

Configuring the private VLAN

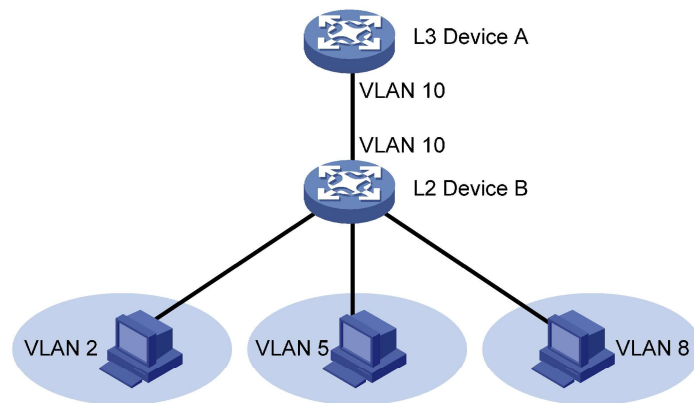
VLAN technology provides a method for isolating traffic from customers. At the access layer of a network, customer traffic must be isolated for security or accounting purposes. If VLANs are assigned on a per-user basis, a large number of VLANs will be required.

The private VLAN feature saves VLAN resources. It uses a two-tier VLAN structure as follows:

- **Primary VLAN**—Used for connecting the upstream device. A primary VLAN can be associated with multiple secondary VLANs. The upstream device identifies only the primary VLAN.
- **Secondary VLANs**—Used for connecting users. Secondary VLANs are isolated at Layer 2. To implement Layer 3 communication between secondary VLANs associated with the primary VLAN, enable local proxy ARP or ND on the upstream device (for example, L3 Device A in Figure 56).

As shown in Figure 56, the private VLAN feature is enabled on L2 Device B. VLAN 10 is the primary VLAN. VLANs 2, 5, and 8 are secondary VLANs that are associated with VLAN 10. L3 Device A is only aware of VLAN 10.

Figure 56 Private VLAN example



If the private VLAN feature is configured on a Layer 3 device, use one of the following methods on the Layer 3 device to enable Layer 3 communication. Layer 3 communication might be required between secondary VLANs that are associated with the same primary VLAN, or between secondary VLANs and other networks.

- Method 1:
 - a. Create VLAN interfaces for the secondary VLANs.
 - b. Assign IP addresses to the secondary VLAN interfaces.
- Method 2:
 - a. Enable Layer 3 communication between the secondary VLANs that are associated with the primary VLAN.
 - b. Create the VLAN interface for the primary VLAN and assign an IP address to it. (Do not create secondary VLAN interfaces if you use this method.)
 - c. Enable local proxy ARP or ND on the primary VLAN interface.

Configuration task list

To configure the private VLAN feature, perform the following tasks:

1. Configure the primary VLAN.
2. Configure the secondary VLANs.

3. Associate the secondary VLANs with the primary VLAN.
 4. Configure the uplink and downlink ports:
 - Configure the uplink port (for example, the port connecting L2 Device B to L3 Device A in [Figure 56](#)):
 - When the port allows only one primary VLAN, configure the port as a promiscuous port of the primary VLAN. The promiscuous port can be automatically assigned to the primary VLAN and its associated secondary VLANs.
 - When the port allows multiple primary VLANs, configure the port as a trunk promiscuous port of the primary VLANs. The trunk promiscuous port can be automatically assigned to the primary VLANs and their associated secondary VLANs.
 - Configure a downlink port (for example, the port connecting L2 Device B to a host in [Figure 56](#)) as a host port. The host port can be automatically assigned to the secondary VLAN and its associated primary VLAN.
 - If a downlink port allows multiple secondary VLANs, configure the port as a trunk secondary port. The trunk secondary port can be automatically assigned to the secondary VLANs and their associated primary VLANs.
- For more information about promiscuous, trunk promiscuous, host, and trunk secondary ports, see *Layer 2—LAN Switching Command Reference*.
5. Configure Layer 3 communication between the specified secondary VLANs that are associated with the primary VLAN.

Configuration restrictions and guidelines

When you configure the private VLAN feature, follow these restrictions and guidelines:

- Make sure the following requirements are met:
 - For a promiscuous port:
 - The primary VLAN is the PVID of the port.
 - The port is an untagged member of the primary VLAN and secondary VLANs.
 - For a host port:
 - The PVID of the port is a secondary VLAN.
 - The port is an untagged member of the primary VLAN and the secondary VLAN.
 - A trunk promiscuous or trunk secondary port must be a tagged member of the primary VLANs and the secondary VLANs.
- VLAN 1 (system default VLAN) does not support the private VLAN configuration.

Configuration procedure

To configure the private VLAN feature:

Step	Command	Remarks
1. Enter system view.	system-view	N/A
2. Create a VLAN and enter VLAN view.	vlan <i>vlan-id</i>	N/A
3. Configure the VLAN as a primary VLAN.	private-vlan primary	By default, a VLAN is not a primary VLAN.
4. Return to system view.	quit	N/A
5. Create one or multiple	vlan { <i>vlan-id1</i> [to <i>vlan-id2</i>] all }	N/A

Step	Command	Remarks
secondary VLANs.		
6. Return to system view.	quit	N/A
7. Enter VLAN view of the primary VLAN.	vlan <i>vlan-id</i>	N/A
8. Associate the primary VLAN with the secondary VLANs.	private-vlan secondary <i>vlan-id-list</i>	By default, a primary VLAN is not associated with any secondary VLANs.
9. Return to system view.	quit	N/A
10. Enter interface view of the uplink port.	interface <i>interface-type</i> <i>interface-number</i>	N/A
11. Configure the uplink port as a promiscuous or trunk promiscuous port of the specified VLANs.	<ul style="list-style-type: none"> Configure the uplink port as a promiscuous port of the specified VLAN: port private-vlan <i>vlan-id</i> promiscuous Configure the uplink port as a trunk promiscuous port of the specified VLANs: port private-vlan <i>vlan-id-list</i> trunk promiscuous 	By default, a port is not a promiscuous or trunk promiscuous port of any VLANs.
12. Return to system view.	quit	N/A
13. Enter interface view of the downlink port.	interface <i>interface-type</i> <i>interface-number</i>	N/A
14. Assign the downlink port to secondary VLANs.	<p>a Set the link type of the port: port link-type { access hybrid trunk }</p> <p>b Assign the access port to the specified VLAN: port access vlan <i>vlan-id</i></p> <p>c Assign the trunk port to the specified VLANs: port trunk permit vlan { <i>vlan-id-list</i> all }</p> <p>d Assign the hybrid port to the specified VLANs: port hybrid vlan <i>vlan-id-list</i> { tagged untagged }</p>	Select substep b, c, or d depending on the port link type.
15. Configure the downlink port as a host or trunk secondary port.	<ul style="list-style-type: none"> Configure the downlink port as a host port: port private-vlan host Configure the downlink port as a trunk secondary port of the specified VLANs: port private-vlan <i>vlan-id-list</i> trunk secondary 	By default, a port is not a host or trunk secondary port.
16. Return to system view.	quit	N/A
17. Enter VLAN view of a secondary VLAN.	vlan <i>vlan-id</i>	N/A
18. (Optional.) Enable Layer 2 communication for ports in the same secondary VLAN.	<ul style="list-style-type: none"> undo private-vlan isolated private-vlan community 	By default, ports in the same secondary VLAN can communicate with each other at Layer 2.
19. Return to system view.	quit	N/A

Step	Command	Remarks
20. (Optional.) Configure Layer 3 communication between the specified secondary VLANs.	<p>a Enter VLAN interface view of the primary VLAN interface: interface vlan-interface <i>interface-number</i></p> <p>b Enable Layer 3 communication between secondary VLANs that are associated with the primary VLAN: private-vlan secondary <i>vlan-id-list</i></p> <p>c Assign an IPv4 address to the primary VLAN interface: ip address <i>ip-address</i> { <i>mask-length</i> <i>mask</i> } [sub]</p> <p>d Assign an IPv6 address to the primary VLAN interface: ipv6 address { <i>ipv6-address</i> <i>prefix-length</i> <i>ipv6-address/prefix-length</i> }</p> <p>e Enable local proxy ARP: local-proxy-arp enable</p> <p>f Enable local proxy ND: local-proxy-nd enable</p>	<p>Use substeps a, b, c, and e for devices that run IPv4 protocols.</p> <p>Use substeps a, b, d, and f for devices that run IPv6 protocols.</p> <p>By default:</p> <ul style="list-style-type: none"> Secondary VLANs cannot communicate with each other at Layer 3. No IP address is configured for a VLAN interface. Local proxy ARP and ND are disabled. <p>For more information about local proxy ARP and ND, see <i>Layer 3—IP Services Configuration Guide</i>. For more information about the local-proxy-arp enable and local-proxy-nd enable commands, see <i>Layer 3—IP Services Command Reference</i>.</p>

Displaying and maintaining the private VLAN

Execute **display** commands in any view.

Task	Command
Display information about primary VLANs and the secondary VLANs associated with each primary VLAN.	display private-vlan [<i>primary-vlan-id</i>]

Private VLAN configuration examples

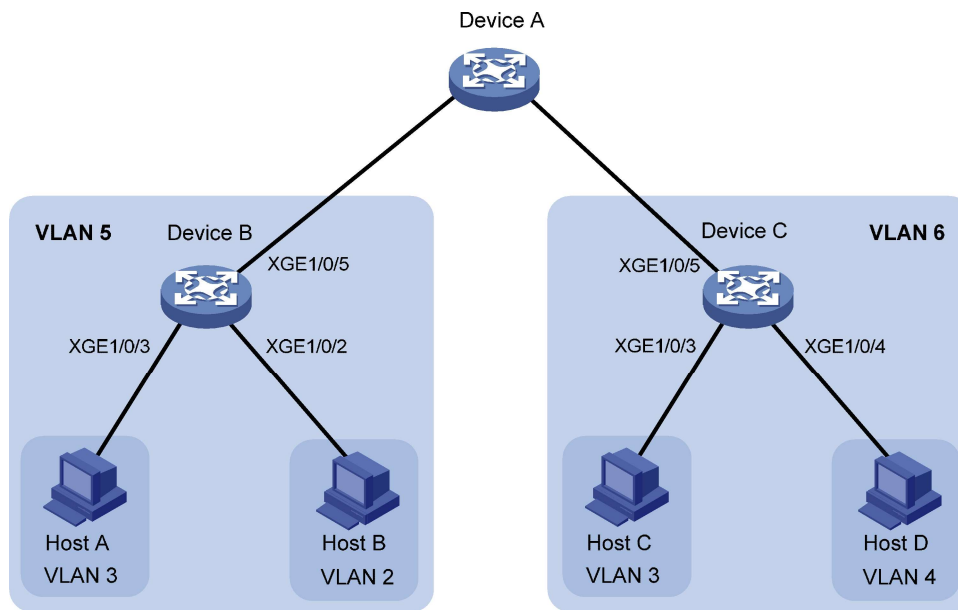
Promiscuous port configuration example

Network requirements

As shown in [Figure 57](#), configure the private VLAN feature to meet the following requirements:

- On Device B, VLAN 5 is a primary VLAN that is associated with secondary VLANs 2 and 3. Ten-GigabitEthernet 1/0/5 is in VLAN 5. Ten-GigabitEthernet 1/0/2 is in VLAN 2. Ten-GigabitEthernet 1/0/3 is in VLAN 3.
- On Device C, VLAN 6 is a primary VLAN that is associated with secondary VLANs 3 and 4. Ten-GigabitEthernet 1/0/5 is in VLAN 6. Ten-GigabitEthernet 1/0/3 is in VLAN 3. Ten-GigabitEthernet 1/0/4 is in VLAN 4.
- Device A is aware of only VLAN 5 on Device B and VLAN 6 on Device C.

Figure 57 Network diagram



Configuration procedure

This example describes the configurations on Device B and Device C.

1. Configure Device B:

Configure VLAN 5 as a primary VLAN.

```
<DeviceB> system-view
[DeviceB] vlan 5
[DeviceB-vlan5] private-vlan primary
[DeviceB-vlan5] quit
```

Create VLANs 2 and 3.

```
[DeviceB] vlan 2 to 3
```

Associate secondary VLANs 2 and 3 with primary VLAN 5.

```
[DeviceB] vlan 5
[DeviceB-vlan5] private-vlan secondary 2 to 3
[DeviceB-vlan5] quit
```

Configure the uplink port (Ten-GigabitEthernet 1/0/5) as a promiscuous port of VLAN 5.

```
[DeviceB] interface ten-gigabitethernet 1/0/5
[DeviceB-Ten-GigabitEthernet1/0/5] port private-vlan 5 promiscuous
[DeviceB-Ten-GigabitEthernet1/0/5] quit
```

Assign downlink port Ten-GigabitEthernet 1/0/2 to VLAN 2, and configure the port as a host port.

```
[DeviceB] interface ten-gigabitethernet 1/0/2
[DeviceB-Ten-GigabitEthernet1/0/2] port access vlan 2
[DeviceB-Ten-GigabitEthernet1/0/2] port private-vlan host
[DeviceB-Ten-GigabitEthernet1/0/2] quit
```

Assign downlink port Ten-GigabitEthernet 1/0/3 to VLAN 3, and configure the port as a host port.

```
[DeviceB] interface ten-gigabitethernet 1/0/3
[DeviceB-Ten-GigabitEthernet1/0/3] port access vlan 3
[DeviceB-Ten-GigabitEthernet1/0/3] port private-vlan host
```

```
[DeviceB-Ten-GigabitEthernet1/0/3] quit
```

2. Configure Device C:

Configure VLAN 6 as a primary VLAN.

```
<DeviceC> system-view
[DeviceC] vlan 6
[DeviceC-vlan6] private-vlan primary
[DeviceC-vlan6] quit
```

Create VLANs 3 and 4.

```
[DeviceC] vlan 3 to 4
```

Associate secondary VLANs 3 and 4 with primary VLAN 6.

```
[DeviceC] vlan 6
[DeviceC-vlan6] private-vlan secondary 3 to 4
[DeviceC-vlan6] quit
```

Configure the uplink port (Ten-GigabitEthernet 1/0/5) as a promiscuous port of VLAN 6.

```
[DeviceC] interface ten-gigabitethernet 1/0/5
[DeviceC-Ten-GigabitEthernet1/0/5] port private-vlan 6 promiscuous
[DeviceC-Ten-GigabitEthernet1/0/5] quit
```

Assign downlink port Ten-GigabitEthernet 1/0/3 to VLAN 3, and configure the port as a host port.

```
[DeviceC] interface ten-gigabitethernet 1/0/3
[DeviceC-Ten-GigabitEthernet1/0/3] port access vlan 3
[DeviceC-Ten-GigabitEthernet1/0/3] port private-vlan host
[DeviceC-Ten-GigabitEthernet1/0/3] quit
```

Assign downlink port Ten-GigabitEthernet 1/0/4 to VLAN 4, and configure the port as a host port.

```
[DeviceC] interface ten-gigabitethernet 1/0/4
[DeviceC-Ten-GigabitEthernet1/0/4] port access vlan 4
[DeviceC-Ten-GigabitEthernet1/0/4] port private-vlan host
[DeviceC-Ten-GigabitEthernet1/0/4] quit
```

Verifying the configuration

Verify the private VLAN configurations on the devices, for example, on Device B.

```
[DeviceB] display private-vlan
Primary VLAN ID: 5
Secondary VLAN ID: 2-3

VLAN ID: 5
VLAN type: Static
Private VLAN type: Primary
Route interface: Not configured
Description: VLAN 0005
Name: VLAN 0005
Tagged ports: None
Untagged ports:
Ten-GigabitEthernet1/0/2
Ten-GigabitEthernet1/0/3
Ten-GigabitEthernet1/0/5
```

```
VLAN ID: 2
VLAN type: Static
Private VLAN type: Secondary
Route interface: Not configured
Description: VLAN 0002
Name: VLAN 0002
Tagged ports: None
Untagged ports:
  Ten-GigabitEthernet1/0/2
  Ten-GigabitEthernet1/0/5
```

```
VLAN ID: 3
VLAN type: Static
Private VLAN type: Secondary
Route interface: Not configured
Description: VLAN 0003
Name: VLAN 0003
Tagged Ports: None
Untagged Ports:
  Ten-GigabitEthernet1/0/3
  Ten-GigabitEthernet1/0/5
```

The output shows that:

- The promiscuous port (Ten-GigabitEthernet 1/0/5) is an untagged member of primary VLAN 5 and secondary VLANs 2 and 3.
- Host port Ten-GigabitEthernet 1/0/2 is an untagged member of primary VLAN 5 and secondary VLAN 2.
- Host port Ten-GigabitEthernet 1/0/3 is an untagged member of primary VLAN 5 and secondary VLAN 3.

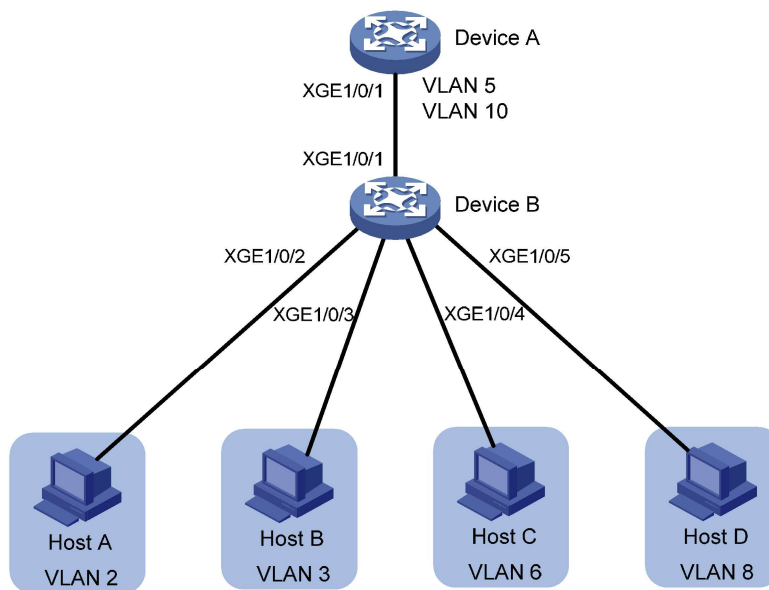
Trunk promiscuous port configuration example

Network requirements

As shown in [Figure 58](#), configure the private VLAN feature to meet the following requirements:

- VLANs 5 and 10 are primary VLANs on Device B. The uplink port (Ten-GigabitEthernet 1/0/1) on Device B permits the packets from VLANs 5 and 10 to pass through tagged.
- On Device B, downlink port Ten-GigabitEthernet 1/0/2 permits secondary VLAN 2. Downlink port Ten-GigabitEthernet 1/0/3 permits secondary VLAN 3. Secondary VLANs 2 and 3 are associated with primary VLAN 5.
- On Device B, downlink port Ten-GigabitEthernet 1/0/4 permits secondary VLAN 6. Downlink port Ten-GigabitEthernet 1/0/5 permits secondary VLAN 8. Secondary VLANs 6 and 8 are associated with primary VLAN 10.
- Device A is aware of only VLANs 5 and 10 on Device B.

Figure 58 Network diagram



Configuration procedure

1. Configure Device B:

Configure VLANs 5 and 10 as primary VLANs.

```
<DeviceB> system-view
[DeviceB] vlan 5
[DeviceB-vlan5] private-vlan primary
[DeviceB-vlan5] quit
[DeviceB] vlan 10
[DeviceB-vlan10] private-vlan primary
[DeviceB-vlan10] quit
```

Create VLANs 2, 3, 6, and 8.

```
[DeviceB] vlan 2 to 3
[DeviceB] vlan 6
[DeviceB-vlan6] quit
[DeviceB] vlan 8
[DeviceB-vlan8] quit
```

Associate secondary VLANs 2 and 3 with primary VLAN 5.

```
[DeviceB] vlan 5
[DeviceB-vlan5] private-vlan secondary 2 to 3
[DeviceB-vlan5] quit
```

Associate secondary VLANs 6 and 8 with primary VLAN 10.

```
[DeviceB] vlan 10
[DeviceB-vlan10] private-vlan secondary 6 8
[DeviceB-vlan10] quit
```

Configure the uplink port (Ten-GigabitEthernet 1/0/1) as a trunk promiscuous port of VLANs 5 and 10.

```
[DeviceB] interface ten-gigabitethernet 1/0/1
[DeviceB-Ten-GigabitEthernet1/0/1] port private-vlan 5 10 trunk promiscuous
[DeviceB-Ten-GigabitEthernet1/0/1] quit
```


Assign downlink port Ten-GigabitEthernet 1/0/2 to VLAN 2, and configure the port as a host port.

```
[DeviceB] interface ten-gigabitethernet 1/0/2
[DeviceB-Ten-GigabitEthernet1/0/2] port access vlan 2
[DeviceB-Ten-GigabitEthernet1/0/2] port private-vlan host
[DeviceB-Ten-GigabitEthernet1/0/2] quit
```

Assign downlink port Ten-GigabitEthernet 1/0/3 to VLAN 3, and configure the port as a host port.

```
[DeviceB] interface ten-gigabitethernet 1/0/3
[DeviceB-Ten-GigabitEthernet1/0/3] port access vlan 3
[DeviceB-Ten-GigabitEthernet1/0/3] port private-vlan host
[DeviceB-Ten-GigabitEthernet1/0/3] quit
```

Assign downlink port Ten-GigabitEthernet 1/0/4 to VLAN 6, and configure the port as a host port.

```
[DeviceB] interface ten-gigabitethernet 1/0/4
[DeviceB-Ten-GigabitEthernet1/0/4] port access vlan 6
[DeviceB-Ten-GigabitEthernet1/0/4] port private-vlan host
[DeviceB-Ten-GigabitEthernet1/0/4] quit
```

Assign downlink port Ten-GigabitEthernet 1/0/5 to VLAN 8, and configure the port as a host port.

```
[DeviceB] interface ten-gigabitethernet 1/0/5
[DeviceB-Ten-GigabitEthernet1/0/5] port access vlan 8
[DeviceB-Ten-GigabitEthernet1/0/5] port private-vlan host
[DeviceB-Ten-GigabitEthernet1/0/5] quit
```

2. Configure Device A:

Create VLANs 5 and 10.

```
[DeviceA] vlan 5
[DeviceA-vlan5] quit
[DeviceA] vlan 10
[DeviceA-vlan10] quit
```

Configure Ten-GigabitEthernet 1/0/1 as a hybrid port, and assign it to VLANs 5 and 10 as a tagged VLAN member.

```
[DeviceA] interface ten-gigabitethernet 1/0/1
[DeviceA-Ten-GigabitEthernet1/0/1] port link-type hybrid
[DeviceA-Ten-GigabitEthernet1/0/1] port hybrid vlan 5 10 tagged
[DeviceA-Ten-GigabitEthernet1/0/1] quit
```

Verifying the configuration

Verify the primary VLAN configurations on Device B. The following output uses primary VLAN 5 as an example.

```
[DeviceB] display private-vlan 5
Primary VLAN ID: 5
Secondary VLAN ID: 2-3
```

```
VLAN ID: 5
VLAN type: Static
Private VLAN type: Primary
Route interface: Not configured
Description: VLAN 0005
```

```

Name: VLAN 0005
Tagged ports:
  Ten-GigabitEthernet1/0/1
Untagged ports:
  Ten-GigabitEthernet1/0/2
  Ten-GigabitEthernet1/0/3

VLAN ID: 2
VLAN type: Static
Private VLAN type: Secondary
Route interface: Not configured
Description: VLAN 0002
Name: VLAN 0002
Tagged ports:
  Ten-GigabitEthernet1/0/1
Untagged ports:
  Ten-GigabitEthernet1/0/2

```

```

VLAN ID: 3
VLAN type: Static
Private VLAN type: Secondary
Route interface: Not configured
Description: VLAN 0003
Name: VLAN 0003
Tagged ports:
  Ten-GigabitEthernet1/0/1
Untagged ports:
  Ten-GigabitEthernet1/0/3

```

The output shows that:

- The trunk promiscuous port (Ten-GigabitEthernet 1/0/1) is a tagged member of primary VLAN 5 and secondary VLANs 2 and 3.
- Host port Ten-GigabitEthernet 1/0/2 is an untagged member of primary VLAN 5 and secondary VLAN 2.
- Host port Ten-GigabitEthernet 1/0/3 is an untagged member of primary VLAN 5 and secondary VLAN 3.

Trunk promiscuous and trunk secondary port configuration example

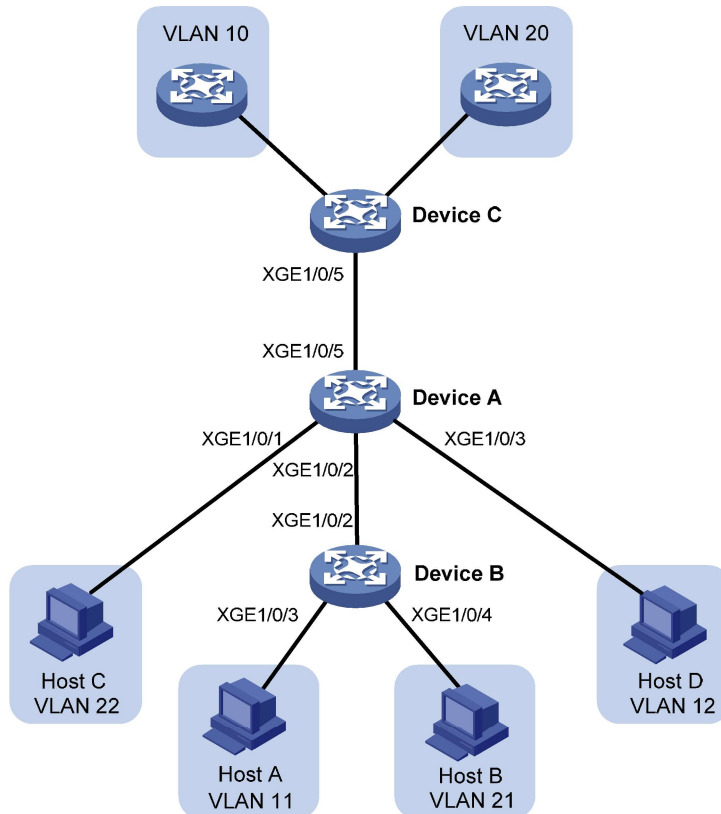
Network requirements

As shown in [Figure 59](#), configure the private VLAN feature to meet the following requirements:

- VLANs 10 and 20 are primary VLANs on Device A. The uplink port (Ten-GigabitEthernet 1/0/5) on Device A permits the packets from VLANs 10 and 20 to pass through tagged.
- VLANs 11, 12, 21, and 22 are secondary VLANs on Device A.
 - Downlink port Ten-GigabitEthernet 1/0/2 permits the packets from secondary VLANs 11 and 21 to pass through tagged.
 - Downlink port Ten-GigabitEthernet 1/0/1 permits secondary VLAN 22.

- Downlink port Ten-GigabitEthernet 1/0/3 permits secondary VLAN 12.
- Secondary VLANs 11 and 12 are associated with primary VLAN 10.
- Secondary VLANs 21 and 22 are associated with primary VLAN 20.

Figure 59 Network diagram



Configuration procedure

1. Configure Device A:

Configure VLANs 10 and 20 as primary VLANs.

```

<DeviceA> system-view
[DeviceA] vlan 10
[DeviceA-vlan10] private-vlan primary
[DeviceA-vlan10] quit
[DeviceA] vlan 20
[DeviceA-vlan20] private-vlan primary
[DeviceA-vlan20] quit
  
```

Create VLANs 11, 12, 21, and 22.

```

[DeviceA] vlan 11 to 12
[DeviceA] vlan 21 to 22
  
```

Associate secondary VLANs 11 and 12 with primary VLAN 10.

```

[DeviceA] vlan 10
[DeviceA-vlan10] private-vlan secondary 11 12
[DeviceA-vlan10] quit
  
```

Associate secondary VLANs 21 and 22 with primary VLAN 20.

```

[DeviceA] vlan 20
[DeviceA-vlan20] private-vlan secondary 21 22
  
```

```
[DeviceA-vlan20] quit
```

Configure the uplink port (Ten-GigabitEthernet 1/0/5) as a trunk promiscuous port of VLANs 10 and 20.

```
[DeviceA] interface ten-gigabitethernet 1/0/5
```

```
[DeviceA-Ten-GigabitEthernet1/0/5] port private-vlan 10 20 trunk promiscuous
```

```
[DeviceA-Ten-GigabitEthernet1/0/5] quit
```

Assign downlink port Ten-GigabitEthernet 1/0/1 to VLAN 22 and configure the port as a host port.

```
[DeviceA] interface ten-gigabitethernet 1/0/1
```

```
[DeviceA-Ten-GigabitEthernet1/0/1] port access vlan 22
```

```
[DeviceA-Ten-GigabitEthernet1/0/1] port private-vlan host
```

```
[DeviceA-Ten-GigabitEthernet1/0/1] quit
```

Assign downlink port Ten-GigabitEthernet 1/0/3 to VLAN 12 and configure the port as a host port.

```
[DeviceA] interface ten-gigabitethernet 1/0/3
```

```
[DeviceA-Ten-GigabitEthernet1/0/3] port access vlan 12
```

```
[DeviceA-Ten-GigabitEthernet1/0/3] port private-vlan host
```

```
[DeviceA-Ten-GigabitEthernet1/0/3] quit
```

Configure downlink port Ten-GigabitEthernet 1/0/2 as a trunk secondary port of VLANs 11 and 21.

```
[DeviceA] interface ten-gigabitethernet 1/0/2
```

```
[DeviceA-Ten-GigabitEthernet1/0/2] port private-vlan 11 21 trunk secondary
```

```
[DeviceA-Ten-GigabitEthernet1/0/2] quit
```

2. Configure Device B:

Create VLANs 11 and 21.

```
<DeviceB> system-view
```

```
[DeviceB] vlan 11
```

```
[DeviceB-vlan11] quit
```

```
[DeviceB] vlan 21
```

```
[DeviceB-vlan21] quit
```

Configure Ten-GigabitEthernet 1/0/2 as a hybrid port, and assign it to VLANs 11 and 21 as a tagged VLAN member.

```
[DeviceB] interface ten-gigabitethernet 1/0/2
```

```
[DeviceB-Ten-GigabitEthernet1/0/2] port link-type hybrid
```

```
[DeviceB-Ten-GigabitEthernet1/0/2] port hybrid vlan 11 21 tagged
```

```
[DeviceB-Ten-GigabitEthernet1/0/2] quit
```

Assign Ten-GigabitEthernet 1/0/3 to VLAN 11.

```
[DeviceB] interface ten-gigabitethernet 1/0/3
```

```
[DeviceB-Ten-GigabitEthernet1/0/3] port access vlan 11
```

```
[DeviceB-Ten-GigabitEthernet1/0/3] quit
```

Assign Ten-GigabitEthernet 1/0/4 to VLAN 21.

```
[DeviceB] interface ten-gigabitethernet 1/0/4
```

```
[DeviceB-Ten-GigabitEthernet1/0/4] port access vlan 21
```

```
[DeviceB-Ten-GigabitEthernet1/0/4] quit
```

3. Configure Device C:

Create VLANs 10 and 20.

```
<DeviceC> system-view
```

```
[DeviceC] vlan 10
```

```
[DeviceC-vlan10] quit
[DeviceC] vlan 20
[DeviceC-vlan20] quit
```

Configure Ten-GigabitEthernet 1/0/5 as a hybrid port, and assign it to VLANs 10 and 20 as a tagged VLAN member.

```
[DeviceC] interface ten-gigabitethernet 1/0/5
[DeviceC-Ten-GigabitEthernet1/0/5] port link-type hybrid
[DeviceC-Ten-GigabitEthernet1/0/5] port hybrid vlan 10 20 tagged
[DeviceC-Ten-GigabitEthernet1/0/5] quit
```

Verifying the configuration

Verify the primary VLAN configurations on Device A. The following output uses primary VLAN 10 as an example.

```
[DeviceA] display private-vlan 10
Primary VLAN ID: 10
Secondary VLAN ID: 11-12
```

```
VLAN ID: 10
VLAN type: Static
Private-vlan type: Primary
Route interface: Not configured
Description: VLAN 0010
Name: VLAN 0010
```

Tagged ports:

```
Ten-GigabitEthernet1/0/2
Ten-GigabitEthernet1/0/5
```

Untagged ports:

```
Ten-GigabitEthernet1/0/3
```

```
VLAN ID: 11
VLAN type: Static
Private-vlan type: Secondary
Route interface: Not configured
Description: VLAN 0011
Name: VLAN 0011
```

Tagged ports:

```
Ten-GigabitEthernet1/0/2
Ten-GigabitEthernet1/0/5
```

Untagged ports: None

```
VLAN ID: 12
VLAN type: Static
Private-vlan type: Secondary
Route interface: Not configured
Description: VLAN 0012
Name: VLAN 0012
```

Tagged ports:

```
Ten-GigabitEthernet1/0/5
```

Untagged ports:

Ten-GigabitEthernet1/0/3

The output shows that:

- The trunk promiscuous port (Ten-GigabitEthernet 1/0/5) is a tagged member of primary VLAN 10 and secondary VLANs 11 and 12.
- The trunk secondary port (Ten-GigabitEthernet 1/0/2) is a tagged member of primary VLAN 10 and secondary VLAN 11.
- The host port (Ten-GigabitEthernet 1/0/3) is an untagged member of primary VLAN 10 and secondary VLAN 12.

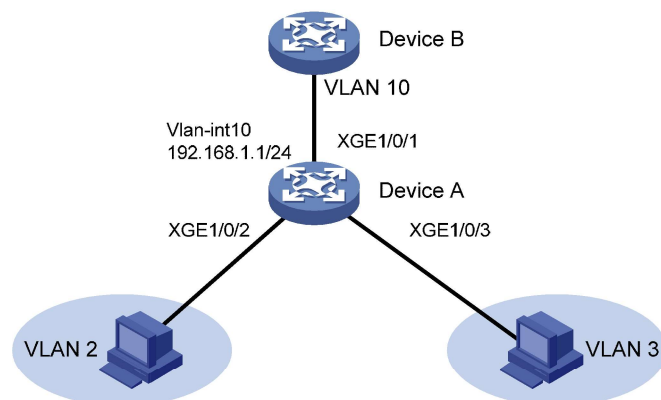
Secondary VLAN Layer 3 communication configuration example

Network requirements

As shown in [Figure 60](#), configure the private VLAN feature to meet the following requirements:

- Primary VLAN 10 on Device A is associated with secondary VLANs 2 and 3. The IP address of VLAN-interface 10 is 192.168.1.1/24.
- Ten-GigabitEthernet 1/0/1 belongs to VLAN 10. Ten-GigabitEthernet 1/0/2 and Ten-GigabitEthernet 1/0/3 belong to VLAN 2 and VLAN 3, respectively.
- Secondary VLANs are isolated at Layer 2 but interoperable at Layer 3.

Figure 60 Network diagram



Configuration procedure

Create VLAN 10 and configure it as a primary VLAN.

```
<DeviceA> system-view
[DeviceA] vlan 10
[DeviceA-vlan10] private-vlan primary
[DeviceA-vlan10] quit
```

Create VLANs 2 and 3.

```
<DeviceA> system-view
[DeviceA] vlan 2 to 3
```

Associate primary VLAN 10 with secondary VLANs 2 and 3.

```
[DeviceA] vlan 10
[DeviceA-vlan10] private-vlan primary
[DeviceA-vlan10] private-vlan secondary 2 3
[DeviceA-vlan10] quit
```

Configure the uplink port (Ten-GigabitEthernet 1/0/1) as a promiscuous port of VLAN 10.

```
[DeviceA] interface ten-gigabitethernet 1/0/1
[DeviceA-Ten-GigabitEthernet1/0/1] port private-vlan 10 promiscuous
[DeviceA-Ten-GigabitEthernet1/0/1] quit
```

Assign downlink port Ten-GigabitEthernet 1/0/2 to VLAN 2, and configure the port as a host port.

```
[DeviceA] interface ten-gigabitethernet 1/0/2
[DeviceA-Ten-GigabitEthernet1/0/2] port access vlan 2
[DeviceA-Ten-GigabitEthernet1/0/2] port private-vlan host
[DeviceA-Ten-GigabitEthernet1/0/2] quit
```

Assign downlink port Ten-GigabitEthernet 1/0/3 to VLAN 3, and configure the port as a host port.

```
[DeviceA] interface ten-gigabitethernet 1/0/3
[DeviceA-Ten-GigabitEthernet1/0/3] port access vlan 3
[DeviceA-Ten-GigabitEthernet1/0/3] port private-vlan host
[DeviceA-Ten-GigabitEthernet1/0/3] quit
```

Enable Layer 3 communication between secondary VLANs 2 and 3 that are associated with primary VLAN 10.

```
[DeviceA] interface vlan-interface 10
[DeviceA-Vlan-interface10] private-vlan secondary 2 3
```

Assign IP address 192.168.1.1/24 to VLAN-interface 10.

```
[DeviceA-Vlan-interface10] ip address 192.168.1.1 255.255.255.0
```

Enable local proxy ARP on VLAN-interface 10.

```
[DeviceA-Vlan-interface10] local-proxy-arp enable
[DeviceA-Vlan-interface10] quit
```

Verifying the configuration

Display the configuration of primary VLAN 10.

```
[DeviceA] display private-vlan 10
Primary VLAN ID: 10
Secondary VLAN ID: 2-3
```

```
VLAN ID: 10
VLAN type: Static
Private VLAN type: Primary
Route interface: Configured
IPv4 address: 192.168.1.1
IPv4 subnet mask: 255.255.255.0
Description: VLAN 0010
Name: VLAN 0010
Tagged ports: None
Untagged ports:
    Ten-GigabitEthernet1/0/1
    Ten-GigabitEthernet1/0/2
    Ten-GigabitEthernet1/0/3
```

```
VLAN ID: 2
VLAN type: Static
Private VLAN type: Secondary
Route interface: Configured
```

IPv4 address: 192.168.1.1
IPv4 subnet mask: 255.255.255.0
Description: VLAN 0002
Name: VLAN 0002
Tagged ports: None
Untagged ports:
 Ten-GigabitEthernet1/0/1
 Ten-GigabitEthernet1/0/2

VLAN ID: 3
VLAN type: Static
Private VLAN type: Secondary
Route interface: Configured
IPv4 address: 192.168.1.1
IPv4 subnet mask: 255.255.255.0
Description: VLAN 0003
Name: VLAN 0003
Tagged ports: None
Untagged ports:
 Ten-GigabitEthernet1/0/1
 Ten-GigabitEthernet1/0/3

The **Route interface** field in the output is **Configured**, indicating that secondary VLANs 2 and 3 are interoperable at Layer 3.