

VLAN Configuration Commands

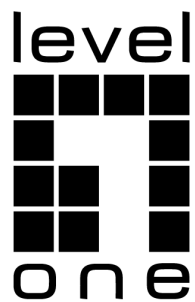


Table of Contents

Chapter 1 VLAN Configuration Commands	1
1.1 VLAN Configuration Commands	1
1.1.1 vlan.....	1
1.1.2 vlan-view	2
1.1.3 name	2
1.1.4 dot1q-tunnel	3
1.1.5 switchport pvid	4
1.1.6 switchport mode	4
1.1.7 switchport trunk	6
1.1.8 switchport dot1q-translating-tunnel	6
1.1.9 mac-vlan mac-address	7
1.1.10 switchport mac-vlan	8
1.1.11 subnet	8
1.1.12 switchport vlan-subnet enable.....	9
1.1.13 protocol-vlan.....	9
1.1.14 switchport protocol-vlan	10
1.1.15 show vlan	10
1.1.16 show interface vlan	12

Chapter 1 VLAN Configuration Commands

1.1 VLAN Configuration Commands

The following are VLAN configuration commands:

- `Vlan`
- `vlan-view`
- `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`

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
<i>vlan-id</i>	Defines the ID of the VLAN. Value range: 1-4094

Default value

1 by default

Command mode

Global configuration mode

Instruction

After this command is run, the VLAN is created.

Example

The following example shows how to add the VLAN whose ID is 2-10:

```
Switch(config)#
Switch(config)#vlan 2-10
```

1.1.2 vlan-view

vlan-view *vlan-id*

To enter VLAN configuration mode, run **vlan-view** *vlan-id*.

Parameter

Parameter	Parameter description
<i>vlan-id</i>	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. If the VLAN has not been created, create the VLAN first and then enter VLAN mode.

Example

The following example shows how to add VLAN with ID 2

```
Switch(config)#
Switch(config)#vlan-view 2
Switch(config-vlanid2)#exit
Switch(config)#
```

1.1.3 name

[no] name *str*

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

Parameter

Parameter	Parameter description
<i>str</i>	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)#vlan-view 200  
Switch(config-vlanid200)#name main405  
Switch(config-vlanid200)#
```

1.1.4 dot1q-tunnel

dot1q-tunnel

no dot1q-tunnel

To enable Dot1q Tunnel, run **dot1q-tunnel**; to disable Dot1q Tunnel, run **no Dot1q Tunnel**.

Parameter

None

Default value

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

Command mode

Global configuration mode

Instruction

After the Dot1Q Tunnel is enabled globally, all ports will become Dot1Q Tunnel downlink ports by default, and SPVLAN tags are forcibly added to incoming packets.

Example

The following example shows how to enable Dot1q Tunnel globally:

```
Switch(config)#dot1q-tunnel
```

1.1.5 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
<i>vlan-id</i>	VLAN ID which the port belongs to, ranging between 1 and 4049.

Default value

All ports belong to VLAN 1.

Command mode

Port configuration mode

Instruction

Before this command is configured, the port can be in access mode or trunk mode. If the VLAN does not exist, the VLAN will be created.

Example

The following example shows how to set port GigaEthernet g1/1 to the access port of VLAN10:

```
Switch(config)#interface g0/0/1
Switch(config-g0/0/1)#switchport pvid 10
```

1.1.6 switchport mode

switchport mode {**access** | **trunk** | **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
<i>access</i>	Access mode
<i>trunk</i>	Relay mode
<i>dot1q-tunnel-uplink</i> [<i>tpid</i>]	VLAN tunnel uplink mode, tpid is the tpid field in the VLAN TAG
<i>dot1q-translating-tunnel</i>	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-g0/0/1)#switchport mode dot1q-tunnel-uplink 0x9100
```

1.1.7 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
<i>vlan-allowed</i>	VLAN ID which can be received and transmitted by the port Value range: 1-4094
<i>vlan-untagged</i>	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-g0/0/1)#switchport trunk vlan-allowed 1-10
```

```
Switch(config-g0/0/1)#switchport trunk vlan-untagged 2-1000
```

1.1.8 switchport dot1q-translating-tunnel

```
switchport dot1q-translating-tunnel mode qinq translate { oldvlanid | oldvlanlist } newvlanid [priority]
```

```
no switchport dot1q-translating-tunnel mode qinq translate { oldvlanid | oldvlanlist }
```

```
switchport dot1q-translating-tunnel mode flat translate {1to1|nto1} { oldvlanid | oldvlanlist } newvlanid [priority]
```

```
no switchport dot1q-translating-tunnel mode flat translate {1to1|nto1}{ oldvlanid | oldvlanlist }
```


To configure the VLAN translation tunnel port feature, run the above command.

Parameter

Parameter	Parameter description
<i>[1to1 nto1]</i>	VLAN translating mode of the Flat is 1:1 or n:1.
<i>translate {oldvlanlist oldvlanid} newvlanid [priority]</i>	VLAN translation list of the VLAN translating tunnel port, among which the VLAN's value range of oldvlanlist oldvlanid and newvlanid is 1-4094 and the value range of priority is 0-7.

Default value

The VLAN translating mode of the VLAN translating tunnel port is QinQ and no VLAN translating items exists.

Command mode

Port configuration mode

Instruction

Both the VLAN translating mode and the VLAN translating items validate in dot1q-translating-tunnel mode after they are configured. The translation modes fall into two kinds: the Flat mode and the QinQ mode. In Flat mode, the CLAN tag of packets which are received by the dot1q-translating-tunnel downlink port will be used as an index to look up the VLAN translating list. The CVLAN will be replaced by detected SPVLANs; when the packets are forwarded out of the port, the SPVLAN will then be replaced by CVLAN. In QinQ mode, the CLAN tag of packets which are received by the dot1q-translating-tunnel downlink port will be used as an index to look up the VLAN translating list and then the detected SPVLANs will form into SPVLAN tag to be added to the outside of CVLAN tag; when the packets are forwarded out of the port, the SPVLAN tag will then be removed.

When the VLAN translating items are configured on a port, the mapping between CVLAN and multiple SPVLANs can be configured in QinQ mode. To configure the mapping between CVLAN and multiple SPVLANs in flat mode, you have to configure QoS and then the correct transformation from SPVLAN to CVLAN can be conducted when packets are transmitted out from this port.

Example

The following example shows how to add the translation items to g0/0/1, translate CVLAN 1000 into SPVLAN 100 and set the VLAN translation mode of the translation items to **Flat**.

```
Switch(config)#interface g0/0/1
Switch(config-g0/0/1)#switchport dot1q-translating-tunnel mode flat translate 1000 100
```

1.1.9 mac-vlan mac-address

mac-vlan mac-address *mac-addr* **vlan** *vlan-id* [*priority*]
no mac-vlan mac-address *mac-addr*

To add or delete the MAC-based VLAN entries, run the above-mentioned commands.

Parameter

Parameter	Parameter description
<i>mac-addr</i>	Stands for the MAC address that corresponds to a MAC VLAN entry.
<i>vlan-id</i>	Stands for the corresponding VLAN ID of MAC VLAN entry, which ranges from 1 to 4094.
<i>priority</i>	Priority of MAC VLAN entry, which ranges from 0 to 7.

Default value

No MAC-based VLAN entry exists.

Command mode

This command is run in global configuration mode.

Instruction

None

1.1.10 switchport mac-vlan

[no] switchport mac-vlan

To enable or disable the MAC-based VLAN function, run the above-mentioned commands respectively.

Parameter

None

Default value

The MAC-based VLAN is disabled on the ports.

Command mode

Port configuration mode

Instruction

In port access mode, an incoming packet will be dropped if its VLAN, which is obtained through the matchup of MAC VLAN entry, is not PVID. Hence, if not necessary, do not set the port mode, which is to enable MAC VLAN, to **access**.

1.1.11 subnet

[no] subnet { any | ip-addr mask }

To add or delete the IP-subnet VLAN entries, run the above-mentioned commands respectively.

Parameter

Parameter	Parameter description
any	Means that a source IP address can be matched to the corresponding VLAN of this entry when the source IP address is any address.
<i>ip-addr mask</i>	Means the corresponding IP address and subnet mask of this entry.

Default value

No IP-subnet VLAN entry exists.

Command mode

VLAN configuration mode

Instruction

None

1.1.12 switchport vlan-subnet enable

[no] switchport vlan-subnet enable

To enable or disable the IP-subnet VLAN function on the ports, run the above-mentioned commands respectively.

Parameter

None

Default value

The IP-subnet VLAN function is disabled on the ports.

Command mode

Port configuration mode

Instruction

In port access mode, an incoming packet will be dropped if its VLAN, which is obtained through the matchup of subnet VLAN entry, is not PVID of the port. Hence, if not necessary, do not set the port mode, which is to enable subnet VLAN, to **access**.

1.1.13 protocol-vlan

protocol-vlan ether-type *etype-id* **vlan** *vlan-id*

no protocol-vlan *etype-id*

To add a protocol template or a protocol VLAN entry, run the above command.

Parameter

Parameter	Description
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<i>etype-id</i>	Stands for the Ethernet type of the incoming packets.
<i>vlan-id</i>	Stands for the corresponding VLAN ID, which ranges from 1 to 4094.

Default value

There is no protocol template or protocol VLAN entry.

Command mode

This command is run in global configuration mode.

Instruction

Different configuration commands may be used on different switches.

1.1.14 switchport protocol-vlan

switchport protocol-vlan

no switchport protocol-vlan

To Enable or disable the protocol-based VLAN function on the port, run the above command.

Parameter

None

Default value

A port does not associate with any protocol template or the protocol-based VLAN is disabled on a port.

Command mode

Port configuration mode

Instruction

Different configuration commands may be used on different switches.

In port access mode, an incoming packet will be dropped if its VLAN, which is obtained through the matchup of protocol-based VLAN entry, is not PVID of the port. Hence, if not necessary, do not set the port mode, which is to enable protocol-based VLAN, to **access**.

1.1.15 show vlan

show vlan [id *vlan-id* | interface *intf-id* | dot1q-tunnel [interface *intf*] | mac-vlan | subnet | protocol-vlan | private-vlan | run-config [interface *intf*] | debug]

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

Parameter

Parameter	Parameter description
-----------	-----------------------

Id <i>vlan-id</i>	Displays the designated VLAN. Value range: 1-4094
Interface <i>Intf-id</i>	Displays the designated port.
dot1q-tunnel [interface <i>intf</i>]	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-based VLAN entries
subnet	Displays the configured IP subnet-based VLAN entries
protocol-vlan	Displays the configured protocol-based VLAN template or entry
private-vlan	Shows private vlan information
run-config [interface <i>intf</i>]	Displays global or port vlan configuration information
debug	Shows enabled vlan debug command

Default value

None

Command mode

EXEC mode, global configuration or port configuration mode

Instruction

None

Example

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

```
Switch(config)#show vlan
```

VLAN	Status	Name	Ports
1	Static	Default	g0/0/1, g0/0/2, g0/0/3, g0/0/4 tg0/0/1, tg0/0/2, tg0/0/3 tg0/0/4
2	Static	VLAN0002	g0/0/2, g0/0/3
3	Static	VLAN0003	g0/0/2, g0/0/3
4	Static	VLAN0004	g0/0/2, g0/0/3
5	Static	VLAN0005	g0/0/2, g0/0/3
6	Static	VLAN0006	g0/0/2, g0/0/3
7	Static	VLAN0007	g0/0/2, g0/0/3
8	Static	VLAN0008	g0/0/2, g0/0/3
9	Static	VLAN0009	g0/0/2, g0/0/3
10	Static	VLAN0010	g0/0/2, g0/0/3
200	Static	main405	g0/0/2, g0/0/3

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(config)#show vlan id 2
```

VLAN id: 2, Name: VLAN0002

Mode: Static, Total Ports: 2

Interface	Attributes
g0/0/2	Trunk, Tagged
g0/0/3	Trunk, Tagged

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

Switch(config)#show vlan interface g0/0/3

Interface Name	VLAN Property	PVID	Vlan-Map	uTagg-Vlan-Map
g0/0/3	Trunk	1	1-10,200	1

Switch(config)#

1.1.16 show interface vlan

show interface vlan*intf-id*

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

Parameter

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

Default value

None

Command mode

EXEC mode, global configuration or port configuration mode

Instruction

None

Example

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

Switch(config)#show interface vlan1

vlan1 is up, line protocol is up

lindex is 449

Encapsulation ARPA

Peak input rate 0 pps, output 0 pps

3383 packets input, 1047691 bytes

Received 3383 broadcasts, 0 multicasts

0 mpls unicasts, 0 mpls multicasts, 0 mpls input discards

0 input errors, 0 discards, 0 protocol unknown

0 packets output, 0 bytes

Transmitted 0 broadcasts, 0 multicasts

0 mpls unicasts, 0 mpls multicasts, 0 mpls output discards

0 output errors, 0 discards

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.