



USER MANUAL

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Chapter 1 VLAN CONFIGURATION

1.1 Commands for VLAN Configuration

1.1.1 debug gvrp event

- **Command:** `debug gvrp event interface (ethernet | port-channel |) IFNAME`
 - `no debug gvrp event interface (ethernet | port-channel |) IFNAME`
- **Function:** Enable/disable GVRP event debugging including the transfer of state machine and the expiration of timer.
- **Parameters:** ethernet, physical port
 - port-channel, aggregate port
 - IFNAME, port name
- **Command Mode:** Admin mode
- **Default:** GVRP event debugging is disabled.
- **Usage Guide:** Use this command to enable GVRP event debugging.
- **Example:** Show GVRP event debugging.
- `Switch(config)#debug gvrp event interface ethernet 1/0/1`
- `%Jan 16 02:25:14 2006 GVRP EVENT: LO -> VO , interface ethernet 1/0/1, vlan 100`
- `%Jan 16 02:35:15 2006 GVRP EVENT: join timer expire , interface ethernet 1/0/1`

1.1.2 debug gvrp packet

- **Command:** `debug gvrp packet (receive | send) interface (ethernet | port-channel |) IFNAME`
 - `no debug gvrp packet (receive | send) interface (ethernet | port-channel |) IFNAME`
- **Function:** Enable/disable GVRP packet debugging.
- **Parameters:** receive, enabling the debugging of receiving GVRP packet
 - send, enabling the debugging of sending GVRP packet
 - ethernet, physical port
 - port-channel, aggregate port
 - IFNAME, port name
- **Command Mode:** Admin mode
- **Default:** GVRP packet debugging is disabled.
- **Usage Guide:** Use this command to enable the debugging of GVRP packet.
- **Example:** Show information of sending and receiving GVRP packet.
- `Switch(config)#debug gvrp packet receive interface ethernet 1/0/1`
- `Receive packet, smac 00-21-27-aa-0f-46, dmac 01-80-C2-00-00-21,`
- `length 90, protocol ID:1,attribute type:0x01,`
- `Attribute Index Length Event Value`
 - `-----`

- 1 10 joinIn 100
- 2 10 joinEmpty 140
- 3 10 leaveIn 150
- 4 10 leaveEmpty 180

1.1.3 dot1q-tunnel enable

- **Command: dot1q-tunnel enable**
 - **no dot1q-tunnel enable**
- **Function:** Set the access port of the switch to dot1q-tunnel mode; the no command restores to default.
- **Parameter:** None.
- **Command Mode:** Port Mode.
- **Default:** Dot1q-tunnel function disabled on the port by default.
- **Usage Guide:** After enabling dot1q-tunnel on the port, data packets without VLAN tag (referred to as tag) will be packed with a tag when entering through the port; those with tag will be packed with an external tag. The TPID in the tag is 8100 and the VLAN ID is the VLAN ID that the port belongs to. Data packets with double tags will be forwarded according to MAC address and external tag, till the external tag is removed when transmitted outside from the access port. Since the length of the data packet may be over sized when packed with external tag, it is recommended to use this command associating the Jumbo function. Normally this command is used on access ports. This command and dot1q-tunnel tpid are mutually exclusive.
- **Example:** Join port1 into VLAN3, enable dot1q-tunnel function.
 - Switch(config)#vlan 3
 - Switch(Config-Vlan3)#switchport interface ethernet 1/0/1
 - Switch(Config-Vlan3)#exit
 - Switch(config)#interface ethernet 1/0/1
 - Switch(Config-If-Ethernet1/0/1)# dot1q-tunnel enable
 - Switch(Config-If-Ethernet1/0/1)# exit
 - Switch(config)#

1.1.4 dot1q-tunnel untag add c-tag

- This command is not supported by the switch.

1.1.5 dot1q-tunnel selective enable

- This command is not supported by the switch.

1.1.6 dot1q-tunnel selective s-vlan

- This command is not supported by the switch.

1.1.7 dot1q-tunnel tpid

- **Command:** `dot1q-tunnel tpid {0x8100|0x9100|0x9200| <1-65535> }`
- **Function:** Configure the type (TPID) of the protocol of switch trunk port.
- **Parameter:** None.
- **Command Mode:** Port Mode.
- **Default:** TPID on the port is defaulted at 0x8100.
- **Usage Guide:** This function is to facilitate internetworking with equipments of other manufacturers. If the equipment connected with the switch trunk port sends data packet with a TPID of 0x9100, the port TPID will be set to 0x9100, this way switch will receive and process data packets normally. This command and dot1q-tunnel enable are mutually exclusive.
- **Example:** Set port 10 of the switch to trunk port and sends data packet with a TPID of 0x9100.
- `Switch(config)#interface ethernet 1/0/10`
- `Switch(Config-If-Ethernet1/0/10)#switchport mode trunk`
- `Switch(Config-If-Ethernet1/0/10)#dot1q-tunnel tpid 0x9100`
- `Switch(Config-If-Ethernet1/0/10)#exit`
- `Switch(config)#`

1.1.8 garp timer join

- **Command:** `garp timer join <200-500>`
- **Function:** Set the value of garp join timer, note that the value of join timer must be less than half leave timer.
- **Parameters:** `<200-500>`, the value of timer in millisecond
- **Command Mode:** Global mode
- **Default:** 200 ms.
- **Usage Guide:** Check whether the value satisfy the range. If so, modify the value of garp timer to the specified value, otherwise return a configuration error.
- **Example:** Set the value of garp join timer as 200ms.
- `Switch(config)#garp timer join 200`

1.1.9 garp timer leave

- **Command:** `garp timer leave <500-1200>`
- **Function:** Set the value of garp leave timer, note that the value of leave timer must be double of join timer and less than leaveAll timer.
- **Parameters:** `<500-1200>`, the value of timer in millisecond
- **Command Mode:** Global mode
- **Default:** 600 ms.
- **Usage Guide:** Check whether the value satisfy the range. If so, modify the value of garp timer to the specified value, otherwise return a configuration error.
- **Example:** Set the value of garp leave timer as 600ms.
- `Switch(config)#garp timer leave 600`

1.1.10 garp timer leaveAll

- **Command:** `garp timer leaveall <5000-60000>`
- **Function:** Set the value of garp leaveAll timer, note that the value of leaveAll timer must be larger than leave timer.
- **Parameters:** <5000-60000>, the value of timer in millisecond
- **Command Mode:** Global mode
- **Default:** 10000 ms.
- **Usage Guide:** Check whether the value satisfy the range. If so, modify the value of garp leaveAll timer to the specified value, otherwise return a configuration error.
- **Example:** Set the value of garp leaveAll as 20000ms.
- `Switch(config)#garp timer leaveall 20000`

1.1.11 gvrp (Global)

- **Command:** `gvrp`
 - `no gvrp`
- **Function:** Enable/disable GVRP function globally.
- **Parameters:** None.
- **Command Mode:** Global mode
- **Default:** Disabled.
- **Usage Guide:** Enable GVRP function globally and only in this way GVRP module can work normally.
- **Example:** Enable GVRP function globally.
- `Switch(config)#gvrp`

1.1.12 gvrp (Port)

- **Command:** `gvrp`
 - `no gvrp`
- **Function:** Enable/disable GVRP function on port. Notice: although GVRP can be enabled on port when GVRP is not enabled globally, it will not take effect until global GVRP is enabled.
- **Parameters:** None
- **Command Mode:** Port mode
- **Default:** Disabled
- **Usage Guide:** GVRP function can only be enabled on trunk and hybrid ports, and enabling GVRP will return an error on access port. After GVRP enabled on port, this port will be added to GVRP (i.e. adding corresponding state machine to GVRP of the port).
- **Example:** Enable GVRP of port.
- `Switch(config-if-ethernet1/0/1)#gvrp`

1.1.13 no garp timer

- **Command:** `no garp timer (join | leave | leaveall)`

- **Function:** Restore garp join | leave | leaveAll timer to the default value.
- **Parameters:** join, join timer
 - leave, leave timer
 - leaveAll, leaveAll timer
- **Command Mode:** Global mode
- **Default:** 200 | 600 | 10000 milliseconds for join | leave | leaveall timer respectively.
- **Usage Guide:** Check whether the default value satisfy the range. If so, modify the value of garp join | leave | leaveAll timer to the default value, otherwise return a configuration error.
- **Example:** Restore garp timer to the default value.
- Switch(config)#no garp timer leaveall

1.1.14 name

- **Command:** name <vlan-name>
 - no name
- **Function:** Specify a name, a descriptive string, for the VLAN; the no operation of the command will delete the name of the VLAN.
- **Parameters:** <vlan-name> is the specified name string.
- **Command Mode:** VLAN Configuration Mode.
- **Default:** The default VLAN name is vlanXXX, where xxx is VID.
- **Usage Guide:** The switch can specify names for different VLANs, making it easier for users to identify and manage VLANs.
- **Examples:** Specify the name of VLAN100 as TestVlan.
- Switch(Config-Vlan100)#name TestVlan

1.1.15 private-vlan

- **Command:** private-vlan {primary | isolated | community}
 - no private-vlan
- **Function:** Configure current VLAN to Private VLAN. The no command cancels the Private VLAN configuration.
- **Parameter:** **primary** set current VLAN to Primary VLAN, **isolated** set current VLAN to Isolated VLAN, **community** set current VLAN to Community VLAN.
- **Command Mode:** VLAN mode
- **Default:** Private VLAN is not configured by default.
- **Usage Guide:** There are three Private VLANs: **Primary** VLAN, **Isolated** VLAN and **Community** VLAN. Ports in Primary there are three Private VLANs: Primary VLAN, Isolated VLAN and Community VLAN can communicate with ports of Isolated VLAN and Community VLAN related to this Primary VLAN; Ports in Isolated VLAN are isolated between each other and only communicate with ports in Primary VLAN they related to; ports in Community VLAN can communicate both with each other and with Primary VLAN ports they related to; there is no communication between ports in Community VLAN and port in Isolated VLAN.

- Only VLANs containing empty Ethernet ports can be set to Private VLAN, and only the Private VLANs configured with associated private relationships can set the Access Ethernet ports their member ports. Normal VLAN will clear its Ethernet ports when set to Private VLAN.
- It is to be noted Private VLAN messages will not be transmitted by GVRP.
- **Example:** Set VLAN100, 200, 300 to private vlans, with respectively primary, Isolated, Community types.
- Switch(config)#vlan 100
- Switch(Config-Vlan100)#private-vlan primary
- Note:This will remove all the ports from vlan 100
- Switch(Config-Vlan100)#exit
- Switch(config)#vlan 200
- Switch(Config-Vlan200)#private-vlan isolated
- Note:This will remove all the ports from vlan 200
- Switch(Config-Vlan200)#exit
- Switch(config)#vlan 300
- Switch(Config-Vlan300)#private-vlan community
- Note:This will remove all the ports from vlan 300
- Switch(Config-Vlan300)#exit

1.1.16 private-vlan association

- **Command:** private-vlan association <secondary-vlan-list>
- **no private-vlan association**
- **Function:** Set Private VLAN association; the no command cancels Private VLAN association.
- **Parameter:** <secondary-vlan-list> Sets Secondary VLAN list which is associated to Primary VLAN. There are two types of Secondary VLAN: Isolated VLAN and Community VLAN. Users can set multiple Secondary VLANs by ','.
- **Command mode:** VLAN Mode.
- **Default:** There is no Private VLAN association by default.
- **Usage Guide:** This command can only used for Private VLAN. The ports in Secondary VLANs which are associated to Primary VLAN can communicate to the ports in Primary VLAN.
- Before setting Private VLAN association, three types of Private VLANs should have no member ports; the Private VLAN with Private VLAN association can't be deleted. When users delete Private VLAN association, all the member ports in the Private VLANs whose association is deleted are removed from the Private VLANs.
- **Example:** Associate Isolated VLAN200 and Community VLAN300 to Primary VLAN100.
- Switch(Config-Vlan100)#private-vlan association 200;300

1.1.17 show dot1q-tunnel

- **Command:** show dot1q-tunnel

- **Function:** Display the information of all the ports at dot1q-tunnel state.
- **Parameter:** None.
- **Command Mode:** Admin and Configuration Mode.
- **Usage Guide:** This command is used for displaying the information of the ports at dot1q-tunnel state.
- **Example:** Display current dot1q-tunnel state.
- Switch#show dot1q-tunnel
- Interface Ethernet1/0/1:
 - dot1q-tunnel is enable
- Interface Ethernet1/0/3:
 - dot1q-tunnel is enable

1.1.18 show garp timer

- **Command:** show garp timer (join | leave | leaveall |)
- **Function:** Show the value of each timer. Note that the value is not the remaining time to run the timer but the initial value when enabling the timer.
- **Parameters:** join, join timer
 - leave, leave timer
 - leaveAll, leaveAll timer
- **Command Mode:** Admin mode
- **Default:** 200|600|10000 milliseconds for join | leave | leaveAll timer respectively.
- **Usage Guide:** Show the corresponding value of the timer specified in the command.
- **Example:** Show the value of all garp timers currently.
- Switch#show garp timer join
- Garp join timer's value is 200(ms)

1.1.19 show gvrp fsm information

- **Command:** show gvrp fsm information interface (ethernet | port-channel) IFNAME
- **Function:** Show the current state of all registered machines and request state machines on specified or all ports.
- **Parameters:** ethernet, physical port
 - port-channel, aggregate port
 - IFNAME, port name
- **Command Mode:** Admin mode
- **Default:** MT for registered machine and VO for request state machine.
- **Usage Guide:** Show the corresponding state of all registered machines and request state machines.
- **Example:** Show the state of all state machines.
- Switch#show gvrp fsm information interface ethernet 1/0/1
- VA: Very anxious Active member, AA: Anxious Active member, QA: Quiet Active member

- VP: Very anxious Passive member, AP: Anxious Passive member, QP: Quiet Passive member
- VO: Very anxious Observer, AO: Anxious Observer, QO: Quiet Observer
- LA: Leaving Active member, LO: leaving Observer
- Interface ethernet 1/0/1 gvrp fsm information:
- Index VLANID Applicant Registrar
- -----
- 1 100 VO LV
- 2 300 VP IN

1.1.20 show gvrp leaveAll fsm information

- **Command:** show gvrp leaveall fsm information interface (ethernet | port-channel) IFNAME
- **Function:** Show the state of leaveAll state machine on specified or all ports.
- **Parameters:** ethernet, physical port
 - port-channel, aggregate port
 - IFNAME, port name
- **Command Mode:** Admin mode
- **Default:** Passive.
- **Usage Guide:** Check the state of leaveAll state machine.
- **Example:** Show the state of leaveAll state machine on port.
- Switch#show gvrp leaveall fsm information interface ethernet 1/0/1
- Interface leaveAll fsm
- -----
- Ethernet1/0/1 passive

1.1.21 show gvrp leavetimer running information

- **Command:** show gvrp leavetimer running information (vlan <1-4094> |) interface (Ethernet | port-channel |) IFNAME
- **Function:** Show running of all leavetimer on current port.
- **Parameters:** <1-4094>, VLAN tag
 - Ethernet, physical port
 - port-channel, aggregate port
 - IFNAME, port name
- **Command Mode:** Admin mode
- **Default:** leavetimer is disabled.
- **Usage Guide:** Show running state and expiration time of each leave timer.
- **Example:** Show running state and expiration time of each leave timer on current port.
- Switch#show gvrp leavetimer running information interface ethernet 1/0/1
- VLANID running state expired time
- -----

- 100 UP 0.2 s
- 300 DOWN non

1.1.22 show gvrp port-member

- **Command:** show gvrp (active |) port-member
- **Function:** Shows all ports with GVRP enabled. “active” means the port is in active state with GVRP enabled.
- **Parameters:** active means the port is in active state
- **Command Mode:** Admin mode
- **Default:** GVRP is disabled on port.
- **Usage Guide:** Show all ports (enable GVRP) saved in GVRP.
- **Example:** Show all ports with GVRP enabled.
- Switch#show gvrp port member
- Ports which were enabled gvrp included:
- Ethernet1/0/3 (T) Ethernet1/0/4 (T)
- Ethernet1/0/5 (T) Ethernet1/0/6 (T)
- Ethernet1/0/7 (T) Ethernet1/0/8 (T)
- Ethernet1/0/9 (T) Ethernet1/0/10 (T)

1.1.23 show gvrp port registerd vlan

- **Command:** show gvrp port (dynamic | static |) registerd vlan interface (Ethernet | port-channel |) IFNAME
- **Function:** Show the dynamic or static registration VLANs on current port.
- **Parameters:** dynamic, dynamic registration
 - static, static registration
 - Ethernet, physical port
 - port-channel, aggregate port
 - IFNAME, port name
- **Command Mode:** Admin mode
- **Default:** No dynamic or static registration VLANs on port.
- **Usage Guide:** Show the corresponding VLANs of the registered machines by dynamic or static registration.
- **Example:** Show all dynamic or static registration VLANs on current port.
- Switch#show gvrp port registerd vlan interface ethernet 1/0/1
- Current port dynamic registerd vlan included:
- Vlan10 vlan20
- Vlan40 vlan60
- Current port static registerd vlan included:
- Vlan10 vlan30
- Vlan40 vlan200

1.1.24 show gvrp timer running information

- **Command:** show gvrp timer (join | leaveall) running information interface (ethernet | port-channel |) IFNAME
- **Function:** Show running of all join|leaveAll timer on current port.
- **Parameters:** join, join timer
 - leaveall, leaveAll timer
 - ethernet, physical port
 - port-channel, aggregate port
 - IFNAME, port name
- **Command Mode:** Admin mode
- **Default:** Join timer is disabled and leaveAll timer is enabled.
- **Usage Guide:** Check running state of join|leaveAll timer on port.
- **Example:** Show running state and expiration time of each timer.
- Switch(config)#show gvrp timer join running information interface ethernet 1/0/1
- Current port's jointimer running state is: UP
- Current port's jointimer expired time is: 0.2 s

1.1.25 show gvrp vlan registerd port

- **Command:** show gvrp vlan <1-4094> registerd port
- **Function:** Show the ports with specified VLAN registered.
- **Parameters:** <1-4094>: VLAN tag
- **Command Mode:** Admin mode
- **Default:** No ports with specified VLAN registered.
- **Usage Guide:** None.
- **Example:** Show all ports with current VLAN registered.
- Switch#show gvrp vlan 100 registerd port
- Ethernet1/0/3 (T) Ethernet1/0/4 (T)
- Ethernet1/0/5 (T) Ethernet1/0/6 (T)
- Ethernet1/0/7 (T) Ethernet1/0/8 (T)
- Ethernet1/0/9 (T) Ethernet1/0/10 (T)

1.1.26 show vlan

- **Command:** show vlan [brief | summary] [id <vlan-id>] [name <vlan-name>] [internal usage [id <vlan-id> | name <vlan-name>]] [private-vlan [id <vlan-id> | name <vlan-name>]]
- **Function:** Display detailed information for all VLANs or specified VLAN.
- **Parameter:** **brief** stands for brief information; **summary** for VLAN statistics; <vlan-id> for VLAN ID of the VLAN to display status information, the valid range is 1 to 4094; <vlan-name> is the VLAN name for the VLAN to display status information, valid length is 1 to 11 characters. **private-vlan** displays the ID, name, relating VLAN and port of the private-vlan relative information.

- **Command mode:** Admin Mode and Configuration Mode.
- **Usage Guide:** If no *<vlan-id>* or *<vlan-name>* is specified, then information for all VLANs in the switch will be displayed.
- **Example:** Display the status for the current VLAN; display statistics for the current VLAN.
- Switch#show vlan
- VLAN Name Type Media Ports
- -----
- 1 default Static ENET Ethernet1/0/1 Ethernet1/0/2
 - Ethernet1/0/3 Ethernet1/0/4
 - Ethernet1/0/9 Ethernet1/0/10
 - Ethernet1/0/11 Ethernet1/0/12
- 2 VLAN0002 Static ENET Ethernet1/0/5 Ethernet1/0/6
 - Ethernet1/0/7 Ethernet1/0/8
- Switch#show vlan summary
- The max. vlan entrys: 4094
- Existing Vlan:
- Universal Vlan:
- 1 12 13 15 16 22
- Total Existing Vlan is:6

Displayed information	Explanation
VLAN	VLAN number
Name	VLAN name
Type	VLAN type, statically configured or dynamically learned.
Media	VLAN interface type: Ethernet
Ports	Access port within a VLAN

- Switch(config)#show vlan private-vlan
- VLAN Name Type Asso VLAN Ports
- -----
- 100 VLAN0100 Primary 101 102 Ethernet1/0/9 Ethernet1/0/10
 - Ethernet1/0/11

- Ethernet1/0/12
 - Ethernet1/0/13
- 101 VLAN0101 Community 100 Ethernet1/0/9 Ethernet1/0/10
 - Ethernet1/0/11 Ethernet1/0/12
 - Ethernet1/0/13
- 102 VLAN0102 Isolate 100 Ethernet1/0/9

1.1.27 show vlan-translation

- **Command:** show vlan-translation
- **Function:** Show the related configuration of vlan-translation.
- **Parameter:** None.
- **Command mode:** Admin mode.
- **Usage Guide:** Show the related configuration of vlan-translation.
- The access ports of the switch can not support this function.
- **Example:** Show the related configuration of vlan-translation.
- Switch#show vlan-translation
- Interface Ethernet1/0/1:
 - vlan-translation is enable, miss drop is not set
 - vlan-translation 5 to 10 in
- Interface Ethernet1/0/2:
 - vlan-translation is enable, miss drop is set both
 - vlan-translation 6 to 12 out

1.1.28 switchport access vlan

- **Command:** switchport access vlan <vlan-id>
 - no switchport access vlan
- **Function:** Add the current Access port to the specified VLAN. The “no switchport access vlan” command deletes the current port from the specified VLAN, and the port will be partitioned to VLAN1.
- **Parameter:** <vlan-id> is the VID for the VLAN to be added the current port, valid range is 1 to 4094.
- **Command mode:** Port Mode.
- **Default:** All ports belong to VLAN1 by default.
- **Usage Guide:** Only ports in Access mode can join specified VLANs, and an Access port can only join one VLAN at a time.
- **Example:** Add some Access port to VLAN100.
- Switch(config)#interface ethernet 1/0/8
- Switch(Config-If-Ethernet1/0/8)#switchport mode access
- Switch(Config-If-Ethernet1/0/8)#switchport access vlan 100
- Switch(Config-If-Ethernet1/0/8)#exit

1.1.29 switchport dot1q-tunnel

- This command is not supported by this switch.

1.1.30 switchport forbidden vlan

- **Command:** `switchport forbidden vlan {WORD | all | add WORD | except WORD | remove WORD}`
- **no switchport forbidden vlan**
- **Function:** Configure the forbidden vlan for a port. Note that this command can only be used to configure on trunk or hybrid ports and the port with GVRP not enabled. No command cancels the forbidden vlanlist for a port.
- **Parameters:** WORD, add the vlanList as forbidden vlan and cover the previous configuration
- all, set all VLANs as forbidden vlan
- add WORD, add vlanList to the current forbidden vlanList
- except WORD, set all VLANs as forbidden vlan except vlanList
- remove WORD, remove vlan specified by vlanList from current forbidden vlanList
- **Command Mode:** Port mode
- **Default:** Forbidden vlanList is empty
- **Usage Guide:** Tag the corresponding position for forbidden vlanList and clear allow vlanList flags in ports. A port leaves these VLANs if it joins them statically, and it sends message to GVRP module to enable corresponding registered machine of the port to enter forbidden mode.
- **Example:** Port quits the corresponding VLAN and the corresponding registered machine of GVRP to enter forbidden mode.
- `Switch(config-if-ethernet1/0/1)#switchport forbidden vlan all`

1.1.31 switchport hybrid allowed vlan

- **Command:** `switchport hybrid allowed vlan {WORD | all | add WORD | except WORD | remove WORD} {tag | untag}`
 - **no switchport hybrid allowed vlan**
- **Function:** Set hybrid port which allow the VLAN to pass with tag or untag method; the “no switchport hybrid allowed vlan” command restores the default setting.
- **Parameter: WORD:** Set vlan List to allowed vlan, and the late configuration will cover the previous configuration;
 - **all:** Set all VLANs to allowed vlan;
 - **add WORD:** Add vlanList to the existent allowed vlanList;
 - **except WORD:** Set all VLANs to allowed vlan except the configured vlanList;
 - **remove WORD:** Delete the specific VLAN of vlanList from the existent allow vlanList;
 - **tag:** Join the specific VLAN with tag mode;

- **untag:** Join the specific VLAN with untag mode.
- **Command mode:** Port Mode.
- **Default:** Deny all VLAN traffic to pass.
- **Usage Guide:** The user can use this command to set the VLANs whose traffic allowed to pass through the Hybrid port, traffic of VLANs not included are prohibited. The difference between tag and untag mode by setting allowed vlan: set VLAN to untag mode, the frame sent via hybrid port without VLAN tag; set VLAN to tag mode, the frame sent via hybrid port with corresponding VLAN tag. The same VLAN can not be allowed with tag and untag mode by a Hybrid port at the same time. If configure the tag (or untag) allowed VLAN to untag (or tag) allowed VLAN, the last configuration will cover the previous.
- **Example:** Set hybrid port allowed vlan 1, 3, 5-20 with untag mode and allow vlan 100; 300; 500-2000 with tag mode.
- Switch(config)#interface ethernet 1/0/5
- Switch(Config-If-Ethernet1/0/5)#switchport mode hybrid
- Switch(Config-If-Ethernet1/0/5)#switchport hybrid allowed vlan 1;3;5-20 untag
- Switch(Config-If-Ethernet1/0/5)#switchport hybrid allowed vlan 100;300;500-2000 tag
- Switch(Config-If-Ethernet1/0/5)#exit

1.1.32 switchport hybrid native vlan

- **Command:** `switchport hybrid native vlan <vlan-id>`
 - **no switchport hybrid native vlan**
- **Function:** Set the PVID for Hybrid port; the “no switchport hybrid native vlan” command restores the default setting.
- **Parameter:** `<vlan-id>` is the PVID of Hybrid port.
- **Command mode:** Port Mode.
- **Default:** The default PVID of Hybrid port is 1.
- **Usage Guide:** When an untagged frame enters a Hybrid port, it will be added a tag of the native PVID which is set by this command, and is forwarded to the native VLAN.
- **Example:** Set the native vlan to 100 for a Hybrid port.
- Switch(config)#interface ethernet 1/0/5
- Switch(Config-If-Ethernet1/0/5)#switchport mode hybrid
- Switch(Config-If-Ethernet1/0/5)#switchport hybrid native vlan 100
- Switch(Config-If-Ethernet1/0/5)#exit

1.1.33 switchport interface

- **Command:** `switchport interface [ethernet | portchannel] [<interface-name | interface-list>]`
 - **no switchport interface [ethernet | portchannel] [<interface-name | interface-list>]**
- **Function:** Specify Ethernet port to VLAN; the no command deletes one or one set of ports from the specified VLAN.

- **Parameter:** **ethernet** is the Ethernet port to be added. **portchannel** means that the port to be added is a link-aggregation port. **interface-name** port name, such as e1/0/1. If this option is selected, ethernet or portchannel should not be. **interface-list** is the port list to be added or deleted, “;” and “-” are supported, for example: ethernet1/0/1;3;4-7;8.
- **Command mode:** VLAN Mode.
- **Default:** A newly created VLAN contains no port by default.
- **Usage Guide:** Access ports are normal ports and can join a VLAN, but a port can only join one VLAN for a time.
- **Example:** Assign Ethernet port 1, 3, 4-7, 8 of VLAN100.
- Switch(Config-Vlan100)#switchport interface ethernet 1/0/1;3;4-7;8

1.1.34 switchport mode

- **Command:** **switchport mode {trunk | access | hybrid}**
- **Function:** Set the port in access mode, trunk mode or hybrid mode.
- **Parameter:** **trunk** means the port allows traffic of multiple VLAN; **access** indicates the port belongs to one VLAN only; **hybrid** means the port allows the traffic of multi-VLANs to pass with tag or untag mode.
- **Command mode:** Port Mode.
- **Default:** The port is in Access mode by default.
- **Usage Guide:** Ports in trunk mode is called Trunk ports. Trunk ports can allow traffic of multiple VLANs to pass through. VLAN in different switches can be interconnected with the Trunk ports. Ports under access mode are called Access ports. An access port can be assigned to one and only one VLAN at a time. Hybrid ports can allow traffic of multiple VLANs to pass through, receive and send the packets of multiple VLANs, used to connect switch, or user's computer. When Hybrid ports and Trunk ports receive the data, the deal way is same, but the deal way is different in sending the data. Because Hybrid ports can allow the packets of multiple VLANs to send with no tag, however, Trunk ports can only allow the packets of the default VLAN to send with no tag. The attribute of ports can not directly convert between Hybrid and Trunk, it must configure to be access at first, then configure to be Hybrid or Trunk. When the Trunk or Hybrid attribute is cancelled, the port attribute restores the default (access) attribute and belongs to vlan1.
- **Example:** Set port 5 to trunk mode and port 8 to access mode, port 10 to hybrid mode.
- Switch(config)#interface ethernet 1/0/5
- Switch(Config-If-Ethernet1/0/5)#switchport mode trunk
- Switch(Config-If-Ethernet1/0/5)#exit
- Switch(config)#interface ethernet 1/0/8
- Switch(Config-If-Ethernet1/0/8)#switchport mode access
- Switch(Config-If-Ethernet1/0/8)#exit
- Switch(config)#interface ethernet 1/0/10
- Switch(Config-If-Ethernet1/0/10)#switchport mode hybrid

- Switch(Config-If-Ethernet1/0/10)#exit

1.1.35 switchport mode trunk allow-null

- **Command:** `switchport mode trunk allow-null`
- **Function:** Add a port as trunk mode. When enabling GVRP, the mode that adds the ports with trunk mode to all VLANs is not appropriate. Therefore, add a port as trunk port and does not join any VLANs by default for enabling GVRP on trunk port is appropriate. It is recommended to configure a port as trunk with this command before enabling GVRP. This command can also be used when a port has been configured as trunk already, which equals to clearing allow-list and quits all VLANs.
- **Parameters:** None
- **Command Mode:** Port mode
- **Default:** access mode.
- **Usage Guide:** Configure the port as trunk, enable it to leave all VLANs and clear allow-list.
- **Example:** Switch(config-if-ethernet1/0/1)#switchport mode trunk allow-null

1.1.36 switchport trunk allowed vlan

- **Command:** `switchport trunk allowed vlan {WORD | all | add WORD | except WORD | remove WORD}`
 - **no switchport trunk allowed vlan**
- **Function:** Set trunk port to allow VLAN traffic; the “no switchport trunk allowed vlan” command restores the default setting.
- **Parameter: WORD:** specified VIDs; keyword;
 - **all:** all VIDs, the range from 1 to 4094;
 - **add:** add assigned VIDs behind **allow vlan**;
 - **except:** all VID add to **allow vlan** except assigned VIDs;
 - **remove:** delete assigned **allow vlan** from **allow vlan** list.
- **Command mode:** Port Mode.
- **Default:** Trunk port allows all VLAN traffic by default.
- **Usage Guide:** The user can use this command to set the VLAN traffic allowed to passthrough the Trunk port; traffic of VLANs not included are prohibited.
- **Example:** Set Trunk port to allow traffic of VLAN1, 3, 5-20.
- Switch(config)#interface ethernet 1/0/5
- Switch(Config-If-Ethernet1/0/5)#switchport mode trunk
- Switch(Config-If-Ethernet1/0/5)#switchport trunk allowed vlan 1;3;5-20
- Switch(Config-If-Ethernet1/0/5)#exit

1.1.37 switchport trunk native vlan

- **Command:** `switchport trunk native vlan <vlan-id>`
 - **no switchport trunk native vlan**

- **Function:** Set the PVID for Trunk port; the “no switchport trunk native vlan” command restores the default setting.
- **Parameter:** `<vlan-id>` is the PVID for Trunk port.
- **Command mode:** Port Mode.
- **Default:** The default PVID of Trunk port is 1.
- **Usage Guide:** PVID concept is defined in 802.1Q. PVID in Trunk port is used to tag untagged frames. When an untagged frame enters a Trunk port, the port will tag the untagged frame with the native PVID set with this commands for VLAN forwarding.
- **Example:** Set the native VLAN for a Trunk port to 100.
 - Switch(config)#interface ethernet 1/0/5
 - Switch(Config-If-Ethernet1/0/5)#switchport mode trunk
 - Switch(Config-If-Ethernet1/0/5)#switchport trunk native vlan 100
 - Switch(Config-If-Ethernet1/0/5)#exit

1.1.38 vlan

- **Command:** `vlan WORD`
- **no vlan WORD**
- **Function:** Create VLANs and enter VLAN configuration mode. If using ';' and '-' connect with multi-VLANs, then only create these VLANs. If only existing VLAN, then enter VLAN configuration mode; if the VLAN is not exist, then create VLAN and enter VLAN configuration mode. In VLAN Mode, the user can set VLAN name and assign the switch ports to the VLAN. The no command deletes specified VLANs.
- **Parameter:** WORD is the VLAN ID to be created/deleted, valid range is 1 to 4094, connect with ';' and '-'.
- **Command mode:** Global Mode.
- **Default:** Only VLAN1 is set by default.
- **Usage Guide:** VLAN1 is the default VLAN and cannot be configured or deleted by the user. The maximal VLAN number is 4094. It should be noted that dynamic VLANs learnt by GVRP cannot be deleted by this command.
- **Example:** Create VLAN100 and enter the configuration mode for VLAN 100.
 - Switch(config)#vlan 100
 - Switch(Config-Vlan100)#

1.1.39 vlan internal

- **Command:** `vlan <2-4094> internal`
- **Function:** Specify the internal VLAN ID. After an ID is specified as the internal VLAN ID, it is not allowed to be used by other VLAN. Internal VLAN is only used to LOOPBACK interface and can not add physical port. New internal VLAN ID takes effect after save the configuration and reboot the switch.
- **Parameter:** `<vlan-id>`: The ID is specified as internal VLAN ID, the range is 2 to 4094.
- **Command mode:** Global Mode.
- **Default:** 1006.

- **Usage Guide:** Set 1006 as the default internal VLAN ID, the internal VLAN ID needs to be modified when the network set 1006 as VLAN ID. Internal VLAN ID must select an unused ID or else affect other VLAN. This command takes effect after save the configuration and reboot the switch.
- **Example:** Set 100 as the internal VLAN ID.
- Switch(config)#vlan 100 internal

1.1.40 vlan ingress enable

- **Command:** vlan ingress enable
 - no vlan ingress enable
- **Function:** Enable the VLAN ingress filtering for a port; the “no vlan ingress enable” command disables the ingress filtering.
- **Command mode:** Port Mode
- **Default:** Enable VLAN ingress filtering function.
- **Usage Guide:** After VLAN ingress filtering is enabled on the port, when the system receives data it will check source port first, and forwards the data to the destination port if it is the VLAN member port, or else drop the data.
- **Example:** Disable VLAN ingress rules on the port.
- Switch(Config-If-Ethernet1/0/1)# no vlan ingress enable

1.1.41 vlan-translation

- **Command:** vlan-translation <old-vlan-id> to <new-vlan-id>{in | out}
 - no vlan-translation <old-vlan-id>{in | out}
- **Function:** Add VLAN translation by creating a mapping between original VLAN ID and current VLAN ID; the no form of this command deletes corresponding mapping.
- **Parameter:** old-vlan-id is the original VLAN ID; new-vlan-id is the translated VLAN ID; in indicates ingress translation; out indicates egress translation.
- **Command Mode:** Port Mode.
- **Default:** There is no VLAN translation relation.
- **Usage Guide:** The command is for configuring the in and out translation relation of the VLAN translation function. The data packets will be matched according to the configured translation relations, and its VLAN ID will be changed to the one in the configured item once matched, while the vlan-translation miss drop command will determine the next forwarding if not match.
- The access ports of the switch can not support this function.
- **Example:** Move the VLAN100 data entered from the port1 to VLAN2 after ingress translation.
- Switch#config
- Switch(config)#interface ethernet 1/0/1
- Switch(Config-If-Ethernet1/0/1)#vlan-translation enable
- Switch(Config-If-Ethernet1/0/1)#vlan-translation 100 to 2 in
- Switch(Config-If-Ethernet1/0/1)#exit

- Switch(config)#

1.1.42 vlan-translation enable

- **Command: vlan-translation enable**
 - **no vlan-translation enable**
- **Function:** Enable VLAN translation on the port; the no command restores to the default value.
- **Parameter:** None.
- **Command Mode:** Port Mode.
- **Default:** VLAN translation has not been enabled on the port by default.
- **Usage Guide:** vlan-translation and dot1q-tunnel are mutually exclusive, it is recommended to enable vlan-translation on trunk port and manually disable port filtering.
- The access ports of the switch can not support this function.
- **Example:** Enable VLAN translation function on port1.
 - Switch#config
 - Switch(config)#interface ethernet 1/0/1
 - Switch(Config-If-Ethernet1/0/1)#vlan-translation enable

1.1.43 vlan-translation miss drop

- **Command: vlan-translation miss drop {in | out | both}**
 - **no vlan-translation miss drop {in | out | both}**
- **Function:** Set packet dropping when checking vlan-translation is failing; the no command restores to the default value.
- **Parameter:** **In** refers to ingress; **out** indicates egress; **both** represents bidirectional.
- **Command Mode:** Port Mode.
- **Default:** Do not drop the packets when checking vlan-translation is failing.
- **Usage Guide:** When performing the mapping translation between the original and the current VID, if no corresponding translation is configured, the packet will not be dropped by default, but checking failure will drop the tag message after use this command, this command is of no effect for untag message.
- The access ports of the switch can not support this function.
- **Example:** Set ingress packet dropped on port1 when translation failure.
 - Switch(Config-If-Ethernet1/0/1)#vlan-translation miss drop in

1.2 Commands for Dynamic VLAN Configuration

1.2.1 dynamic-vlan mac-vlan prefer

- **Command: dynamic-vlan mac-vlan prefer**
- **Function:** Set the MAC-based VLAN preferred.
- **Parameter:** None.

- **Command Mode:** Global Mode.
- **Default:** MAC-based VLAN is preferred by default.
- **Usage Guide:** Configure the preference of dynamic-vlan on switch. The default priority sequence is MAC-based VLAN、IP-subnet-based VLAN、Protocol-based VLAN, namely the preferred order when several dynamic VLAN is available. After the IP-subnet-based VLAN is set to be preferred and the user wish to restore to preferring the MAC-based VLAN, please use this command.
- **Example:** Set the MAC-based VLAN preferred.
- Switch#config
- Switch(config)#dynamic-vlan mac-vlan prefer

1.2.2 dynamic-vlan subnet-vlan prefer

- **Command:** `dynamic-vlan subnet-vlan prefer`
- **Function:** Set the IP-subnet-based VLAN preferred.
- **Parameter:** None.
- **Command Mode:** Global Mode.
- **Default:** MAC-based VLAN is preferred by default.
- **Usage Guide:** Configure the preference of dynamic-vlan on switch. The default priority sequence is MAC-based VLAN、IP-subnet-based VLAN、Protocol-based VLAN, namely the preferred order when several dynamic VLAN is available. This command is used to set to preferring the IP-subnet-based VLAN.
- **Example:** Set the IP-subnet-based VLAN preferred.
- Switch#config
- Switch(config)#dynamic-vlan subnet-vlan prefer

1.2.3 mac-vlan

- **Command:** `mac-vlan mac <mac-addrss> vlan <vlan-id> priority <priority-id>`
- `no mac-vlan {mac <mac-addrss> | all}`
- **Function:** Add the correspondence between MAC address and VLAN, namely specify certain MAC address to join specified VLAN. The no form of this command deletes all/the correspondence.
- **Parameter:** mac-address is the MAC address which is shown in the form of XX-XX-XX-XX-XX-XX, vlan-id is the ID of the VLAN with a valid range of 1~4094; priority-id is the level of priority and is used in the VLAN tag with a valid range of 0~7; all refers to all the MAC addresses.
- **Command Mode:** Global Mode.
- **Default:** No MAC address joins the VLAN by default.
- **Usage Guide:** With this command user can add specified MAC address to specified VLAN. If there is a non VLAN label data packet enters from the switch port from the specified MAC address, it will be assigned with specified VLAN ID so sent enter specified VLAN. Their belonging VLAN are the same no matter which port did they enter through. The command does not have any interfere on the VLAN label data packet.

- **Example:** Add network device of MAC address as 00-03-0f-11-22-33 to VLAN 100.
- Switch#config
- Switch(config)#mac-vlan mac 00-03-0f-11-22-33 vlan 100 priority 0

1.2.4 mac-vlan vlan

- **Command:** `mac-vlan vlan <vlan-id>`
 - `no mac-vlan vlan <vlan-id>`
- **Function:** Configure the specified VLAN to MAC VLAN; the “`no mac-vlan vlan <vlan-id>`” command cancels the MAC VLAN configuration of this VLAN.
- **Parameter:** `<vlan-id>` is the number of the specified VLAN.
- **Command Mode:** Global Mode.
- **Default:** No MAC VLAN is configured by default.
- **Usage Guide:** Set specified VLAN for MAC VLAN.
- **Example:** Set VLAN100 to MAC VLAN.
- Switch#config
- Switch(config)#mac-vlan vlan 100

1.2.5 protocol-vlan

- **Command:** `protocol-vlan mode {ethernetii etype <etype-id> | llc {dsap <dsap-id> ssap <ssap-id>} | snap etype <etype-id>} vlan <vlan-id> priority <priority-id>`
 - `no protocol-vlan {mode {ethernetii etype <etype-id> | llc {dsap <dsap-id> ssap <ssap-id>} | snap etype <etype-id>} | all}`
- **Function:** Add the correspondence between the protocol and the VLAN namely specify the protocol to join specified VLAN. The no form of this command deletes all/the correspondence.
- **Parameter:** **mode** is the encapsulate type of the configuration which is ethernetii, llc, snap; the encapsulate **type** of the ethernetii is EthernetII; **etype-id** is the type of the packet protocol, with a valid range of 1536~65535; **llc** is LLC encapsulate format; **dsap-id** is the access point of the destination service, the valid range is 0~255; **ssap-id** is the access point of the source service with a valid range of 0~255; **snap** is SNAP encapsulate format; **etype-id** is the type of the packet protocol, the valid range is 1536~65535; **vlan-id** is the ID of VLAN, the valid range is 1~4094; **priority** is the priority, the range is 0~7; **all** indicates all the encapsulate protocols.
- **Command Mode:** Global Mode.
- **Default:** No protocol joined the VLAN by default.
- **Usage Guide:** The command adds specified protocol into specified VLAN. If there is any non VLAN label packet from specified protocol enters through the switch port, it will be assigned with specified VLAN ID and enter the specified VLAN. No matter which port the packets go through, their belonging VLAN is the same. The command will not interfere with VLAN labeled data packets. It is recommended to configure ARP protocol together with the IP protocol or else some application may be affected.

- **Example:** Assign the IP protocol data packet encapsulated by the EthernetII to VLAN200.
- Switch#config
- Switch(config)#protocol-vlan mode ethernetii etype 2048 vlan 200

1.2.6 show dynamic-vlan prefer

- **Command:** show dynamic-vlan prefer
- **Function:** Display the preference of the dynamic VLAN.
- **Parameter:** None.
- **Command Mode:** Admin Mode and Configuration Mode.
- **Usage Guide:** Display the dynamic VLAN preference.
- **Example:** Display current dynamic VLAN preference.
- Switch#show dynamic-vlan prefer
- Mac Vlan/Voice Vlan
- IP Subnet Vlan
- Protocol Vlan

1.2.7 show mac-vlan

- **Command:** show mac-vlan
 - **Function:** Display the configuration of MAC-based VLAN on the switch.
 - **Parameter:** None.
 - **Command Mode:** Admin Mode and other configuration Mode.
 - **Usage Guide:** Display the configuration of MAC-based VLAN on the switch.
 - **Example:** Display the configuration of the current MAC-based VLAN.
 - Switch#show mac-vlan
- | MAC-Address | VLAN_ID | Priority |
|-------------------|---------|----------|
| 00-e0-4c-77-ab-9d | 2 | 2 |
| 00-0a-eb-26-8d-f3 | 2 | 2 |
| 00-03-0f-11-22-33 | 5 | 5 |

1.2.8 show mac-vlan interface

- **Command:** show mac-vlan interface
- **Function:** Display the ports at MAC-based VLAN.
- **Parameter:** None.
- **Command Mode:** Admin Mode and other configuration Mode.
- **Usage Guide:** Display the ports of enabling MAC-based VLAN, the character in the bracket indicate the ports mode, A means Access port, T means Trunk port, H means Hybrid port.
- **Example:** Display the ports of enabling MAC-based VLAN currently.

- Switch#show mac-vlan interface
- Ethernet1/0/1(A) Ethernet1/0/2(A)
- Ethernet1/0/3(A) Ethernet1/0/4(A)
- Ethernet1/0/5(H) Ethernet1/0/6(T)

▪ show protocol-vlan

- **Command:** show portocol-vlan
 - **Function:** Display the configuration of Protocol-based VLAN on the switch.
 - **Parameter:** None.
 - **Command Mode:** Admin Mode and Configuration Mode
 - **Usage Guide:** Display the configuration of Protocol-based VLAN on the switch.
 - **Example:** Display the configuration of the current Protocol-based VLAN.
 - Switch#show protocol-vlan
- | Protocol_Type | VLAN_ID | Priority |
|------------------------------|---------|----------|
| mode ethernetii etype 0x800 | 200 | 4 |
| mode ethernetii etype 0x860 | 200 | 4 |
| mode snap etype 0xabc | 100 | 5 |
| mode llc dsap 0xac ssap 0xbd | 100 | 5 |

1.2.9 show subnet-vlan

- **Command:** show subnet-vlan
 - **Function:** Display the configuration of the IP-subnet-based VLAN on the switch.
 - **Parameter:** None.
 - **Command Mode:** Admin Mode and other Configuration Mode.
 - **Usage Guide:** Display the configuration of the IP-subnet-based VLAN on the switch.
 - **Example:** Display the configuration of the current IP-subnet-based VLAN.
 - Switch#show subnet-vlan
- | IP-Address | Mask | VLAN_ID |
|----------------|---------------|---------|
| 192.168.1.165 | 255.255.255.0 | 2 |
| 202.200.121.21 | 255.255.0.0 | 2 |
| 10.0.0.1 | 255.248.0.0 | 5 |

1.2.10 show subnet-vlan interface

- **Command:** show subnet-vlan interface
- **Function:** Display the port at IP-subnet-based VLAN.
- **Parameter:** None.
- **Command Mode:** Admin Mode and other Configuration Mode.

- **Usage Guide:** Display the port of enabling IP-subnet-based VLAN, the character in the bracket indicate the ports mode, A means Access port, T means Trunk port, H means Hybrid port.
- **Example:** Display the port of enabling IP-subnet-based VLAN currently.
- Switch#show subnet-vlan interface
- Ethernet1/0/1(A) Ethernet1/0/2(A)
- Ethernet1/0/3(A) Ethernet1/0/4(A)
- Ethernet1/0/5(H) Ethernet1/0/6(T)

1.2.11 subnet-vlan

- **Command:** `subnet-vlan ip-address <ipv4-addrss> mask <subnet-mask> vlan <vlan-id> priority <priority-id>`
 - `no subnet-vlan {ip-address <ipv4-addrss> mask <subnet-mask> | all}`
- **Function:** Add a correspondence between the IP subnet and the VLAN, namely add specified IP subnet into specified VLAN; the no form of this command deletes all/the correspondence.
- **Parameter:** ipv4-address is the IPv4 address shown in dotted decimal notation; the valid range of each section is 0~255; subnet-mask is the subnet mask code shown in dotted decimal notation; the valid range of each section is 0~255; priority-id is the priority applied in the VLAN tag with a valid range of 0~7; vlan-id is the VLAN ID with a valid range of 1~4094;all indicates all the subnets.
- **Command Mode:** Global Mode.
- **Default:** No IP subnet joined the VLAN by default.
- **Usage Guide:** This command is used for adding specified IP subnet to specified VLAN. When packet without VLAN label and from the specified IP subnet enters through the switch port, it will be matched with specified VLAN id and enters specified VLAN. These packets will always come to the same VLAN no matter through which port did they enter. This command will not interfere with VLAN labeled data packets.
- **Example:** Add the network equipment with IP subnet of 192.168.1.0/24 to VLAN 300.
- Switch#config
- Switch(config)#subnet-vlan ip-address 192.168.1.1 mask 255.255.255.0 vlan 300 priority 0

1.2.12 switchport mac-vlan enable

- **Command:** `switchport mac-vlan enable`
 - `no switchport mac-vlan enable`
- **Function:** Enable the MAC-based VLAN function on the port; the no form of this command will disable the MAC-based VLAN function on the port.
- **Parameter:** None.
- **Command Mode:** Port Mode.
- **Default:** The MAC-base VLAN function is enabled on the port by default.

- **Usage Guide:** After adding a MAC address to specified VLAN, the MAC-based VLAN function will be globally enabled. This command can disable the MAC-based VLAN function on specified port to meet special user applications.
- **Example:** Disable the MAC-based VLAN function on port1.
 - Switch#config
 - Switch(config)#interface ethernet 1/0/1
 - Switch(Config-If-Ethernet1/0/1)#no switchport mac-vlan enable
 - **switchport subnet-vlan enable**
- **Command: switchport subnet-vlan enable**
 - **no switchport subnet-vlan enable**
- **Function:** Enable the IP-subnet-based VLAN on the port; the no form of this command disables the IP-subnet-based VLAN function on the port.
- **Parameter:** None.
- **Command Mode:** Port Mode.
- **Default:** The IP-subnet-based VLAN is enabled on the port by default.
- **Usage Guide:** After adding the IP subnet to specified VLAN, the IP-subnet-based VLAN function will be globally enabled. This command can disable the IP-subnet-based VLAN function on specified port to meet special user applications.
- **Example:** Disable the IP-subnet-based VLAN function on port1.
 - Switch#config
 - Switch(config)#interface ethernet 1/0/1
 - Switch(Config-If-Ethernet1/0/1)#no switchport subnet-vlan enable

1.3 Commands for Voice VLAN Configuration

1.3.1 show voice-vlan

- **Command: show voice-vlan**
 - **Function:** Display the configuration status of the Voice VLAN on the switch.
 - **Parameter:** None.
 - **Command Mode:** Admin Mode and other Configuration Mode.
 - **Usage Guide:** Display Voice VLAN Configuration.
 - **Example:** Display the Current Voice VLAN Configuration.
 - Switch#show voice-vlan
 - Voice VLAN ID:2
 - Ports:ethernet1/0/1;ethernet1/0/3
- | Voice name | MAC-Address | Mask | Priority |
|--------------|-------------------|------|----------|
| financePhone | 00-e0-4c-77-ab-9d | 0xff | 5 |
| manager | 00-0a-eb-26-8d-f3 | 0xfe | 6 |
| Mr_Lee | 00-03-0f-11-22-33 | 0x80 | 5 |

- NULL 00-03-0f-11-22-33 0x0 5

1.3.2 switchport voice-vlan enable

- **Command:** `switchport voice-vlan enable`
 - `no switchport voice-vlan enable`
- **Function:** Enable the Voice VLAN function on the port; the “no” form of this command disables Voice VLAN function on the port.
- **Parameter:** None.
- **Command Mode:** Port Mode.
- **Default:** Voice VLAN is enabled by default.
- **Usage Guide:** When voice equipment is added to the Voice VLAN, the Voice VLAN is enabled globally by default. This command disables Voice VLAN on specified port to meet specified application of the user.
- **Example:** Disable the Voice VLAN function on port3.
 - Switch#config
 - Switch(config)#interface ethernet1/0/3
 - switch(Config-If-Ethernet1/0/3)#no switchport voice-vlan enable

1.3.3 voice-vlan

- **Command:** `voice-vlan mac <mac-address> mask <mac-mask> priority <priority-id> [name <voice-name>]`
- `no voice-vlan {mac <mac-address> mask <mac-mask> | name <voice-name> | all}`
- **Function:** Specify certain voice equipment to join in Voice VLAN; the no form of this command will let the equipment leave the Voice VLAN.
- **Parameter:** Mac-address is the voice equipment MAC address, shown in “xx-xx-xx-xx-xx-xx” format; mac-mask is the last eight digit of the mask code of the MAC address, the valid values are: 0xff, 0xfe, 0xfc, 0xf8, 0xf0, 0xe0, 0xc0,0x80, 0x0; priority-id is the priority of the voice traffic, the valid range is 0–7; the voice-name is the name of the voice equipment, which is to facilitate the equipment management; all indicates all the MAC addresses of the voice equipments.
- **Command Mode:** Global Mode.
- **Default:** This command will add a specified voice equipment into the Voice VLAN, if a non VLAN labeled data packet from the specified voice equipment enters through the switch port, then no matter through which port the packet enters, it will belongs to Voice VLAN. The command will not interfere with the packets of VLAN labels.
- **Example:** Add the 256 sets of voice equipments of the R&D department with MAC address ranging from 00-03-0f-11-22-00 to 00-03-0f-11-22-ff to the Voice VLAN.
 - Switch#config
 - Switch(config)#voice-vlan vlan 100
 - Switch(config)#voice-vlan mac 00-03-0f-11-22-00 mask 0 priority 5 name test

1.3.4 voice-vlan vlan

- **Command:** `voice-vlan vlan <vlan-id>`
 - `no voice-vlan`
- **Function:** Configure the specified VLAN to Voice VLAN; the “no voice-vlan” command cancels the Voice VLAN configuration of this VLAN.
- **Parameter:** Vlan id is the number of the specified VLAN.
- **Command Mode:** Global Mode.
- **Default:** No Voice VLAN is configured by default.
- **Usage Guide:** Set specified VLAN for Voice VLAN, There can be only one Voice VLAN at the same time. The voice VLAN can not be applied concurrently with MAC-based VLAN.
- **Example:** Set VLAN100 to Voice VLAN.
- Switch#config

1.4 Commands for Multi-to-One VLAN Translation

1.4.1 vlan-translation n-to-1

- **Command:** `vlan-translation n-to-1 <WORD> to <new-vlan-id>`
- `no vlan-translation n-to-1 <WORD>`
- **Function:** Enable/disable Multi-to-One VLAN translation of the port.
- **Parameters:** WORD is the original VLAN ID, its range from 1 to 4094, connect them with ‘;’ and ‘-’. If there are two VLANs with different range are translated into different VLAN ID in the same port, two VLAN ranges should not be superposed.
- new-vlan-id is the translated VLAN ID, its range from 1 to 4094.
- **Command Mode:** Port mode
- **Default:** Disable
- **Usage Guide:** Multi-to-One VLAN translation is used to network edge to map multiple VLANs to one VLAN of backbone network. When data traffic returns from backbone network to network edge, it will restore VLAN of network edge to implement Multi-to-One VLAN translation and save VLAN resource of backbone network. Note: When using this function, the device must establish the original and the translated VLAN firstly, and enabling the downlink port of this function and the uplink port for connecting backbone network, which must be join in the original and the translated VLAN with tagged mode. This function should not be used with dot1q-tunnel and VLAN translation at the same time
- Note: Multi-to-One VLAN translation should be enabled after MAC learning.
- The access ports of the switch can not support this function.
- **Example:** On Ethernet 1/0/1, translate the data traffic from VLAN with the range between 1 to 5 into VLAN 100, and translate the data traffic (belongs to VLAN with the range between 1 to 5) out from VLAN100 into the corresponding VLAN ID, connect the uplink port of the backbone network as Ethernet 1/0/5.
- Switch(config)#vlan 1-5;100
- Switch(config)#interface ethernet 1/0/1
- Switch(Config-If-Ethernet1/0/1)# switchport mode trunk

- Switch(Config-If-Ethernet1/0/1)# vlan-translation n-to-1 1-5 to 100
- Switch(config)#interface ethernet 1/0/5
- Switch(Config-If-Ethernet1/0/5)# switchport mode trunk

1.4.2 show vlan-translation n-to-1

- **Command:** show vlan-translation n-to-1 [<interface-name>]
- **Function:** Show the port configuration with Multi-to-One VLAN translation.
- **Parameter:** interface-name: Specify the name of the port which will be shown. If there is no parameter, show all port configurations with this function.
- **Command Mode:** Admin mode.
- **Default:** There is no Multi-to-One VLAN translation information.
- **Usage Guide:** show
- The access ports of the switch can not support this function.
- **Example:** Show all port configurations with Multi-to-One VLAN translation function.
- Switch# show vlan-translation n-to-1
- Interface Ethernet1/0/1:
 - vlan-translation n-to-1 enable, vlan 1-4 to 100
 - vlan-translation n-to-1 enable,vlan 5-8;13 to 101
- Interface Ethernet1/0/2:
 - vlan-translation n-to-1 enable,vlan 1-4 to 100

1.5 Commands for Super VLAN

1.5.1 supervlan

- **Command:** supervlan
 - no supervlan
- **Function:** Set VLAN as super vlan, the no command restores the default configuration.
- **Parameter:** None.
- **Command Mode:** VLAN Configuration Mode.
- **Default:** No configuration.
- **Usage Guide:** Set VLAN (except SUB VLAN) as super vlan. Super vlan will be filtered automatically when setting trunk port and any port can not belong to it.
- **Example:** Set vlan2 as supervlan.
- Switchc#config
- Switch(config)#vlan 2
- Switch (config-vlan2)#supervlan

1.5.2 subvlan

- **Command:** subvlan WORD
 - no subvlan {WORD | all}
- **Function:** Set VLAN as subvlan, the no command restores the default configuration.

- **Parameter: WORD:** VLAN ID, use “-” and “;” to connect VLANs.
 - **all:** all subvlans.
- **Command Mode:** VLAN Configuration Mode.
- **Default:** No configuration.
- **Usage Guide:** Set VLAN (it must exist and must be common VLAN, at the same time, it should not be sub vlan of other super vlan and should not be super vlan) as sub vlan. Each super vlan can establish mapping relation with 127 Sub VLANs, and switch can set 1024 Super VLANs at most.
- **Example:** Set vlan3 as subvlan.
- Switch#config
- Switch(config)#vlan 2-3
- Switch(config)#vlan 2
- Switch (config-vlan2)#supervlan
- Switch (config-vlan2)#subvlan 3

1.5.3 arp-proxy subvlan

- **Command:** arp-proxy subvlan {WORD | all}
 - no arp-proxy subvlan {WORD | all}
- **Function:** Enable arp proxy function of subvlan, the flow received by this VLAN can be forwarded to other subvlan. The no command restores the default configuration.
- **Parameter: WORD:** VLAN ID, use “-” and “;” to connect VLANs.
 - **all:** all subvlans.
- **Command Mode:** Interface Configuration Mode.
- **Default:** No Configuration.
- **Usage Guide:** Interface of VLAN must be supervlan’s interface, the flow received by this VLAN can be forwarded to other subvlan. When switch receives ARP REQUEST from this VLAN, it uses its MAC to reply ARP REPLY, so as to forward flows by switch.
- **Example:** Enable arp-proxy function of all subvlans on vlan2.
- Switch#config
- Switch(config)#interface vlan 2
- Switch (config-if-vlan2)#arp-proxy subvlan all

1.5.4 ip-addr-range subvlan

- **Command:** ip-addr-range subvlan <vlan-id> <ipv4-address> to <ipv4-address>
 - no ip-addr-range subvlan <vlan-id>
- **Function:** Configure the specified address range for a subvlan. After switch received flows, it needs to check whether destination IP address of package is within the address range when sending ARP REQUEST. If not, switch will not send ARP REQUEST. The no command restores the default configuration.
- **Parameter: <vlan-id>:** VLAN ID, its range between 1 and 4094.
 - **<ipv4-address>:** IPv4 address in dotted decimal notation, the value range from 0 to 255.

- **Command Mode:** Interface Configuration Mode.
- **Default:** No address range.
- **Usage Guide:** After switch received flows from sub vlan with address range, it needs to check whether destination IP address of package is within the address range when sending ARP REQUEST. If not, switch will not send ARP REQUEST.
- **Example:** Set address range of subvlan3.
- Switch#config
- Switch(config)#interface vlan 2
- Switch (config-if-vlan2)#ip-addr-range subvlan 3 1.1.1.1 to 1.1.1.10

1.5.5 ip-addr-range

- **Command:** `ip-addr-range <ipv4-address> to <ipv4-address>`
 - `no ip-addr-range`
- **Function:** Configure the specified address range for an interface. After switch received flows, it needs to check whether the destination IP address of package is within the address range when sending ARP REQUEST. If not, switch will not send ARP REQUEST. The no command restores the default configuration.
- **Parameter:** `<ipv4-address>`: IPv4 address in dotted decimal notation, the value range from 0 to 255.
- **Command Mode:** Interface Configuration Mode.
- **Default:** No address range.
- **Usage Guide:** After switch received flows from the interface with the address range, it needs to check whether the destination IP address of package is within the address range when sending ARP REQUEST. If not, switch will not send ARP REQUEST. If the interface is supervlan's interface, but the requested IP address is not within the address range when this interface received ARP REQUEST, it will not forward this ARP REQUEST.
- **Example:** Set address range for interface vlan2.
- Switch#config
- Switch(config)#interface vlan 2
- Switch (config-if-vlan2)#ip-addr-range 1.1.1.1 to 1.1.1.10

1.5.6 show supervlan

- **Command:** `show supervlan [<vlan-id>]`
- **Function:** Show super vlan configuration.
- **Parameter:** `<vlan-id>`: VLAN ID, its range between 1 and 4094.
- **Command Mode:** Admin Mode.
- **Usage Guide:** Show all supervlan configurations if VLAN ID is not specified.
- **Example:** Show the current supervlan configuration.
- Switch#show supervlan
- VLAN Name Type sub VLAN Ports
- -----
- 2 VLAN0002 Universal 3 Ethernet1/0/2

- 4 Ethernet1/0/3

Chapter 2 COMMANDS FOR MAC ADDRESS TABLE CONFIGURATION

2.1 Commands for MAC Address Table Configuration

2.1.1 mac-address-table avoid-collision

- This command is not supported by switch.

2.1.2 clearCollisionMacTable

- **Command:** clearCollisionMacTable
- **Function:** Clear the hash collision mac table.
- **Parameter:** None.
- **Command mode:** Admin Mode.
- **Usage Guide:** If enable the function of the hash collision mac table that issued ffp (**mac-address-table avoid-collision**), the mac cannot be cleared.
- **Example:** Clear the hash collision mac table.
- Switch#clearCollisionMacTable

2.1.3 clear mac-address-table dynamic

- **Command:** clear mac-address-table dynamic [address <mac-addr>] [vlan <vlan-id>] [interface [ethernet | portchannel] <interface-name>]
- **Function:** Clear the dynamic address table.
- **Parameter:** <mac-addr>: MAC address will be deleted; <interface-name> the port name for forwarding the MAC packets; <vlan-id> VLAN ID.
- **Command mode:** Admin mode.
- **Usage Guide:** Delete all dynamic address entries which exist in MAC address table, except application, system entries. MAC address entries can be classified according to different sources, the types are as follows: DYNAMIC, STATIC, APPLICATION, SYSTEM. DYNAMIC is the dynamic MAC address entries learned by switch, it can be aged by switch automatically.
- **Example:** Delete all dynamic MAC.
- Switch#clear mac-address-table dynamic

2.1.4 mac-address-learning cpu-control

- **Command:** mac-address-learning cpu-control
 - no mac-address-learning cpu-control
- **Function:** Enable MAC learning through CPU control, the no command restores that the chip automatically learn MAC address.
- **Parameter:** None.
- **Command Mode:** Global mode.
- **Default:** Chip automatically learn MAC address.

- **Usage Guide:** If enable port-security, private-vlan, mac-notification, mac-limit, etc., it should enable MAC learning through CPU first.
- **Example:** Enable MAC learning through CPU.
- Switch(Config)#mac-address-learning cpu-control

2.1.5 mac-address-table aging-time

- **Command:** `mac-address-table aging-time <0 | aging-time>`
 - `no mac-address-table aging-time`
- **Function:** Sets the aging-time for the dynamic entries of MAC address table.
- **Parameter:** `<aging-time>` is the aging-time seconds, range from 10 to 1000000; `0` to disable aging.
- **Command Mode:** Global Mode.
- **Default:** Default aging-time is 300 seconds.
- **Usage Guide:** If no destination address of the packets is same with the address entry in aging-time, the address entry will get aged. The user had better set the aging-time according to the network condition, it usually use the default value.
- **Example:** Set the aging-time to 600 seconds.
- Switch(config)#mac-address-table aging-time 600

2.1.6 mac-address-table static | static-multicast | blackhole

- **Command:** `mac-address-table {static | static-multicast | blackhole} address <mac-addr> vlan <vlan-id> [interface [ethernet | portchannel] <interface-name>] | [source | destination | both]`
 - `no mac-address-table {static | static-multicast | blackhole | dynamic} [address <mac-addr>] [vlan <vlan-id>] [interface [ethernet | portchannel] <interface-name>]`
- **Function:** Add or modify static address entries, static multicast entries and filter address entries. The no command deletes the three entries.
- **Parameter:** **static** is the static entries; **static-multicast** is the static multicast entries; **blackhole** is filter entries, which is for discarding frames from specific MAC address, it can filter source address, destination address or the both. When choose the filter entries, blackhole address can't based on port, and not configure to interface; **dynamic** is dynamic address entries; `<mac-addr>` MAC address to be added or deleted; `<interface-name>` name of the port transmitting the MAC data packet; `<vlan-id>` is the vlan number. **source** is based on source address filter; **destination** is based on destination address filter; **both** is based on source address and destination address filter, the default is both.
- **Command Mode:** Global Mode
- **Default:** When VLAN interface is configured and is up, the system will generate a static address mapping entry of which the inherent MAC address corresponds to the VLAN number.

- **Usage Guide:** In certain special applications or when the switch is unable to dynamically learn the MAC address, users can use this command to manually establish mapping relation between the MAC address and port and VLAN.
- **no mac-address-table** command is for deleting all dynamic, static, filter MAC address entries existing in the switch MAC address list, except application, system entries. MAC address entries can be classified according to the different source, the types are as follows: DYNAMIC, STATIC, APPLICATION, SYSTEM. DYNAMIC is the dynamic MAC address entries learned by switch, it can be aged by switch automatically. STATIC is the static MAC address entries (including blackhole entries) added by user. APPLICATION is the static MAC address entries added by application protocol (such as dot1x, security port...). SYSTEM is the additive static MAC address entries according to VLAN interface. When adding STATIC entries, it can cover the conflictive DYNAMIC, except APPLICATION, SYSTEM entries.
- After configure the static multicast MAC by this command, the multicast MAC traffic will be forwarded to the specified port of the specified VLAN.
- **Example:** Port 1/0/1 belongs to VLAN200, and establishes address mapping with MAC address 00-03-0f-f0-00-18.
- Switch(config)#mac-address-table static address 00-03-0f-f0-00-18 vlan 200 interface ethernet 1/0/1
- Configure a static multicast MAC 01-00-5e-00-00-01, the egress is ethernet 1/0/1.
- Switch(config)#mac-address-table static-multicast address 01-00-5e-00-00-01 vlan 1 interface ethernet1/0/1

2.1.7 showCollisionMacTable

- **Command:** showCollisionMacTable
- **Function:** Show the hash collision mac table.
- **Parameter:** None.
- **Command mode:** Global Mode.
- **Usage Guide:** If enable the function of the hash collision mac table that issued ffp (**mac-address-table avoid-collision**), the collision mac which issued ffp use

2.1.8 show mac-address-table

- **Command:** show mac-address-table [static | blackhole | multicast | aging-time <aging-time> | count] [address <mac-addr>] [vlan <vlan-id>] [count] [interface <interface-name>]
- **Function:** Show the current MAC table.
- **Parameter:** **static** static entries; **blackhole** filter entries; **aging-time <aging-time>** address aging time; **count** entry's number, **multicast** multicast entries; **<mac-addr>** entry's MAC address; **<vlan-id>** entry's VLAN number; **<interface-name>** entry's interface name.
- **Command mode:** Admin and Configuration Mode.
- **Default:** MAC address table is not displayed by default.

- **Usage guide:** This command can display various classes of MAC address entries. Users can also use **show mac-address-table** to display all the MAC address entries.
- **Example:** Display all the filter MAC address entries.
- Switch#show mac-address-table blackhole

2.2 Commands for MAC Notification

2.2.1 clear mac-notification statistics

- **Command:** clear mac-notification statistics
- **Function:** Clear the statistics of MAC notification trap.
- **Parameter:** None.
- **Default:** None.
- **Command Mode:** Admin mode
- **Usage Guide:** When this command is used with show command, it is able to check the executive result by show command after executing this command.
- **Example:**
- Switch# clear mac-notification statistics

2.2.2 mac-address-table notification

- **Command:** mac-address-table notification
 - no mac-address-table notification
- **Function:** Enable the MAC address notification globally, the no command disables the global MAC address notification.
- **Parameter:** None.
- **Default:** Disable.
- **Command Mode:** Global mode
- **Usage Guide:** This command is used with trap switch of snmp. When disabling the MAC address notification, other configuration can be shown, but the function is invalid.
- **Example:** Enable the MAC address notification.
- Switch(Config)#mac-address-table notification

2.2.3 mac-address-table notification history-size

- **Command:** mac-address-table notification history-size <0-500>
 - no mac-address-table notification history-size
- **Function:** Configure the maximum history-size for storing MAC changing message, the no command restores the default value.
- **Parameter:** history-size: data length of sending the notification, its range from 1 to 500.
- **Default:** 10.
- **Command Mode:** Global mode
- **Usage Guide:** After the global switch is disabled, this command is also able to be configured sequentially.
- **Example:** Change the maximum history-size to be 256.

- Switch(Config)#mac-address-table notification history-size 256

2.2.4 mac-address-table notification interval

- **Command:** mac-address-table notification interval <0-86400>
 - no mac-address-table notification interval
- **Function:** Configure the interval for sending the MAC address notification, the no command restores the default interval.
- **Parameter:** interval: interval for sending the notification, unit is second, its range from 0 to 86400.
- **Default:** 30s.
- **Command Mode:** Global mode
- **Usage Guide:** After the global switch is disabled, this command is also able to be configured sequentially.
- **Example:** Configure the interval as 30s for sending the MAC address notification.
- Switch(Config)#mac-address-table notification interval 30

2.2.5 mac-notification

- **Command:** mac-notification {added | both | removed}
 - no mac-notification
- **Function:** Configure the MAC address notification for the specified port, the no command cancels the function.
- **Parameter:** added: the added MAC address
 - removed: the removed MAC address
 - both: the added and the removed MAC addresses
- **Default:** No MAC address notification.
- **Command Mode:** Port mode
- **Usage Guide:** After the global switch is disabled, this command is also able to be configured sequentially.
- **Example:** Send the trap notification after the MAC address is added to Ethernet 1/0/5.
- Switch(Config)#in ethernet 1/0/5
- Switch(Config-if-ethernet 1/0/5)#mac-notification added

2.2.6 show mac-notification summary

- **Command:** show mac-notification summary
- **Function:** Show the configuration of MAC notification and the data of the notification packet.
- **Parameter:** None.
- **Default:** Do not show the summary.
- **Command Mode:** Admin mode
- **Usage Guide:** With this command, check the configuration of MAC address and the sending status of MAC notification trap.
- **Example:**

- Switch#show mac-notification summary
- MAC address notification:enabled
- MAC address snmp traps:enabled
- MAC address notification interval = 10
- MAC address notification history log size = 120
- MAC address added = 0
- MAC address removed = 0
- MAC address snmp traps generated = 0

2.2.7 snmp-server enable traps mac-notification

- **Command:** snmp-server enable traps mac-notification
 - no snmp-server enable traps mac-notification
- **Function:** Enable the trap notification of MAC address globally, the no command disables the trap notification.
- **Parameter:** None.
- **Default:** Disable trap notification globally.
- **Command Mode:** Global mode
- **Usage Guide:** This command is used with MAC notification switch. When the switch is disabled, other configuration can be shown, but the function is invalid.
- **Example:** Enable the trap notification of MAC address.
- Switch(Config)#snmp-server enable traps mac-notification