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# Introduction

This document provides IPv6 multicast VLAN configuration examples.

## Prerequisites

The configuration examples in this document were created and verified in a lab environment, and all the devices were started with the factory default configuration. When you are working on a live network, make sure you understand the potential impact of every command on your network.

This document assumes that you have basic knowledge of IPv6 multicast VLAN.

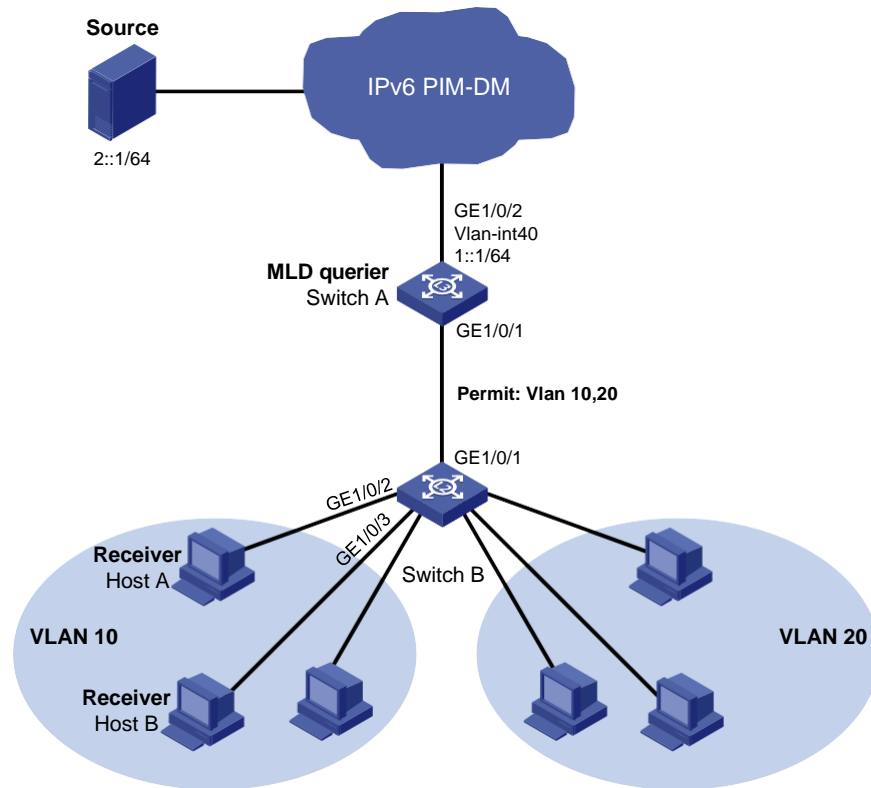
## Example: Configuring sub-VLAN-based IPv6 multicast VLANs

### Network configuration

As shown in [Figure 1](#):

- VLAN 10 and VLAN 20 are Department 1 and Department 2, respectively.
- VLAN-interface 10 and VLAN-interface 20 on Layer 3 device Switch A are the gateways of VLAN 10 and VLAN 20, respectively.
- MLDv1 runs in VLAN 10 on Switch A, and MLDv1 snooping runs in VLAN 10 on Layer 2 device Switch B.
- The source sends IPv6 multicast data to IPv6 multicast group FF1E::101.
- Host A and Host B in VLAN 10 join IPv6 multicast group FF1E::101. They can receive the IPv6 multicast data that the source sends to the group.

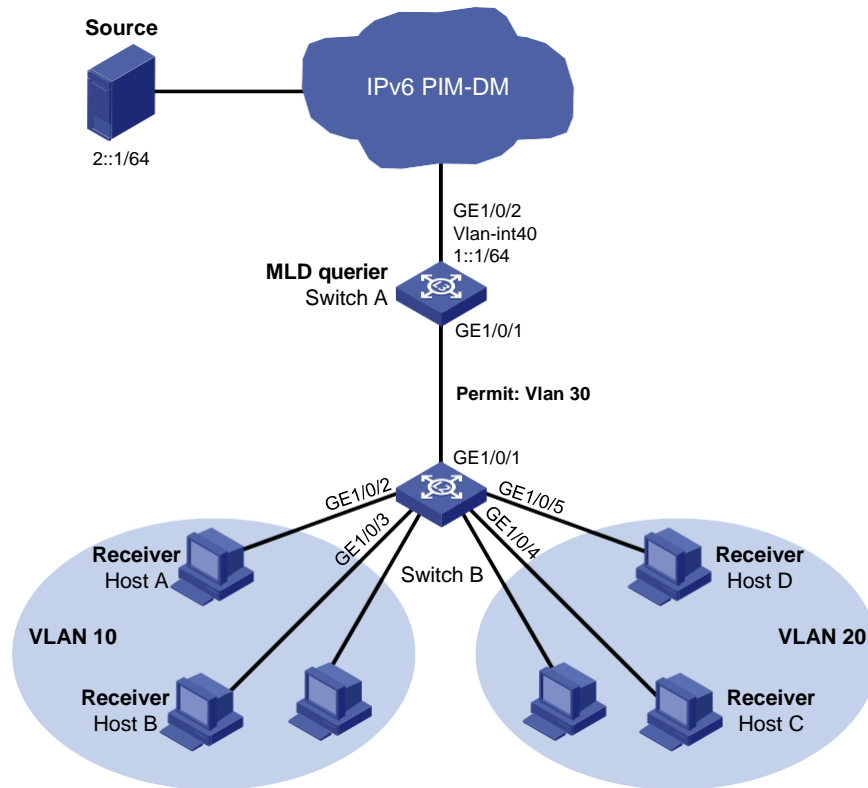
**Figure 1 Network diagram**



Now, Host C and Host D in VLAN 20 also join the group to receive the IPv6 multicast data, as shown in [Figure 2](#). You can enable MLDv1 for VLAN 20 on Switch A and MLDv1 snooping for VLAN 20 on Switch B. In this way, Host C and Host D can receive the data addressed to the group. However, this occupies a large amount of bandwidth and increases the burden on Switch A.

To avoid the problems, you can configure a sub-VLAN-based IPv6 multicast VLAN on Switch B.

**Figure 2 Network diagram**



## Analysis

To meet the network requirements, you must perform the following tasks:

- Create VLAN 30 on Switch A and Switch B, and assign GigabitEthernet 1/0/1 on them to VLAN 30 as tagged VLAN members.
- Create VLAN-interface 30 on Switch A, and enable MLD on the interface.
- Enable MLD snooping for VLAN 10 through VLAN 30 on Switch B.
- Configure VLAN 30 on Switch B as an IPv6 multicast VLAN, and assign VLAN 10 and VLAN 20 to IPv6 multicast VLAN 30 as sub-VLANs.

## Applicable hardware and software versions

The following matrix shows the hardware and software versions to which this configuration example is applicable:

Hardware	Software version
SC 3570 switch series	Release 11xx
SC 5525 switch series	Release 63xx, Release 65xx, Release 6615Pxx, Release 6628Pxx
SC 5520 switch series	Release 63xx, Release 65xx, Release 6615Pxx, Release 6628Pxx
SC 3170 switch series	Release 11xx
SC 3130 switch series	Release 63xx

# Restrictions and guidelines

When you configure sub-VLAN-based IPv6 multicast VLANs, follow these restrictions and guidelines:

- As a best practice, do not configure IPv6 multicast VLANs on the device enabled with IPv6 multicast routing.
- The IPv6 address assigned to the VLAN interface of the IPv6 multicast VLAN must be unique on the user network.

## Procedures

1. Assign IPv6 addresses to VLAN-interface 10 and VLAN-interface 20 on Switch A. (Details not shown.)
2. Configure a unicast routing protocol so that all devices on the network are interoperable at the network layer. (Details not shown.)
3. Configure Switch A:

**# Enable IPv6 multicast routing.**

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

**# Create VLAN 30, configure GigabitEthernet 1/0/1 as a hybrid port, and assign it to VLAN 30 as a tagged VLAN member.**

```
[SwitchA] vlan 30
[SwitchA-vlan30] quit
[SwitchA] interface gigabitethernet 1/0/1
[SwitchA-GigabitEthernet1/0/1] port link-type hybrid
[SwitchA-GigabitEthernet1/0/1] port hybrid vlan 30 tagged
```

**# Create VLAN-interface 30, assign it an IPv6 address, and enable MLD on it.**

```
[SwitchA] interface vlan-interface 30
[SwitchA-Vlan-interface30] ipv6 address 2001::1 64
[SwitchA-Vlan-interface30] mld enable
[SwitchA-Vlan-interface30] quit
```

**# Create VLAN 40, and assign GigabitEthernet 1/0/2 to VLAN 40.**

```
[SwitchA] vlan 40
[SwitchA-vlan40] port gigabitethernet 1/0/2
[SwitchA-vlan40] quit
```

**# Create VLAN-interface 40, assign it an IPv6 address, and enable IPv6 PIM-DM on it.**

```
[SwitchA] interface vlan-interface 40
[SwitchA-Vlan-interface40] ipv6 address 1::1 64
[SwitchA-Vlan-interface40] ipv6 pim dm
[SwitchA-Vlan-interface40] quit
```

#### **4. Configure Switch B:**

**# Enable MLD snooping globally.**

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

**# Create VLAN 10, and enable MLD snooping for VLAN 10.**

```
[SwitchB] vlan 10
[SwitchB-vlan10] mld-snooping enable
[SwitchB-vlan10] quit
```

**# Create VLAN 20, and enable MLD snooping for VLAN 20.**

```
[SwitchB] vlan 20
[SwitchB-vlan20] mld-snooping enable
[SwitchB-vlan20] quit
```

**# Create VLAN 30, and enable MLD snooping for VLAN 30.**

```
[SwitchB] vlan 30
[SwitchB-vlan30] mld-snooping enable
[SwitchB-vlan30] quit
```

**# Configure GigabitEthernet 1/0/1 as a hybrid port, and assign it to VLAN 30 as a tagged VLAN member.**

```
[SwitchB] interface gigabitethernet 1/0/1
[SwitchB-GigabitEthernet1/0/1] port link-type hybrid
[SwitchA-GigabitEthernet1/0/1] port hybrid vlan 30 tagged
```

# Configure VLAN 30 as an IPv6 multicast VLAN, and assign VLAN 10 and VLAN 20 to IPv6 multicast VLAN 30 as sub-VLANs.

```
[SwitchB] ipv6 multicast-vlan 30
[SwitchB-ipv6-mvlan-30] subvlan 10 20
[SwitchB-ipv6-mvlan-30] quit
```

## Verifying the configuration

# Display information about all IPv6 multicast VLANs on Switch B.

```
[SwitchB] display ipv6 multicast-vlan
Total 1 IPv6 multicast VLANs.
```

```
IPv6 multicast VLAN 30:
  Sub-VLAN list(2 in total):
    10,20
  Port list(0 in total):
```

# Display information about multicast groups in IPv6 multicast VLANs on Switch B.

```
[SwitchB] display ipv6 multicast-vlan group
Total 1 entries.
```

```
IPv6 multicast VLAN 30: Total 1 entries.
  (::, FF1E::101)
  Sub-VLANs (2 in total):
    VLAN 10
    VLAN 20
```

The output shows that IPv6 multicast VLAN (VLAN 30) contains sub-VLANs VLAN 10 and VLAN 20. Switch B will forward IPv6 multicast data for VLAN 30 to VLAN 10 and VLAN 20.

## Configuration files

---

### ⚠ IMPORTANT:

Support for the **port link-mode bridge** command depends on the device model.

---

- Switch A:

```
#
vlan 10
#
vlan 20
#
vlan 30
#
vlan 40
#
interface Vlan-interface10
  ipv6 address 2002::1/64
#
interface Vlan-interface20
```

```

    ipv6 address 2003::1/64
#
interface Vlan-interface30
    ipv6 address 2001::1/64
    mld enable
#
interface Vlan-interface40
    ipv6 address 1::1/64
    ipv6 pim dm
#
interface GigabitEthernet1/0/1
    port link-mode bridge
    port link-type hybrid
    port hybrid vlan 30 tagged
    port hybrid vlan 1 untagged
#
interface GigabitEthernet1/0/2
    port link-mode bridge
    port access vlan 40
#
ipv6 multicast routing
#

```

- **Switch B:**

```

#
mld-snooping
#
vlan 10
    mld-snooping enable
#
vlan 20
    mld-snooping enable
#
vlan 30
    mld-snooping enable
#
ipv6 multicast-vlan 30
    subvlan 10 20
#
interface GigabitEthernet1/0/1
    port link-mode bridge
    port link-type hybrid
    port hybrid vlan 30 tagged
    port hybrid vlan 1 untagged
#
interface GigabitEthernet1/0/2
    port link-mode bridge
    port access vlan 10
#

```



```
interface GigabitEthernet1/0/3
port link-mode bridge
port access vlan 10
#
interface GigabitEthernet1/0/4
port link-mode bridge
port access vlan 20
#
interface GigabitEthernet1/0/5
port link-mode bridge
port access vlan 20
#
```

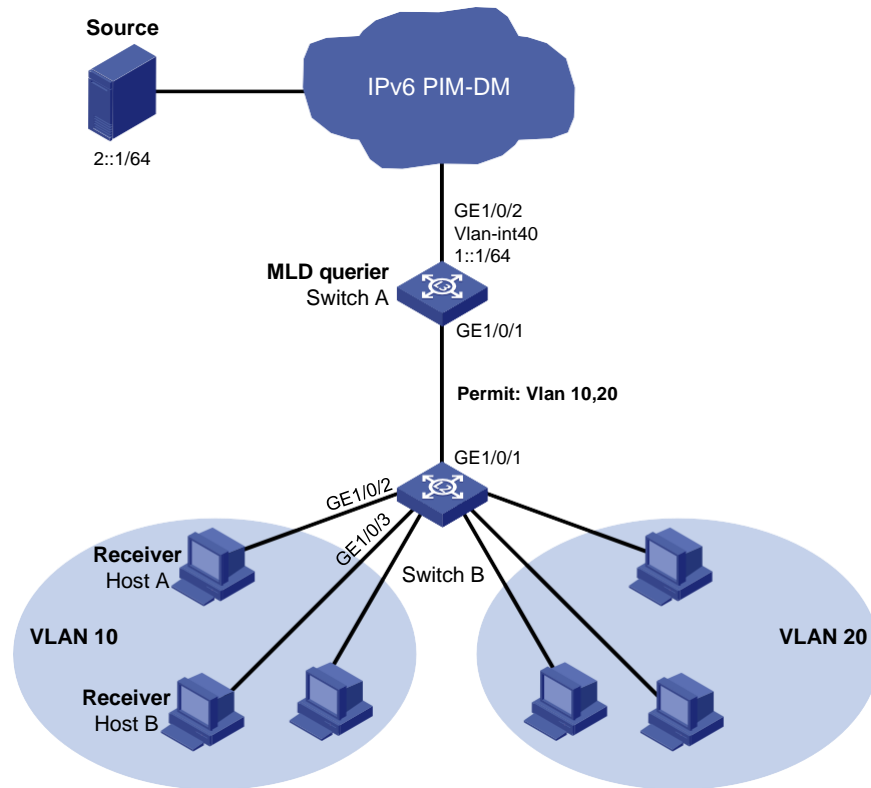
## Example: Configuring port-based IPv6 multicast VLANs

### Network configuration

As shown in [Figure 3](#):

- VLAN 10 and VLAN 20 are Department 1 and Department 2, respectively.
- VLAN-interface 10 and VLAN-interface 20 on Layer 3 device Switch A are the gateways of VLAN 10 and VLAN 20, respectively.
- MLDv1 runs in VLAN 10 on Switch A, and MLDv1 snooping runs in VLAN 10 on Layer 2 device Switch B.
- The source sends IPv6 multicast data to IPv6 multicast group FF1E::101.
- Host A and Host B in VLAN 10 join IPv6 multicast group FF1E::101. They can receive the IPv6 multicast data that the source sends to the group.

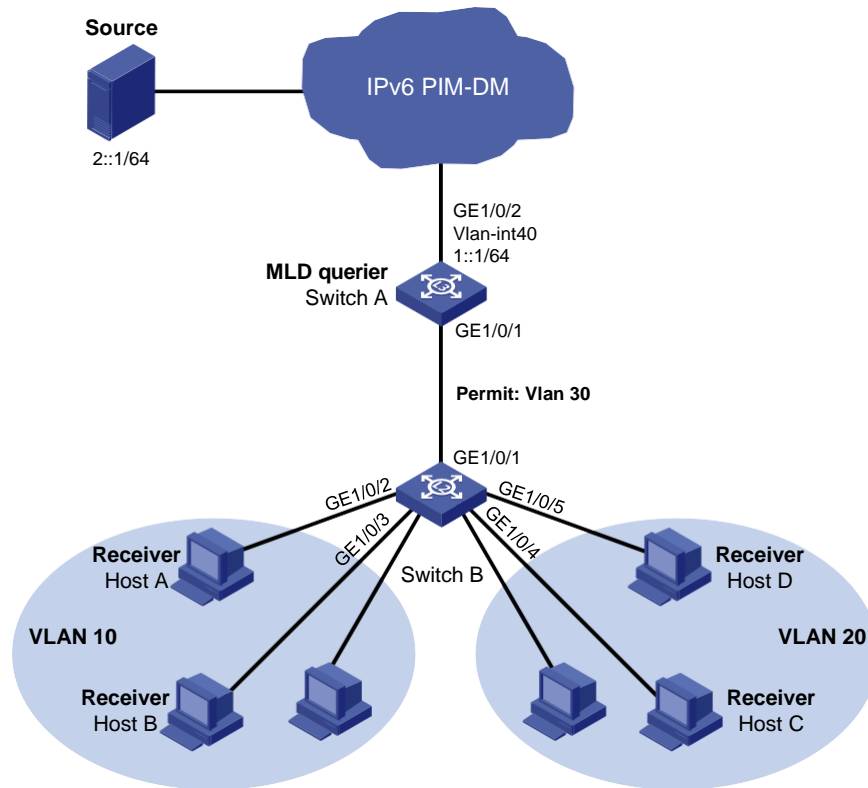
**Figure 3 Network diagram**



Now, Host C and Host D in VLAN 20 also join the group to receive the IPv6 multicast data, as shown in [Figure 4](#). You can enable MLDv1 for VLAN 20 on Switch A and MLDv1 snooping for VLAN 20 on Switch B. In this way, Host C and Host D can receive the data addressed to the group. However, this occupies a large amount of bandwidth and increases the burden on Switch A.

To avoid the problems, you can configure a port-based IPv6 multicast VLAN on Switch B.

**Figure 4 Network diagram**



## Analysis

To meet the network requirements, you must perform the following tasks:

- Create VLAN 30 on Switch A and Switch B, and assign GigabitEthernet 1/0/1 on them to VLAN 30 as tagged VLAN members.
- Create VLAN-interface 30 on Switch A, and enable MLD on the interface.
- On Switch B, configure the ports that have receiver hosts attached as hybrid ports, and assign the ports to their port VLAN IDs and VLAN 30 as untagged VLAN members.
- On Switch B, configure VLAN 30 as an IPv6 multicast VLAN, and assign the ports that have receiver hosts attached to IPv6 multicast VLAN 30.
- Enable MLD snooping for VLAN 10, VLAN 20, and VLAN 30 on Switch B.

## Applicable hardware and software versions

The following matrix shows the hardware and software versions to which this configuration example is applicable:

Hardware	Hardware
SC 3570 switch series	Release 11xx
SC 5525 switch series	Release 63xx, Release 65xx, Release 6615Pxx, Release 6628Pxx

SC 5520 switch series	Release 63xx, Release 65xx, Release 6615Pxx, Release 6628Pxx
SC 3170 switch series	Release 11xx
SC 3130 switch series	Release 63xx

## Restrictions and guidelines

When you configure port-based IPv6 multicast VLANs, follow these restrictions and guidelines:

- As a best practice, do not configure IPv6 multicast VLANs on a device enabled with IPv6 multicast routing.
- A port can belong to only one IPv6 multicast VLAN.
- The IPv6 address assigned to the VLAN interface of the IPv6 multicast VLAN must be unique on the user network.

## Procedures

1. Assign IPv6 addresses to VLAN-interface 10 and VLAN-interface 20 on Switch A. (Details not shown.)

2. Configure a unicast routing protocol so that all devices on the network are interoperable at the network layer. (Details not shown.)

3. Configure Switch A:

**# Enable IPv6 multicast routing.**

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

**# Create VLAN 30, configure GigabitEthernet 1/0/1 as a hybrid port, and assign it to VLAN 30 as a tagged VLAN member.**

```
[SwitchA] vlan 30
[SwitchA-vlan30] quit
[SwitchA] interface gigabitethernet 1/0/1
[SwitchA-GigabitEthernet1/0/1] port link-type hybrid
[SwitchA-GigabitEthernet1/0/1] port hybrid vlan 30 tagged
```

**# Create VLAN-interface 30, assign it an IPv6 address, and enable MLD on it.**

```
[SwitchA] interface vlan-interface 30
[SwitchA-Vlan-interface30] ipv6 address 2001::1 64
[SwitchA-Vlan-interface30] mld enable
[SwitchA-Vlan-interface30] quit
```

**# Create VLAN 40, and assign GigabitEthernet 1/0/2 to VLAN 40.**

```
[SwitchA] vlan 40
[SwitchA-vlan40] port gigabitethernet 1/0/2
[SwitchA-vlan40] quit
```

**# Create VLAN-interface 40, assign it an IPv6 address, and enable IPv6 PIM-DM on it.**

```
[SwitchA] interface vlan-interface 40
[SwitchA-Vlan-interface40] ipv6 address 1::1 64
[SwitchA-Vlan-interface40] ipv6 pim dm
[SwitchA-Vlan-interface40] quit
```

4. Configure Switch B:

**# Enable MLD snooping globally.**

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

**# Create VLAN 10, and enable MLD snooping for VLAN 10.**

```
[SwitchB] vlan 10
[SwitchB-vlan10] mld-snooping enable
[SwitchB-vlan10] quit
```

**# Create VLAN 20, and enable MLD snooping for VLAN 20.**

```
[SwitchB] vlan 20
[SwitchB-vlan20] mld-snooping enable
[SwitchB-vlan20] quit
```

**# Create VLAN 30, and enable MLD snooping for VLAN 30.**

```
[SwitchB] vlan 30
[SwitchB-vlan30] mld-snooping enable
[SwitchB-vlan30] quit
```

**# Configure GigabitEthernet 1/0/1 as a hybrid port, and assign it to VLAN 30 as a tagged VLAN member.**

```
[SwitchB] interface gigabitethernet 1/0/1
```

```
[SwitchB-GigabitEthernet1/0/1] port link-type hybrid
[SwitchA-GigabitEthernet1/0/1] port hybrid vlan 30 tagged
# Configure GigabitEthernet 1/0/2 as a hybrid port.
[SwitchB] interface gigabitethernet 1/0/2
[SwitchB-GigabitEthernet1/0/2] port link-type hybrid
# Set the PVID of GigabitEthernet 1/0/2 to VLAN 10, and assign the port to VLAN 10 and VLAN 30 as an untagged VLAN member.
[SwitchB-GigabitEthernet1/0/2] port hybrid pvid vlan 10
[SwitchB-GigabitEthernet1/0/2] port hybrid vlan 10 30 untagged
[SwitchB-GigabitEthernet1/0/2] quit
# Configure GigabitEthernet 1/0/3 as a hybrid port.
[SwitchB] interface gigabitethernet 1/0/3
[SwitchB-GigabitEthernet1/0/3] port link-type hybrid
# Set the PVID of GigabitEthernet 1/0/3 to VLAN 10, and assign the port to VLAN 10 and VLAN 30 as an untagged VLAN member.
[SwitchB-GigabitEthernet1/0/3] port hybrid pvid vlan 10
[SwitchB-GigabitEthernet1/0/3] port hybrid vlan 10 30 untagged
[SwitchB-GigabitEthernet1/0/3] quit
# Configure GigabitEthernet 1/0/4 as a hybrid port.
[SwitchB] interface gigabitethernet 1/0/4
[SwitchB-GigabitEthernet1/0/4] port link-type hybrid
# Set the PVID of GigabitEthernet 1/0/4 to VLAN 20, and assign the port to VLAN 20 and VLAN 30 as an untagged VLAN member.
[SwitchB-GigabitEthernet1/0/4] port hybrid pvid vlan 20
[SwitchB-GigabitEthernet1/0/4] port hybrid vlan 20 30 untagged
[SwitchB-GigabitEthernet1/0/4] quit
# Configure GigabitEthernet 1/0/5 as a hybrid port.
[SwitchB] interface gigabitethernet 1/0/5
[SwitchB-GigabitEthernet1/0/5] port link-type hybrid
# Set the PVID of GigabitEthernet 1/0/5 to VLAN 20, and assign the port to VLAN 20 and VLAN 30 as an untagged VLAN member
[SwitchB-GigabitEthernet1/0/5] port hybrid pvid vlan 20
[SwitchB-GigabitEthernet1/0/5] port hybrid vlan 20 30 untagged
[SwitchB-GigabitEthernet1/0/5] quit
5. Configure VLAN 30 as an IPv6 multicast VLAN, and assign GigabitEthernet 1/0/1 through GigabitEthernet 1/0/5 to IPv6 multicast VLAN 30.
[SwitchB] ipv6 multicast-vlan 30
[SwitchB-ipv6-mvlan-30] port gigabitethernet 1/0/2 to gigabitethernet 1/0/5
[SwitchB-ipv6-mvlan-30] quit
```

## Verifying the configuration

**# Display information about IPv6 multicast VLANs on Switch B.**

```
[SwitchB] display ipv6 multicast-vlan
Total 1 IPv6 multicast VLANs.
```

```
IPv6 multicast VLAN 30:
```

```
Sub-VLAN list(0 in total):
```

```

Port list(4 in total):
    GE1/0/2
    GE1/0/3
    GE1/0/4
    GE1/0/5

# Display information about dynamic MLD snooping group entries.
[SwitchB] display mld-snooping group
Total 1 entries.

VLAN 30: Total 1 entries.
(::, FF1E::101)
Host ports (4 in total):
    GE1/0/2                (00:03:23)
    GE1/0/3                (00:04:07)
    GE1/0/4                (00:04:16)
    GE1/0/5                (00:05:10)

```

The output shows that MLD snooping maintains the user ports in the multicast VLAN (VLAN 30). Switch B will forward the IPv6 multicast data of VLAN 10 through these user ports.

## Configuration files



### IMPORTANT:

Support for the **port link-mode bridge** command depends on the device model.

- Switch A:
 

```

#
vlan 10
#
vlan 20
#
vlan 30
#
vlan 40
#
ipv6 multicast-vlan 30
#
interface Vlan-interface10
    ipv6 address 2002::1/64
#
interface Vlan-interface20
    ipv6 address 2003::1/64
#
interface Vlan-interface30
    ipv6 address 2001::1/64
    mld enable
#
interface Vlan-interface40
    ipv6 address 1::1/64

```

```

    ipv6 pim dm
#
interface GigabitEthernet1/0/1
    port link-mode bridge
    port link-type hybrid
    port hybrid vlan 30 tagged
    port hybrid vlan 1 untagged
#
interface GigabitEthernet1/0/2
    port link-mode bridge
    port access vlan 40
#
ipv6 multicast routing
#
• Switch B:
#
mld-snooping
#
vlan 10
    mld-snooping enable
#
vlan 20
    mld-snooping enable
#
vlan 30
    mld-snooping enable
#
ipv6 multicast-vlan 30
#
interface GigabitEthernet1/0/1
    port link-mode bridge
    port link-type hybrid
    port hybrid vlan 30 tagged
    port hybrid vlan 1 untagged
#
interface GigabitEthernet1/0/2
    port link-mode bridge
    port link-type hybrid
    port hybrid vlan 10 30 untagged
    port hybrid pvid vlan 10
    ipv6 port multicast-vlan 30
#
interface GigabitEthernet1/0/3
    port link-mode bridge
    port link-type hybrid
    port hybrid vlan 10 30 untagged
    port hybrid pvid vlan 10
    ipv6 port multicast-vlan 30

```



```
#
interface GigabitEthernet1/0/4
port link-mode bridge
port link-type hybrid
port hybrid vlan 20 30 untagged
port hybrid pvid vlan 20
ipv6 port multicast-vlan 30
#
interface GigabitEthernet1/0/5
port link-mode bridge
port link-type hybrid
port hybrid vlan 20 30 untagged
port hybrid pvid vlan 20
ipv6 port multicast-vlan 30
#
```