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HP 5820 Switch Series - Voice VLAN Configuration

Configuring a voice VLAN

Configuration prerequisites

Before we configure a voice VLAN, complete the following tasks:

- Create a VLAN.
- Configure QoS priority settings for voice VLAN traffic on an interface before we enable voice VLAN on the interface.

  If the configuration order is reversed, the priority configuration will fail.
- Configure the voice VLAN assignment mode.

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Configuring QoS priority settings for voice traffic on an interface

In voice VLAN applications, we can improve the quality of voice traffic by configuring the appropriate QoS priority settings, including the CoS and DSCP values, for voice traffic. Voice traffic carries its own QoS priority settings. We can configure the device either to modify or not to modify the QoS priority settings carried by incoming voice traffic.

To configure QoS priority settings for voice traffic:

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1. Enter system view, use the command:

   ```
   system-view
   ```
2. Enter Layer 2 Ethernet interface view, use the command:

   ```
   interface interface-type interface-number
   ```

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3. Configure the interface to trust the QoS priority settings in incoming voice traffic, but not to modify the CoS and DSCP values marked for incoming traffic of the voice VLAN, use the command:

   ```
   voice vlan qos trust
   ```

4. Configure the interface to modify the CoS and DSCP values marked for incoming traffic of the voice VLAN into specified values, use the command:

   ```
   voice vlan qos cos-value dscp-value
   ```

NOTE: Required. Use either command. By default, an interface modifies the CoS value and the DSCP value marked for voice VLAN traffic into 6 and 46, respectively. The voice vlan qos command and the voice vlan qos trust command can overwrite each other, whichever is configured last.

Configure the QoS priority settings for voice traffic on an interface before we enable voice VLAN on the interface. If the configuration order is reversed, the priority trust setting will fail.

Configure the QoS priority settings for voice traffic on an interface before enabling voice VLAN on the interface. If the configuration order is reversed, the priority trust setting will fail. After configuring an interface enabled with voice VLAN to trust the QoS priority settings in incoming voice traffic, the user still needs to use the **qos trust dot1p** command in interface view to configure the interface to use the 802.1p priority in incoming packets for priority mapping.

Configuring a port to operate in automatic voice VLAN assignment mode

To set a port to operate in automatic voice VLAN assignment mode:

1. Enter system view, use the command:

   ```
   system-view
   ```

2. Set the voice VLAN aging time, use the command:

   ```
   voice vlan aging minutes
   ```

3. Enable the voice VLAN security mode, use the command:

   ```
   voice vlan security enable
   ```

4. Add a recognizable OUI address, use the command:

   ```
   voice vlan mac-address oui mask oui-mask [ description text ]
   ```

5. Enter Ethernet interface view, use the command:

   ```
   interface interface-type interface-number
   ```

6. Configure the port to operate in automatic voice VLAN assignment mode, use the command:

   ```
   voice vlan mode auto
   ```

7. Enable the voice VLAN feature, use the command:

   ```
   voice vlan vlan-id enable
   ```

A protocol-based VLAN on a hybrid port can process only untagged inbound packets, whereas the voice VLAN in automatic mode on a hybrid port can process only tagged voice traffic. Do not configure a VLAN as both a protocol-based VLAN and a voice VLAN.

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Configuring a port to operate in manual voice VLAN assignment mode

To set a port to operate in manual voice VLAN assignment mode:

1. Enter system view, use the command:

   ```
   system-view
   ```

2. Enable the voice VLAN security mode, use the command:

   ```
   voice vlan security enable
   ```

3. Add a recognizable OUI address

   ```
   voice vlan mac-address oui mask oui-mask [ description text ]
   ```

4. Enter interface view, use the command:

   ```
   interface interface-type interfacenumber
   ```

5. Configure the port to operate in manual voice VLAN assignment mode, use the command:

   ```
   undo voice vlan mode auto
   ```

6. Assign the access, trunk, or hybrid port in manual voice VLAN assignment mode to the voice VLAN
7. Configure the voice VLAN as the PVID of the trunk or hybrid port
8. Enable voice VLAN on the port, use the command:

   ```
   voice vlan vlan-id enable
   ```

Configure different voice VLANs on different ports at the same time. However, one port can be configured with only one voice VLAN, and this voice VLAN must be a static VLAN that already exists on the device. Voice VLAN cannot be enabled on a port with LACP enabled. To make voice VLAN take effect on a port that is enabled with voice VLAN and operates in manual voice VLAN assignment mode, the user needs to assign the port to the voice VLAN manually.

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Displaying and maintaining voice VLAN

- Display the voice VLAN state, use the command:

  ```
  display voice vlan state [ | { begin | exclude | include } regular-expression ]
  ```

- Display the OUI addresses that the system supports, use the command:

  ```
  display voice vlan oui [ | { begin | exclude | include } regular-expression ]
  ```

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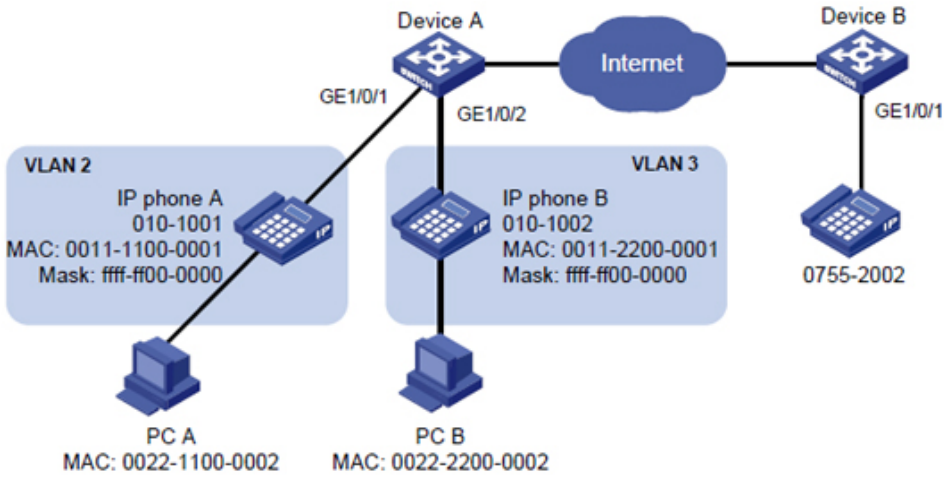
Voice VLAN configuration examples

Automatic voice VLAN mode configuration example

Network requirements (as shown in the figure Network diagram for automatic voice VLAN assignment mode configuration):

- The MAC address of IP phone A is 0011-1100-0001. The phone connects to a downstream device named PC A whose MAC address is 0022-1100-0002 and to GigabitEthernet 1/0/1 on an upstream device named Device A.
- The MAC address of IP phone B is 0011-2200-0001. The phone connects to a downstream device named PC B whose MAC address is 0022-2200-0002 and to GigabitEthernet 1/0/2 on Device A.
- Device A uses voice VLAN 2 to transmit voice packets for IP phone A and uses voice VLAN 3 to transmit voice packets for IP phone B.
- Configure GigabitEthernet 1/0/1 and GigabitEthernet 1/0/2 to work in automatic voice VLAN assignment mode. In addition, if one of them has not received any voice packet in 30 minutes, the port is removed from the corresponding voice VLAN automatically.

  Figure 1: Network diagram for automatic voice VLAN assignment mode configuration



Configuration procedure

1. # Create VLAN 2 and VLAN 3.

```
<DeviceA> system-view

[DeviceA] vlan 2 to 3

Please wait... Done.
```

2. # Set the voice VLAN aging time to 30 minutes.

```
[DeviceA] voice vlan aging 30
```

3. # Since GigabitEthernet 1/0/1 might receive both voice traffic and data traffic at the same time, to make sure the quality of voice packets and effective bandwidth use, configure voice VLANs to work in security mode. Configure the voice VLANs to transmit only voice packets. By default, voice VLANs work in security mode (optional).

```
[DeviceA] voice vlan security enable
```

4. # Configure the allowed OUI addresses as MAC addresses prefixed by 0011-1100-0000 or 0011- 2200-0000. In this way, Device A identifies packets whose MAC addresses match any of the configured OUI addresses as voice packets.

```
[DeviceA] voice vlan mac-address 0011-1100-0001 mask ffff-ff00-00
A

[DeviceA] voice vlan mac-address 0011-2200-0001 mask ffff-ff00-00
B
```

5. # Configure GigabitEthernet 1/0/1 as a hybrid port.

```
[DeviceA] interface gigabitethernet 1/0/1
[DeviceA-GigabitEthernet1/0/1] port link-type hybrid
```

6. # Configure GigabitEthernet 1/0/1 to operate in automatic voice VLAN assignment mode. By default, a port operates in automatic voice VLAN assignment mode (optional).

```
[DeviceA-GigabitEthernet1/0/1] voice vlan mode auto
```

7. # Configure VLAN 2 as the voice VLAN for GigabitEthernet 1/0/1.

```
[DeviceA-GigabitEthernet1/0/1] voice vlan 2 enable

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

8. # Configure GigabitEthernet 1/0/2.

```
[DeviceA] interface gigabitethernet 1/0/2
[DeviceA-GigabitEthernet1/0/2] port link-type hybrid
```

```
[DeviceA-GigabitEthernet1/0/2] voice vlan mode auto

[DeviceA-GigabitEthernet1/0/2] voice vlan 3 enable
```

Verification

Display the OUI addresses, OUI address masks, and description strings.

```
<DeviceA> display voice vlan oui
Oui Address     Mask            Description
0001-e300-0000  ffff-ff00-0000  Siemens phone
0003-6b00-0000  ffff-ff00-0000  Cisco phone
0004-0d00-0000  ffff-ff00-0000  Avaya phone
0011-1100-0000  ffff-ff00-0000  IP phone A
0011-2200-0000  ffff-ff00-0000  IP phone B
0060-b900-0000  ffff-ff00-0000  Philips/NEC phone
00d0-1e00-0000  ffff-ff00-0000  Pingtel phone
00e0-7500-0000  ffff-ff00-0000  Polycom phone
00e0-bb00-0000  ffff-ff00-0000  3com phone
```

Display the states of voice VLANs.

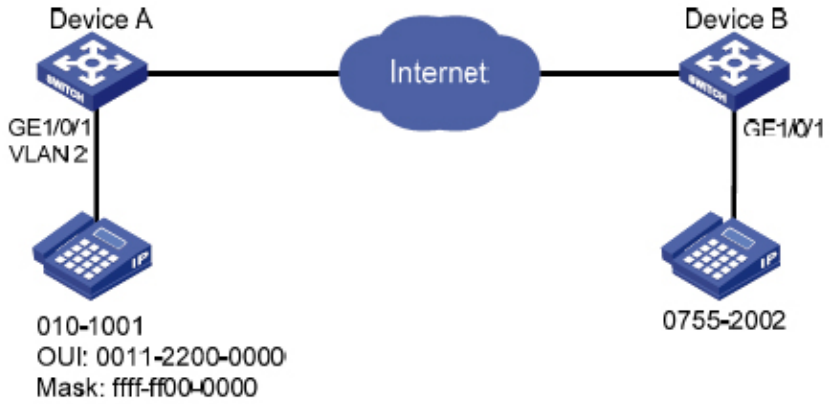
```
<DeviceA> display voice vlan state
Maximum of Voice VLANs: 128
 Current Voice VLANs: 2
 Voice VLAN security mode: Security
 Voice VLAN aging time: 30 minutes
 Voice VLAN enabled port and its mode:
PORT                        VLAN   MODE   COS    DSCP
 ------------------------------------------------------
GigabitEthernet1/0/1          2    AUTO   6      46
GigabitEthernet1/0/2          3    AUTO   6      46
```

Manual voice VLAN assignment mode configuration example:

Network requirements (as shown in the figure Network diagram for manual voice VLAN assignment mode configuration):

- Create VLAN 2 and configure it as a voice VLAN that permits only voice traffic to pass through.
- The IP phones send untagged voice traffic. Configure GigabitEthernet 1/0/1 as a hybrid port.
- Configure GigabitEthernet 1/0/1 to operate in manual voice VLAN assignment mode. Configure GigabitEthernet 1/0/1 to allow voice traffic with an OUI address of 0011-2200-0000, a mask of ffff-ff00-0000, and a description string of test to be forwarded in the voice VLAN.

Figure 2: Network diagram for manual voice VLAN assignment mode configuration



Configuration procedure

1. # Configure the voice VLAN to operate in security mode (optional). A voice VLAN operates in security mode by default.)

```
<DeviceA> system-view
[DeviceA] voice vlan security enable
```

2. # Add a recognizable OUI address 0011-2200-0000.

```
[DeviceA] voice vlan mac-address 0011-2200-0000 mask ffff-ff00-00
```

3. # Create VLAN 2

```
[DeviceA] vlan 2
[DeviceA-vlan2] quit
```

4. # Configure GigabitEthernet 1/0/1 to operate in manual voice VLAN assignment mode.

```
[DeviceA] interface gigabitethernet 1/0/1
[DeviceA-GigabitEthernet1/0/1] undo voice vlan mode auto
```

5. # Configure GigabitEthernet 1/0/1 as a hybrid port.

```
[DeviceA-GigabitEthernet1/0/1]port link-type hybrid
```

6. # Configure the voice VLAN (VLAN 2) as the default VLAN of GigabitEthernet 1/0/1 and configure GigabitEthernet 1/0/1 to permit the voice traffic of VLAN 2 to pass through untagged.

```
[DeviceA-GigabitEthernet1/0/1] port hybrid pvid vlan 2
[DeviceA-GigabitEthernet1/0/1] port hybrid vlan 2 untagged
```

7. # Enable voice VLAN on GigabitEthernet 1/0/1.

```
[DeviceA-GigabitEthernet1/0/1] voice vlan 2 enable
```

Verification

Display the OUI addresses, OUI address masks, and description strings.

```
<DeviceA> display voice vlan oui
Oui Address     Mask            Description
0001-e300-0000  ffff-ff00-0000  Siemens phone
0003-6b00-0000  ffff-ff00-0000  Cisco phone
0004-0d00-0000  ffff-ff00-0000  Avaya phone
0011-2200-0000  ffff-ff00-0000  test
00d0-1e00-0000  ffff-ff00-0000  Pingtel phone
0060-b900-0000  ffff-ff00-0000  Philips/NEC phone
00e0-7500-0000  ffff-ff00-0000  Polycom phone
00e0-bb00-0000  ffff-ff00-0000  3com phone
```

Display the states of voice VLANs.

```
<DeviceA> display voice vlan state
Maximum of Voice VLANs: 128
 Current Voice VLANs: 1
 Voice VLAN security mode: Security
 Voice VLAN aging time: 1440 minutes
 Voice VLAN enabled port and its mode:
 PORT                        VLAN  MODE   COS        DSCP
 ------------------------------------------------------------
 GigabitEthernet1/0/1        2     MANUAL   6          46
```

top

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