Configuring VLANs

This chapter contains the following sections:

Information About VLANs

vEthernet interfaces that are assigned to specific VLANs are tagged with the VLAN when transmitted. A vEthernet interface that is not assigned to a specific VLAN, or assigned to VLAN 0, is transmitted as untagged on the physical NIC interfaces. When the VLAN is not specified, it is assumed to be 1.

The following table summarizes the actions taken on packets that are received by the Virtual Service Engine (VSE) based on VLAN tagging.

Table 1: VSE Action on VLAN Tagging

Port Type	Packet received	Action
Access	Tagged	The packet is dropped.
Access	Untagged	The VSE adds an access VLAN to the packet.
Trunk	Tagged	No action is taken on the packet.
Trunk	Untagged	The VSE adds a native VLAN tag to the packet.

Guidelines and Limitations

In accordance with the IEEE 802.1Q standard, up to 4094 VLANs (from 1 to 4094) are supported in the Cisco Nexus 1000VE, and are listed in the following table.

Table 2: Cisco Nexus 1000VE VLAN Numbering

VLAN Numbers	Range	Usage
1	Normal	Cisco Nexus 1000VE default. You can use this VLAN, but you cannot modify or delete it.
2 to1005	Normal	You can create, use, modify, or delete these VLANs.
1006 to 4094	Extended	You can create, name, or use these VLANs. You cannot change the following parameters: • The state is always active. • These VLANs are always enabled. You cannot shut down these VLANs. The extended system ID is always automatically enabled.
3968 to 4047 and 4094	Internally allocated	You cannot use, create, delete, or modify these VLANs. You can display these VLANs. The Cisco Nexus 1000VE allocates these 80 VLANs, plus VLAN 4094, for features, like diagnostics, that use internal VLANs for their operation.

Default Settings

Table 3: Default VLAN Settings

Parameters	Default
VLAN assignment for all interfaces and all ports configured as switchports	VLAN 1
VLAN name	VLANxxxx where xxxx represent four numeric digits (including leading zeroes) equal to the VLAN ID number
Shut state	No shutdown
Operational state	Active
External Switch Tagging (EST)	Enabled

Parameters	Default
Physical ports	Trunk ports

Configuring a VLAN

Creating a VLAN

You can do one of the following:

- Create a single VLAN that does not already exist.
- Create a range of VLANs that does not already exist.
- Delete an existing VLAN.

Note All interfaces and all ports configured as switchports are in VLAN 1 by default.

Before you begin

- Log in to the CLI in EXEC mode.
- Know that VLAN characteristics are configured in the VLAN configuration mode. To configure a VLAN that is already created, see Configuring VLAN Characteristics, on page 5.
- Be familiar with the VLAN numbering in the Guidelines and Limitations, on page 1.
- Know that newly created VLANs remain unused until Layer 2 ports are assigned to them.
- Know that when you delete a specified VLAN, the ports associated to that VLAN are shut down and no traffic flows. When you delete a specified VLAN from a trunk port, only that VLAN is shut down and traffic continues to flow on all the other VLANs through the trunk port. However, the system retains all the VLAN-to-port mapping for that VLAN, and when you reenable, or re-create, that specified VLAN, the system automatically reinstates all the original ports to that VLAN. Note that the static MAC addresses and aging time for that VLAN are not restored when the VLAN is reenabled.

Note Be aware that the Cisco NX-OS commands may differ from those commands used in Cisco IOS.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **show vlan**	Displays the VLANs that already exist.

	Command or Action	Purpose
Step 3	switch(config)# [**no**] **vlan** {*vlan-id* | *vlan-range*}	Creates or deletes, and saves in the running configuration, a VLAN or a range or VLANs. To configure the VLAN, see Configuring VLAN Characteristics, on page 5. **Note** If you enter a VLAN ID that is assigned to an internally allocated VLAN, the system returns an error message. From the VLAN configuration mode, you can also create and delete VLANs. For information about Assigning Layer 2 interfaces to VLANs (access or trunk ports), see the *Cisco Nexus 1000VE Interface Configuration Guide*. For information about configuring ports as VLAN access or trunk ports and assigning ports to VLANs, see the *Cisco Nexus 1000VE Interface Configuration Guide*.
Step 4	(Optional) switch(config-vlan)# **show vlan id** *vlan-id*	Displays the VLAN configuration.
Step 5	(Optional) switch(config-vlan)# **copy running-config startup-config**	Saves the running configuration persistently through reboots and restarts by copying it to the startup configuration.

Example

In this example, VLAN 5 is created and you are automatically placed into the VLAN configuration mode for VLAN 5:

```
switch# configure terminal
switch(config)# vlan 5
switch(config-vlan)#
```

This example shows the range, VLAN 15 to 20, being created. The VLANs in the range are activated, and you are automatically placed into VLAN configuration mode for VLANs 15 to 20.

Note If you create a range of VLANs that includes an unusable VLAN, all VLANs in the range are created except those that are unusable; and Cisco Nexus 1000VE returns a message listing the failed VLANs.

```
switch# configure terminal
switch(config)# vlan 15-20
switch(config-vlan)#
```

This example shows how to delete VLAN 3967:

```
switch# configure terminal
switch(config)# no vlan 3967
switch(config)#
```

This example shows how to display the VLAN 5 configuration:

```
switch# configure terminal
switch(config)# vlan 5
switch(config-vlan)# show vlan id 5

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------

5    VLAN0005                         active

VLAN Type
---- -----
5    enet

Remote SPAN VLAN
----------------
Disabled

Primary  Secondary  Type              Ports
-------  ---------  ----------------  ------------------------------------------

n1000v(config-vlan)# copy run start
[########################################] 100%
n1000v(config)#
```

Configuring VLAN Characteristics

You can do the following for a VLAN that has already been created:

Note Commands entered in the VLAN configuration mode are immediately saved to the running configuration.

- Name the VLAN.
- Configure the operational state (active or suspend) of the VLAN.
- Configure the VLAN media type (Ethernet).
- Shut down switching on the VLAN.

Before you begin

Log in to the CLI in EXEC mode.

Note Some characteristics cannot be modified on some VLANs. For more information, see the VLAN numbering described in the Guidelines and Limitations, on page 1.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **vlan** {*vlan-id* | *vlan-range*}	Enters VLAN configuration mode for the specified VLAN. **Note** If the VLAN does not already exist, the system creates it and then enters the VLAN configuration mode for that VLAN.
Step 3	switch(config-vlan)# **name** *vlan-name*	Adds a name to the VLAN of up to 32 alphanumeric characters. • You cannot change the name of VLAN1 or the VLANs that are reserved for internal use. • The default name is VLANxxxx where xxxx represent four numeric digits (including leading zeroes) equal to the VLAN ID number.
Step 4	switch(config-vlan)# **state** {**active** | **suspend**}	Changes the operational state of the VLAN and saves it in the running configuration. Allowable entries are as follows: • **active** (default) • **suspend** While the VLAN state is suspended, the ports associated with this VLAN are shut down, and that VLAN does not pass any traffic. **Note** You cannot suspend the state for the default VLAN or VLANs 1006 to 4094.
Step 5	switch(config-vlan)# **no shutdown**	Enables VLAN switching in the running configuration. Allowable entries are as follows: • **no shutdown** (default) • **shutdown** **Note** You cannot shut down the default VLAN, VLAN1, or VLANs 1006 to 4094.

	Command or Action	Purpose
Step 6	switch(config-vlan)# **exit**	Exits VLAN configuration mode. **Note** You must exit VLAN configuration mode for the configurations to take effect.
Step 7	(Optional) switch(config)# **show vlan** [**id** *vlan-id*]	Displays the VLAN configuration.
Step 8	(Optional) switch(config)# **copy running-config startup-config**	Saves the running configuration persistently through reboots and restarts by copying it to the startup configuration.

Example

This example shows how to configure VLAN characteristics:

```
switch# configure terminal
switch(config)# vlan 5
switch(config-vlan)# name accounting
switch(config-vlan)# state active
switch(config-vlan)# no shutdown
switch(config-vlan)# exit
switch(config)# show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Eth2/1, Eth2/2, Eth2/3, Eth2/5
                                                Eth2/7, Eth2/8, Eth2/9, Eth2/10
                                                Eth2/15, Eth2/21, Eth2/22
                                                Eth2/23, Eth2/24, Eth2/25
                                                Eth2/46, Eth2/47, Eth2/48
5    accounting                       active
6    VLAN0006                         active
7    VLAN0007                         active
8    test                             active
9    VLAN0009                         active
10   VLAN0010                         active
50   VLAN0050                         active    Eth2/6
100  trunked                          active
200  VLAN0200                         active
201  VLAN0201                         active
202  VLAN0202                         active
3966 VLAN3966                         active
switch(config)#
```

Verifying the Configuration

Use the following commands to verify the configuration:

Command	Purpose
show running-config vlan *vlan-id*	Displays VLAN information in the running configuration.

Command	Purpose
show vlan [**all-ports** | **brief** | **id** *vlan-id* | **name** *name* | **dot1q tag native**]	Displays the specified VLAN information.
show vlan summary	Displays a summary of VLAN information.