VLAN Configuration Commands

Table of Contents

Chapter 1   VLAN Configuration Commands

1.1   VLAN Configuration Commands

The following are VLAN configuration commands:

- vlan
- name
- dot1q-tunnel
- switchport pvid
- switchport mode
- switchport trunk
- switchport dot1q-translating-tunnel
- mac-vlan mac-address
- switchport mac-vlan
- subnet
- switchport vlan-subnet enable
- protocol-vlan
- switchport protocol-vlan
- show vlan
- show interface vlan
- interface supervlan
- subvlan

1.1.1   vlan

[**no**] **vlan** *vlan-id*

To add or delete VLAN, run **vlan *vlan-id*** or **no vlan *vlan-id***.

Parameter

Parameter	Parameter description
vlan-id	Defines the ID of the VLAN. Value range: 1-4094

Default value

None

Command mode

Global configuration mode

Instruction

After this command is run, the system enters the VLAN configuration mode and then you can modify some VLAN attributes.

Example

The following example shows how to add the VLAN whose ID is 2:

Switch_config#
Switch_config#vlan 2
Switch_config_vlan2#exit

1.1.2   name

[**no**] **name** *str*

To name a VLAN, run **name *str***.

Parameter

Parameter	Parameter description
str	Defines the name of the VLAN. Value range: 1-32 characters

Default value

The name of the default VLAN is **default**. Other VLANs are named as VLANxxxx (**xxxx** stands for a 4-bit ID).

Command mode

VLAN configuration mode

Instruction

This command can be used to modify the VLAN name to symbolize a specific VLAN.

Example

The following example shows how to set the name of VLAN200 to **main405**:

Switch_config#
Switch_config#
Switch_config#vlan 200
Switch_config_vlan200#name ?
  WORD   The ascii name of VLAN(32bytes)
Switch_config_vlan200#name main405

1.1.3   dot1q-tunnel

dot1q-tunnel [*tpid*]

no dot1q-tunnel

To enable Dot1q Tunnel, run **dot1q-tunnel [*tpid*]**; to disable Dot1q Tunnel, run **no Dot1q Tunnel**. As to those switches that support the global TPID, the global TPID can be set at the same time.

Parameter

Parameter	Parameter description
tpid	Means TPID of the SPVLAN tag carried by the packet when the packet is received from the uplink port of Dot1q tunnel. Value range: 1-0xFFFF

Default value

Dot1q Tunnel is not enabled globally. The default value of TPID is TPID 0x8100 of 802.1.1Q.

Command mode

Global configuration mode

Instruction

Example

The following example shows how to enable Dot1Q Tunnel globally and how to set TPID to 0*9100:

Switch_config#dot1q-tunnel 0x9100

1.1.4 switchport pvid

switchport pvid *vlan-id*

no switchport pvid

To configure VLAN of the access-mode port, run **switchport pvid *vlan-id***.

Parameter

Parameter	Parameter description
vlan-id	VLAN ID which the port belongs to, ranging between 1 and 4049 Value range: 1-4094

Default value

All ports belong to VLAN 1.

Command mode

Port configuration mode

Instruction

Before this command is configured, VLAN which PVID belongs to must exist. The port can be in access mode or relay mode.

Example

The following example shows how to set port FastEthernet0/1 to the access port of VLAN10:

Switch_config#interface f0/1
Switch_config_f0/1#switchport pvid 10

1.1.5   switchport mode

switchport mode {access | trunk | dot1q-tunnel *tpid*   **| dot1q-tunnel-uplink** *tpid* **|**

dot1q-translating-tunnel}

no switchport mode

To configure the mode of the port, run the previous command.

Parameter

Parameter	Parameter description
access	Access mode
trunk	Relay mode
dot1q-tunnel tpid	VLAN tunnel mode
dot1q-tunnel-uplink tpid	VLAN tunnel uplink mode
dot1q-translating-tunnel	VLAN translating tunnel mode

Default value

Access mode

Command mode

Port configuration mode

Instruction

The switch's port supports the following modes: the access mode, the relay mode, the VLAN tunnel mode, the VLAN translating tunnel mode and the VLAN tunnel uplink mode.

The access mode indicates that the port belongs to just one VLAN; only the untagged Ethernet frame can be transmitted and received.

The relay mode indicates that the port connects other switches and the tagged Ethernet frame can be transmitted and received.

The VLAN tunnel mode is a sub mode based on the access mode. The packets received by the port are thought to those without tag no matter whether they have VLAN tags, and the switching chip automatically add the PVID of the port to them as their new tag. Some switch models can modify the TPID value of new tag on the downlink port. Hence, the switch omits different VLAN partitions that access the network, and then passes them without change to the other subnet that connects the other port of the same client, realizing transparent transmission.

The VLAN translating tunnel mode is a sub mode based on the relay mode. The port looks up the VLAN translation table according to the VLAN tag of received packets to obtain corresponding SPVLAN, and then the switching chip replaces the original tag with SPVLAN or adds the SPVLAN tag to the outside layer of the original tag.   When the packets are forwarded out of the port, the SPVLAN will be replaced by the original tag or the SPVLAN tag will be removed mandatorily. Hence, the switch omits different VLAN partitions that access the network, and then passes them without change to the

other subnet that connects the other port of the same client, realizing transparent transmission.

The VLAN tunnel uplink mode is a sub mode based on the relay mode. The SPVLAN should be set when packets are forwarded out of the port. If the packets are in the untagged range, all these packets are forwarded out without any change. When the packets are received by the port, their TPIDs will be checked. If difference occurs or they are untagged packets, the SPVLAN tag which contains their own TPID will be added to them as their outer-layer tag.

The port mode collides with the 802.1X protocol. The 802.1X protocol cannot be configured in relay mode (including the VLAN translating tunnel mode and the VLAN tunnel uplink mode); the port on which the 802.1X protocol is configured cannot be set to the relay mode. That is to say, the 802.1X protocol can be effective only on the access-mode port (including the VLAN tunnel mode).

The 802.1X standard does not support authentication on the trunk port. The reason is that the authentication object regulated in the standard is not the port. As to port multiplexing, if user authentication is approved in one VLAN, all other VLAN users who multiplex this port are also authorized correspondingly, therefore, the trunk port does not support authentication.

Example

The following example shows how to set the port to the VLAN tunnel uplink mode and how to set the TPID of the unlink port to **0x9100**:

Switch(config-f0/1)#switchport mode dot1q-tunnel-uplink 0x9100

1.1.6   switchport trunk

[**no**] **switchport trunk {** {*vlan-allowed* vlan-list} | {*vlan-untagged* vlan-list } **}**

To configure the attributes of the relay port, run the previous command.

Parameter

Parameter	Parameter description
vlan-allowed	VLAN ID which can be received and transmitted by the port Value range: 1-4094
vlan-untagged	Frame that will be transmitted without adding the VLAN tag Value range: 1-4094

Default value

The native VLAN ID of all relay ports is 1. The allowable value for all VLANs ranges between 1 and 4094.

Command mode

Port configuration mode

Instruction

No matter the port is in access mode or in relay mode, you can run this command on the port. However, the port is in relay mode when this command functions.

The **vlan-allowed** parameter is used to control the VLAN range of the port; the **vlan-untagged** parameter is used to decide which packets need be added with the VLAN tag when a port transmits these packets.

When the vlan list is used, you can add, remove or set the lists of the existing VLAN. The entered lists are separated by the comma or the hyphen. For example, "1, 3, 5, 7" stands for "vlan 1, vlan 3, vlan 5, vlan 7", while "1, 3-5, 7" stands for "vlan 1, vlan 3, vlan 4, vlan 5, vlan 7".

Example

The following example shows how to set the allowable VLAN range to **1-10**, and the untagged VLAN range to **2-1000**.

Switch_config_f0/1#switchport trunk vlan-allowed 1-10
Switch_config_f0/1#switchport trunk vlan-untagged 2-1000

1.1.7 show vlan

show vlan [id *vlan-id* **| interface** *intf-id* **| dot1q-tunnel [interface** *intf*] **| mac-vlan | subnet | protocol-vlan]**

To display relative information about all VLANs, run the previous command.

Parameter

Parameter	Parameter description
Id vlan-id	Displays the designated VLAN. Value range: 1-4094
Interface Intf-id	Displays the designated port.
dot1q-tunnel [interface *intf*]	Displays the global information and statistics information about Dot1Q tunnel, or displays the detailed information about Dot1Q tunnel of the designated port.
mac-vlan	Displays the configured MAC VLAN entries.
subnet	Displays the configured IP-subnet VLAN entries.
protocol-vlan	Displays the configured protocol VLAN template or entry.

Default value

None

Command mode

EXEC mode

Instruction

None

Example

The following example shows how to display relative information about all VLANs.

Switch#show vlan
VLAN Status   Name   Ports

6

```
---- ------- ---------------- --------------------------------------------------
1   Static  Default        F0/1, F0/2, F0/3, F0/4, F0/5, F0/6, F0/7, F0/8
                           F0/9, F0/10, F0/11, F0/12, F0/13, F0/14, F0/15
                           F0/16, F0/17, F0/18, F0/19, F0/20, F0/21, F0/22
                           F0/23, F0/24, G1/1, G2/1, P1
2   Static  VLAN0002       F0/3
3   Static  VLAN0003       F0/3
4   Static  VLAN0004       F0/3
5   Static  VLAN0005       F0/3
6   Static  VLAN0006       F0/3
```

The **status** parameter stands for the VLAN generation source; the **static** parameter means that VLAN is generated through configuration; the **dynamic** parameter means that VLAN is generated dynamically through the GVRP protocol.

The following example shows the detailed information about a VLAN:

Switch#show vlan id 1
VLAN id: 1, Name: default, TotalPorts:11

```
Ports        Atttributes
----------------------------------------------------------------
F0/1         Trunk,Untagged
F0/2         Access
F0/5         Trunk,Untagged
F0/7         Trunk,Tagged
F0/8         Trunk,Tagged
F0/9         Trunk,Tagged
F0/11        Access
F0/12        Access
F0/14        Trunk,Tagged
F0/15        Trunk,Tagged
F0/16        Trunk,Untagged
```

The following example shows relative information about a VLAN on a port:

Switch#show vlan int f0/6

```
Interface        VLAN
Name             Property PVID Vlan-Map        uTagg-VLan-Map
-------------------- -------- ---- ---------------- ----------------
FastEthernet0/6     Trunk   1    3,5,7,9,11,13,15 none
                    17,19
```
Switch#show vlan int f0/7

```
Interface        VLAN
Name             Property PVID Vlan-Map        uTagg-VLan-Map
-------------------- -------- ---- ---------------- ----------------
FastEthernet0/7     Access  7    7               ----
```

1.1.8   show interface vlan

show interface vlan *intf-id*

To display relative information about the VLAN interface, run the previous command.

Parameter

	Remarks	Value Range
Intf-id	Displays the designated port.	1-4094

Default value

None

Command mode

EXEC mode

Instruction

None

Example

The following example shows how to display the information about interface VLAN 1.

Switch#show int vlan 1

VLAN1 is up, line protocol is up

Hardware is EtherSVI, Address is 00e0.0f42.0071(00e0.0f42.0071)

MTU 1500 bytes, BW 1000000 kbit, DLY 2000 usec

Encapsulation ARPA, loopback not set

5 minute input rate 0 bits/sec, 0 packets/sec

5 minute output rate 0 bits/sec, 0 packets/sec

0 packets input, 0 bytes, 0 no buffer

Received 0 broadcasts, 0 multicasts

0 input errors, 0 input discards

0 packets output, 0 bytes, 0 underruns

Transmited 0 broadcasts, 0 multicasts

0 output errors, , 0 discards

ARP type: ARPA, ARP timeout 04:00:00

The statistics values are explained as follows:

Packets input means the input of all packets, including broadcast packets, multicast packets and unicast packets.

Bytes means the byte volume of all packets.

Broadcasts means received broadcast packets.

Broadcasts means received broadcast packets.

Input errors means received error packets.

Input discards means that the received packets are dropped, such as the received packets when the interface protocol is down.

Packets output means the output of all packets, including broadcast packets, multicast packets and unicast packets.

Bytes means the byte volume of all transmitted packets.

Broadcasts means transmitted broadcast packets.

Multicasts means transmitted multicast packets.

Output errors means transmitting error packets.

Output discards means that the transmitted packets are dropped, such as the transmitted packets when the interface protocol is down.