



# Configuring VLANs

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## 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 Ethernet Module (VEM) based on VLAN tagging.

**Table 1: VEM Action on VLAN Tagging**

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

## Guidelines and Limitations

VLAN configuration has the following guidelines and limitations:

- You configure VLANs through OpenStack as a VM subnet.

You must consistently use OpenStack for all VM network and subnet configuration. If you use *both* OpenStack and the VSM to configure VM networks and subnets, the OpenStack and the VSM configurations can become out-of-sync and result in faulty or inoperable network deployments.

- In accordance with the IEEE 802.1Q standard, Cisco Nexus 1000V can use the VLANs within the range of 1-4094 (see the following table).

**Table 2: Cisco Nexus 1000V VLAN Numbering**

VLANs Numbers	Range	Usage
1	Normal	Cisco Nexus 1000V default. You can use this VLAN, but you cannot modify or delete it.
2–1005	Normal	You can create, use, modify, and delete these VLANs.
1006–4094	Extended	<p>You can create, name, and use these VLANs. You cannot change the following parameters:</p> <ul style="list-style-type: none"> <li>State is always active.</li> <li>VLAN is always enabled. You cannot shut down these VLANs.</li> </ul> <p>The extended system ID is always automatically enabled.</p>
3968–4047 and 4094	Internally allocated	<p>You cannot use, create, delete, or modify these VLANs. You can display these VLANs.</p> <p>Cisco Nexus 1000V allocates these 80 VLANs, plus VLAN 4094, for features, like diagnostics, that use internal VLANs for their operation.</p> <p>For information about diagnostics, see the <i>Cisco Nexus 1000V for KVM System Management Configuration Guide</i>.</p>

# 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
IGMP snooping	Enabled

## Configuring a VLAN

### Creating a VLAN

You must configure VLANs as VM subnets using the OpenStack Horizon Dashboard or the OpenStack CLI.

You must consistently use OpenStack for all VM network and subnet configuration. If you use *both* OpenStack and the VSM to configure VM networks and subnets, the OpenStack and the VSM configurations can become out-of-sync and result in faulty or inoperable network deployments.

Use this procedure to do the following:

- Create a single VLAN that does not already exist.
- Create a range of VLANs that do 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

- You are logged in to the CLI in EXEC mode.
- VLAN characteristics are configured in the VLAN configuration mode.

- You are familiar with the VLAN numbering.
- Newly-created VLANs remain unused until Layer 2 ports are assigned to them.
- 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 reenables, or re-creates, 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 reenables.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	switch(config)# <b>show vlan</b>	(Optional) Displays the VLANs that already exist.
<b>Step 3</b>	switch(config)# { <b>no</b> } <b>vlan</b> { <i>vlan-id</i>   <i>vlan-range</i> }	Creates or deletes, and saves in the running configuration, a VLAN or a range of VLANs.  <b>Note</b> 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.  If a VLAN has been defined as a system VLAN on any port profile, then you cannot delete that VLAN.
<b>Step 4</b>	switch(config-vlan)# <b>show vlan id</b> <i>vlan-id</i>	(Optional) Displays the VLAN configuration.
<b>Step 5</b>	switch(config-vlan)# <b>copy</b> <b>running-config startup-config</b>	(Optional) Saves the running configuration persistently through reboots and restarts by copying it to the startup configuration.

In the following 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)#
```

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



**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 1000V returns a message listing the failed VLANs.

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

The following example shows VLAN 3967 being deleted, using the no form of the command:

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

The following example displays 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

Use this procedure to configure 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.
- The operational state (active, suspend) of the VLAN.
- The VLAN media type .
- Shut down switching on the VLAN.

### Before You Begin

You are logged 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](#) section.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	switch(config)# <b>vlan</b> { <i>vlan-id</i>   <i>vlan-range</i> }	Enters VLAN configuration mode for the specified VLAN. <b>Note</b> If the VLAN does not already exist, the system creates it and then enters the VLAN configuration mode for that VLAN.
<b>Step 3</b>	switch(config-vlan)# <b>name</b> <i>vlan-name</i>	Adds a name to the VLAN of up to 32 alphanumeric characters. <ul style="list-style-type: none"> <li>You cannot change the name of VLAN1 nor the VLANs reserved for internal use.</li> <li>The default name is VLANxxxx where xxxx represent four numeric digits (including leading zeroes) equal to the VLAN ID number.</li> </ul>
<b>Step 4</b>	switch(config-vlan)# <b>state</b> { <b>active</b>   <b>suspend</b> }	Changes the operational state of the VLAN and saves it in the running configuration. Allowable entries are: <ul style="list-style-type: none"> <li>Active (default)</li> <li>Suspend</li> </ul> While the VLAN state is suspended, the ports associated with this VLAN are shut down, and that VLAN does not pass any traffic. <b>Note</b> You cannot suspend the state for the default VLAN or VLANs 1006 to 4094.
<b>Step 5</b>	switch(config-vlan)# <b>no shutdown</b>	Enables VLAN switching in the running configuration. Allowable entries are: <ul style="list-style-type: none"> <li>no shutdown (default)</li> <li>shutdown</li> </ul> <b>Note</b> You cannot shut down the default VLAN, VLAN1, or VLANs 1006 to 4094.
<b>Step 6</b>	switch(config-vlan)# <b>show vlan</b> [ <i>id vlan-id</i> ]	(Optional) Displays the VLAN configuration.

	Command or Action	Purpose
<b>Step 7</b>	switch(config-vlan)# <b>copy running-config startup-config</b>	(Optional) Saves the running configuration persistently through reboots and restarts by copying it to the startup configuration.

```
n1000v# configure terminal
n1000v(config)# vlan 5
n1000v(config-vlan)# name accounting
n1000v(config-vlan)# state active
n1000v(config-vlan)# no shutdown
n1000v(config-vlan)# show vlan brief
VLAN Name                Status      Ports
-----
1      default                active
5      VLAN0005                active
2166  VLAN2166                 active
2167  VLAN2167                 active
2168  VLAN2168                 active
2169  VLAN2169                 active
2170  VLAN2170                 active
```

## Verifying the Configuration

Use one of the following commands to verify the configuration:

Command	Purpose
<b>show running-config vlan <i>vlan-id</i></b>	Displays VLAN information in the running configuration.
<b>show vlan [ <i>all-ports</i>   <i>brief</i>   <i>id vlan-id</i>   <i>name name</i>   <i>dot1q tag native</i> ]</b>	Displays the specified VLAN information.
<b>show vlan summary</b>	Displays a summary of VLAN information.

## Feature History for VLANs

Feature Name	Release	Description
VLANs	Release 5.2(1)SK1(2.1)	This feature was introduced

