1. Principles

1.1 MAC-based Voice VLAN

OUI is the first 24 bits (binary) of the MAC address and can be used to represent a MAC address segment. It is a globally unique identifier assigned by the IEEE to different equipment vendors. Each device manufacturer allocates another 24 bits to form a 48-bit MAC address together with OUI.

Therefore, the principle of identifying an IP phone according to OUI is to identify which messages are sent by the phone according to the MAC address segment applied by the IP phone manufacturer, so as to determine which messages are voice messages.

The OUI in the Voice VLAN is different from the above-mentioned common OUI. This OUI is configured by the user and can be masked. That means, it does not have to be a 24-bit mask. The mask length can be specified by the user. The OUI value is the result of the AND of the mac-address and mask parameters in the voice-vlan mac-address command.

1.2 VLAN-based Voice VLAN

After receiving the packets from the PC and IP Phone, the switch determines whether the VLAN ID of the packet is the same as the Voice VLAN ID configured on the port of switch. If the same, consider this data stream as a voice data stream and raise the priority. The untagged packets sent by the PC will be tagged with PVID VLAN tags.

This mode requires a VLAN-based Voice VLAN IP Phone to obtain voice VLAN information configured on the switch: When the IP phone goes online, it will actively send LLDP packets to obtain the voice VLAN information configured on the switch; When the switch receives the LLDP packet sent by the IP phone, it will fill the Voice VLAN information in the relevant fields and send the IP phone; After the IP phone receives the LLDP packet carrying the voice VLAN information, it will send the tag with the tag when sending the voice packet.

The switch receives the tagged voice packet. If the tag matches the voice VLAN configured on the switch, it will raise the priority and forward it. After receiving the untagged packet, the switch will still join the VLAN where the PVID is located. In this way, when network congestion occurs, the switch can ensure the priority transmission of voice messages.

Only IP phones with tags can use this mode.

2. Configuration Command

2.1   voice-vlan mac-address

[no] **voice-vlan mac-address** *mac-addr* **mask** *mask-addr*

Add / delete voice-vlan entries based on MAC addresses。

parameter

parameter	Parameter Description
mac-addr	MAC address corresponding to the voice VLAN entry
mask-addr	MAC mask corresponding to the voice VLAN entry

default

There are no voice-vlan entries.

Command mode

Global configuration mode.

Instructions for use

Configure the OUI of the voice VLAN:The so-called OUI in the Voice VLAN is different from the above-mentioned OUI in the usual sense. This OUI is configured by the user and can use a mask, that is, it does not need to be a 24-bit mask. The mask length can be specified by the user. . The OUI value is the result of the AND of the mac-address and mask parameters in the voice-vlan mac-address command. Currently, 16 OUIs can be configured, that is, the system can only configure 16 commands. When the number of OUI configuration commands reaches 16, you cannot increase the configuration.Some models do not support mask configuration

Example

Switch_config#voice-vlan mac-address 00e0.0f5e.22f6 mask ffff.ffff.0000

Switch_config# no voice-vlan mac-address 00e0.0f5e.22f6 mask ffff.ffff.0000

2.2   voice-vlan mac-address

switchport voice-vlan *vlanvalue* **[cos** *cos-value* |**dscp** *dscp-value* **]**

[no] switchport voice-vlan *vlanvalue*

Enable / disable the voice-vlan function on the port.

Parameter

Parameter	Parameter Description
vlanvalue	Voice-vlan id value，range 2-4094
cos-value	Voice-vlan cos priority，range0-7，default value 6
dscp-value	Voice-vlan dscp priority，range0-63，default value为0

Default

Disable the voice-vlan function on the port.

Command mode

Port configuration mode.

Instructions for use

Enable the voice VLAN function on the port and specify the VLAN as a voice VLAN:In order to ensure the normal use of various functions, the port needs to be configured in trunk mode, and please assign different VLAN IDs to the voice VLAN and the port's pvid; the vlan corresponding to the voice vlan needs to be manually created; at the same time, an interface can only have one VLAN Set to Voice VLAN.

Example

Switch_config_g0/1#switchport voice-vlan 5

Switch_config_g0/1#no switchport voice-vlan 5

2.3   voice-vlan mac-address

switchport voice-vlan mode [mac-address |vlan]

[no] switchport voice-vlan mode

```
Set the voice-vlan mode on the port.
```

Parameter

No

Default

The port is in mac-address mode, and the default mode is not displayed when show running

Command mode

Port configuration mode。

Instructions for use

When the port is configured in mac-address mode, voice vlan works in voice vlan based on mac address, combined with the globally configured mac address entries to identify the IPphone device; when the port is configured in vlan mode, voice vlan works in The voice vlan of the vlan is combined with the lldp function (just turn on lldp run globally) to realize the information interaction with the IPphone device.

Example

Switch_config_g0/1#switchport voice-vlan mode vlan

Switch_config_g0/1#no switchport voice-vlan mode

3. Configuration example

3.1 Voice VLAN function based on MAC address

As image one show, switch accepts computer and IP phone untagged message will do as below: if source MAC match with switch set OUI (source MAC address is equal to OUI after the OUI mask is matched), add Voice VLAN's tag to this message and promote priority. If not match, will add PVID's VLAN tag to ensure the priority of voice message transmission.
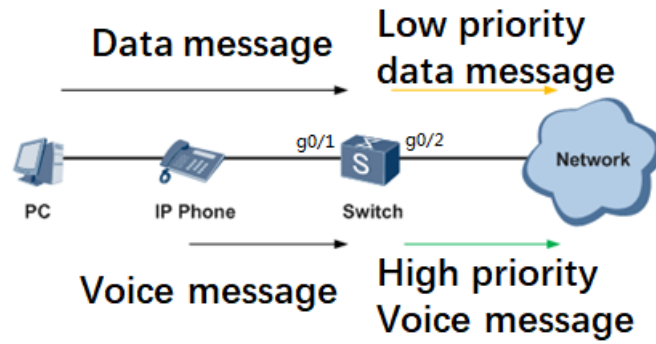
Image 1 Voice VLAN function based on MAC address

commond

    interface GigaEthernet0/1

     switchport mode trunk

     switchport voice-vlan 5

    !

    interface GigaEthernet0/2

     switchport mode trunk

    !

    vlan 1,5

    voice-vlan mac-address 00e0.0f5e.22f6 mask ffff.ffff.0000

    !

note:

    If IP phone can't solve message with tag , please set port g0/1 voice VLAN during the vlan-untagged range which connect to IP phone.

    Switch_config_g0/1#switchport trunk vlan-untagged add 5

3.2 Voice VLAN function based on VLAN

IP phone will send LLDP message once it online to get Voice VLAN information which set in switch; after switch receive IP phone's LLDP message , switch will add Voice VLAN information then send to IP phone; after IP phone receive LLDP message with Voice VLAN message , it sends voice message again will carry tag.
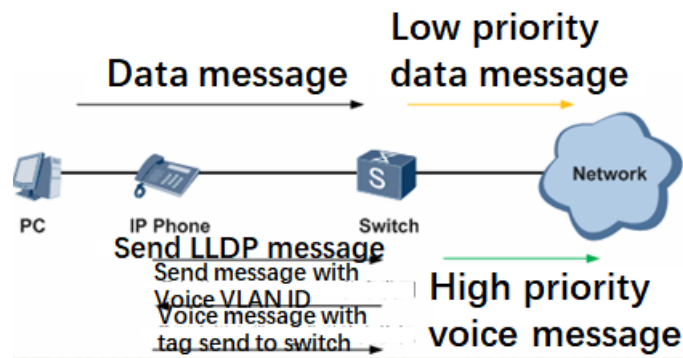

Image 2 Voice VLAN function based on VLAN

Command:

!

lldp run

!

interface GigaEthernet0/1

  switchport mode trunk

  switchport voice-vlan mode vlan

  switchport voice-vlan 5

!

interface GigaEthernet0/2

  switchport mode trunk

!

vlan 1,5

!