



Private VLANs

This chapter describes how to identify and resolve problems related to private VLANs and includes the following sections:

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- [Troubleshooting Guidelines, page 14-2](#)
- [Private VLAN Troubleshooting Commands, page 14-2](#)

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*.

Troubleshooting Guidelines

Follow these guidelines when troubleshooting private VLAN issues:

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

Private VLAN Troubleshooting Commands

Use the commands listed in this section to troubleshoot problems related to private VLANs.

Command	Purpose
show vlan private-vlan	Displays that a private VLAN is configured correctly. See Example 14-1 on page 14-2 .
show interface name	Displays that a physical Ethernet interface in a private VLAN trunk promiscuous mode is up. See Example 14-2 on page 14-3 .
show interface veth-name	Displays that a virtual Ethernet interface in private VLAN host mode is up. See Example 14-3 on page 14-3 .
module vem module-number execute vemcmd show port	Displays that a VEM is configured correctly. See Example 14-4 on page 14-3 .

Example 14-1 show vlan private-vlan Command

```
switch# show vlan private-vlan
  Primary  Secondary  Type           Ports
  -----  -
  152      157        community
```

```

152      158      isolated
156      153      community
156      154      community
156      155      isolated

```

Example 14-2 show interface name Command

```

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

```

Example 14-3 show interface veth Command

```

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

```

Example 14-4 module vem module-number execute vemcmd show port Command

```

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	120
9	0	3969	0	2	2	VIRT	UP	UP	4	Access	121
10	0	150	0	2	2	VIRT	UP	UP	4	Access	122
11	0	3968	0	2	2	VIRT	UP	UP	4	Access	123
12	0	151	0	2	2	VIRT	UP	UP	4	Access	124
13	0	1	0	2	2	VIRT	UP	UP	0	Access	125
14	0	3967	0	2	2	VIRT	UP	UP	4	Access	126

```

    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

```

If additional information is required for Cisco Technical Support to troubleshoot a private VLAN issue, use the following commands:

- **show system internal private-vlan info**
- **show system internal private-vlan event-history traces**
- **show system internal private-vlan event-history errors**
- **show system internal private-vlan event-history events**