

H3C S6850 & S9850 & S9820-64H VLAN Tagging Configuration Examples

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Introduction

This document provides examples for using VLAN tagging features to extend customer VLANs (CVLANs) across an Ethernet service provider network.

VLAN tagging features enable service providers to separate or aggregate customer traffic in the service provider network. The following are available VLAN tagging operations:

- Adding a layer of service provider VLAN (SVLAN) tag.
- Modifying the SVLAN tag, CVLAN tag, or both.

To add an SVLAN tag, use one of the following VLAN tagging features:

- **QinQ**—Tags all incoming frames (tagged or untagged) on the customer-side port with the PVID of the port.
- **One-to-two VLAN mapping**—Adds different SVLANs for traffic with different CVLAN tags.
- **Policy-based VLAN manipulation**—Uses QoS nest actions in a QoS policy to tag different classes of frames with different SVLAN tags. Traffic classifiers include CVLAN ID, IP address, and MAC address. In addition, you can use QoS priority marking to set the 802.1p priority in SVLAN tags.

To modify VLAN tags, use one of the following VLAN tagging features:

- **VLAN mapping**—Includes the following features:
 - **One-to-one VLAN mapping**—Replaces one VLAN tag with another.
 - **Many-to-one VLAN mapping**—Replaces multiple VLAN tags with the same VLAN tag.
 - **Two-to-two VLAN mapping**—Replaces the SVLAN ID, CVLAN ID, or both IDs for an incoming double-tagged frame.
- **Policy-based VLAN manipulation**—Uses a QoS policy to modify the CVLAN or SVLAN ID by using the **remark customer-vlan-id** or **remark service-vlan-id** action.

The devices in the service provider network learn MAC addresses of CVLANs into the MAC address table of the SVLAN.

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 QinQ, VLAN mapping, QoS nesting, and QoS priority and CVLAN marking.

General restrictions and guidelines

EVB and the VLAN tagging features are mutually exclusive. Do not use EVB with any VLAN tagging features on a port.

Example: Configuring QinQ

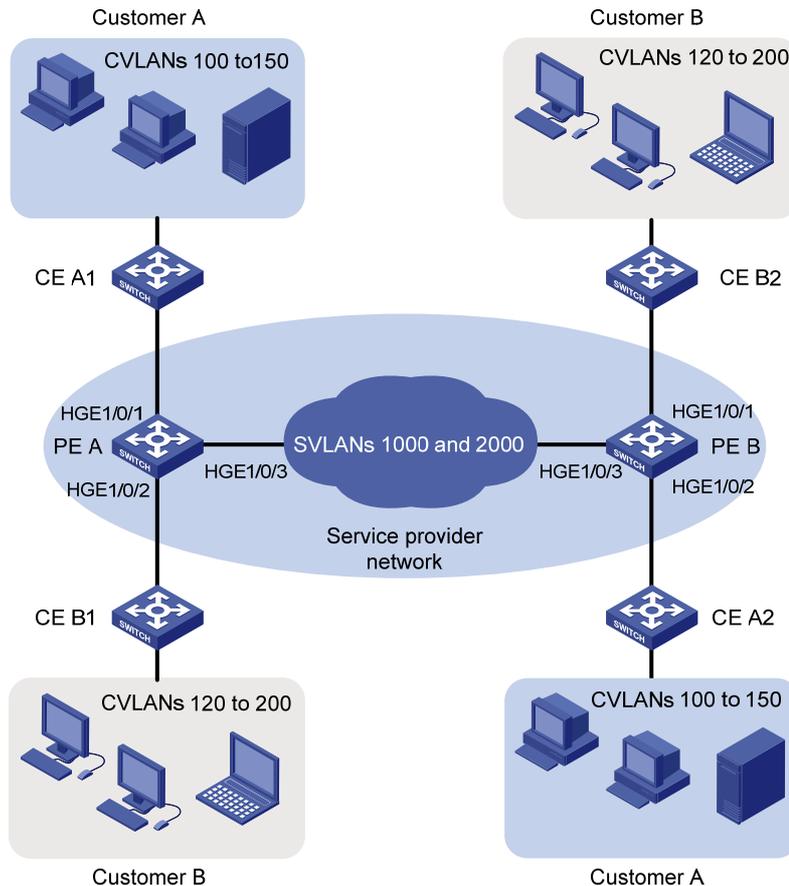
Network configuration

As shown in [Figure 1](#):

- The service provider assigns VLAN 1000 to Company A's VLANs 100 through 150.
- The service provider assigns VLAN 2000 to Company B's VLANs 120 through 200.

Configure QinQ on PE A and PE B to transmit traffic in VLANs 1000 and 2000 for Company A and Company B, respectively.

Figure 1 Network diagram



Applicable hardware and software versions

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

Hardware	Software version
S6850 switch series S9850 switch series	Release 6555P01
S9820-64H switches	Release 6555P01

Restrictions and guidelines

When you configure QinQ, follow these restrictions and guidelines:

- You only need to configure QinQ on customer-side ports of PEs.
- The link type of the customer-side port can be access, hybrid, or trunk.

- If the link type is access, you must assign the port to the SVLAN.
- If the link type is trunk, you must assign the port to the SVLAN, and set the SVLAN ID as the PVID of the port.
- If the link type is hybrid, you must assign the port to the SVLAN as an untagged VLAN member, and set the SVLAN ID as the PVID of the port. The settings ensure that the port can forward traffic to the customer site with the SVLAN tag removed.
- For QinQ frames to travel across the service provider network, you must perform the following tasks:
 - Set the MTU to a minimum of 1504 bytes for each port on the path of QinQ frames. This value is the sum of the default Ethernet interface MTU (1500 bytes) and the length (4 bytes) of a CVLAN tag. The CVLAN tag of QinQ frames is treated as part of the payload during transmission.
 - Configure all the ports on the forwarding path to allow frames from VLANs 1000 and 2000 to pass through without removing the VLAN tag.

Procedures

Configuring PE A

1. Create VLANs 1000 and 2000.

```
<PE_A> system-view
[PE_A] vlan 1000
[PE_A-vlan1000] quit
[PE_A] vlan 2000
[PE_A-vlan2000] quit
```

2. Configure HundredGigE 1/0/1:

Configure the port as an access port, and assign the port to VLAN 1000.

```
[PE_A] interface hundredgige 1/0/1
[PE_A-HundredGigE1/0/1] port access vlan 1000
```

Enable QinQ on the port.

```
[PE_A-HundredGigE1/0/1] qinq enable
[PE_A-HundredGigE1/0/1] quit
```

3. Configure HundredGigE 1/0/2:

Configure the port as an access port, and assign the port to VLAN 2000.

```
[PE_A] interface hundredgige 1/0/2
[PE_A-HundredGigE1/0/2] port access vlan 2000
```

Enable QinQ on the port.

```
[PE_A-HundredGigE1/0/2] qinq enable
[PE_A-HundredGigE1/0/2] quit
```

4. Configure HundredGigE 1/0/3:

Configure the port as a trunk port.

```
[PE_A] interface hundredgige 1/0/3
[PE_A-HundredGigE1/0/3] port link-type trunk
```

Assign the port to VLANs 1000 and 2000.

```
[PE_A-HundredGigE1/0/3] port trunk permit vlan 1000 2000
```

Remove the port from VLAN 1.

```
[PE_A-HundredGigE1/0/3] undo port trunk permit vlan 1
[PE_A-HundredGigE1/0/3] quit
```

Configuring PE B

1. Create VLANs 1000 and 2000.

```
<PE_B> system-view
[PE_B] vlan 1000
[PE_B-vlan1000] quit
[PE_B] vlan 2000
[PE_B-vlan2000] quit
```

2. Configure HundredGigE 1/0/1:

Configure the port as an access port, and assign the port to VLAN 2000.

```
[PE_B] interface hundredgige 1/0/1
[PE_B-HundredGigE1/0/1] port access vlan 2000
```

Enable QinQ on the port.

```
[PE_B-HundredGigE1/0/1] qinq enable
[PE_B-HundredGigE1/0/1] quit
```

3. Configure HundredGigE 1/0/2:

Configure the port as an access port, and assign the port to VLAN 1000.

```
[PE_B] interface hundredgige 1/0/2
[PE_B-HundredGigE1/0/2] port access vlan 1000
```

Enable QinQ on the port.

```
[PE_B-HundredGigE1/0/2] qinq enable
[PE_B-HundredGigE1/0/2] quit
```

4. Configure HundredGigE 1/0/3:

Configure the port as a trunk port.

```
[PE_B] interface hundredgige 1/0/3
[PE_B-HundredGigE1/0/3] port link-type trunk
```

Assign the port to VLANs 1000 and 2000.

```
[PE_B-HundredGigE1/0/3] port trunk permit vlan 1000 2000
```

Remove the port from VLAN 1.

```
[PE_B-HundredGigE1/0/3] undo port trunk permit vlan 1
[PE_B-HundredGigE1/0/3] quit
```

Configuring devices between PE A and PE B

Set the MTU to a minimum of 1504 bytes for each port on the path of QinQ frames. (Details not shown.)

Configure all ports on the forwarding path to allow frames from VLANs 1000 and 2000 to pass through without removing the VLAN tag. (Details not shown.)

Verifying the configuration

Verify that each company's PCs can ping each other in the same CVLAN across the service provider network. (Details not shown.)

Verify that the two companies' PCs cannot communicate at Layer 2 even if their CVLAN IDs are the same. The ARP tables on one company's PCs do not contain entries for MAC addresses of the other company's PCs. (Details not shown.)

Configuration files

- PE A:

```
#
vlan 1000
#
vlan 2000
#
interface HundredGigE1/0/1
 port link-mode bridge
 port access vlan 1000
 qinq enable
#
interface HundredGigE1/0/2
 port link-mode bridge
 port access vlan 2000
 qinq enable
#
interface HundredGigE1/0/3
 port link-mode bridge
 port link-type trunk
 undo port trunk permit vlan 1
 port trunk permit vlan 1000 2000
#
```

- PE B:

```
#
vlan 1000
#
vlan 2000
#
interface HundredGigE1/0/1
 port link-mode bridge
 port access vlan 2000
 qinq enable
#
interface HundredGigE1/0/2
 port link-mode bridge
 port access vlan 1000
 qinq enable
#
interface HundredGigE1/0/3
 port link-mode bridge
 port link-type trunk
 undo port trunk permit vlan 1
 port trunk permit vlan 1000 2000
#
#
```

Example: Configuring one-to-two VLAN mapping

Network configuration

As shown in [Figure 2](#):

- Customer A and Customer B each have two branches that require Layer 2 connectivity over the service provider network.
- Both customers have three types of traffic. For each customer, the service provider assigns one SVLAN by traffic type.

Configure one-to-two VLAN mapping on each customer-side port of PE A and PE B to meet the following requirements:

- The service provider adds an SVLAN tag to packets from customer networks based on the traffic type, as described in [Table 1](#) and [Figure 3](#).
- The SVLAN tag uses the same 802.1p priority as the CVLAN tag.

Figure 2 Network diagram

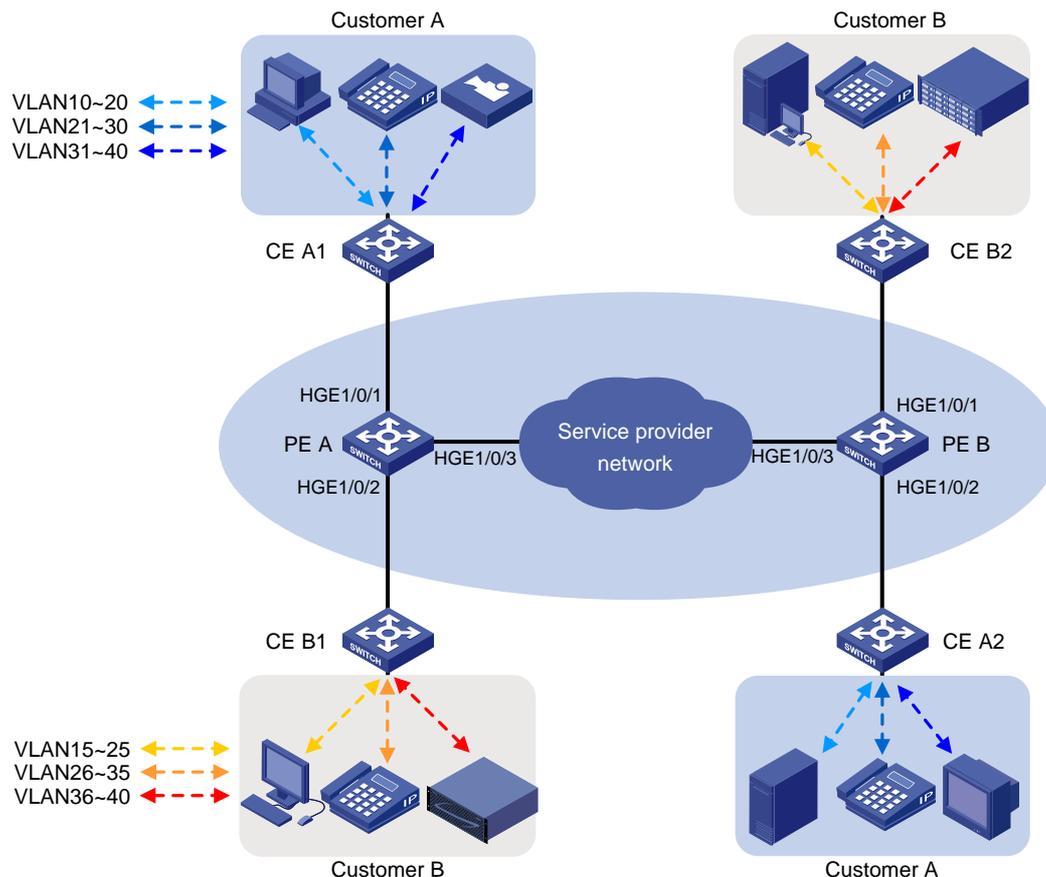
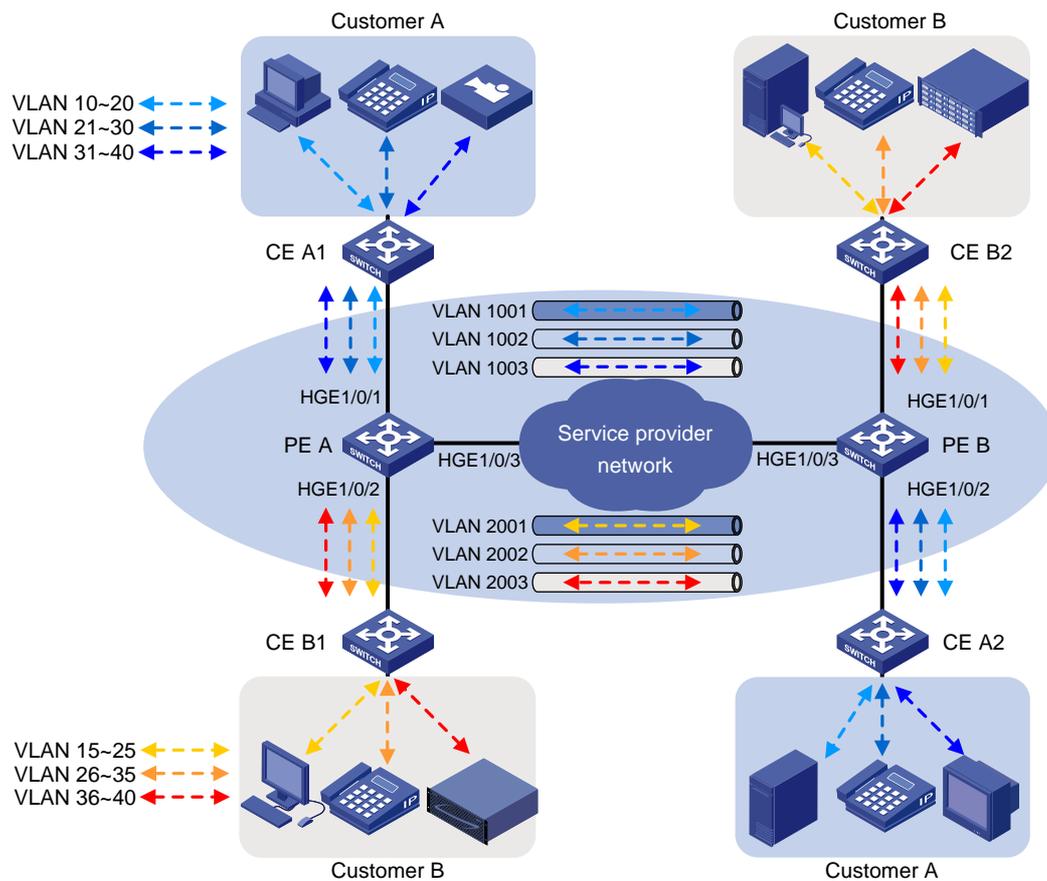


Table 1 VLAN mapping table

Traffic type	CVLANs	SVLAN
Customer A		
Video	31 to 40	1003
Voice	21 to 30	1002
Data	10 to 20	1001
Customer B		
Storage	36 to 40	2003
Voice	26 to 35	2002
Data	15 to 25	2001

Figure 3 Required traffic pattern in the service provider network



Analysis

To support multiple SVLANs and send traffic to the customer networks with the SVLAN tag removed, perform the following tasks on the customer-side ports:

1. Configure the link type of the ports as hybrid.
2. Assign the ports to the SVLANs as untagged VLAN members.

For the SVLAN tag to use the same 802.1p priority as the CVLAN tag, configure the customer-side port to use the 802.1p priority in incoming packets for priority mapping.

Applicable hardware and software versions

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

Hardware	Software version
S6850 switch series S9850 switch series	Release 6555P01
S9820-64H switches	Release 6555P01

Restrictions and guidelines

When you configure ports on the forwarding path of double-tagged packets across the service provider network, follow these restrictions and guidelines:

- Set the MTU to a minimum of 1504 bytes for each port.
- Configure all ports to allow double-tagged packets to pass through without removing the SVLAN tag.

Procedures

Configuring PE A

1. Create CVLANs and SVLANs:
Create CVLANs 10 to 40.

```
<PE_A> system-view  
[PE_A] vlan 10 to 40
```


Create SVLANs 1001 through 1003 and SVLANs 2001 through 2003.

```
[PE_A] vlan 1001 to 1003  
[PE_A] vlan 2001 to 2003
```
2. Configure the customer-side port HundredGigE 1/0/1:
Configure the port as a hybrid port.

```
[PE_A] interface hundredgige 1/0/1  
[PE_A-HundredGigE1/0/1] port link-type hybrid
```


Assign the port to CVLANs 10 through 40 as a tagged VLAN member.

```
[PE_A-HundredGigE1/0/1] port hybrid vlan 10 to 40 tagged
```


Assign the port to SVLANs 1001 through 1003 as an untagged VLAN member.

```
[PE_A-HundredGigE1/0/1] port hybrid vlan 1001 to 1003 untagged
```


Remove the port from VLAN 1.

```
[PE_A-HundredGigE1/0/1] undo port hybrid vlan 1
```


Configure one-to-two VLAN mapping to add SVLAN tag 1001 to traffic from VLANs 10 through 20.

```
[PE_A-HundredGigE1/0/1] vlan mapping nest range 10 to 20 nested-vlan 1001
```

Configure one-to-two VLAN mapping to add SVLAN tag 1002 to traffic from VLANs 21 through 30.

```
[PE_A-HundredGigE1/0/1] vlan mapping nest range 21 to 30 nested-vlan 1002
```

Configure one-to-two VLAN mapping to add SVLAN tag 1003 to traffic from VLANs 31 through 40.

```
[PE_A-HundredGigE1/0/1] vlan mapping nest range 31 to 40 nested-vlan 1003
```

Configure the port to use the 802.1p priority in incoming packets for priority mapping.

```
[PE_A-HundredGigE1/0/1] qos trust dot1p
```

```
[PE_A-HundredGigE1/0/1] quit
```

3. Configure the customer-side port HundredGigE 1/0/2:

Configure the port as a hybrid port.

```
[PE_A] interface hundredgige 1/0/2
```

```
[PE_A-HundredGigE1/0/2] port link-type hybrid
```

Assign the port to CVLANs 15 through 40 as a tagged VLAN member.

```
[PE_A-HundredGigE1/0/2] port hybrid vlan 15 to 40 tagged
```

Assign the port to SVLANs 2001 through 2003 as an untagged VLAN member.

```
[PE_A-HundredGigE1/0/2] port hybrid vlan 2001 to 2003 untagged
```

Remove the port from VLAN 1.

```
[PE_A-HundredGigE1/0/2] undo port hybrid vlan 1
```

Configure one-to-two VLAN mapping to add SVLAN tag 2001 to traffic from VLANs 15 through 25.

```
[PE_A-HundredGigE1/0/2] vlan mapping nest range 15 to 25 nested-vlan 2001
```

Configure one-to-two VLAN mapping to add SVLAN tag 2002 to traffic from VLANs 26 through 35.

```
[PE_A-HundredGigE1/0/2] vlan mapping nest range 26 to 35 nested-vlan 2002
```

Configure one-to-two VLAN mapping to add SVLAN tag 2003 to traffic from VLANs 36 through 40.

```
[PE_A-HundredGigE1/0/2] vlan mapping nest range 36 to 40 nested-vlan 2003
```

Configure the port to use the 802.1p priority in incoming packets for priority mapping.

```
[PE_A-HundredGigE1/0/2] qos trust dot1p
```

```
[PE_A-HundredGigE1/0/2] quit
```

4. Configure the service provider-side port HundredGigE 1/0/3:

Configure the port as a trunk port.

```
[PE_A] interface hundredgige 1/0/3
```

```
[PE_A-HundredGigE1/0/3] port link-type trunk
```

Remove the port from VLAN 1.

```
[PE_A-HundredGigE1/0/3] undo port trunk permit vlan 1
```

Assign the port to SVLANs 1001 through 1003 and SVLANs 2001 through 2003.

```
[PE_A-HundredGigE1/0/3] port trunk permit vlan 1001 to 1003 2001 to 2003
```

```
[PE_A-HundredGigE1/0/3] quit
```

Configuring PE B

1. Create CVLANs and SVLANs:

Create CVLANs 10 to 40.

```
<PE_B> system-view
```

```
[PE_B] vlan 10 to 40
```

Create SVLANs 1001 through 1003 and SVLANs 2001 through 2003.

```
[PE_B] vlan 1001 to 1003
```

```
[PE_B] vlan 2001 to 2003
```

2. Configure the customer-side port HundredGigE 1/0/1:

Configure the port as a hybrid port.

```
[PE_B] interface hundredgige 1/0/1
```

```
[PE_B-HundredGigE1/0/1] port link-type hybrid
```

Assign the port to CVLANs 15 through 40 as a tagged VLAN member.

```
[PE_B-HundredGigE1/0/1] port hybrid vlan 15 to 40 tagged
```

Assign the port to SVLANs 2001 through 2003 as an untagged VLAN member.

```
[PE_B-HundredGigE1/0/1] port hybrid vlan 2001 to 2003 untagged
```

Remove the port from VLAN 1.

```
[PE_B-HundredGigE1/0/1] undo port hybrid vlan 1
```

Configure one-to-two VLAN mapping to add SVLAN tag 2001 to traffic from VLANs 15 through 25.

```
[PE_B-HundredGigE1/0/1] vlan mapping nest range 15 to 25 nested-vlan 2001
```

Configure one-to-two VLAN mapping to add SVLAN tag 2002 to traffic from VLANs 26 through 35.

```
[PE_B-HundredGigE1/0/1] vlan mapping nest range 26 to 35 nested-vlan 2002
```

Configure one-to-two VLAN mapping to add SVLAN tag 2003 to traffic from VLANs 36 through 40.

```
[PE_B-HundredGigE1/0/1] vlan mapping nest range 36 to 40 nested-vlan 2003
```

Configure the port to use the 802.1p priority in incoming packets for priority mapping.

```
[PE_B-HundredGigE1/0/1] qos trust dot1p
```

```
[PE_B-HundredGigE1/0/1] quit
```

3. Configure the customer-side port HundredGigE 1/0/2:

Configure the port as a hybrid port.

```
[PE_B] interface hundredgige 1/0/2
```

```
[PE_B-HundredGigE1/0/2] port link-type hybrid
```

Assign the port to CVLANs 10 through 40 as a tagged VLAN member.

```
[PE_B-HundredGigE1/0/2] port hybrid vlan 10 to 40 tagged
```

Assign the port to SVLANs 1001 through 1003 as an untagged VLAN member.

```
[PE_B-HundredGigE1/0/2] port hybrid vlan 1001 to 1003 untagged
```

Remove the port from VLAN 1.

```
[PE_B-HundredGigE1/0/2] undo port hybrid vlan 1
```

Configure one-to-two VLAN mapping to add SVLAN tag 1001 to traffic from VLANs 10 through 20.

```
[PE_B-HundredGigE1/0/2] vlan mapping nest range 10 to 20 nested-vlan 1001
```

Configure one-to-two VLAN mapping to add SVLAN tag 1002 to traffic from VLANs 21 through 30.

```
[PE_B-HundredGigE1/0/2] vlan mapping nest range 21 to 30 nested-vlan 1002
```

Configure one-to-two VLAN mapping to add SVLAN tag 1003 to traffic from VLANs 31 through 40.

```
[PE_B-HundredGigE1/0/2] vlan mapping nest range 31 to 40 nested-vlan 1003
```

Configure the port to use the 802.1p priority in incoming packets for priority mapping.

```
[PE_B-HundredGigE1/0/2] qos trust dot1p
```

```
[PE_B-HundredGigE1/0/2] quit
```

4. Configure the service provider-side port HundredGigE 1/0/3:

```

# Configure the port as a trunk port.
[PE_B] interface hundredgige 1/0/3
[PE_B-HundredGigE1/0/3] port link-type trunk
# Remove the port from VLAN 1.
[PE_B-HundredGigE1/0/3] undo port trunk permit vlan 1
# Assign the port to SVLANs 1001 through 1003 and SVLANs 2001 through 2003.
[PE_B-HundredGigE1/0/3] port trunk permit vlan 1001 to 1003 2001 to 2003
[PE_B-HundredGigE1/0/3] quit

```

Configuring devices between PE A and PE B

- # Set the MTU to a minimum of 1504 bytes for each port on the path of double-tagged packets. (Details not shown.)
- # Configure all ports on the forwarding path to allow packets from VLANs 1001 through 1003 and VLANs 2001 through 2003 to pass through without removing the SVLAN tag. (Details not shown.)

Verifying the configuration

1. Verify VLAN mapping information:

Verify VLAN mapping information on PE A.

```

[PE_A] display vlan mapping
Interface HundredGigE1/0/1:
  Outer VLAN   Inner VLAN   Translated Outer VLAN   Translated Inner VLAN
  10-20        N/A          1001                    10-20
  21-30        N/A          1002                    21-30
  31-40        N/A          1003                    31-40
Interface HundredGigE1/0/2:
  Outer VLAN   Inner VLAN   Translated Outer VLAN   Translated Inner VLAN
  15-25        N/A          2001                    15-25
  26-35        N/A          2002                    26-35
  36-40        N/A          2003                    36-40

```

Verify VLAN mapping information on PE B.

```

[PE_B] display vlan mapping
Interface HundredGigE1/0/1:
  Outer VLAN   Inner VLAN   Translated Outer VLAN   Translated Inner VLAN
  15-25        N/A          2001                    15-25
  26-35        N/A          2002                    26-35
  36-40        N/A          2003                    36-40
Interface HundredGigE1/0/2:
  Outer VLAN   Inner VLAN   Translated Outer VLAN   Translated Inner VLAN
  10-20        N/A          1001                    10-20
  21-30        N/A          1002                    21-30
  31-40        N/A          1003                    31-40

```

2. Verify that PCs of the same customer in a CVLAN can ping each other across the service provider network. (Details not shown.)
3. Verify that PCs of different customers in a CVLAN cannot communicate at Layer 2. The ARP tables on one customer's PCs do not contain entries for MAC addresses of the other customer's PCs. (Details not shown.)

Configuration files

- PE A:

```
#
vlan 10 to 40
#
vlan 1001 to 1003
#
vlan 2001 to 2003
#
interface HundredGigE1/0/1
  port link-type hybrid
  undo port hybrid vlan 1
  port hybrid vlan 10 to 40 tagged
  port hybrid vlan 1001 to 1003 untagged
  vlan mapping nest range 10 to 20 nested-vlan 1001
  vlan mapping nest range 21 to 30 nested-vlan 1002
  vlan mapping nest range 31 to 40 nested-vlan 1003
  qos trust dot1p
#
interface HundredGigE1/0/2
  port link-type hybrid
  undo port hybrid vlan 1
  port hybrid vlan 15 to 40 tagged
  port hybrid vlan 2001 to 2003 untagged
  vlan mapping nest range 15 to 25 nested-vlan 2001
  vlan mapping nest range 26 to 35 nested-vlan 2002
  vlan mapping nest range 36 to 40 nested-vlan 2003
  qos trust dot1p
#
interface HundredGigE1/0/3
  port link-type trunk
  undo port trunk permit vlan 1
  port trunk permit vlan 1001 to 1003 2001 to 2003
#
```

- PE B:

```
#
vlan 10 to 40
#
vlan 1001 to 1003
#
vlan 2001 to 2003
#
interface HundredGigE1/0/1
  port link-type hybrid
  undo port hybrid vlan 1
  port hybrid vlan 15 to 40 tagged
  port hybrid vlan 2001 to 2003 untagged
```

```

vlan mapping nest range 15 to 25 nested-vlan 2001
vlan mapping nest range 26 to 35 nested-vlan 2002
vlan mapping nest range 36 to 40 nested-vlan 2003
qos trust dot1p
#
interface HundredGigE1/0/2
port link-type hybrid
undo port hybrid vlan 1
port hybrid vlan 10 to 40 tagged
port hybrid vlan 1001 to 1003 untagged
vlan mapping nest range 10 to 20 nested-vlan 1001
vlan mapping nest range 21 to 30 nested-vlan 1002
vlan mapping nest range 31 to 40 nested-vlan 1003
qos trust dot1p
#
interface HundredGigE1/0/3
port link-type trunk
undo port trunk permit vlan 1
port trunk permit vlan 1001 to 1003 2001 to 2003
#

```

Example: Configuring QoS policies for SVLAN tagging and 802.1p priority marking

Network configuration

As shown in [Figure 4](#):

- Customer A and Customer B each have two branches that require Layer 2 connectivity over the service provider network.
- Both customers have three types of traffic and require different transmission priorities for the three types of traffic.

Apply a QoS policy to each customer-side port on PE A and PE B to meet the following requirements:

- Separate the traffic by customer and traffic type.
- Assign different 802.1p priority values to the traffic flows.

Figure 4 Network diagram

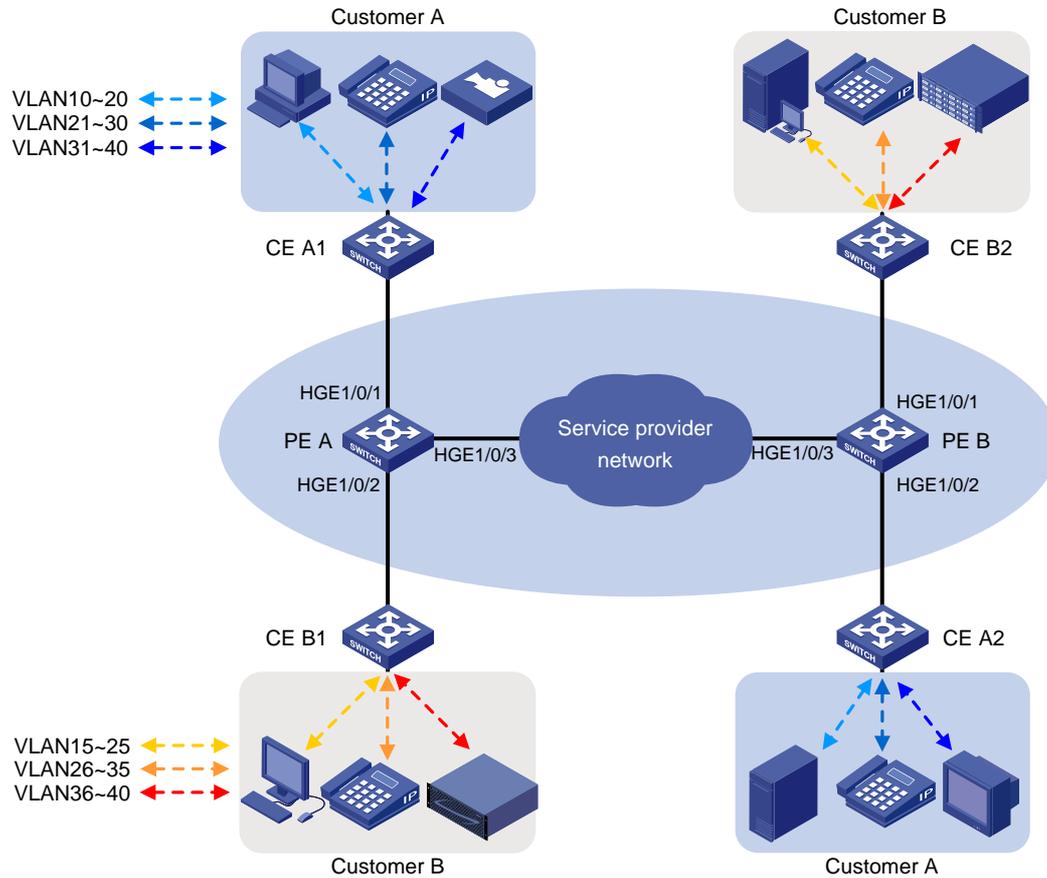
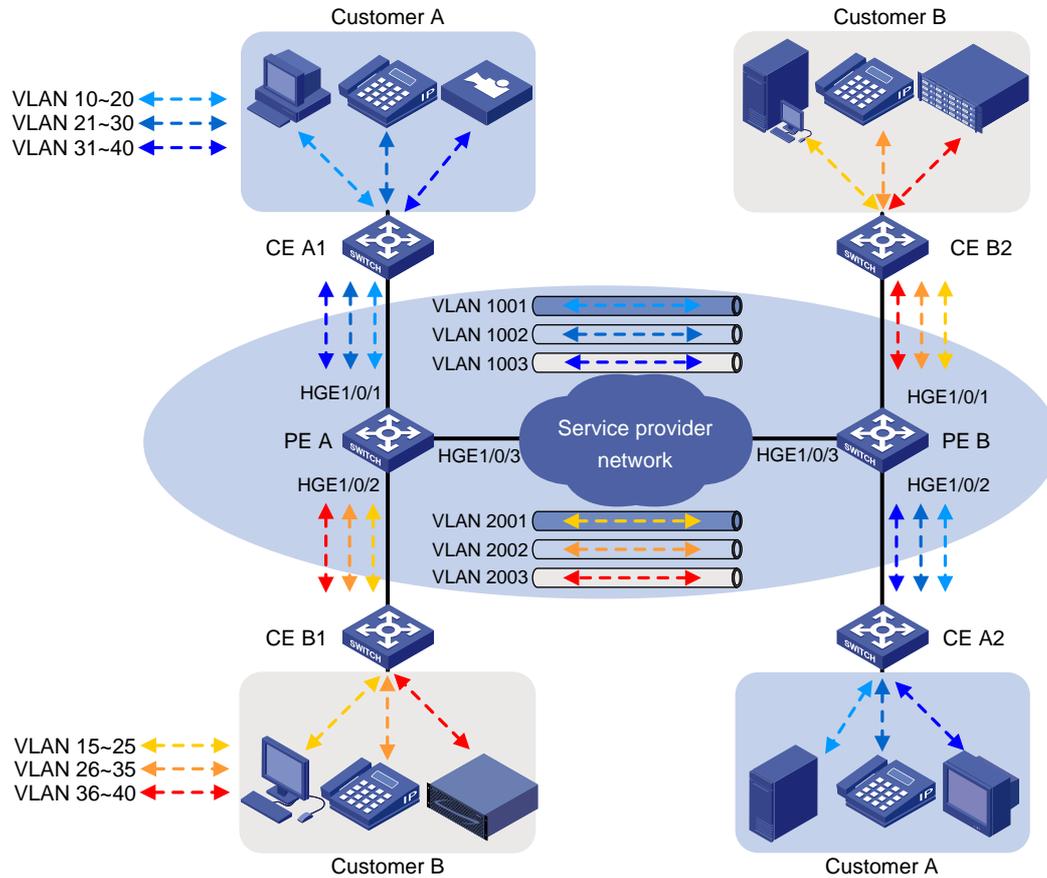


Table 2 shows the VLAN and 802.1p priority assignment scheme. For each customer, the service provider assigns one SVLAN by traffic type. Figure 5 shows the expected traffic transmission pattern after the QoS policies are applied to customer-side ports.

Table 2 VLAN and traffic priority assignment

Traffic type	CVLANs	SVLAN	Traffic priority
Customer A:			
Video	31 to 40	1003	High
Voice	21 to 30	1002	Medium
Data	10 to 20	1001	Low
Customer B:			
Storage	36 to 40	2003	High
Voice	26 to 35	2002	Medium
Data	15 to 25	2001	Low

Figure 5 Expected traffic pattern in the service provider network



Analysis

For the customer-side ports to support multiple SVLANs and send traffic to the customer site with the SVLAN tag removed, you must perform the following tasks:

1. Configure the link type as hybrid on the customer-side ports.
2. Assign the ports to the SVLANs as untagged VLAN members.

To change the 802.1p priority for a class of traffic, use the **remark dot1p** action. By default, the 802.1p priority in the SVLAN tag added by a QinQ-enabled port depends on the priority trust mode on the port.

- If the 802.1p priority in frames is trusted, the device copies the 802.1p priority in the CVLAN tag to the SVLAN tag.
- If port priority is trusted, the port priority is used as the 802.1p priority in the SVLAN tag. For untagged incoming frames, the port encapsulates the port priority as the 802.1p priority in the SVLAN tag.

Applicable hardware and software versions

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

Hardware	Software version
S6850 switch series S9850 switch series	Release 6555P01
S9820-64H switches	Release 6555P01

Restrictions and guidelines

When you configure an SVLAN tagging QoS policy, follow these restrictions and guidelines:

- Use the nest action for SVLAN tagging. You can configure only one nest action in the traffic behavior for a traffic class.
- You must apply the QoS policy to the inbound direction of customer-side ports.
- If an incoming frame does not match the QoS policy, the port adds the PVID tag to the frame as the SVLAN tag.

For QinQ frames to travel across the service provider network, follow these restrictions and guidelines:

- Set the MTU to a minimum of 1504 bytes for each port on the path of QinQ frames. This value is the sum of the default Ethernet interface MTU (1500 bytes) and the length (4 bytes) of a CVLAN tag. The CVLAN tag of QinQ frames is treated as part of the payload during transmission.
- Configure all the ports on the forwarding path to allow frames from VLANs 1001 through 1003 and VLANs 2001 through 2003 to pass through without removing the VLAN tag.

Procedures

Configuring PE A

1. Create SVLANs 1001 through 1003 and SVLANs 2001 through 2003.

```
<PE_A> system-view
[PE_A] vlan 1001 to 1003
[PE_A] vlan 2001 to 2003
```

2. Configure the customer-side port HundredGigE 1/0/1:

Configure the port as a hybrid port.

```
[PE_A] interface hundredgige 1/0/1
[PE_A-HundredGigE1/0/1] port link-type hybrid
```

Remove the port from VLAN 1.

```
[PE_A-HundredGigE1/0/1] undo port hybrid vlan 1
```

Assign the port to SVLANs 1001 through 1003 as an untagged VLAN member.

```
[PE_A-HundredGigE1/0/1] port hybrid vlan 1001 to 1003 untagged
```

Enable QinQ on the port.

```
[PE_A-HundredGigE1/0/1] qinq enable
```

Configure the port to trust the 802.1p priority of frames.

```
[PE_A-HundredGigE1/0/1] qos trust dot1p
[PE_A-HundredGigE1/0/1] quit
```

3. Configure the customer-side port HundredGigE 1/0/2:

Configure the port as a hybrid port.

```
[PE_A] interface hundredgige 1/0/2
```

```

[PE_A-HundredGigE1/0/2] port link-type hybrid
# Remove the port from VLAN 1.
[PE_A-HundredGigE1/0/2] undo port hybrid vlan 1
# Assign the port to SVLANs 2001 through 2003 as an untagged VLAN member.
[PE_A-HundredGigE1/0/2] port hybrid vlan 2001 to 2003 untagged
# Enable QinQ on the port.
[PE_A-HundredGigE1/0/2] qinq enable
# Configure the port to trust the 802.1p priority of frames.
[PE_A-HundredGigE1/0/2] qos trust dot1p
[PE_A-HundredGigE1/0/2] quit
3. Configure the service provider-side port HundredGigE 1/0/3:
# Configure the port as a trunk port.
[PE_A] interface hundredgige 1/0/3
[PE_A-HundredGigE1/0/3] port link-type trunk
# Remove the port from VLAN 1.
[PE_A-HundredGigE1/0/3] undo port trunk permit vlan 1
# Assign the port to SVLANs 1001 through 1003 and SVLANs 2001 through 2003.
[PE_A-HundredGigE1/0/3] port trunk permit vlan 1001 to 1003 2001 to 2003
[PE_A-HundredGigE1/0/3] quit
4. Configure QoS policies for SVLAN tagging and 802.1p priority marking:
# Create the class customer_A_pc to match traffic from CVLANs 10 through 20 (data traffic)
for Customer A.
[PE_A] traffic classifier customer_A_pc
[PE_A-classifier-customer_A_pc] if-match customer-vlan-id 10 to 20
[PE_A-classifier-customer_A_pc] quit
# Create the classes customer_A_voice and customer_A_video to match Customer A's
voice traffic and video traffic, respectively.
[PE_A] traffic classifier customer_A_voice
[PE_A-classifier-customer_A_voice] if-match customer-vlan-id 21 to 30
[PE_A-classifier-customer_A_voice] quit
[PE_A] traffic classifier customer_A_video
[PE_A-classifier-customer_A_video] if-match customer-vlan-id 31 to 40
[PE_A-classifier-customer_A_video] quit
# Configure SVLAN tagging and 802.1p priority marking actions for Customer A's three traffic
types.
[PE_A] traffic behavior customer_A_pc
[PE_A-behavior-customer_A_pc] nest top-most vlan 1001
[PE_A-behavior-customer_A_pc] remark dot1p 3
[PE_A-behavior-customer_A_pc] quit
[PE_A] traffic behavior customer_A_voice
[PE_A-behavior-customer_A_voice] nest top-most vlan 1002
[PE_A-behavior-customer_A_voice] remark dot1p 5
[PE_A-behavior-customer_A_voice] quit
[PE_A] traffic behavior customer_A_video
[PE_A-behavior-customer_A_video] nest top-most vlan 1003
[PE_A-behavior-customer_A_video] remark dot1p 7
[PE_A-behavior-customer_A_video] quit

```

Create the QoS policy *customer_A* for Customer A, and associate the classes with their respective behaviors in the QoS policy.

```
[PE_A] qos policy customer_A
[PE_A-qospolicy-customer_A] classifier customer_A_pc behavior customer_A_pc
[PE_A-qospolicy-customer_A] classifier customer_A_voice behavior customer_A_voice
[PE_A-qospolicy-customer_A] classifier customer_A_video behavior customer_A_video
[PE_A-qospolicy-customer_A] quit
```

Apply the QoS policy *customer_A* to the inbound direction of HundredGigE 1/0/1.

```
[PE_A] interface hundredgige 1/0/1
[PE_A-HundredGigE1/0/1] qos apply policy customer_A inbound
[PE_A-HundredGigE1/0/1] quit
```

Create traffic classes for matching Customer B's three traffic types.

```
[PE_A] traffic classifier customer_B_pc
[PE_A-classifier-customer_B_pc] if-match customer-vlan-id 15 to 25
[PE_A-classifier-customer_B_pc] quit
[PE_A] traffic classifier customer_B_voice
[PE_A-classifier-customer_B_voice] if-match customer-vlan-id 26 to 35
[PE_A-classifier-customer_B_voice] quit
[PE_A] traffic classifier customer_B_storage
[PE_A-classifier-customer_B_storage] if-match customer-vlan-id 36 to 40
[PE_A-classifier-customer_B_storage] quit
```

Configure SVLAN tagging and 802.1p priority marking behaviors for Customer B's traffic types.

```
[PE_A] traffic behavior customer_B_pc
[PE_A-behavior-customer_B_pc] nest top-most vlan 2001
[PE_A-behavior-customer_B_pc] remark dot1p 3
[PE_A-behavior-customer_B_pc] quit
[PE_A] traffic behavior customer_B_voice
[PE_A-behavior-customer_B_voice] nest top-most vlan 2002
[PE_A-behavior-customer_B_voice] remark dot1p 5
[PE_A-behavior-customer_B_voice] quit
[PE_A] traffic behavior customer_B_storage
[PE_A-behavior-customer_B_storage] nest top-most vlan 2003
[PE_A-behavior-customer_B_storage] remark dot1p 7
[PE_A-behavior-customer_B_storage] quit
```

Create the QoS policy *customer_B* for Customer B, and associate the classes with their respective behaviors in the QoS policy.

```
[PE_A] qos policy customer_B
[PE_A-qospolicy-customer_B] classifier customer_B_pc behavior customer_B_pc
[PE_A-qospolicy-customer_B] classifier customer_B_voice behavior customer_B_voice
[PE_A-qospolicy-customer_B] classifier customer_B_storage behavior
customer_B_storage
[PE_A-qospolicy-customer_B] quit
```

Apply the QoS policy *customer_B* to the inbound direction of HundredGigE 1/0/2.

```
[PE_A] interface hundredgige 1/0/2
[PE_A-HundredGigE1/0/2] qos apply policy customer_B inbound
[PE_A-HundredGigE1/0/2] quit
```

Configuring PE B

1. Create SVLANs 1001 through 1003 and SVLANs 2001 through 2003.

```
<PE_B> system-view
[PE_B] vlan 1001 to 1003
[PE_B] vlan 2001 to 2003
```
2. Configure the customer-side port HundredGigE 1/0/1:
Configure the port as a hybrid port.

```
[PE_B] interface hundredgige 1/0/1
[PE_B-HundredGigE1/0/1] port link-type hybrid
```


Remove the port from VLAN 1.

```
[PE_B-HundredGigE1/0/1] undo port hybrid vlan 1
```


Assign the port to SVLANs 2001 through 2003 as an untagged VLAN member.

```
[PE_B-HundredGigE1/0/1] port hybrid vlan 2001 to 2003 untagged
```


Enable QinQ on the port.

```
[PE_B-HundredGigE1/0/1] qinq enable
```


Configure the port to trust the 802.1p priority of frames.

```
[PE_B-HundredGigE1/0/1] qos trust dot1p
[PE_B-HundredGigE1/0/1] quit
```
3. Configure the customer-side port HundredGigE 1/0/2:
Configure the port as a hybrid port.

```
[PE_B] interface hundredgige 1/0/2
[PE_B-HundredGigE1/0/2] port link-type hybrid
```


Remove the port from VLAN 1.

```
[PE_B-HundredGigE1/0/2] undo port hybrid vlan 1
```


Assign the port to SVLANs 1001 through 1003 as an untagged VLAN member.

```
[PE_B-HundredGigE1/0/2] port hybrid vlan 1001 to 1003 untagged
```


Enable QinQ on the port.

```
[PE_B-HundredGigE1/0/2] qinq enable
```


Configure the port to trust the 802.1p priority of frames.

```
[PE_B-HundredGigE1/0/2] qos trust dot1p
[PE_B-HundredGigE1/0/2] quit
```
4. Configure the service provider-side port HundredGigE 1/0/3:
Configure the port as a trunk port.

```
[PE_B] interface hundredgige 1/0/3
[PE_B-HundredGigE1/0/3] port link-type trunk
```


Remove the port from VLAN 1.

```
[PE_B-HundredGigE1/0/3] undo port trunk permit vlan 1
```


Assign the port to SVLANs 1001 through 1003 and SVLANs 2001 through 2003.

```
[PE_B-HundredGigE1/0/3] port trunk permit vlan 1001 to 1003 2001 to 2003
[PE_B-HundredGigE1/0/3] quit
```
5. Configure QoS policies for SVLAN tagging and 802.1p priority marking:
Create traffic classes for matching Customer A's traffic types.

```
[PE_B] traffic classifier customer_A_pc
[PE_B-classifier-customer_A_pc] if-match customer-vlan-id 10 to 20
[PE_B-classifier-customer_A_pc] quit
```

```

[PE_B] traffic classifier customer_A_voice
[PE_B-classifier-customer_A_voice] if-match customer-vlan-id 21 to 30
[PE_B-classifier-customer_A_voice] quit
[PE_B] traffic classifier customer_A_video
[PE_B-classifier-customer_A_video] if-match customer-vlan-id 31 to 40
[PE_B-classifier-customer_A_video] quit
# Configure SVLAN tagging and 802.1p priority marking behaviors for Customer A's three traffic types.
[PE_B] traffic behavior customer_A_pc
[PE_B-behavior-customer_A_pc] nest top-most vlan 1001
[PE_B-behavior-customer_A_pc] remark dot1p 3
[PE_B-behavior-customer_A_pc] quit
[PE_B] traffic behavior customer_A_voice
[PE_B-behavior-customer_A_voice] nest top-most vlan 1002
[PE_B-behavior-customer_A_voice] remark dot1p 5
[PE_B-behavior-customer_A_voice] quit
[PE_B] traffic behavior customer_A_video
[PE_B-behavior-customer_A_video] nest top-most vlan 1003
[PE_B-behavior-customer_A_video] remark dot1p 7
[PE_B-behavior-customer_A_video] quit
# Create the QoS policy customer_A for Customer A, and associate the classes with their respective behaviors in the QoS policy.
[PE_B] qos policy customer_A
[PE_B-qospolicy-customer_A] classifier customer_A_pc behavior customer_A_pc
[PE_B-qospolicy-customer_A] classifier customer_A_voice behavior customer_A_voice
[PE_B-qospolicy-customer_A] classifier customer_A_video behavior customer_A_video
[PE_B-qospolicy-customer_A] quit
# Apply the QoS policy customer_A to the inbound direction of HundredGigE 1/0/2.
[PE_B] interface hundredgige 1/0/2
[PE_B-HundredGigE1/0/2] qos apply policy customer_A inbound
[PE_B-HundredGigE1/0/2] quit
# Create traffic classes for matching Customer B's three traffic types.
[PE_B] traffic classifier customer_B_pc
[PE_B-classifier-customer_B_pc] if-match customer-vlan-id 15 to 25
[PE_B-classifier-customer_B_pc] quit
[PE_B] traffic classifier customer_B_voice
[PE_B-classifier-customer_B_voice] if-match customer-vlan-id 26 to 35
[PE_B-classifier-customer_B_voice] quit
[PE_B] traffic classifier customer_B_storage
[PE_B-classifier-customer_B_storage] if-match customer-vlan-id 36 to 40
[PE_B-classifier-customer_B_storage] quit
# Configure SVLAN tagging and 802.1p priority marking behaviors for Customer B's three traffic types.
[PE_B] traffic behavior customer_B_pc
[PE_B-behavior-customer_B_pc] nest top-most vlan 2001
[PE_B-behavior-customer_B_pc] remark dot1p 3
[PE_B-behavior-customer_B_pc] quit
[PE_B] traffic behavior customer_B_voice

```

```

[PE_B-behavior-customer_B_voice] nest top-most vlan 2002
[PE_B-behavior-customer_B_voice] remark dot1p 5
[PE_B-behavior-customer_B_voice] quit
[PE_B] traffic behavior customer_B_storage
[PE_B-behavior-customer_B_storage] nest top-most vlan 2003
[PE_B-behavior-customer_B_storage] remark dot1p 7
[PE_B-behavior-customer_B_storage] quit
# Create the QoS policy customer_B for Customer B, and associate the classes with their
respective behaviors in the QoS policy.
[PE_B] qos policy customer_B
[PE_B-qospolicy-customer_B] classifier customer_B_pc behavior customer_B_pc
[PE_B-qospolicy-customer_B] classifier customer_B_voice behavior customer_B_voice
[PE_B-qospolicy-customer_B] classifier customer_B_storage behavior
customer_B_storage
[PE_B-qospolicy-customer_B] quit
# Apply the QoS policy customer_B to the inbound direction of HundredGigE 1/0/1.
[PE_B] interface hundredgige 1/0/1
[PE_B-HundredGigE1/0/1] qos apply policy customer_B inbound
[PE_B-HundredGigE1/0/1] quit

```

Configuring devices between PE A and PE B

Set the MTU to a minimum of 1504 bytes for each port on the path of QinQ frames. (Details not shown.)

Configure all ports on the path between PE A and PE B allow frames from VLANs 1001 through 1003 and VLANs 2001 through 2003 to pass through without removing the VLAN tag. (Details not shown.)

Verifying the configuration

Verify the configuration on each port. This example uses HundredGigE 1/0/1 of PE A.

```

[PE_A] interface hundredgige 1/0/1
[PE_A-HundredGigE1/0/1] display this
#
interface HundredGigE1/0/1
  port link-mode bridge
  port link-type hybrid
  undo port hybrid vlan 1
  port hybrid vlan 1001 to 1003 untagged
  qinq enable
  qos trust dot1p
  qos apply policy customer_A inbound
#
Return
[PE_A-HundredGigE1/0/1] quit

```

Verify the QoS configuration on each port. This example uses HundredGigE 1/0/1 of PE A.

```

[PE_A] display qos policy interface hundredgige 1/0/1
Interface: HundredGigE1/0/1

```

```

Direction: Inbound

Policy: customer_A
Classifier: customer_A_pc
  Operator: AND
  Rule(s) :
    If-match customer-vlan-id 10 to 20
  Behavior: customer_A_pc
  Nesting:
    Nest top-most vlan-id 1001
  Marking:
    Remark dot1p 3
Classifier: customer_A_voice
  Operator: AND
  Rule(s) :
    If-match customer-vlan-id 21 to 30
  Behavior: customer_A_voice
  Nesting:
    Nest top-most vlan-id 1002
  Marking:
    Remark dot1p 5
Classifier: customer_A_video
  Operator: AND
  Rule(s) :
    If-match customer-vlan-id 31 to 40
  Behavior: customer_A_video
  Nesting:
    Nest top-most vlan-id 1003
  Marking:
    Remark dot1p 7

```

Configuration files

- PE A:


```

#
vlan 1001 to 1003
#
vlan 2001 to 2003
#
traffic classifier customer_A_pc operator and
  if-match customer-vlan-id 10 to 20
#
traffic classifier customer_A_voice operator and
  if-match customer-vlan-id 21 to 30
#
traffic classifier customer_A_video operator and
  if-match customer-vlan-id 31 to 40

```

```

#
traffic classifier customer_B_pc operator and
  if-match customer-vlan-id 15 to 25
#
traffic classifier customer_B_voice operator and
  if-match customer-vlan-id 26 to 35
#
traffic classifier customer_B_storage operator and
  if-match customer-vlan-id 36 to 40
#
traffic behavior customer_A_pc
  nest top-most vlan 1001
  remark dot1p 3
#
traffic behavior customer_A_voice
  nest top-most vlan 1002
  remark dot1p 5
#
traffic behavior customer_A_video
  nest top-most vlan 1003
  remark dot1p 7
#
traffic behavior customer_B_pc
  nest top-most vlan 2001
  remark dot1p 3
#
traffic behavior customer_B_voice
  nest top-most vlan 2002
  remark dot1p 5
#
traffic behavior customer_B_storage
  nest top-most vlan 2003
  remark dot1p 7
#
qos policy customer_A
  classifier customer_A_pc behavior customer_A_pc
  classifier customer_A_voice behavior customer_A_voice
  classifier customer_A_video behavior customer_A_video
#
qos policy customer_B
  classifier customer_B_pc behavior customer_B_pc
  classifier customer_B_voice behavior customer_B_voice
  classifier customer_B_storage behavior customer_B_storage
#
interface HundredGigE1/0/1
  port link-mode bridge
  port link-type hybrid
  undo port hybrid vlan 1

```

```

port hybrid vlan 1001 to 1003 untagged
qinq enable
qos trust dot1p
qos apply policy customer_A inbound
#
interface HundredGigE1/0/2
port link-mode bridge
port link-type hybrid
undo port hybrid vlan 1
port hybrid vlan 2001 to 2003 untagged
qinq enable
qos trust dot1p
qos apply policy customer_B inbound
#
interface HundredGigE1/0/3
port link-mode bridge
port link-type trunk
undo port trunk permit vlan 1
port trunk permit vlan 1001 to 1003 2001 to 2003
#

```

- **PE B:**

```

#
vlan 1001 to 1003
#
vlan 2001 to 2003
#
traffic classifier customer_A_pc operator and
if-match customer-vlan-id 10 to 20
#
traffic classifier customer_A_voice operator and
if-match customer-vlan-id 21 to 30
#
traffic classifier customer_A_video operator and
if-match customer-vlan-id 31 to 40
#
traffic classifier customer_B_pc operator and
if-match customer-vlan-id 15 to 25
#
traffic classifier customer_B_voice operator and
if-match customer-vlan-id 26 to 35
#
traffic classifier customer_B_storage operator and
if-match customer-vlan-id 36 to 40
#
traffic behavior customer_A_pc
nest top-most vlan 1001
remark dot1p 3
#

```

```

traffic behavior customer_A_voice
  nest top-most vlan 1002
  remark dot1p 5
#
traffic behavior customer_A_video
  nest top-most vlan 1003
  remark dot1p 7
#
traffic behavior customer_B_pc
  nest top-most vlan 2001
  remark dot1p 3
#
traffic behavior customer_B_voice
  nest top-most vlan 2002
  remark dot1p 5
#
traffic behavior customer_B_storage
  nest top-most vlan 2003
  remark dot1p 7
#
qos policy customer_A
  classifier customer_A_pc behavior customer_A_pc
  classifier customer_A_voice behavior customer_A_voice
  classifier customer_A_video behavior customer_A_video
#
qos policy customer_B
  classifier customer_B_pc behavior customer_B_pc
  classifier customer_B_voice behavior customer_B_voice
  classifier customer_B_storage behavior customer_B_storage
#
interface HundredGigE1/0/1
  port link-mode bridge
  port link-type hybrid
  undo port hybrid vlan 1
  port hybrid vlan 2001 to 2003 untagged
  qinq enable
  qos trust dot1p
  qos apply policy customer_B inbound
#
interface HundredGigE1/0/2
  port link-mode bridge
  port link-type hybrid
  undo port hybrid vlan 1
  port hybrid vlan 1001 to 1003 untagged
  qinq enable
  qos trust dot1p
  qos apply policy customer_A inbound
#

```

```

interface HundredGigE1/0/3
 port link-mode bridge
 port link-type trunk
 undo port trunk permit vlan 1
 port trunk permit vlan 1001 to 1003 2001 to 2003
#

```

Example: Configuring one-to-one and many-to-one VLAN mapping

Network configuration

As shown in [Figure 6](#):

- Each household subscribes to PC, VoD, and VoIP services, and obtains the IP address through DHCP.
- On the home gateways, PC, VoD, and VoIP service traffic is assigned to VLANs 1, 2, and 3, respectively.

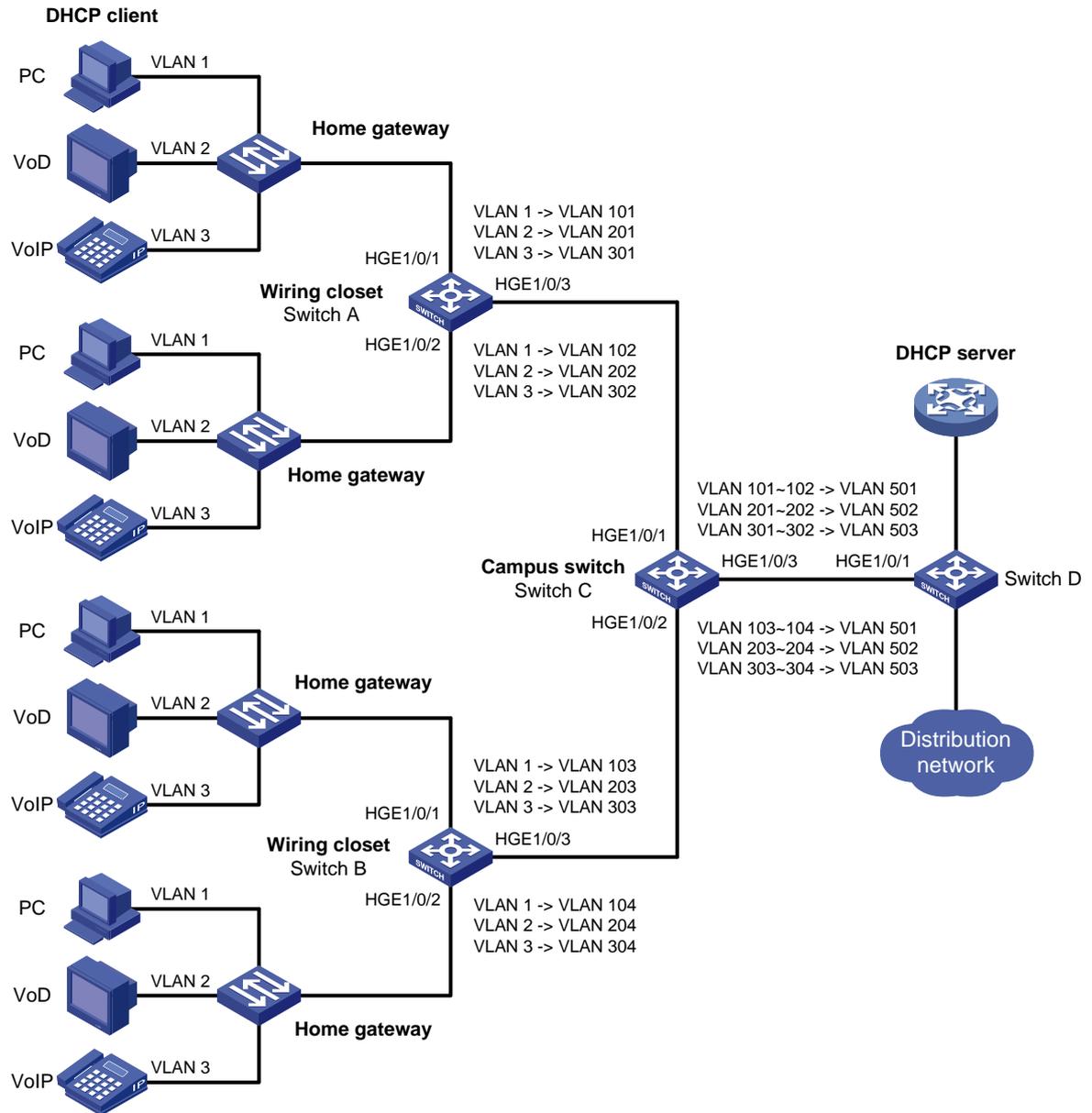
To isolate traffic of the same service type from different households, configure one-to-one VLAN mapping on the wiring-closet switches. This feature assigns one VLAN to each type of traffic from each household.

To save VLAN resources, configure many-to-one VLAN mapping on the campus switch (Switch C). This feature transmits the same type of traffic from different households in one VLAN. Use VLANs 501, 502, and 503 for PC, VoD, and VoIP traffic, respectively.

Table 3 VLAN mapping scheme for each service

Service	VLANs on home gateways	VLANs on wiring-closet switches (Switch A and Switch B)	VLANs on campus switch (Switch C)
PC	VLAN 1	VLANs 101, 102, 103, 104	VLAN 501
VoD	VLAN 2	VLANs 201, 202, 203, 204	VLAN 502
VoIP	VLAN 3	VLANs 301, 302, 303, 304	VLAN 503

Figure 6 Network diagram



Applicable hardware and software versions

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

Hardware	Software version
S6850 switch series S9850 switch series	Release 6555P01
S9820-64H switches	Release 6555P01

Procedures

Configuring Switch A

```
# Create the original VLANs 2 and 3. (VLAN 1 is the system default VLAN and already exists.)
<SwitchA> system-view
[SwitchA] vlan 2 to 3

# Create the translated VLANs 101 through 102, 201 through 202, and 301 through 302.
[SwitchA] vlan 101 to 102
[SwitchA] vlan 201 to 202
[SwitchA] vlan 301 to 302

# Configure the customer-side port HundredGigE 1/0/1 as a trunk port.
[SwitchA] interface hundredgige 1/0/1
[SwitchA-HundredGigE1/0/1] port link-type trunk

# Assign HundredGigE 1/0/1 to the original VLANs and translated VLANs.
[SwitchA-HundredGigE1/0/1] port trunk permit vlan 1 2 3 101 201 301

# Configure one-to-one VLAN mapping on HundredGigE 1/0/1 to map VLANs 1, 2, and 3 to VLANs
101, 201, and 301, respectively.
[SwitchA-HundredGigE1/0/1] vlan mapping 1 translated-vlan 101
[SwitchA-HundredGigE1/0/1] vlan mapping 2 translated-vlan 201
[SwitchA-HundredGigE1/0/1] vlan mapping 3 translated-vlan 301
[SwitchA-HundredGigE1/0/1] quit

# Configure the customer-side port HundredGigE 1/0/2 as a trunk port.
[SwitchA] interface hundredgige 1/0/2
[SwitchA-HundredGigE1/0/2] port link-type trunk

# Assign HundredGigE 1/0/2 to the original VLANs and translated VLANs.
[SwitchA-HundredGigE1/0/2] port trunk permit vlan 1 2 3 102 202 302

# Configure one-to-one VLAN mapping on HundredGigE 1/0/2 to map VLANs 1, 2, and 3 to VLANs
102, 202, and 302, respectively.
[SwitchA-HundredGigE1/0/2] vlan mapping 1 translated-vlan 102
[SwitchA-HundredGigE1/0/2] vlan mapping 2 translated-vlan 202
[SwitchA-HundredGigE1/0/2] vlan mapping 3 translated-vlan 302
[SwitchA-HundredGigE1/0/2] quit

# Configure the network-side port HundredGigE 1/0/3 as a trunk port.
[SwitchA] interface hundredgige 1/0/3
[SwitchA-HundredGigE1/0/3] port link-type trunk

# Assign HundredGigE 1/0/3 to the translated VLANs.
[SwitchA-HundredGigE1/0/3] undo port trunk permit vlan 1
[SwitchA-HundredGigE1/0/3] port trunk permit vlan 101 201 301 102 202 302
[SwitchA-HundredGigE1/0/3] quit
```

Configuring Switch B

```
# Configure Switch B in the same way Switch A is configured. (Details not shown.)
```

Configuring Switch C

1. Configure basic settings required for many-to-one VLAN mapping:

Enable DHCP snooping.

```
<SwitchC> system-view
```

```
[SwitchC] dhcp snooping enable
```

Create the original VLANs 101 through 104, 201 through 204, and 301 through 304, and enable ARP detection for these VLANs.

```
[SwitchC] vlan 101
```

```
[SwitchC-vlan101] arp detection enable
```

```
[SwitchC-vlan101] vlan 201
```

```
[SwitchC-vlan201] arp detection enable
```

```
[SwitchC-vlan201] vlan 301
```

```
[SwitchC-vlan301] arp detection enable
```

```
[SwitchC-vlan301] vlan 102
```

```
[SwitchC-vlan102] arp detection enable
```

```
[SwitchC-vlan102] vlan 202
```

```
[SwitchC-vlan202] arp detection enable
```

```
[SwitchC-vlan202] vlan 302
```

```
[SwitchC-vlan302] arp detection enable
```

```
[SwitchC-vlan302] vlan 103
```

```
[SwitchC-vlan103] arp detection enable
```

```
[SwitchC-vlan103] vlan 203
```

```
[SwitchC-vlan203] arp detection enable
```

```
[SwitchC-vlan203] vlan 303
```

```
[SwitchC-vlan303] arp detection enable
```

```
[SwitchC-vlan303] vlan 104
```

```
[SwitchC-vlan104] arp detection enable
```

```
[SwitchC-vlan104] vlan 204
```

```
[SwitchC-vlan204] arp detection enable
```

```
[SwitchC-vlan204] vlan 304
```

```
[SwitchC-vlan304] arp detection enable
```

Create the translated VLANs 501 through 503, and enable ARP detection for these VLANs.

```
[SwitchC-vlan304] vlan 501
```

```
[SwitchC-vlan501] arp detection enable
```

```
[SwitchC-vlan501] vlan 502
```

```
[SwitchC-vlan502] arp detection enable
```

```
[SwitchC-vlan502] vlan 503
```

```
[SwitchC-vlan503] arp detection enable
```

```
[SwitchC-vlan503] quit
```

2. Configure the customer-side port HundredGigE 1/0/1:

Configure the port as a trunk port.

```
[SwitchC] interface hundredgige 1/0/1
```

```
[SwitchC-HundredGigE1/0/1] port link-type trunk
```

Assign the port to the original VLANs and translated VLANs.

```
[SwitchC-HundredGigE1/0/1] undo port trunk permit vlan 1
```

```
[SwitchC-HundredGigE1/0/1] port trunk permit vlan 101 102 201 202 301 302 501 to 503
```

Configure the user-side many-to-one VLAN mapping to map VLANs for PC, VoD, and VoIP traffic to VLANs 501, 502, and 503, respectively.

```
[SwitchC-HundredGigE1/0/1] vlan mapping uni range 101 to 102 translated-vlan 501
[SwitchC-HundredGigE1/0/1] vlan mapping uni range 201 to 202 translated-vlan 502
[SwitchC-HundredGigE1/0/1] vlan mapping uni range 301 to 302 translated-vlan 503
```

Enable DHCP snooping entry recording.

```
[SwitchC-HundredGigE1/0/1] dhcp snooping binding record
[SwitchC-HundredGigE1/0/1] quit
```

3. Configure the customer-side port HundredGigE 1/0/2:

Configure the port as a trunk port.

```
[SwitchC] interface hundredgige 1/0/2
[SwitchC-HundredGigE1/0/2] port link-type trunk
```

Assign the port to the original VLANs and translated VLANs.

```
[SwitchC-HundredGigE1/0/2] undo port trunk permit vlan 1
[SwitchC-HundredGigE1/0/2] port trunk permit vlan 103 104 203 204 303 304 501 to 503
```

Configure the user-side many-to-one VLAN mapping to map VLANs for PC, VoD, and VoIP traffic to VLANs 501, 502, and 503, respectively.

```
[SwitchC-HundredGigE1/0/2] vlan mapping uni range 103 to 104 translated-vlan 501
[SwitchC-HundredGigE1/0/2] vlan mapping uni range 203 to 204 translated-vlan 502
[SwitchC-HundredGigE1/0/2] vlan mapping uni range 303 to 304 translated-vlan 503
```

Enable DHCP snooping entry recording.

```
[SwitchC-HundredGigE1/0/2] dhcp snooping binding record
[SwitchC-HundredGigE1/0/2] quit
```

4. Configure the network-side port HundredGigE 1/0/3:

Enable the network-side VLAN mapping function on the port.

```
[SwitchC] interface hundredgige 1/0/3
[SwitchC-HundredGigE1/0/3] vlan mapping nni
```

Configure the port as a trunk port.

```
[SwitchC-HundredGigE1/0/3] port link-type trunk
```

Assign the port to the translated VLANs 501 through 503.

```
[SwitchC-HundredGigE1/0/3] undo port trunk permit vlan 1
[SwitchC-HundredGigE1/0/3] port trunk permit vlan 501 to 503
```

Configure the port as a DHCP snooping trusted and ARP trusted port.

```
[SwitchC-HundredGigE1/0/3] dhcp snooping trust
[SwitchC-HundredGigE1/0/3] arp detection trust
[SwitchC-HundredGigE1/0/3] quit
```

Configuring Switch D

Create the translated VLANs 501 through 503.

```
<SwitchD> system-view
[SwitchD] vlan 501 to 503
```

Configure HundredGigE 1/0/1 as a trunk port.

```
[SwitchD] interface hundredgige 1/0/1
[SwitchD-HundredGigE1/0/1] port link-type trunk
```

Assign HundredGigE 1/0/1 to the translated VLANs 501 through 503.

```
[SwitchD-HundredGigE1/0/1] port trunk permit vlan 501 to 503
```

```
[SwitchD-HundredGigE1/0/1] quit
```

Verifying the configuration

Verify VLAN mapping information on the wiring-closet switches, for example, Switch A.

```
[SwitchA] display vlan mapping
```

```
Interface HundredGigE1/0/1:
```

Outer VLAN	Inner VLAN	Translated Outer VLAN	Translated Inner VLAN
1	N/A	101	N/A
2	N/A	201	N/A
3	N/A	301	N/A

```
Interface HundredGigE1/0/2:
```

Outer VLAN	Inner VLAN	Translated Outer VLAN	Translated Inner VLAN
1	N/A	102	N/A
2	N/A	202	N/A
3	N/A	302	N/A

Verify VLAN mapping information on Switch C.

```
[SwitchC] display vlan mapping
```

```
Interface HundredGigE1/0/1:
```

Outer VLAN	Inner VLAN	Translated Outer VLAN	Translated Inner VLAN
101-102	N/A	501	N/A
201-202	N/A	502	N/A
301-302	N/A	503	N/A

```
Interface HundredGigE1/0/2:
```

Outer VLAN	Inner VLAN	Translated Outer VLAN	Translated Inner VLAN
103-104	N/A	501	N/A
203-204	N/A	502	N/A
303-304	N/A	503	N/A

Configuration files

- Switch A:

```
#
vlan 1
#
vlan 2 to 3
#
vlan 101 to 102
#
vlan 201 to 202
#
vlan 301 to 302
#
interface HundredGigE1/0/1
port link-type trunk
port trunk permit vlan 1 to 3 101 201 301
vlan mapping 1 translated-vlan 101
```

```

vlan mapping 2 translated-vlan 201
vlan mapping 3 translated-vlan 301
#
interface HundredGigE1/0/2
port link-type trunk
port trunk permit vlan 1 to 3 102 202 302
vlan mapping 1 translated-vlan 102
vlan mapping 2 translated-vlan 202
vlan mapping 3 translated-vlan 302
#
interface HundredGigE1/0/3
port link-type trunk
port trunk permit vlan 1 101 to 102 201 to 202 301 to 302
#

```

- **Switch B:**

```

#
vlan 1
#
vlan 2 to 3
#
vlan 103 to 104
#
vlan 203 to 204
#
vlan 303 to 304
#
interface HundredGigE1/0/1
port link-type trunk
port trunk permit vlan 1 to 3 103 203 303
vlan mapping 1 translated-vlan 103
vlan mapping 2 translated-vlan 203
vlan mapping 3 translated-vlan 303
#
interface HundredGigE1/0/2
port link-type trunk
port trunk permit vlan 1 to 3 104 204 304
vlan mapping 1 translated-vlan 104
vlan mapping 2 translated-vlan 204
vlan mapping 3 translated-vlan 304
#
interface HundredGigE1/0/3
port link-type trunk
port trunk permit vlan 1 103 to 104 203 to 204 303 to 304
#

```

- **Switch C:**

```

#
dhcp snooping enable
#

```

```
vlan 101
  arp detection enable
#
vlan 102
  arp detection enable
#
vlan 103
  arp detection enable
#
vlan 104
  arp detection enable
#
vlan 201
  arp detection enable
#
vlan 202
  arp detection enable
#
vlan 203
  arp detection enable
#
vlan 204
  arp detection enable
#
vlan 301
  arp detection enable
#
vlan 302
  arp detection enable
#
vlan 303
  arp detection enable
#
vlan 304
  arp detection enable
#
vlan 501
  arp detection enable
#
vlan 502
  arp detection enable
#
vlan 503
  arp detection enable
#
interface HundredGigE1/0/1
  port link-type trunk
  undo port trunk permit vlan 1
```

```

port trunk permit vlan 101 to 102 201 to 202 301 to 302 501 to 503
vlan mapping uni range 101 to 102 translated-vlan 501
vlan mapping uni range 201 to 202 translated-vlan 502
vlan mapping uni range 301 to 302 translated-vlan 503
dhcp snooping binding record
#
interface HundredGigE1/0/2
port link-type trunk
undo port trunk permit vlan 1
port trunk permit vlan 103 to 104 203 to 204 303 to 304 501 to 503
vlan mapping uni range 103 to 104 translated-vlan 501
vlan mapping uni range 203 to 204 translated-vlan 502
vlan mapping uni range 303 to 304 translated-vlan 503
dhcp snooping binding record
#
interface HundredGigE1/0/3
port link-type trunk
undo port trunk permit vlan 1
port trunk permit vlan 501 to 503
vlan mapping nni
arp detection trust
dhcp snooping trust
#

```

- Switch D:

```

#
vlan 501 to 503
#
interface HundredGigE1/0/1
port link-type trunk
port trunk permit vlan 1 501 to 503
#

```

Example: Configuring two-to-two VLAN mapping

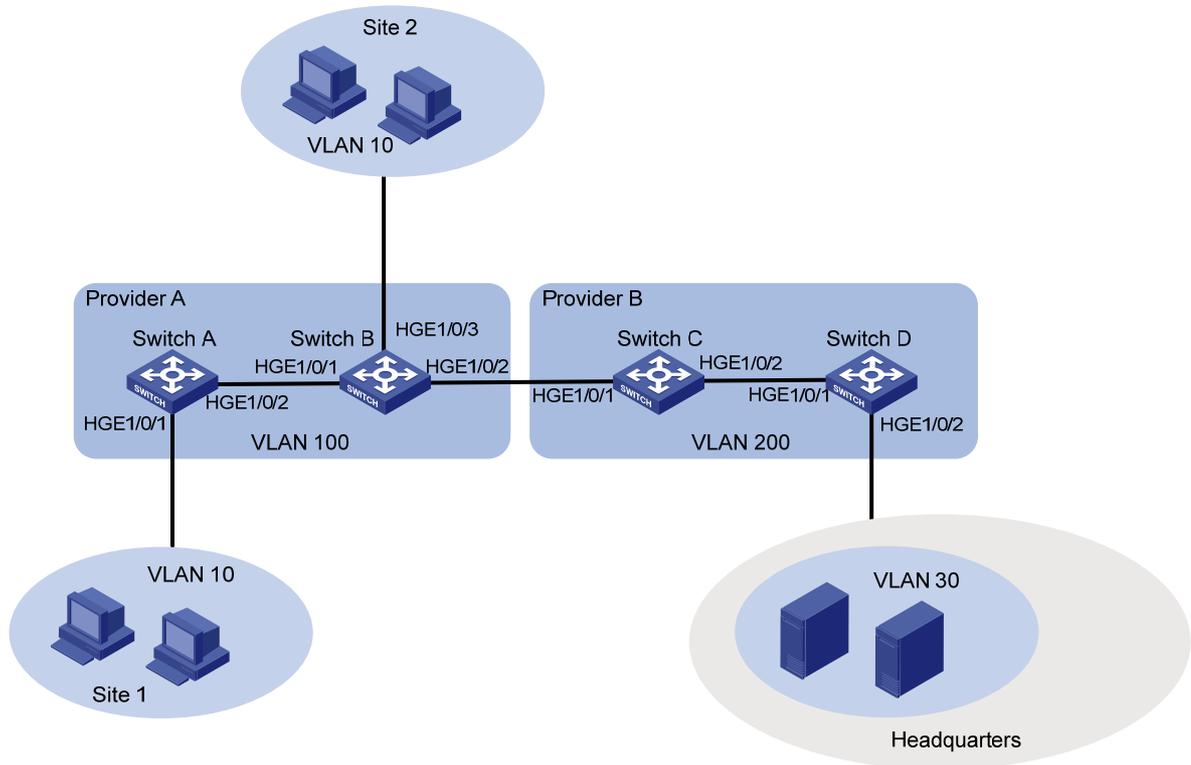
Network configuration

As shown in [Figure 7](#):

- A company assigns its branch sites (Site 1 and Site 2) to VLAN 10, and the headquarters provides services in VLAN 30.
- Service provider A uses SVLAN 100 to transmit VLAN 10 traffic for the branch sites.
- Service provider B uses SVLAN 200 to transmit VLAN 30 traffic for the headquarters.

Configure two-to-two VLAN mapping to permit the two branch sites to access VLAN 30 of the headquarters without changing their VLAN assignment.

Figure 7 Network diagram



Applicable hardware and software versions

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

Hardware	Software version
S6850 switch series S9850 switch series	Release 6555P01
S9820-64H switches	Release 6555P01

Restrictions and guidelines

Configure two-to-two VLAN mapping on one of the edge devices between the two service provider networks. This example uses Switch C.

Procedures

Configuring Switch A

```
# Create CVLAN 10 and SVLAN 100.
<SwitchA> system-view
[SwitchA] vlan 10
```

```

[SwitchA-vlan10] quit
[SwitchA] vlan 100
[SwitchA-vlan100] quit

# Configure a one-to-two VLAN mapping on the customer-side port (HundredGigE 1/0/1) to add
SVLAN tag 100 to packets from VLAN 10.
[SwitchA] interface hundredgige 1/0/1
[SwitchA-HundredGigE1/0/1] vlan mapping nest single 10 nested-vlan 100

# Configure HundredGigE 1/0/1 as a hybrid port.
[SwitchA-HundredGigE1/0/1] port link-type hybrid

# Assign HundredGigE 1/0/1 to VLAN 10 as a tagged member.
[SwitchA-HundredGigE1/0/1] port hybrid vlan 10 tagged

# Assign HundredGigE 1/0/1 to VLAN 100 as an untagged member.
[SwitchA-HundredGigE1/0/1] port hybrid vlan 100 untagged

# Remove HundredGigE 1/0/1 from VLAN 1.
[SwitchA-HundredGigE1/0/1] undo port hybrid vlan 1
[SwitchA-HundredGigE1/0/1] quit

# Configure the network-side port HundredGigE 1/0/2 as a trunk port.
[SwitchA] interface hundredgige 1/0/2
[SwitchA-HundredGigE1/0/2] port link-type trunk

# Assign HundredGigE 1/0/2 to VLAN 100.
[SwitchA-HundredGigE1/0/2] port trunk permit vlan 100

# Remove HundredGigE 1/0/2 from VLAN 1.
[SwitchA-HundredGigE1/0/2] undo port trunk permit vlan 1
[SwitchA-HundredGigE1/0/2] quit

```

Configuring Switch B

```

# Create CVLAN 10 and SVLAN 100.
<SwitchB> system-view
[SwitchB] vlan 10
[SwitchB-vlan10] quit
[SwitchB] vlan 100
[SwitchB-vlan100] quit

# Configure a one-to-two VLAN mapping on the customer-side port (HundredGigE 1/0/3) to add
SVLAN tag 100 to packets from VLAN 10.
[SwitchB] interface hundredgige 1/0/3
[SwitchB-HundredGigE1/0/3] vlan mapping nest single 10 nested-vlan 100

# Configure HundredGigE 1/0/3 as a hybrid port.
[SwitchB] interface hundredgige 1/0/3
[SwitchB-HundredGigE1/0/3] port link-type hybrid

# Assign HundredGigE 1/0/3 to VLAN 10 as a tagged member.
[SwitchB-HundredGigE1/0/3] port hybrid vlan 10 tagged

# Assign HundredGigE 1/0/3 to VLAN 100 as an untagged member.
[SwitchB-HundredGigE1/0/3] port hybrid vlan 100 untagged

# Remove HundredGigE 1/0/3 from VLAN 1.
[SwitchB-HundredGigE1/0/3] undo port hybrid vlan 1

```

```

[SwitchB-HundredGigE1/0/3] quit
# Configure HundredGigE 1/0/1 as a trunk port.
[SwitchB] interface hundredgige 1/0/1
[SwitchB-HundredGigE1/0/1] port link-type trunk
# Assign HundredGigE 1/0/1 to VLAN 100.
[SwitchB-HundredGigE1/0/1] port trunk permit vlan 100
# Remove HundredGigE 1/0/1 from VLAN 1.
[SwitchB-HundredGigE1/0/1] undo port trunk permit vlan 1
[SwitchB-HundredGigE1/0/1] quit
# Configure HundredGigE 1/0/2 as a trunk port.
[SwitchB] interface hundredgige 1/0/2
[SwitchB-HundredGigE1/0/2] port link-type trunk
# Assign HundredGigE 1/0/2 to VLAN 100.
[SwitchB-HundredGigE1/0/2] port trunk permit vlan 100
# Remove HundredGigE 1/0/2 from VLAN 1.
[SwitchB-HundredGigE1/0/2] undo port trunk permit vlan 1
[SwitchB-HundredGigE1/0/2] quit

```

Configuring Switch C

```

# Create SVLANs 100 and 200.
<SwitchC> system-view
[SwitchC] vlan 100
[SwitchC-vlan100] quit
[SwitchC] vlan 200
[SwitchC-vlan200] quit
# Configure HundredGigE 1/0/1 as a trunk port.
[SwitchC] interface hundredgige 1/0/1
[SwitchC-HundredGigE1/0/1] port link-type trunk
# Assign HundredGigE 1/0/1 to VLANs 100 to 200.
[SwitchC-HundredGigE1/0/1] port trunk permit vlan 100 200
# Remove HundredGigE 1/0/1 from VLAN 1.
[SwitchC-HundredGigE1/0/1] undo port trunk permit vlan 1
# Configure a two-to-two VLAN mapping on HundredGigE 1/0/1 to map SVLAN 100 and CVLAN 10
to SVLAN 200 and CVLAN 30.
[SwitchC-HundredGigE1/0/1] vlan mapping tunnel 100 10 translated-vlan 200 30
[SwitchC-HundredGigE1/0/1] quit
# Configure HundredGigE 1/0/2 as a trunk port.
[SwitchC] interface hundredgige 1/0/2
[SwitchC-HundredGigE1/0/2] port link-type trunk
# Assign HundredGigE 1/0/2 to VLAN 200.
[SwitchC-HundredGigE1/0/2] port trunk permit vlan 200
# Remove HundredGigE 1/0/2 from VLAN 1.
[SwitchC-HundredGigE1/0/2] undo port trunk permit vlan 1
[SwitchC-HundredGigE1/0/2] quit

```

Configuring Switch D

Create CVLAN 30 and SVLAN 200.

```
<SwitchD> system-view
[SwitchD] vlan 30
[SwitchD-vlan30] quit
[SwitchD] vlan 200
[SwitchD-vlan200] quit
```

Configure the link type of HundredGigE 1/0/1 as trunk.

```
[SwitchD] interface hundredgige 1/0/1
[SwitchD-HundredGigE1/0/1] port link-type trunk
```

Assign HundredGigE 1/0/1 to VLAN 200.

```
[SwitchD-HundredGigE1/0/1] port trunk permit vlan 200
```

Remove HundredGigE 1/0/1 from VLAN 1.

```
[SwitchD-HundredGigE1/0/1] undo port trunk permit vlan 1
[SwitchD-HundredGigE1/0/1] quit
```

Configure HundredGigE 1/0/2 as a hybrid port.

```
[SwitchD] interface hundredgige 1/0/2
[SwitchD-HundredGigE1/0/2] port link-type hybrid
```

Assign HundredGigE 1/0/2 to VLAN 30 as a tagged member.

```
[SwitchD-HundredGigE1/0/2] port hybrid vlan 30 tagged
```

Assign HundredGigE 1/0/2 to VLAN 200 as an untagged member.

```
[SwitchD-HundredGigE1/0/2] port hybrid vlan 200 untagged
```

Remove HundredGigE 1/0/2 from VLAN 1.

```
[SwitchD-HundredGigE1/0/2] undo port hybrid vlan 1
[SwitchD-HundredGigE1/0/2] quit
```

Configure a one-to-two VLAN mapping on the customer-side port (HundredGigE 1/0/2) to add SVLAN tag 200 to packets from VLAN 30.

```
[SwitchD] interface hundredgige 1/0/2
[SwitchD-HundredGigE1/0/2] vlan mapping nest single 30 nested-vlan 200
[SwitchD-HundredGigE1/0/2] quit
```

Verifying the configuration

Verify VLAN mapping information on Switch C.

```
[SwitchC] display vlan mapping
Interface HundredGigE1/0/1:
  Outer VLAN   Inner VLAN   Translated Outer VLAN   Translated Inner VLAN
  100          10          200                    30
```

Configuration files

- Switch A:

vlan 10
vlan 100

```

#
interface HundredGigE1/0/1
 port link-type hybrid
 port hybrid vlan 10 tagged
 port hybrid vlan 100 untagged
 vlan mapping nest single 10 nested-vlan 100
#
interface HundredGigE1/0/2
 port link-type trunk
 undo port trunk permit vlan 1
 port trunk permit vlan 100

```

- **Switch B:**

```

#
vlan 10
vlan 100
#
interface HundredGigE1/0/1
 port link-type trunk
 undo port trunk permit vlan 1
 port trunk permit vlan 100
#
interface HundredGigE1/0/2
 port link-type trunk
 undo port trunk permit vlan 1
 port trunk permit vlan 100
#
interface HundredGigE1/0/3
 port link-type hybrid
 port hybrid vlan 10 tagged
 port hybrid vlan 100 untagged
 vlan mapping nest single 10 nested-vlan 100

```

- **Switch C:**

```

#
vlan 100
#
vlan 200
#
interface HundredGigE1/0/1
 port link-type trunk
 undo port trunk permit vlan 1
 port trunk permit vlan 100 200
 vlan mapping tunnel 100 10 translated-vlan 200 30
#
interface HundredGigE1/0/2
 port link-type trunk
 undo port trunk permit vlan 1
 port trunk permit vlan 200
#

```

- Switch D:

```
#
vlan 30
vlan 200
#
interface HundredGigE1/0/1
port link-type trunk
undo port trunk permit vlan 1
port trunk permit vlan 200
#
interface HundredGigE1/0/2
port link-type hybrid
port hybrid vlan 30 tagged
port hybrid vlan 200 untagged
vlan mapping nest single 30 nested-vlan 200
#
```

Example: Modifying the CVLAN ID through QoS marking

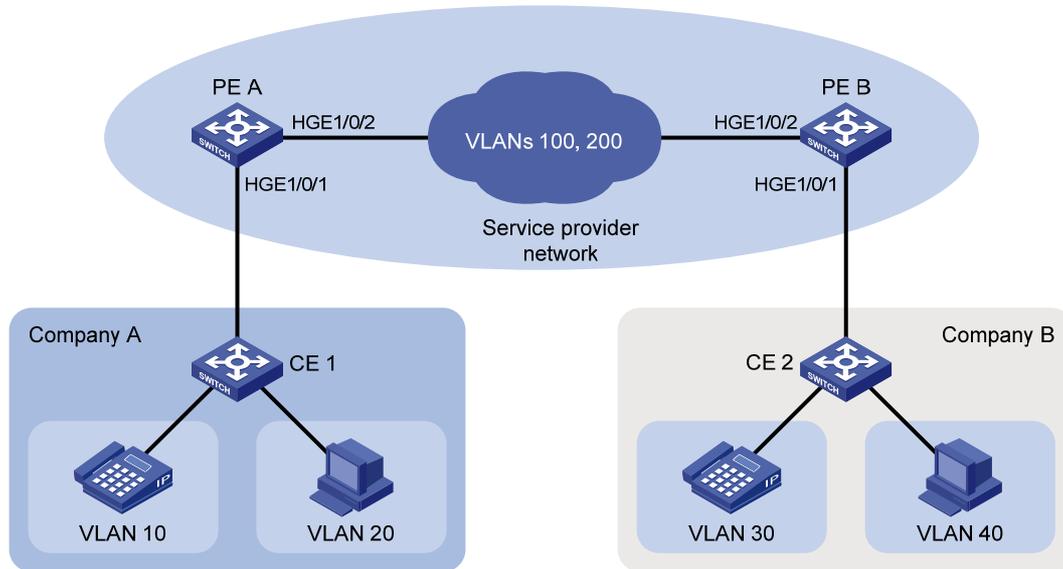
Network configuration

As shown in [Figure 8](#):

- Company A uses CVLANs 10 and 20 to transmit voice traffic and data traffic, respectively.
- Company B uses CVLANs 30 and 40 to transmit voice traffic and data traffic, respectively.
- The service provider uses SVLANs 100 and 200 to transmit these two companies' voice and data traffic, respectively.

To provide Layer 2 connectivity for the voice and data traffic between the two companies, configure QoS CVLAN marking on PE A and PE B.

Figure 8 Network diagram



Analysis

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

- To add different SVLAN tags to voice and data traffic, use the nest action for SVLAN tagging on the customer-side ports of PE A and PE B.
- To provide Layer 2 connectivity for the traffic from different CVLANs, configure QoS CVLAN marking on the service provider-side ports of PE A and PE B.

Applicable hardware and software versions

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

Hardware	Software version
S6850 switch series S9850 switch series	Release 6555P01
S9820-64H switches	Release 6555P01

Procedures

Configuring PE A

1. Create the CVLANs and SVLANs.

```
<PE_A> system-view
[PE_A] vlan 10
[PE_A-vlan10] quit
[PE_A] vlan 20
```

```
[PE_A-vlan20] quit
[PE_A] vlan 100
[PE_A-vlan100] quit
[PE_A] vlan 200
[PE_A-vlan200] quit
[PE_A] vlan 30
[PE_A-vlan30] quit
[PE_A] vlan 40
[PE_A-vlan40] quit
```

2. Configure the customer-side port HundredGigE1/0/1:

Configure the port as a hybrid port.

```
[PE_A] interface hundredgige 1/0/1
[PE_A-HundredGigE1/0/1] port link-type hybrid
```

Configure the port as an untagged VLAN member of VLANs 100 and 200.

```
[PE_A-HundredGigE1/0/1] port hybrid vlan 100 200 untagged
```

Remove the port from VLAN 1.

```
[PE_A-HundredGigE1/0/1] undo port hybrid vlan 1
[PE_A-HundredGigE1/0/1] quit
```

Create the class **A10 to match frames with CVLAN 10.**

```
[PE_A] traffic classifier A10
[PE_A-classifier-A10] if-match customer-vlan-id 10
[PE_A-classifier-A10] quit
```

Configure the traffic behavior **P100 to tag packets with SVLAN 100.**

```
[PE_A] traffic behavior P100
[PE_A-behavior-P100] nest top-most vlan 100
[PE_A-behavior-P100] quit
```

Create the class **A20 to match frames with CVLAN 20.**

```
[PE_A] traffic classifier A20
[PE_A-classifier-A20] if-match customer-vlan-id 20
[PE_A-classifier-A20] quit
```

Configure the traffic behavior **P200 to tag packets with SVLAN 200.**

```
[PE_A] traffic behavior P200
[PE_A-behavior-P200] nest top-most vlan 200
[PE_A-behavior-P200] quit
```

Create the QoS policy **qinq to associate the traffic classes **A10** and **A20** with the traffic behaviors **P100** and **P200**, respectively.**

```
[PE_A] qos policy qinq
[PE_A-qospolicy-qinq] classifier A10 behavior P100
[PE_A-qospolicy-qinq] classifier A20 behavior P200
[PE_A-qospolicy-qinq] quit
```

Enable QinQ in the port.

```
[PE_A-HundredGigE1/0/1] qinq enable
```

Apply the QoS policy to the inbound direction of the port.

```
[PE_A-HundredGigE1/0/1] qos apply policy qinq inbound
[PE_A-HundredGigE1/0/1] quit
```

3. Configure the service network-side port HundredGigE1/0/2:

Configure the port as a trunk port.

```

[PE_A] interface hundredgige 1/0/2
[PE_A-HundredGigE1/0/2] port link-type trunk
# Assign the port to VLANs 100 and 200.
[PE_A-HundredGigE1/0/2] port trunk permit vlan 100 200
# Remove the port from VLAN 1.
[PE_A-HundredGigE1/0/2] undo port trunk permit vlan 1
[PE_A-HundredGigE1/0/2] quit
# Create the class A100 to match frames with CVLAN 10 and SVLAN 100.
[PE_A] traffic classifier A100
[PE_A-classifier-A100] if-match customer-vlan-id 10
[PE_A-classifier-A100] if-match service-vlan-id 100
[PE_A-classifier-A100] quit
# Configure the traffic behavior T100 to mark matching traffic with CVLAN 30.
[PE_A] traffic behavior T100
[PE_A-behavior-T100] remark customer-vlan-id 30
[PE_A-behavior-T100] quit
# Create the class A200 to match frames with CVLAN 20 and SVLAN 200.
[PE_A] traffic classifier A200
[PE_A-classifier-A200] if-match customer-vlan-id 20
[PE_A-classifier-A200] if-match service-vlan-id 200
[PE_A-classifier-A200] quit
# Configure the traffic behavior T200 to mark matching traffic with CVLAN 40.
[PE_A] traffic behavior T200
[PE_A-behavior-T200] remark customer-vlan-id 40
[PE_A-behavior-T200] quit
# Create the QoS policy vlanmapping to associate the traffic classes A100 and A200 with the traffic behaviors T100 and T200, respectively.
[PE_A] qos policy vlanmapping
[PE_A-qospolicy-vlanmapping] classifier A100 behavior T100
[PE_A-qospolicy-vlanmapping] classifier A200 behavior T200
[PE_A-qospolicy-vlanmapping] quit
# Apply the QoS policy to the outbound direction of the port.
[PE_A-HundredGigE1/0/2] qos apply policy vlanmapping outbound
[PE_A-HundredGigE1/0/2] quit

```

Configuring PE B

1. Create the CVLANs and SVLANs.

```

<PE_B> system-view
[PE_B] vlan 30
[PE_B-vlan30] quit
[PE_B] vlan 40
[PE_B-vlan40] quit
[PE_B] vlan 100
[PE_B-vlan100] quit
[PE_B] vlan 200
[PE_B-vlan200] quit
[PE_B] vlan 10

```

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

2. Configure the customer-side port HundredGigE1/0/1:

Configure the port as a hybrid port.

```
[PE_B] interface hundredgige 1/0/1
[PE_B-HundredGigE1/0/1] port link-type hybrid
```

Assign the port to VLANs 100 and 200 as an untagged VLAN member.

```
[PE_B-HundredGigE1/0/1] port hybrid vlan 100 200 untagged
```

Remove the port from VLAN 1.

```
[PE_B-HundredGigE1/0/1] undo port hybrid vlan 1
[PE_B-HundredGigE1/0/1] quit
```

Create the class **A30 to match frames with CVLAN 30.**

```
[PE_B] traffic classifier A30
[PE_B-classifier-A30] if-match customer-vlan-id 30
[PE_B-classifier-A30] quit
```

Configure the traffic behavior **P100 to tag packets with SVLAN 100.**

```
[PE_B] traffic behavior P100
[PE_B-behavior-P100] nest top-most vlan 100
[PE_B-behavior-P100] quit
```

Create the class **A40 to match frames with CVLAN 40.**

```
[PE_B] traffic classifier A40
[PE_B-classifier-A40] if-match customer-vlan-id 40
[PE_B-classifier-A40] quit
```

Configure the traffic behavior **P200 to tag packets with SVLAN 200.**

```
[PE_B] traffic behavior P200
[PE_B-behavior-P200] nest top-most vlan 200
[PE_B-behavior-P200] quit
```

Create the QoS policy **qinq to associate the traffic classes **A30** and **A40** with the traffic behaviors **P100** and **P200**, respectively.**

```
[PE_B] qos policy qinq
[PE_B-qospolicy-qinq] classifier A30 behavior P100
[PE_B-qospolicy-qinq] classifier A40 behavior P200
[PE_B-qospolicy-qinq] quit
```

Enable QinQ on the port.

```
[PE_B-HundredGigE1/0/1] qinq enable
```

Apply the QoS policy to the inbound direction of the port.

```
[PE_B-HundredGigE1/0/1] qos apply policy qinq inbound
[PE_B-HundredGigE1/0/1] quit
```

3. Configure the service provider-side port HundredGigE 1/0/2:

Configure the port as a trunk port.

```
[PE_B] interface hundredgige 1/0/2
[PE_B-HundredGigE1/0/2] port link-type trunk
```

Assign the port to VLANs 100 and 200.

```
[PE_B-HundredGigE1/0/2] port trunk permit vlan 100 200
```

Remove the port from VLAN 1.

```
[PE_B-HundredGigE1/0/2] undo port trunk permit vlan 1
```

```

[PE_B-HundredGigE1/0/2] quit
# Create the class A100 to match frames with CVLAN 30 and SVLAN 100.
[PE_B] traffic classifier A100
[PE_B-classifier-A100] if-match customer-vlan-id 30
[PE_B-classifier-A100] if-match service-vlan-id 100
[PE_B-classifier-A100] quit
# Configure the traffic behavior T100 to mark matching traffic with CVLAN 10.
[PE_B] traffic behavior T100
[PE_B-behavior-T100] remark customer-vlan-id 10
[PE_B-behavior-T100] quit
# Create the class A200 to match frames with CVLAN 40 and SVLAN 200.
[PE_B] traffic classifier A200
[PE_B-classifier-A200] if-match customer-vlan-id 40
[PE_B-classifier-A200] if-match service-vlan-id 200
[PE_B-classifier-A200] quit
# Configure the traffic behavior T200 to mark matching traffic with CVLAN 20.
[PE_B] traffic behavior T200
[PE_B-behavior-T200] remark customer-vlan-id 20
[PE_B-behavior-T200] quit
# Create the QoS policy vlanmapping to associate the traffic classes A100 and A200 with the
traffic behaviors T100 and T200, respectively.
[PE_B] qos policy vlanmapping
[PE_B-qospolicy-vlanmapping] classifier A100 behavior T100
[PE_B-qospolicy-vlanmapping] classifier A200 behavior T200
[PE_B-qospolicy-vlanmapping] quit
# Apply the QoS policy to the outbound direction of the port.
[PE_B] interface hundredgige 1/0/2
[PE_B-HundredGigE1/0/2] qos apply policy vlanmapping outbound
[PE_B-HundredGigE1/0/2] quit

```

Configuring devices between PE A and PE B

Set the MTU to a minimum of 1504 bytes for each port on the path of double-tagged frames. (Details not shown.)

Configure the ports between PE A and PE B to allow frames from VLANs 100 and 200 to pass through tagged. (Details not shown.)

Verifying the configuration

Verify configuration on the customer-side ports on PE A and PE B. This example uses HundredGigE 1/0/1 of PE A.

```

[PE_A] interface hundredgige 1/0/1
[PE_A-HundredGigE1/0/1] display this
#
interface HundredGigE1/0/1
 port link-mode bridge
 port link-type hybrid
 undo port hybrid vlan 1

```

```
port hybrid vlan 100 200 untagged
qinq enable
qos apply policy qinq inbound
#
return
```

Verify the QoS nesting configuration on the customer-side ports on PE A and PE B. This example uses HundredGigE 1/0/1 of PE A.

```
[PE_A] display qos policy interface hundredgige 1/0/1
```

```
Interface: HundredGigE1/0/1
```

```
Direction: Inbound
```

```
Policy: qinq
```

```
Classifier: A10
```

```
Operator: AND
```

```
Rule(s) :
```

```
  If-match customer-vlan-id 10
```

```
Behavior: P100
```

```
Nesting:
```

```
  Nest top-most vlan-id 100
```

```
Classifier: A20
```

```
Operator: AND
```

```
Rule(s) :
```

```
  If-match customer-vlan-id 20
```

```
Behavior: P200
```

```
Nesting:
```

```
  Nest top-most vlan-id 200
```

Verify the QoS marking configuration on the service provider-side ports on PE A and PE B. This example uses HundredGigE 1/0/2 of PE A.

```
[PE_A] display qos policy interface hundredgige 1/0/2
```

```
Interface: HundredGigE1/0/2
```

```
Direction: Outbound
```

```
Policy: vlanmapping
```

```
Classifier: A100
```

```
Operator: AND
```

```
Rule(s) :
```

```
  If-match customer-vlan-id 10
```

```
  If-match service-vlan-id 100
```

```
Behavior: T100
```

```
Marking:
```

```
  Remark Customer VLAN ID 30
```

```
Classifier: A200
```

```
Operator: AND
```

```
Rule(s) :
```

```
    If-match customer-vlan-id 20
    If-match service-vlan-id 200
Behavior: T200
Marking:
    Remark Customer VLAN ID 40
```

Configuration files

- PE A:

```
#
vlan 10
#
vlan 20
#
vlan 30
#
vlan 40
#
vlan 100
#
vlan 200
#
traffic classifier A10 operator and
  if-match customer-vlan-id 10
#
traffic classifier A20 operator and
  if-match customer-vlan-id 20
#
traffic classifier A100 operator and
  if-match customer-vlan-id 10
  if-match service-vlan-id 100
#
traffic classifier A200 operator and
  if-match customer-vlan-id 20
  if-match service-vlan-id 200
#
traffic behavior P100
  nest top-most vlan 100
#
traffic behavior P200
  nest top-most vlan 200
#
traffic behavior T100
  remark customer-vlan-id 30
#
traffic behavior T200
  remark customer-vlan-id 40
#
```

```

qos policy qinq
  classifier A10 behavior P100
  classifier A20 behavior P200
#
qos policy vlanmapping
  classifier A100 behavior T100
  classifier A200 behavior T200
#
interface HundredGigE1/0/1
  port link-mode bridge
  port link-type hybrid
  undo port hybrid vlan 1
  port hybrid vlan 100 200 untagged
  qinq enable
  qos apply policy qinq inbound
#
interface HundredGigE1/0/2
  port link-mode bridge
  port link-type trunk
  undo port trunk permit vlan 1
  port trunk permit vlan 100 200
  qos apply policy vlanmapping outbound
#

```

- **PE B:**

```

#
vlan 10
#
vlan 20
#
vlan 30
#
vlan 40
#
vlan 100
#
vlan 200
#
traffic classifier A30 operator and
  if-match customer-vlan-id 30
#
traffic classifier A40 operator and
  if-match customer-vlan-id 40
#
traffic classifier A100 operator and
  if-match customer-vlan-id 30
  if-match service-vlan-id 100
#
traffic classifier A200 operator and

```

```

if-match customer-vlan-id 40
if-match service-vlan-id 200
#
traffic behavior P100
  nest top-most vlan 100
#
traffic behavior P200
  nest top-most vlan 200
#
traffic behavior T100
  remark customer-vlan-id 10
#
traffic behavior T200
  remark customer-vlan-id 20
#
qos policy qinq
  classifier A30 behavior P100
  classifier A40 behavior P200
#
qos policy vlanmapping
  classifier A100 behavior T100
  classifier A200 behavior T200
#
interface HundredGigE1/0/1
  port link-mode bridge
  port link-type hybrid
  undo port hybrid vlan 1
  port hybrid vlan 100 200 untagged
  qinq enable
  qos apply policy qinq inbound
#
interface HundredGigE1/0/2
  port link-mode bridge
  port link-type trunk
  undo port trunk permit vlan 1
  port trunk permit vlan 100 200
  qos apply policy vlanmapping outbound
#

```

Related documentation

- *H3C S6850 & S9850 Switch Series ACL and QoS Configuration Guide-Release 655x*
- *H3C S6850 & S9850 Switch Series ACL and QoS Command Reference-Release 655x*
- *H3C S9820-64H Switch ACL and QoS Configuration Guide-Release 655x*
- *H3C S9820-64H Switch ACL and QoS Command Reference-Release 655x*
- *H3C S6850 & S9850 Switch Series Layer 2—LAN Switching Configuration Guide-Release 655x*

- *H3C S6850 & S9850 Switch Series Layer 2—LAN Switching Command Reference-Release 655x*
- *H3C S9820-64H Switch Layer 2—LAN Switching Configuration Guide-Release 655x*
- *H3C S9820-64H Switch Layer 2—LAN Switching Command Reference-Release 655x*