



## Private VLANs

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This chapter describes how to identify and resolve problems that might occur when implementing Private VLANs. This chapter contains the following sections:

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- [Guidelines For Troubleshooting Private VLANs , on page 2](#)
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### Information About Private VLANs

Private VLANs (PVLANS) are used to segregate Layer 2 Internet service provider (ISP) traffic and convey it to a single router interface. PVLANS achieve device isolation by applying Layer 2 forwarding constraints that allow end devices to share the same IP subnet while being Layer 2 isolated. The use of larger subnets reduces address management overhead. Three separate port designations are used. Each has its own unique set of rules that regulate each connected endpoint's ability to communicate with other connected endpoints within the same private VLAN domain.

### Private VLAN Domains

A private VLAN domain consists of one or more pairs of VLANs. The primary VLAN makes up the domain, and each VLAN pair makes up a subdomain. The VLANs in a pair are called the primary VLAN and the secondary VLAN. All VLAN pairs within a private VLAN have the same primary VLAN. The secondary VLAN ID is what differentiates one subdomain from another.

### Spanning Multiple Switches

Private VLANs can span multiple switches, just like regular VLANs. Inter-switch link ports do not need to be aware of the special VLAN type and can carry frames tagged with these VLANs as like they do with any other frames. Private VLANs ensure that traffic from an isolated port in one switch does not reach another isolated or community port in a different switch even after traversing an inter-switch link. By embedding the isolation information at the VLAN level and by transporting it along with the packet, you can maintain consistent behavior throughout the network. The mechanism that restricts Layer 2 communication between two isolated ports in the same switch also restricts Layer 2 communication between two isolated ports in two different switches.

## Private VLAN Ports

Within a private VLAN domain, there are three separate port designations. Each port designation has its own unique set of rules that regulate the ability of one endpoint to communicate with other connected endpoints within the same private VLAN domain. The following are the three port designations:

- Promiscuous
- Isolated
- Community

For additional information about private VLANs, see the *Cisco Nexus 1000V Layer 2 Switching Configuration Guide*.

## Guidelines For Troubleshooting Private VLANs

Follow these guidelines when troubleshooting private VLAN issues:

- Use the **show vlan private-vlan** command to verify that the private VLAN is correctly configured.
- Use the **show interface** command to verify that the interface is up.
- Use the **module vem *module-number* execute vemcmd show port** command to verify that the VEM is correctly configured.

## Private VLAN Troubleshooting Commands

Command	Purpose
<b>show vlan private-vlan</b>	Displays that a private VLAN is correctly configured.
<b>show interface <i>slot-port</i></b>	Displays that a physical Ethernet interface in a private VLAN trunk promiscuous mode is up.
<b>show interface <i>veth-name</i></b>	Displays that a virtual Ethernet interface in private VLAN host mode is up.
<b>module vem <i>module-number</i> execute vemcmd show port</b>	Displays that a VEM is correctly configured.
<b>show system internal private-vlan info</b>	
<b>show system internal private-vlan event-history traces</b>	
<b>show system internal private-vlan event-history errors</b>	
<b>show system internal private-vlan event-history events</b>	

## Command Examples

### show vlan private-vlan

```
switch# show vlan private-vlan
Primary Secondary Type Ports
-----
152 157 community
152 158 isolated
156 153 community
156 154 community
156 155 isolated
```

### show interface

```
switch# show interface eth3/4
Ethernet3/4 is up
Hardware: Ethernet, address: 0050.565a.ca50 (bia 0050.565a.ca50)
MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
reliability 0/255, txload 0/255, rxload 0/255
Encapsulation ARPA
Port mode is Private-vlan trunk promiscuous
full-duplex, 1000 Mb/s
Beacon is turned off
Auto-Negotiation is turned off
Input flow-control is off, output flow-control is off
Auto-mdix is turned on
Switchport monitor is off
Rx
158776 Input Packets 75724 Unicast Packets
76 Multicast Packets 82976 Broadcast Packets
13861581 Bytes
Tx
75763 Output Packets 75709 Unicast Packets
3 Multicast Packets 51 Broadcast Packets 0 Flood Packets
7424670 Bytes
5507 Input Packet Drops 0 Output Packet Drops
2 interface resets
```

```
switch# show interface v3
Vethernet3 is up
Hardware is Virtual, address is 0050.56bb.6330
Owner is VM "fedora9", adapter is Network Adapter 1
Active on module 3
VMware DVS port 10
Port-Profile is pvlancomm153
Port mode is Private-vlan host
Rx
14802 Input Packets 14539 Unicast Packets
122 Multicast Packets 141 Broadcast Packets
1446568 Bytes
Tx
15755 Output Packets 14492 Unicast Packets
0 Multicast Packets 1263 Broadcast Packets 0 Flood Packets
1494886 Bytes
45 Input Packet Drops 0 Output Packet Drops
```

## module vem module-number execute vemcmd show port

```
switch# module vem 3 execute vemcmd show port
LTL IfIndex Vlan Bndl SG_ID Pinned_SGID Type Admin State CBL Mode Name
8 0 3969 0 2 2 VIRT UP UP 4 Access l20
9 0 3969 0 2 2 VIRT UP UP 4 Access l21
10 0 150 0 2 2 VIRT UP UP 4 Access l22
11 0 3968 0 2 2 VIRT UP UP 4 Access l23
12 0 151 0 2 2 VIRT UP UP 4 Access l24
13 0 1 0 2 2 VIRT UP UP 0 Access l25
14 0 3967 0 2 2 VIRT UP UP 4 Access l26
16 1a020100 1 T 0 2 2 PHYS UP UP 4 Trunk vmnic1
18 1a020300 1 T 0 2 2 PHYS UP UP 4 Trunk vmnic3
pvlan promiscuous trunk port
153 --> 156
154 --> 156
155 --> 156
157 --> 152
158 --> 152
19 1a020400 1 T 0 2 2 PHYS UP UP 4 Trunk vmnic4
pvlan promiscuous trunk port
153 --> 156
154 --> 156
155 --> 156
157 --> 152
158 --> 152
47 1b020000 154 0 2 0 VIRT UP UP 4 Access fedora9.eth0
pvlan community 156 153
```