Cisco Nexus 1000V for VMware vSphere Troubleshooting Guide, Release 5.x

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Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
http://www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883

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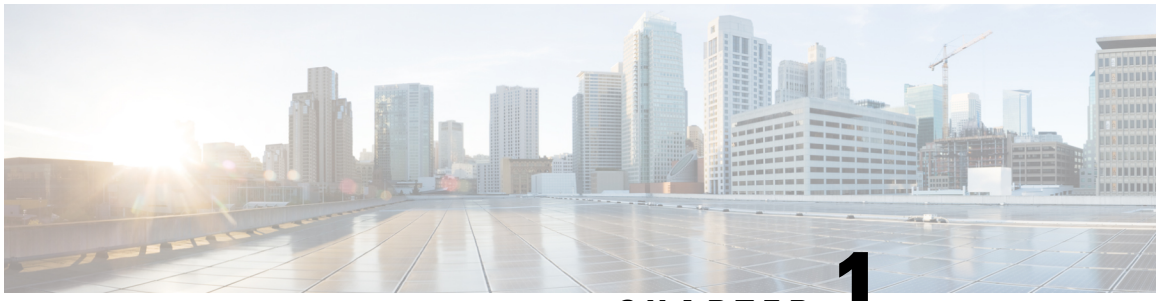


CHAPTER 1

New and Changed Information

This chapter lists new and changed content in this document by software release. This chapter contains the following sections:

New and Changed Information

This section lists new and changed content in this document by software release.

To find additional information about new features or command changes, see the *Cisco Nexus 1000V Release Notes* and *Cisco Nexus 1000V Command Reference*.

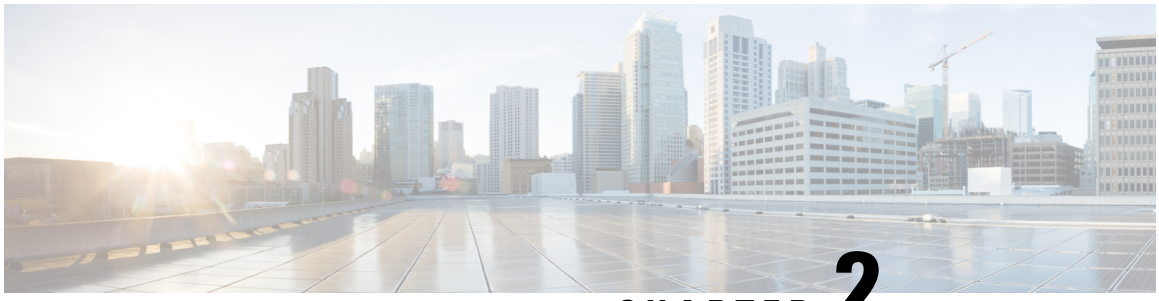
Table 1: New and Changed Features for the Cisco Nexus 1000V Troubleshooting Guide

Feature	Description	Changed in Release	Where Documented
L3Sec	Added information about how to secure the internal control plane communications (Control and Packet traffic) of Cisco Nexus 1000V in a more robust way than in previous releases. It operates only in Layer 3 control mode.	5.2(1)SV3(1.1)	L3Sec, on page 85
Storm Control	Added information about how to identify and resolve the problems related to storm control.	5.2(1)SV3(1.1)	Storm Control, on page 187

Feature	Description	Changed in Release	Where Documented
VSI Discovery and Configuration Protocol	Added new section for troubleshooting commands for the VSI Discovery and Configuration Protocol (VDP).	4.2(1)SV2(2.2)	VSI Discovery and Configuration Protocol, on page 219
VXLAN Gateway	Added a section for troubleshooting commands for VXLAN Gateway. **Note** Starting with Release 5.2(1)SV3(1.15), Cisco Nexus 1000V for VMware vSphere does not support the VXLAN Gateway feature.	4.2(1)SV2(2.1)	VXLANs, on page 209
Upgrade	Added section for problems with VSM-VEM Layer 2 to 3 Conversion Tool.	4.2(1)SV2(1.1)	Upgrade, on page 37
Ethanalyzer	Added Ethanalyzer as a Cisco Nexus 1000V protocol analyzer tool content.	4.2(1)SV2(1.1)	Ethanalyzer, on page 233
DHCP Enhancements	Added the troubleshooting commands for DHCP.	4.2(1)SV2(1.1)	DHCP, DAI, and IPSG, on page 177
High Availability	Updated the high availability section. Added a command output for the new show system internal active-active remote accounting logs command and updated the output for the show system redundancy status command.	4.2(1)SV2(1.1)	High Availability, on page 55

Feature	Description	Changed in Release	Where Documented
Licensing	Added the **svs license transfer src-vem vem no license_pool** command to troubleshoot the issues with checking out the licenses or returning them to the license pool.	4.2(1)SV2(1.1)	Licenses, on page 29
Cisco Nexus 1000V VC Plugin Installation	Added a new section to troubleshoot the Cisco Nexus 1000V VC plugin installation.	4.2(1)SV2(1.1)	vCenter Plug-in, on page 231
Cisco Nexus 1000V Installation Management Center	Added a new section to troubleshoot the Cisco Nexus 1000V Installation Management Center.	4.2(1)SV1(5.1)	Installation, on page 19
Recovering Management and Control Connectivity of a Host	Added a new section to recover management and control connectivity of a host when a VSM is running on a VEM.	4.2(1)SV1(5.1)	VSM and VEM Modules, on page 63
ACL Logging	Added a new section to troubleshoot ACL Logging.	4.2(1)SV1(5.1)	ACLs, on page 149
NSM	Added a new chapter to troubleshoot the Network Segmentation Manager (NSM).	4.2(1)SV1(5.1)	Network Segmentation Manager, on page 201
VXLAN	Added a new chapter to troubleshoot the Virtual Extensible Local Area Network (VXLAN).	4.2(1)SV1(5.1)	VXLANs, on page 209
Microsoft NLB Unicast Mode	Added a new section for troubleshooting Microsoft Network Load Balancing (NLB) unicast mode.	4.2(1)SV1(5.1)	Layer 2 Switching, on page 121
In service software upgrade (ISSU)	Added a new section for troubleshooting ISSU.	4.2(1)SV1(4a)	Upgrade, on page 37

Feature	Description	Changed in Release	Where Documented
VEM software upgrade	Added a new section for troubleshooting a VEM software upgrade.	4.2(1)SV1(4a)	Upgrade, on page 37
DHCP, DAI, IPSG	Added a new section for troubleshooting DHCP, Dynamic ARP Inspection, and IP Source Guard.	4.2(1)SV1(4)	DHCP, DAI, and IPSG, on page 177
Port profiles	Added a new section for port profiles and new information about quarantined port profiles.	4.2(1)SV1(4)	Port Profiles, on page 101
Upgrade	Added a new section for troubleshooting upgrade problems.	4.2(1)SV1(4)	Upgrade, on page 37
VEM health check	Added information about the VEM health check that shows the cause of a connectivity problem.	4.0(4)SV1(3)	VSM and VEM Modules, on page 63



CHAPTER 2

Overview

This chapter introduces the basic concepts, methodology, and general troubleshooting guidelines for problems that might occur when configuring and using Cisco Nexus 1000V. This chapter contains the following sections:

Troubleshooting Process

To troubleshoot your network, follow these steps:

Procedure

Step 1 Gather information that defines the specific symptoms.

Step 2 Identify all potential problems that could be causing the symptoms.

Step 3 Systematically eliminate each potential problem (from most likely to least likely) until the symptoms disappear.

Step 4 If the problem still persists, get technical support. For more information, see Cisco Support Information, on page 235 and Gathering Information for Technical Support, on page 235.

Best Practices

We recommend that you do the following to ensure the proper operation of your networks:

- Maintain a consistent Cisco Nexus 1000V release across all network devices.
- Refer to the release notes for your Cisco Nexus 1000V release for the latest features, limitations, and caveats.
- Enable system message logging. See Overview of Symptoms, on page 6.
- Verify and troubleshoot any new configuration changes after implementing the change.

Troubleshooting Basics

This section introduces questions to ask when troubleshooting a problem with the Cisco Nexus 1000V or connected devices. Use the answers to these questions to identify the scope of the problem and to plan a course of action.

Overview of Symptoms

The symptom-based troubleshooting approach provides multiple ways to diagnose and resolve problems. By using multiple entry points with links to solutions, this guide best serves users who may have identical problems that are perceived by different indicators.

Using a given a set of observable symptoms on a network, it is important to be able to diagnose and correct software configuration issues and inoperable hardware components so that the problems are resolved with minimal disruption to the network. These problems and corrective actions include the following:

- Identify key Cisco Nexus 1000V troubleshooting tools.
- Obtain and analyze protocol traces using SPAN or Ethanalyzer on the CLI.
- Identify or rule out physical port issues.
- Identify or rule out switch module issues.
- Diagnose and correct Layer 2 issues.
- Diagnose and correct Layer 3 issues.
- Obtain core dumps and other diagnostic data for use by the Technical Assistance Center (TAC).
- Recover from switch upgrade failures.

Troubleshooting Guidelines

By answering the following questions, you can determine the paths that you need to follow and the components that you should investigate further.

Answer the following questions to determine the status of your installation:

- Is this a newly installed system or an existing installation? It could be a new host, switch, or VLAN.
- Has the host ever been able to see the network?
- Are you trying to solve an existing application problem (too slow, high latency, excessively long response time) or did the problem show up recently?
- What was changed in the configuration or in the overall infrastructure immediately before the applications started to have problems?

Discovering a Network Problem

To discover a network problem, follow these steps:

Procedure

Step 1 Gather information about problems in your system. See Gathering Information, on page 7.

Step 2 Verify the Layer 2 connectivity. See Verifying Layer 2 Connectivity, on page 8.

Step 3 Verify the configuration for your end devices (storage subsystems and servers).

Step 4 Verify the end-to-end connectivity. See Verifying Layer 3 Connectivity, on page 8.

Gathering Information

This section highlights the tools that are commonly used to troubleshoot problems within your network. These tools are a subset of what you might use to troubleshoot your specific problem. Each chapter in this guide includes additional tools and commands that are specific to the symptoms and possible problems covered in that chapter. You should also have an accurate topology of your network to help isolate problem areas.

Use the following commands and examine the outputs:

- **show module**
- **show version**
- **show running-config**
- **show logging log**
- **show interfaces brief**
- **show vlan**
- **show accounting log**
- **show tech support svs**

Note To use commands with the **internal** keyword, you must log in with the network-admin role.

Verifying Ports

Answer the following questions to verify ports:

- Are you using the correct media copper or optical fiber type?
- Is the media broken or damaged?
- Are you checking a virtual Ethernet port? If yes, use the **show interface brief** command. The status should be up.
- Are you checking a physical Ethernet port? If yes, check the port by looking at the server or by looking at an upstream switch.

- Are the network adapters of the Virtual Supervisor Module (VSM) virtual machine (VM) assigned the right port groups? Are all of them connected from vSphere Client?

Verifying Layer 2 Connectivity

To verify Layer 2 connectivity, do the following:

1. Answer the following questions:
   - Are the necessary interfaces in the same VLANs?
   - Are all ports in the port channel configured for the same speed, duplex, and trunk mode?
2. Use the following commands:
   - Use the **show vlan brief** command to check the status. The status should be up.
   - Use the **show port-profile** command to check a port profile configuration.
   - Use the **show interface-brief** command to check the status of a virtual Ethernet port or a physical Ethernet port.

Verifying Layer 3 Connectivity

To verify Layer 3 connectivity, do the following:

1. Answer the following questions:
   - Have you configured a gateway of last resort?
   - Are any IP access lists, filters, or route maps blocking route updates?
2. Use the following commands:
   - Ping, on page 13
   - Traceroute, on page 14

System Messages

The system software sends the syslog (system) messages to the console (and, optionally, to a logging server on another system) during operation. Not all messages indicate a problem with your system. Some messages are purely informational, while others might help diagnose problems with links, internal hardware, or the system software.

System Message Text

Message-text is a text string that describes the condition. This portion of the message might contain detailed information about the event, including terminal port numbers, network addresses, or addresses that correspond to locations in the system memory address space. Because the information in these variable fields changes

from message to message, it is represented here by short strings enclosed in square brackets. A decimal number, for example, is represented as `[dec]`.

```
2009 Apr 29 12:35:51 switch
%KERN-1-SYSTEM_MSG: stun_set_domain_id : Setting domain ID (1024) -
kernel
```

Use this string to find the matching system message in the *Cisco Nexus 1000V Series and Cisco VSG NX-OS System Messages Reference Guide for VMware vSphere*.

Each system message is followed by an explanation and recommended action. The action may be as simple as "No action required." It may involve a fix or a recommendation to contact technical support as shown in the following example:

```
Error Message 2009 Apr 29 14:57:23 switch
%MODULE-5-MOD_OK: Module 3 is online (serial:)

Explanation VEM module inserted successfully on slot 3
Use the show module command to verify the module in
slot 3.
```

syslog Server Implementation

The syslog facility allows the Cisco Nexus 1000V to send a copy of the message log to a host for more permanent storage. This feature can be useful if the logs need to be examined over a long period of time or when the Cisco Nexus 1000V is not accessible.

This section demonstrates how to configure a Cisco Nexus 1000V to use the syslog facility on a Solaris platform. Although a Solaris host is being used, the syslog configuration on all UNIX and Linux systems is very similar.

Syslog uses the concept of a facility to determine how it should be handled on the syslog server (the Solaris system in this example), and the message severity. Therefore, different message severities can be handled differently by the syslog server. They could be logged to different files or emailed to a particular user. Specifying a severity determines that all messages of that level and greater severity (lower number) will be acted upon.

Note The Cisco Nexus 1000V messages should be logged to a different file from the standard syslog file so that they cannot be confused with other non-Cisco syslog messages. The logfile should not be located on the / file system, to prevent log messages from filling up the / file system.

```
Syslog Client: switch1
Syslog Server: 172.22.36.211 (Solaris)
Syslog facility: local1
Syslog severity: notifications (level 5, the default)
File to log Cisco Nexus 1000V messages to: /var/adm/nxos_logs
```

Configuring a syslog Server

To configure a syslog server, follow these steps:

Procedure

Step 1 Configure the Cisco Nexus 1000V.

```
switch# config terminal
Enter configuration commands, one per line. End with CNTL/Z.
switch (config)# logging server 192.0.2.1 6 facility local1
```

Step 2 Display the configuration.

```
switch# show logging server
Logging server: enabled
{192.0.2.1}
server severity: notifications
server facility: local1
```

Step 3 Configure the syslog server.

a) Modify `/etc/syslog.conf` to handle local1 messages. For Solaris, at least one tab needs to be between the facility severity and the action (`/var/adm/nxos_logs`).

```
#Below is for the NX-OS logging
local1.notice /var/adm/nxos_logs
```

b) Create the log file.

```
#touch /var/adm/nxos_logs
```

c) Restart the syslog.

```
# /etc/init.d/syslog stop
# /etc/init.d/syslog start
syslog service starting.
```

d) Verify that the syslog has started.

```
# ps -ef |grep syslogd
root 23508 1 0 11:01:41 ? 0:00 /usr/sbin/syslogd
```

Step 4 Test the syslog server by creating an event in the Cisco Nexus 1000V. In this case, port e1/2 was bounced and the following was listed on the syslog server. Notice that the IP address of the switch is listed in brackets.

```
# tail -f /var/adm/nxos_logs
Sep 17 11:07:41 [172.22.36.142.2.2] : 2004 Sep 17 11:17:29 pacific:
%PORT-5-IF_DOWN_INITIALIZING: %$VLAN 1%$ Interface e 1/2 is down (Initializing)
Sep 17 11:07:49 [172.22.36.142.2.2] : 2004 Sep 17 11:17:36 pacific: %PORT-5-IF_UP:
%$VLAN 1%$ Interface e 1/2 is up in mode access
Sep 17 11:07:51 [172.22.36.142.2.2] : 2004 Sep 17 11:17:39 pacific:
%VSHD-5-VSHD_SYSLOG_CONFIG_I: Configuring console from pts/0
(dhcp-171-71-49-125.cisco.com)
```

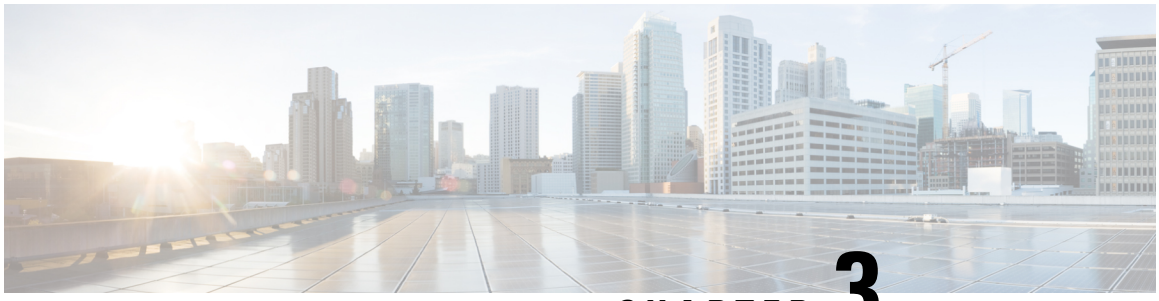
Troubleshooting with Logs

Cisco Nexus 1000V generates many types of system messages on the switch and sends them to a syslog server. These messages can be viewed to determine the events that might have led up to the current problem condition that you are facing.

Viewing Logs

Use the following commands to access and view logs in Cisco Nexus 1000V.

```
switch# show logging ?

console Show console logging configuration
info Show logging configuration
internal syslog syslog internal information
last Show last few lines of logfile
level Show facility logging configuration
logfile Show contents of logfile
loopback Show logging loopback configuration
module Show module logging configuration
monitor Show monitor logging configuration
nvram Show NVRAM log
pending server address pending configuration
pending-diff server address pending configuration diff
server Show server logging configuration
session Show logging session status
status Show logging status
timestamp Show logging timestamp configuration
| Pipe command output to filter


switch# show logging server
Logging server: enabled
{192.0.1.1}
server severity: critical
server facility: user
```



CHAPTER 3

Troubleshooting Tools

This chapter describes the troubleshooting tools available for Cisco Nexus 1000V. This chapter contains the following sections:

Commands

You use the CLI from a local console or remotely using a Telnet or SSH session. The CLI provides a command structure similar to the Cisco NX-OS software with context-sensitive help, **show** commands, multi-user support, and role-based access control.

Each feature has **show** commands that provide information about the feature configuration, status, and performance. Additionally, you can use the **show system** command for information about the system-level components, including cores, errors, and exceptions. To get detailed information about error codes, use the **show system error-id** command.

```
switch# copy running-config startup-config
[########################################] 100%
2008 Jan 16 09:59:29 zoom %$ VDC-1 %$ %BOOTVAR-2-AUTOCOPY_FAILED: Autocopy of file
/bootflash/n1000-s1-dk9.4.0.0.837.bin.S8
to standby failed, error=0x401e0008

switch# show system error-id 0x401e0008
Error Facility: sysmgr
Error Description: request was aborted, standby disk may be full
```

Ping

The ping utility generates a series of echo packets to a destination across a TCP/IP internetwork. When the echo packets arrive at the destination, they are rerouted and sent back to the source. Using ping, you can verify connectivity and latency to a particular destination across an IP-routed network.

The ping utility allows you to ping a port or end device. By specifying the IPv4 address, you can send a series of frames to a target destination. After these frames reach the target, they are looped back to the source and a timestamp is taken.

Traceroute

Use the traceroute feature to do the following:

- Trace the route followed by data traffic.
- Compute inter-switch (hop-to-hop) latency. Traceroute identifies the path taken on a hop-by-hop basis and includes a timestamp at each hop in both directions.
- Test the connectivity of ports along the path between the generating switch and the switch closest to the destination.

  If the destination cannot be reached, the path discovery starts, which traces the path up to the point of failure.

Use the **traceroute** command to access this feature.

Monitoring Processes and CPUs

Identifying the Running Processes and their States

Use the **show processes** command to identify the processes that are running and to view the status of each process.

The command output includes the following:

- PID—Process ID.
- State —Process state.
- PC—Current program counter in hex format.
- Start_cnt—How many times a process has been started (or restarted).
- TTY—Terminal that controls the process. A “-” usually means a daemon is not running on any particular TTY.
- Process—Name of the process.

Process states are as follows:

- D—Uninterruptible sleep (usually I/O).
- R—Runnable (on run queue).
- S—Sleeping.
- T—Traced or stopped.
- Z—Defunct (“zombie”) process.

- NR—Not running.
- ER—Should be running but is currently not running.

Note The ER state typically designates a process that has been restarted too many times, causing the system to classify it as faulty and disable it.

```
switch# show processes ?
cpu Show processes CPU Info
log Show information about process logs
memory Show processes Memory Info

switch# show processes

PID   State  PC      Start_cnt   TTY     Process
----- ----- -------- ----------- ---- -------------
1 S b7f9e468 1 - init
2 S 0 1 - migration/0
3 S 0 1 - ksoftirqd/0
4 S 0 1 - desched/0
5 S 0 1 - migration/1
6 S 0 1 - ksoftirqd/1
7 S 0 1 - desched/1
8 S 0 1 - events/0
9 S 0 1 - events/1
10 S 0 1 - khelper
15 S 0 1 - kthread
24 S 0 1 - kacpid
101 S 0 1 - kblockd/0
102 S 0 1 - kblockd/1
...
```

Displaying CPU Utilization

Use the **show processes cpu** command to display CPU utilization. The command output includes the following

- Runtime(ms)—CPU time the process has used, expressed in milliseconds.
- Invoked—Number of times the process has been invoked.
- uSecs—Microseconds of CPU time in average for each process invocation.
- 1Sec—CPU utilization in percentage for the last one second.

Note VSE consumes most of the CPU (99%) when the system is idle. This usage of CPU causes vCenter to flag **CPU usage warning**. This warning can be ignored or acknowledged on vCenter.

```
switch# show processes cpu

PID Runtime(ms) Invoked uSecs 1Sec Process
----- ----------- -------- ----- ----- -----------
1 922 4294967295 0 0 init
2 580 377810 1 0 migration/0
3 889 3156260 0 0 ksoftirqd/0
```

```
4 1648 532020 3 0 desched/0
5 400 150060 2 0 migration/1
6 1929 2882820 0 0 ksoftirqd/1
7 1269 183010 6 0 desched/1
8 2520 47589180 0 0 events/0
9 1730 2874470 0 0 events/1
10 64 158960 0 0 khelper
15 0 106970 0 0 kthread
24 0 12870 0 0 kacpid
101 62 3737520 0 0 kblockd/0
102 82 3806840 0 0 kblockd/1
115 0 67290 0 0 khubd
191 0 5810 0 0 pdflush
192 983 4141020 0 0 pdflush
...
```

Displaying CPU and Memory Information

Use the **show system resources** command to display system-related CPU and memory statistics. The output includes the following:

- Load average—Number of running processes. The average reflects the system load over the past 1, 5, and 15 minutes.
- Processes—Number of processes in the system and how many processes are actually running when the command is issued.
- CPU states—CPU usage percentage in user mode, kernel mode, and idle time in the last one second.
- Memory usage—Total memory, used memory, free memory, memory used for buffers, and memory used for the cache in KB. Buffers and cache are also included in the used memory statistics.

```
switch# show system resources
Load average: 1 minute: 0.30 5 minutes: 0.34 15 minutes: 0.28
Processes : 606 total, 2 running
CPU states : 0.0% user, 0.0% kernel, 100.0% idle
Memory usage: 2063268K total, 1725944K used, 337324K free
2420K buffers, 857644K cache
```

RADIUS

RADIUS is a protocol used for the exchange of attributes or credentials between a head-end RADIUS server and a client device. These attributes relate to three classes of services:

- Authentication: Authentication refers to the authentication of users for access to a specific device. You can use RADIUS to manage user accounts for access to Cisco Nexus 1000V. When you try to log into a device, Cisco Nexus 1000V validates you with information from a central RADIUS server.
- Authorization: Authorization refers to the scope of access that you have once you have been authenticated. Assigned roles for users can be stored in a RADIUS server with a list of actual devices that the user should have access to. Once the user has been authenticated, the switch can then refer to the RADIUS server to determine the extent of access the user will have within the switch network.
- Accounting: Accounting refers to the log information that is kept for each management session in a switch. This information can be used to generate reports for troubleshooting purposes and user accountability. Accounting can be implemented locally or remotely (using RADIUS).

Note The accounting log shows only the beginning and ending (start and stop) for each session.

The following is an example of an accounting log entries:

```
switch# show accounting log
Sun Dec 15 04:02:27 2002:start:/dev/pts/0_1039924947:admin
Sun Dec 15 04:02:28 2002:stop:/dev/pts/0_1039924947:admin:vsh exited normally
Sun Dec 15 04:02:33 2002:start:/dev/pts/0_1039924953:admin
Sun Dec 15 04:02:34 2002:stop:/dev/pts/0_1039924953:admin:vsh exited normally
Sun Dec 15 05:02:08 2002:start:snmp_1039928528_172.22.95.167:public
Sun Dec 15 05:02:08 2002:update:snmp_1039928528_172.22.95.167:public:Switchname
```

Syslog

The system message logging software saves messages in a log file or directs the messages to other devices. This feature provides the following capabilities:

- Logging information for monitoring and troubleshooting.
- Selection of the types of logging information to be captured.
- Selection of the destination of the captured logging information.

Syslog allows you to store a chronological log of system messages locally or sent to a central syslog server. Syslog messages can also be sent to the console for immediate use. These messages can vary in detail depending on the configuration that you choose.

Syslog messages are categorized into seven severity levels from debug to critical events. You can limit the severity levels that are reported for specific services within the switch.

Log messages are not saved across system reboots. However, a maximum of 100 log messages with a severity level of critical and below (levels 0, 1, and 2) can logged to a local file or server.

Logging Levels

Cisco Nexus 1000V supports the following logging levels:

- 0—emergency
- 1—alert
- 2—critical
- 3—error
- 4—warning
- 5—notification
- 6—informational
- 7—debugging

By default, the Cisco Nexus 1000V logs normal but significant system messages to a log file and sends these messages to the system console. Users can specify which system messages should be saved based on the type of facility and the severity level. Messages are time-stamped to enhance real-time debugging and management.

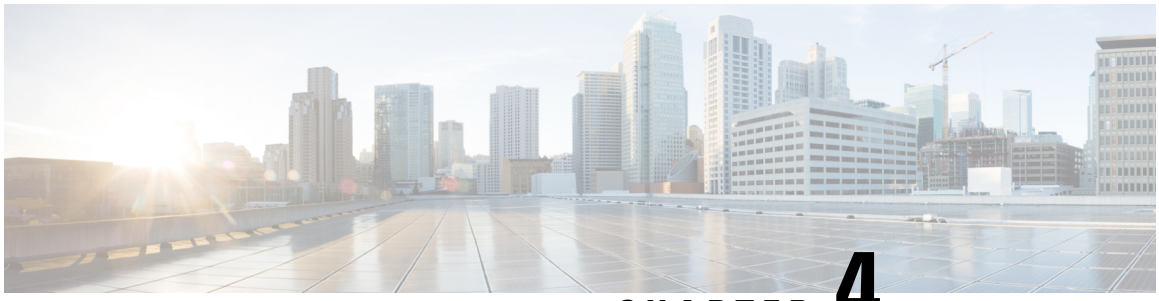
Enabling Logging for Telnet or SSH

System logging messages are sent to the console based on the default or configured logging facility and severity values.

You can disable logging to the console or enable logging to a given Telnet or SSH session.

- To disable console logging, use the **no logging console** command in global CONFIGURATION mode. Console logging is enabled by default.
- To enable logging for Telnet or SSH, use the **terminal monitor** command in EXEC mode. Logging for Telnet or SSH is disabled by default.

Note When logging to a console session is disabled or enabled, that state is applied to all future console sessions. If you exit and log in again to a new session, the state is preserved. However, when logging to a Telnet or SSH session is enabled or disabled, that state is applied only to that session. The state is not preserved after you exit the session.



CHAPTER 4

Installation

This chapter describes how to identify and resolve installation problems. This chapter contains the following topics:

Isolating Installation Problems

Verifying Your VMware License Version

Before you begin to troubleshoot any installation issues, you should verify that your ESX server has the VMware Enterprise Plus license that includes the Distributed Virtual Switch feature.

Before you begin

Before you begin, you must know or do the following:

- You are logged in to the vSphere client on the ESX server.
- You are logged in to the Cisco Nexus 1000V CLI in EXEC mode.
- This procedure verifies that your vSphere ESX server uses the VMware Enterprise Plus license. This license includes the Distributed Virtual Switch feature, which allows visibility to the Cisco Nexus 1000V.
- If your vSphere ESX server does not have the Enterprise Plus license, then you must upgrade your license.

Procedure

Step 1 From the vSphere Client, choose the host whose Enterprise Plus license you want to check.

Step 2 Click the Configuration tab and choose **Licensed Features**.

The Enterprise Plus licensed features are displayed.

Step 3 Verify that the following are included in the Licensed Features:

- Enterprise Plus license
- Distributed Virtual Switch feature

Step 4 Do one of the following:

a) If your vSphere ESX server has an Enterprise Plus license, you have the correct license and visibility to Cisco Nexus 1000V.

b) If your vSphere ESX server does not have an Enterprise Plus license, you must upgrade your VMware License to an Enterprise Plus license to have visibility to the Cisco Nexus 1000V.

Host is Not Visible from the Distributed Virtual Switch

If you have added hosts and adapters with your VSM, you must also add them in the vCenter Client Add Host to Distributed Virtual Switch dialog box as shown in the following figure.

If the hosts and adapters do not appear in this dialog box, you might have the incorrect VMware license installed on your ESX server. See Verifying Your VMware License Version, on page 19 to verify the license version.

Refreshing the vCenter Server Connection

You can refresh the connection between Cisco Nexus 1000V and vCenter Server. From the Cisco Nexus 1000V Connection Configuration mode on the Virtual Supervisor Module (VSM), enter the following command sequence:

```
switch# config t
switch(config)# svs connection s1
switch(config-svs-conn)# no connect
switch(config-svs-conn)# connect
```

Improving Performance on the ESX Host and the VM

Use the following pointers to improve performance on the ESX host and the VMs:

- Install VMware Tools on the vCenter Server VM, with Hardware Acceleration enabled.
- Use the CLI in VMs instead of the graphical interface where possible.

Verifying the Domain Configuration

The Virtual Supervisor Module (VSM) and Virtual Ethernet Module (VEM) are separated within a Layer 2 domain. To allow VSM-VEM pairs to communicate within the same Layer 2 domain, each pair must have a unique identifier. The domain ID serves as the unique identifier that allows multiple VSM-VEM pairs to communicate inside the same Layer 2 domain.

After installing Cisco Nexus 1000V, make sure that you configure a domain ID. Without a domain ID, the VSM cannot connect to the vCenter Server. Follow these guidelines:

- The domain ID should be a value within the range of 1 to 4095.
- All the control traffic between the VSM and the VEM is carried over the configured control VLAN.
- All the data traffic between the VSM and the VEM is carried over the configured packet VLAN.
- Make sure that the control VLAN and the packet VLAN are allowed on the port in the upstream switch to which the physical NIC of the host hosting the VSM and VEM VM are connected

Verifying the Port Group Assignments for a VSM VM Virtual Interface

To verify if the VSM VM network adapter 1, network adapter 2, and network adapter 3 are carrying the control VLAN, management VLAN, and packet VLAN, follow this procedure.

Before you begin

You can verify that port groups are created on the ESX hosting the VSM VM through the vCenter Server. The following port groups (PG) should be created:

- Control PG (Vlan = Control VLAN)
- Packet PG (Vlan = Packet VLAN)
- Management PG (Vlan = Management VLAN)

Make sure the port groups are assigned to the three virtual interfaces of the VSM VM in the following order:

Virtual Interface Number	Port Group
Network Adapter 1	Control PG
Network Adapter 2	Management PG
Network Adapter 3	Packet PG

Procedure

Step 1 Enter the **show mac address-table dynamic interface vlan** *control-vlan* command on the upstream switch.

Expected output: the network adapter1 MAC address of the VSM VM.

Step 2 Enter the **show mac address-table dynamic interface vlan** *mgmt-vlan* command on the upstream switch.
Expected output: the network adapter2 MAC address of the VSM VM.

Step 3 Enter the **show mac address-table dynamic interface vlan** *packet-vlan* command on the upstream switch.
Expected output: the network adapter3 MAC address of the VSM VM.

Guidelines for Verifying VSM and vCenter Server Connectivity

When troubleshooting connectivity between the VSM and vCenter Server, follow these guidelines:

- Make sure that domain parameters are correctly configured.
- Make sure that Port 80 and Port 443 are open on the Windows VM hosting the vCenter Server.
- Try reloading the VSM if after verifying the preceding steps, the connect still fails. Check if the VSM extension is created by the vCenter Server by pointing your web browser to https://your-virtual-center/mob/, and choosing **Content > Extension Manager**.

Verifying VSM and vCenter Server Connectivity

Procedure

Step 1 Make sure that the Cisco Nexus 1000V VSM VM network adapters are configured properly.
Step 2 Make sure that Port 80 and Port 443 are open on the Windows VM hosting the vCenter Server.
Step 3 Ping the vCenter Server from the Cisco Nexus 1000V VSM.
Step 4 Ensure that the VMware vCenter Server service is running.

Troubleshooting Connections to vCenter Server

To troubleshoot connections between a Cisco Nexus 1000V VSM and a vCenter Server, follow these steps.

Procedure

Step 1 In a web browser, enter the path: **http://***VSM-IP*.
Step 2 Download the `cisco_nexus_1000v_extension.xml` file to your desktop.
Step 3 From the vCenter Server menu, choose **Plugins > Manage Plugins**.
Step 4 Right click an empty area and select the plugin from Step 2 as the New Extension.

Step 5 (Optional) If these steps fail, you might be using an out-of-date .xml file. Confirm that the extension is available by following these steps:

a) In a web browser, enter the path: **http://***vCenter-Server-IP***/mob**.
b) Click **Content**.
c) Click **extensionManager**.
d) If extensionList[Cisco_Nexus_1000v_584325821] is displayed in the value column, proceed to connect to the VSM.

Note The actual value of "Cisco_Nexus_1000v_584325821" will vary. It should match the extension key from the cisco_nexus_1000v_extension.xml file.

Recovering the Network Administrator Password

For information about recovering the network administrator password, see the *Cisco Nexus 1000V Password Recovery Guide*.

Managing Extension Keys

Known Extension Problems and Resolutions

Use the following table to troubleshoot and resolve known problems with plug-ins and extensions.

Problem	Resolution
The extension does not show up immediately in the plugin.	Close the VI client and then open the VI client again.
You cannot delete the extension from the VI client.	If you delete the extension using Manager Object Browser (MOB), the VI client screen might not refresh and indicate that the extension was deleted. In this case, close the VI client and then open the VI client again.
If you click the **download and install** link for the extension. you see an invalid URI.	None. You do not need to click the **download and install** link. If you do, it has no effect on the installation or connectivity. The plug-in only needs to be registered with vCenter.

Resolving a Plug-In Conflict

If you see “The specified parameter was not correct,” while creating a Cisco Nexus 1000V plug-in on vCenter Server, you have tried to register a plug-in that is already registered. Use the following procedure to resolve this problem.

Procedure

Step 1 Make sure that that you are using the correct cisco_nexus1000v_extension.xml file.

Step 2 Make sure that you have refreshed your browser because it caches this file and unless refreshed it might cache obsolete content with the same filename.

Step 3 Follow the steps described in Verifying Extension Keys, on page 24 to compare the extension key installed on the VSM with the plug-in installed on the vCenter Server.

Finding the Extension Key on Cisco Nexus 1000V

To find the extension key on Cisco Nexus 1000V, follow these steps:

Before you begin

Know that you can use the extension key in Unregistering the Extension Key in vCenter Server, on page 26.

Procedure

Step 1 Log in to the Cisco Nexus 1000V VSM CLI in EXEC mode.

Step 2 From the Cisco Nexus 1000V for the VSM whose extension key you want to view, enter the **show vmware vc extension-key** command.

```
switch# show vmware vc extension-key
Extension ID: Cisco_Nexus_1000V_1935882621
switch#
```

Finding the Extension Key Tied to a Specific DVS

Procedure

Step 1 From the vSphere Client, choose the DVS whose extension key you want to find.

Step 2 Click the **Summary** tab.

The Summary tab opens with the extension key displayed in the Notes section of the Annotations block.

Verifying Extension Keys

To verify that Cisco Nexus 1000V and vCenter Server are using the same extension key, follow these steps.

Procedure

Step 1 Find the extension key used on Cisco Nexus 1000V using Finding the Extension Key on Cisco Nexus 1000V, on page 24.

Step 2 Find the extension key used on the vCenter Server using Finding the Extension Key Tied to a Specific DVS, on page 24.

Step 3 Verify that the two extension keys (found in Step 1 and Step 2) are the same.

Recreating the Cisco Nexus 1000V Installation

You can recreate the complete Cisco Nexus 1000V configuration in the event of a persistent problem that cannot be resolved using any other workaround. Follow these steps:

1. Remove host from Cisco Nexus 1000V DVS as described in the Removing Hosts from Cisco Nexus 1000V DVS, on page 25 section.
2. Remove Cisco Nexus 1000V from the vCenter server as described in the Removing Cisco Nexus 1000V DVS from vCenter Server, on page 26 section.
3. Find the extension key as described in the Finding the Extension Key on Cisco Nexus 1000V, on page 24 section.
4. Unregister the extension key as described in the Unregistering the Extension Key in vCenter Server, on page 26 section.
5. Install and setup Cisco Nexus 1000V as described in the Cisco Nexus 1000V Installation and Upgrade Guide.

Removing Hosts from Cisco Nexus 1000V DVS

To remove hosts from Cisco Nexus 1000V DVS, follow these steps.

Before you begin

- Log in to vSphere Client.
- Know the name of the Cisco Nexus 1000V DVS to remove from vCenter Server.

Procedure

Step 1 From vSphere Client, choose **Inventory > Networking**.

Step 2 Choose the DVS for Cisco Nexus 1000V and click the **Hosts** tab.

The Host tab opens.

Step 3 Right-click each host, and choose **Remove from Distributed Virtual Switch**.

The hosts are now removed from the DVS.

Removing Cisco Nexus 1000V DVS from vCenter Server

To remove Cisco Nexus 1000V DVS from vCenter Server, follow these steps:

Procedure

Step 1 Log in to the Cisco Nexus 1000V VSM CLI in EXEC mode.

Step 2 Run the following commands:

```
switch# conf t
switch(config)# svs connection vc
switch(config-svs-conn)# no vmware dvs
```

Unregistering the Extension Key in vCenter Server

To unregister the Cisco Nexus 1000V extension key in vCenter Server, follow these steps:

Before you begin

Before beginning this procedure, you must know or do the following:

- Open a browser window.
- Paste the extension key name into the vCenter Server Manager Object Browser (MOB). You should already have the extension key found in Finding the Extension Key on Cisco Nexus 1000V, on page 24.
- After unregistering the extension key in vCenter Server, you can start a new installation of the Cisco Nexus 1000V VSM software

Procedure

Step 1 Go to the following URL: **https://***vc-ip***/mob/?moid=ExtensionManager**.

The Extension Manager opens in your MOB.

Step 2 Click **Unregister Extension**.

A dialog box opens to unregister the extension.

Step 3 In the **Value** field, paste the extension key that you found in Finding the Extension Key on Cisco Nexus 1000V, on page 24, and then click **Invoke Method**.

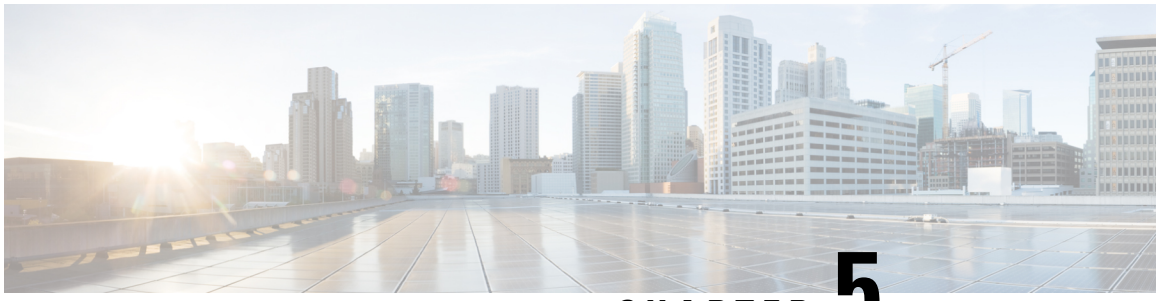
The extension key is unregistered in vCenter Server so that you can start a new installation of the Cisco Nexus 1000V VSM software.

Problems with the Cisco Nexus 1000V Installation Management Center

The following are possible problems and their solutions related to the Cisco Nexus 1000V Installation Management Center.

Symptom	Problem	Recommended Action
Port migration fails	The VSM to VEM migration fails in Layer 2 / Layer 3 mode installation.	• Check if there is any VM running on the vSwitch. You need to power off all VMs running on the vSwitch before migration. • Check if the vCenter is Virtual Update Manager (VUM) enabled. Before migration, the host is added to the DVS by using VUM. • Verify that the native VLAN in the upstream switch configuration is correct. • Ensure that the VUM repositories are up-to-date and accurate.

Symptom	Problem	Recommended Action
VEM is missing on the VSM after migration	• The installer application finishes successfully with port migration in Layer 3 mode. • The VEM is added to the vCenter but does not display when the **show module** command is entered on the VSM.	• Verify that the Layer 3 control profile VLAN is configured as a system VLAN. • Verify that the uplink profile is allowing the Layer 3 control VTEP VLAN and that it is a system VLAN. • From the ESX host (VEM), enter a **vmkping** to the mgmt0/control0 IP address. It should be successful. If not, check the intermediate switches for proper routes between the subnets. • The VTEP should be pingable from the VSM. • Check the vCenter MOB for opaque data propagation.
Configuration file issue	After loading the previously saved configuration file, the installation application does not complete.	• Check the configuration file for appropriate contents. **Note** You might need to change few fields before reusing the previously-saved files. • Check if a VM with the same name already exists in the DC. This can be identified by reviewing the Virtual Machine field in the configuration file.



CHAPTER 5

Licenses

This chapter describes how to identify and resolve problems related to licenses. This chapter contains the following sections:

Information About Licenses

The name for the Cisco Nexus 1000V license package is NEXUS1000V_LAN_SERVICES_PKG and the version is 3.0. By default, 1024 licenses are installed with the Virtual Supervisor Module (VSM). These default licenses are valid for 60 days. You can purchase permanent licenses that do not expire.

Licensing is based on the number of CPU sockets on the ESX servers attached as Virtual Ethernet Modules (VEM) to the VSM.

A module is either licensed or unlicensed:

- Licensed module—A VEM is licensed if it acquires licenses for all of its CPU sockets from the pool of available licenses installed on the VSM.
- Unlicensed module—A VEM is unlicensed if it does not acquire licenses for all of its CPU sockets from the pool of available licenses installed on the VSM.

If a VEM is unlicensed, the virtual Ethernet ports correspond to the virtual machines (VMs) that are kept down and are shown as unlicensed.

Note The server administrator has no information about VEM licenses. The VEM licensed state must be communicated to server administrators so they are aware that vEthernet interfaces on unlicensed modules cannot pass traffic.

For additional information about licensing, including how to purchase, install, or remove an installed license, see the *Cisco Nexus 1000V License Configuration Guide*.

Contents of the License File

The contents of the Cisco Nexus 1000V license file indicates the number of licenses purchased and the host ID. To display the contents of a license file, use the **show license file** command.

```
switch# show license file sample.lic
sample.lic:
SERVER this_host ANY
VENDOR cisco
INCREMENT NEXUS1000V_LAN_SERVICES_PKG cisco 1.0 permanent 16 \
HOSTID=VDH=8449368321243879080 \
NOTICE="<LicFileID>sample.lic</LicFileID><LicLineID>0</LicLineID> \
<PAK>dummyPak</PAK>" SIGN=34FCB2B24AE8
```

The host ID that appears in the license file must match that shown on the VSM. To verify the match, use the **show license host-id** command. See show license host-id, on page 34.

Caution Do not edit the contents of the license file. The license is invalidated if its contents are altered. If you have already done so, contact your Cisco Customer Support Account Team.

Prerequisites to License Troubleshooting

Before you begin troubleshooting licenses, verify the information in this checklist:

- Make sure that the name of the license file has fewer than 32 characters by using the **show license usage** command. See show license usage, on page 33.
- Make sure that no other license file with the same name is installed on the VSM by using the **show license usage** command. If there is a license file with the same name, rename your new license file to something else.
- Do not edit the contents of the license file. If you have already done so, contact your Cisco Customer Support Account Team.
- Make sure that the host ID in the license file is the same as the host ID on the switch by using the **show license host-id** command and the **show license file** command. See show license host-id, on page 34 and show license file, on page 34.

Problems with Licenses

The following are symptoms, possible causes, and solutions for problems with licenses.

Symptom	Possible Causes	Solution
When you power on a virtual machine with ports on a Cisco Nexus 1000V port group, the interfaces do not come up, but display the following status: `VEM Unlicensed`	A license could not be obtained for the server (VEM) where the virtual machine resides.	1. Verify the license usage. **show license usage** *license_name* See show license usage, on page 33. 2. Determine the number of licenses required by viewing the sockets installed on the VEM. **show module vem license-info** See show module vem license-info, on page 33. 3. Contact your Cisco Customer Support Account Team to acquire additional licenses.
You see the following system message: `PLATFORM-2-PFM_LIC_WARN_EXP Syslog` `2008 Dec 19 22:28:30 N1KV %PLATFORM-2-PFM_LIC_WARN_EXP: WARNING License for VEMs is about to expire in 1 days! The VEMs' VNICS will be brought down if license is allowed to expire. Please contact your Cisco account team or partner to purchase Licenses. To activate your purchased licenses, click on www.cisco.com/go/license.`	The default or evaluation license in use is about to expire. **Note** Permanent licenses do not expire.	1. Verify the license usage. **show license usage** *license_name* 2. Contact your Cisco Customer Support Account Team to acquire additional licenses.
You see the following system message: `%LICMGR-2-LOG_LIC_USAGE: Feature NEXUS1000V_LAN_SERVICES_PKG is using 17 licenses, only 16 licenses are installed.`	More licenses are being used than are installed.	1. Verify the license usage. **show license usage** *license_name* 2. Contact your Cisco Customer Support Account Team to acquire additional licenses.

Symptom	Possible Causes	Solution
VEMs fails to acquire licenses even though the **show license usage** command shows there are enough licenses available. The following syslog messages are seen: `2014 Jun 7 20:15:36 vsm-demo VEM_MGR-2-VEM_MGR_UNLICENSED : License for VEM 3 could not be obtained. Please contact your Cisco account team or partner to purchase Licenses or downgrade to Essential Edition. To activate your purchased licenses, click on www.cisco.com/go/license..`	The clock has been changed back manually or through NTP, which has invalidated evaluation licenses. The problem is seen even if there are enough permanent licenses available to license the VEMs as long as evaluation licenses are present. You can look for the following syslog message to find the time when the clock changed: `2014 Jun 7 20:15:24 vsm-demo VEM_MGR-5-VEM_MGR_CLOCK_CHANGE: Clock setting has been changed on the system. Please be aware that, in Advanced edition, clock changes will force a recheckout of all existing VEM licenses. During this recheckout procedure, licensed VEMs which are offline will lose their licenses.`	1. Undo the clock change using the **clock set** command or uninstall all evaluation licenses using the **clear license** command. 2. Ensure there are enough permanent licenses available before uninstalling evaluation licenses. 3. Verify that the modules are licensed using the **show module vem license-info** command.

License Troubleshooting Commands

You can use the commands in this section to troubleshoot problems related to licenses.

Command	Purpose
show module vem license-info	Displays the VEM license information including the license type, license status, license version, and socket count. See show module vem license-info, on page 33.
show license usage [*license_name*]	Displays information about the licenses and where they are used. If displayed for a specific license, indicates VEM and socket information. See show license usage, on page 33.
show interface vethernet	Displays the messages logged about port profile events within the Cisco Nexus 1000V. See show interface vethernet, on page 33.
show license host-id	Displays the serial number for your Cisco Nexus 1000V license. See show license host-id, on page 34.
show license file	Displays the contents of a named license file. See show license file, on page 34.

Command	Purpose
svs license transfer src-vem vem no license_pool	Transfers the licenses from a VEM to the license pool.
show license brief	Displays the version and license count information for each license file. See show license brief, on page 34.
show switch edition	Displays the switch edition, advanced feature status, license expiry, module and virtual Ethernet scale. See show switch edition, on page 34.

For detailed information about **show** command output, see the *Cisco Nexus 1000V Command Reference*.

License Troubleshooting Commands Examples

show module vem license-info

```
switch# show module vem license-info
Licenses are Sticky
Mod Socket Count License Usage Count License Version License Status
--- ------------ ------------------- --------------- --------------
103 2 2 3.0 licensed
104 2 2 3.0 licensed
```

show license usage

```
switch# show license usage NEXUS1000V_LAN_SERVICES_PKG
--------------------------------------
Feature Usage Info
--------------------------------------
Installed Licenses : 10
Eval Licenses : 0
Max Overdraft Licenses : 16
Installed Licenses in Use : 4
Overdraft Licenses in Use : 0
Eval Licenses in Use : 0
Licenses Available : 22
--------------------------------------
Application
--------------------------------------
VEM 3 - Socket 1
VEM 3 - Socket 2
VEM 4 - Socket 1
VEM 4 - Socket 2
--------------------------------------
switch#
```

show interface vethernet

```
switch# show interface veth1
Vethernet1 is down (VEM Unlicensed)
Port description is VM-Pri, Network Adapter 1
Hardware is Virtual, address is 0050.56b7.1c7b
Owner is VM "VM-Pri", adapter is Network Adapter 1
Active on module 5
```

```
VMware DVS port 32
Port-Profile is dhcp-profile
Port mode is access
Rx
5002 Input Packets 4008 Unicast Packets
85 Multicast Packets 909 Broadcast Packets
846478 Bytes
Tx
608046 Output Packets 17129 Unicast Packets
502543 Multicast Packets 88374 Broadcast Packets 0 Flood Packets
38144480 Bytes
20 Input Packet Drops 0 Output Packet Drops
```

show license host-id

```
switch# show license host-id
License hostid: VDH=8449368321243879080
switch#
```

show license file

```
switch# show license file sample.lic
sample.lic:
SERVER this_host ANY
VENDOR cisco
INCREMENT NEXUS1000V_LAN_SERVICES_PKG cisco 3.0 permanent 16 \
HOSTID=VDH=8449368321243879080 \
NOTICE="<LicFileID>sample.lic</LicFileID><LicLineID>0</LicLineID> \
<PAK>dummyPak</PAK>" SIGN=34FCB2B24AE8

switch#
```

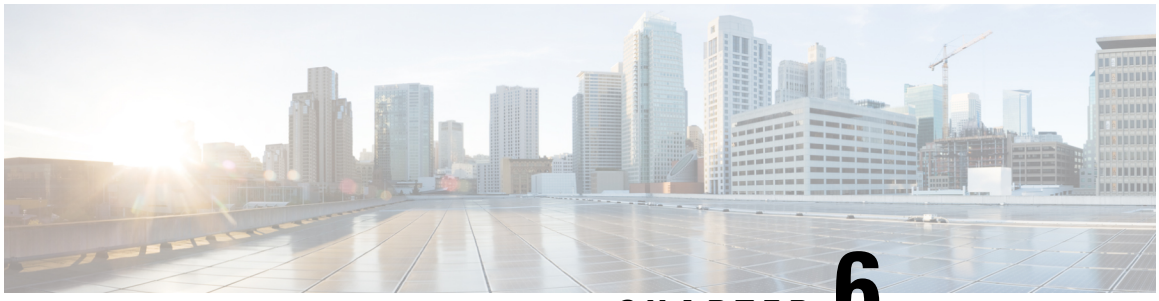
show license brief

```
switch# show license brief
NOTE: * is UPGRADE FILE
-----------------------------------------------------------------------------------------------
File Name Feature Name Version Count Expiry
-----------------------------------------------------------------------------------------------
eval.lic NEXUS1000V_LAN_SERVICES_PKG 1.0 17 3-nov-2014
eval0715.lic NEXUS1000V_LAN_SERVICES_PKG 3.0 17 15-jul-2015
```

show switch edition

```
switch# show switch edition
Switch Edition: ADVANCED (3.0)

Feature Status
Name State Licensed In version
-------------------------------------------------------
cts enabled Y 1.0
dhcp-snooping disabled Y 1.0
vxlan-gateway enabled Y 1.0
bgp disabled Y 3.0
bpduguard disabled Y 3.0

License Status
Edition Available In Use Expiry Date
---------------------------------------------
Advanced 17 0 03 Nov 2014
```

```
Scale Support
Edition Modules Virtual Ports
--------------------------------------
Advanced 256 12288
```



CHAPTER 6

Upgrade

This chapter describes how to identify and resolve problems related to upgrading the Virtual Supervisor Module (VSM) software. This chapter contains the following sections:

Information About Upgrades

The upgrade for Cisco Nexus 1000V involves upgrading software on both the VSM and the Virtual Ethernet Module (VEM).

An in-service software upgrade (ISSU) is available for a stateful upgrade of the Cisco Nexus 1000V image(s) running on the VSM. A stateful upgrade is one without noticeable interruption of data plane services provided by the switch.

For detailed information, see the Cisco Nexus 1000V Installation and Upgrade Guide.

Problems with the In-Service Software Upgrade

The following are symptoms, possible causes, and solutions for problems with ISSUs.

Table 2: Problems with the ISSU

Symptom	Possible Causes	Solution
Error Message: `Pre-Upgrade check failed.` `Return code 0x40930062 (free space in the filesystem is below threshold).`	This error indicates that there is not enough space in the `/var/sysmgr` partition.	Reboot the system.

Symptom	Possible Causes	Solution
Error message: `Pre-Upgrade check failed. Return code 0x4093000A (SRG collection failed)`	A module is removed during the upgrade.	1. Make sure that the module removal is complete. 2. Restart the software upgrade using the instructions in the *Cisco Nexus 1000V Installation and Upgrade Guide*.
Error message: `Pre-Upgrade check failed. Return code 0x40930076 (Standby sup is offline. ISSU will not proceed)`	The standby VSM is not present or is not synchronized with the active VSM, and the VSMs do not form a stable HA pair.	1. Verify the HA synchronization state. **show system redundancy status** The output of this command must indicate the following: `Active VSM: Active with HA standby` `Standby VSM: HA standby` 2. If the output of the **show system redundancy status** command indicates that the VSMs are not synchronized, see Problems with High Availability, on page 56. 3. When the VSMs are synchronized, restart the software upgrade using the detailed instructions in the *Cisco Nexus 1000V Installation and Upgrade Guide*.
Error message: `Pre-Upgrade check failed. Return code 0x807B0002 (No such file or directory)` Error message: `Pre-Upgrade check failed. Return code 0x4093000F (Failed to copy image)`	The software image files required for the upgrade are not present or were not copied to the `bootflash:` repository. There may not be enough room in the `bootflash:` repository for the files to be copied.	1. Verify that there is enough space in bootflash for the image files. **dir** 2. Do one of the following: • If additional space is needed, delete other files from the `bootflash:` repository to make room for the software image files. **delete** **Caution** Do not delete kickstart or system image files from bootflash. If there are no image files in bootflash, the system cannot reboot if required. • If not, continue with the next step. 3. Download the required images from www.cisco.com to the `bootflash:` repository. 4. Verify that the correct images are in the `bootflash:` repository. **show boot** 5. When the correct software images are in the `bootflash:` repository, restart the software upgrade using the instructions in the *Cisco Nexus 1000V Installation and Upgrade Guide*.

Symptom	Possible Causes	Solution
The **install** command fails with the following error: `Return code 0x4045001F (image MD5 checksum error)` `Pre-Upgrade check failed. Return code 0x40930011 (Image verification failed)`	The software image file(s) required for the upgrade do not pass the MD5 checksum verification, indicating that the correct file(s) are not present in `bootflash:` repository for the upgrade to proceed. A file can be truncated when copied.	1. Using the README file from the upgrade zip folder at www.cisco.com, verify the MD5 checksum for each of the image files. **show file bootflash: filename md5sum** 2. Replace the file(s) that do not match. 3. Verify that the correct images are in the `bootflash:` repository and that the checksums match. **show file bootflash: filename md5sum** 4. When the correct software images are in the `bootflash:` repository, restart the software upgrade using the instructions in the *Cisco Nexus 1000V Installation and Upgrade Guide*.
Error message: `Install has failed. Return code 0x40970001 (Incompatible image)`	You might have used an incorrect filename when entering the **install all** command.	Restart the software upgrade using the correct filenames for new software images. **install all kickstart** *filename1* **system** *filename2*
After upgrading, the VSMs are not running the new software version.	The boot variables were not set properly.	1. Verify that the running images and boot variables match the upgrade version. **show version** **show boot** 2. If needed, download the required images from www.cisco.com to your local `bootflash:` repository. 3. Verify that the correct images are in the `bootflash:` repository. **show boot** 4. Restart the software upgrade using the instructions in the *Cisco Nexus 1000V Installation and Upgrade Guide*. 5. If the problem persists, collect details of the upgrade and open a support case. **show system internal log install details**

Symptom	Possible Causes	Solution
Performing the configuration copy process fails and stops the upgrade. `Performing configuration copy.` `[####----------] 30%`	Service or system errors.	**1.** Manually copy the configuration. **copy running-config startup-config** **2.** Do one of the following: • If the progress bar gets stuck before 100% for over one minute, collect details of the upgrade and open a support case. **show system internal log install details** • If the copy succeeds without delays, restart the software upgrade using the instructions in the *Cisco Nexus 1000V Installation and Upgrade Guide*.
Error message: `Another install procedure may be in progress. (0x401E0007)`	Another upgrade session is in progress from a VSM console or SSH/Telnet.	Do one of the following: • Continue the first upgrade session in progress. • Stop the upgrade and restart one session only using the instructions in the *Cisco Nexus 1000V Installation and Upgrade Guide*.
The **install** command fails with following error message: `-- FAIL. Return code 0x4093001E (Standby failed to come online)` `Install has failed. Return code 0x4093001E (Standby failed to come online)`	The standby VSM fails to boot with the new image.	Do one of the following: • Restart the software upgrade using the instructions in the *Cisco Nexus 1000V Installation and Upgrade Guide*. • Postpone the upgrade and reset the boot variables to the original filenames. boot kickstart filename *sup-1 sup-2*
The **install** command fails with following error message: `Install has failed. Return code 0x4093001F (Standby installer failed to take over the installation).` `Please identify the cause of the failure, and try "install all" again"`	The standby VSM takes more than 10 minutes to come up and form a stable HA pair with the active VSM.	**1.** Reset the boot variables to the original filenames. boot kickstart filename *sup-1 sup-2* **2.** If the standby is still running the new software version, reload it. **reload** The standby synchronizes with the active, so that both are running the original software version.

Symptom	Possible Causes	Solution
The **install** command fails with following error message: `Module 2: Waiting for module online. -- SUCCESS -- Install has failed. Return code 0x40930000 (Current operation failed to complete within specified time)`	A failure at the standby VSM caused it to reload again after the `Continuing with installation, please wait` message and before the switchover.	1. Inspect the logs. **show logging** 2. Look for standby reloads caused by process failures. **show cores** If a process crash is observed, collect details of the upgrade and open a support case. **show system internal log install details** 3. Restart the software upgrade using the instructions in the *Cisco Nexus 1000V Installation and Upgrade Guide*.

Problems with the VEM Upgrade

The following are symptoms, possible causes, and solutions for problems with VEM software upgrade.

Table 3: Problems with the VEM Upgrade

Symptom	Possible Causes	Solution
After starting a VEM upgrade from the VSM console, the VMware Upgrade Manager (VUM) skips upgrading the hosts with the new VEM.	One or more of the following are enabled on the host cluster. • VMware high availability (HA) • VMware fault tolerance (FT) • Vmware Distributed Power Management (DPM)	1. Verify the upgrade failure. **show vmware vem upgrade status** 2. From vCenter Server, disable HA, FT, and DPM for the cluster. 3. Restart the VEM software upgrade using the instructions in the Cisco Nexus 1000V Installation and Upgrade Guide.
VEM upgrade fails.	An incorrect VUM version is in use.	1. Identify the VUM version required for the upgrade using the Cisco Nexus 1000V Compatibility Information. 2. Upgrade to the correct VUM version. 3. Restart the software upgrade using the instructions in the *Cisco Nexus 1000V Installation and Upgrade Guide*.
After upgrading, the host is not added to the VSM.	An incorrect VEM software version is installed on the host.	1. Identify the VEM software version required for the upgrade using the *Cisco Nexus 1000V Compatibility Information*. 2. Proceed with the upgrade using the correct VEM software version and the instructions in the *Cisco Nexus 1000V Installation and Upgrade Guide*.

Symptom	Possible Causes	Solution
A message on the ESX/ESXi command line shell and VMkernel logs notifies you that the loading and unloading of modules failed.	The modules were not placed in maintenance mode (all VMs vMotioned over) before starting the upgrade.	1. Place the host in maintenance mode. 2. Proceed with the upgrade using the instructions in the *Cisco Nexus 1000V Installation and Upgrade Guide*.
	The host does not have enough memory to load new modules. A host requires a minimum of 2 GB of physical RAM. If it also hosts a Cisco Nexus 1000V VSM VM, it needs a minimum of 4 GB of physical RAM. If it also hosts the vCenter Server VM, additional memory might be needed.	1. Verify that the host has sufficient memory to load the new modules. For more information about allocating RAM and CPU, see the *Cisco Nexus 1000V Installation and Upgrade Guide*. 2. Proceed with the upgrade using the instructions in the *Cisco Nexus 1000V Installation and Upgrade Guide*.

Problems with the GUI Upgrade

The following are symptoms, possible causes, and solutions for problems with software upgrade using the GUI upgrade application.

Note If you are upgrading directly from SV1(4) to SV1(4a), the GUI is not used and this section does not apply. This section is applicable only if you use the GUI for an intermediate upgrade from a SV1(3x) release to SV1(4), prior to upgrading to SV1(4a).

Table 4: Problems with the GUI Upgrade

Symptom	Possible Causes	Solution
The upgrade GUI stops and times out after 10 minutes and displays the following message: `Error: Could not contact the upgraded VSM at n.n.n.n. Please check the connection.`	During the upgrade, you configured an unreachable IP address for the mgmt0 interface. In this case, one VSM in the redundant pair has new software installed and is unreachable. The other VSM has the original pre-upgrade software version installed and is reachable.	1. Use one of the following sets of procedures to return your VSM pair to the previous software version: • Recovering a Secondary VSM with Active Primary, on page 43 • Recovering a Primary VSM with Active Secondary, on page 47 2. Restart the software upgrade using the instructions in the *Cisco Nexus 1000V Installation and Upgrade Guide*.

Symptom	Possible Causes	Solution
The upgrade GUI stops and times out after 10 minutes and displays the following message: `Error: Could not contact the upgraded VSM at 10.104.244.150. Please check the connection.` After timing out, one VSM comes up in switch(boot) mode.	You have selected incompatible or incorrect VSM software images for the upgrade. The software images you selected from the GUI selection list included a system image for one software version and a kickstart image for another software version. These images must be for the same software version. For an example of how software images are selected during the upgrade, see Example for Specifying Software Images, on page 43.	1. To continue the upgrade, first recover the VSM using one of the following: • Recovering a Secondary VSM with Active Primary, on page 43 • Recovering a Primary VSM with Active Secondary, on page 47 2. Restart the software upgrade using the instructions in the *Cisco Nexus 1000V Installation and Upgrade Guide*.

Example for Specifying Software Images

This example shows how to specify system and kickstart images during the upgrade process. In this example, the images specified are from the same release, SV1.4. If you specify a kickstart image from one release, and a system image from another, then the upgrade cannot proceed.

Recovering a Secondary VSM with Active Primary

You can recover a secondary VSM when the primary VSM is active.

Note The information in this section does not apply when upgrading from Release 4.2(1)SV1(4) to Release 4.2(1)SV2(1.1).

Procedure

Step 1 Stop the upgrade on the VSM. For detailed procedure, see Stopping a VSM Upgrade, on page 44.

Step 2 Change the boot variables back to the previous version. For detailed procedure, see Changing Boot Variables, on page 44.

Step 3 From the vCenter Server left-hand panel, right-click the secondary VSM and then choose **Delete from Disk**.

The secondary VSM is deleted.

Step 4 Create a new VSM by reinstalling the software using the vSphere Client Deploy OVF Template wizard, specifying the following:

- The Cisco Nexus 1000V secondary configuration method (configures the secondary VSM in an HA pair using a GUI setup dialog).
- The host or cluster of the primary VSM.
- The same domain ID and password as that of the primary VSM.

For detailed procedure, see the Cisco Nexus 1000V Installation and Upgrade Guide.

The VSM comes up and forms an HA pair with the newly-created standalone VSM. The VSMs have the previous version of the software installed.

Stopping a VSM Upgrade

You can stop a VSM upgrade that is in progress.

Before you begin

Log in to the CLI in EXEC mode.

Note The information in this section does not apply when upgrading from Release 4.2(1)SV1(4) to Release 4.2(1)SV2(1.1).

Procedure

Step 1 Display the upgrade status.

```
switch# show svs upgrade status
Upgrade State: Start
Upgrade mgmt0 ipv4 addr: 1.1.1.1
Upgrade mgmt0 ipv6 addr:
Upgrade control0 ipv4 addr:
```

Step 2 Stop the upgrade by using the **no svs upgrade start** command.

```
switch# configure terminal
switch#(config)# no svs upgrade start
WARNING! VSM upgrade process is aborted
switch#(config)#
```

Step 3 Display the upgrade status by using the **show svs upgrade status** command.

```
switch#(config)# show svs upgrade status
Upgrade State: Abort
Upgrade mgmt0 ipv4 addr:
Upgrade mgmt0 ipv6 addr:
Upgrade control0 ipv4 addr:
```

What to do next

Return to one of these sections:

- Recovering a Secondary VSM with Active Primary, on page 43
- Recovering a Primary VSM with Active Secondary, on page 47

Changing Boot Variables

You can replace the software images used to boot the VSM.

Before you begin

- Log in to the CLI in EXEC mode.
- Know the filenames of the pre-upgrade system and kickstart image files to apply.

Procedure

	Command or Action	Purpose
Step 1	switch# **show boot** **Example:** `switch# show boot` `sup-1` `kickstart variable =` `bootflash:/nexus-1000v-kickstart-mz.4.0.4.SV1.3a.bin` `system variable =` `bootflash:/nexus-1000v-mz.4.0.4.SV1.3a.bin` `sup-2` `kickstart variable =` `bootflash:/nexus-1000v-kickstart-mzg.4.2.1.SV1.4.bin` `system variable =` `bootflash:/nexus-1000v-mzg.4.2.1.SV1.4.bin` `No module boot variable set` `switch(config)#`	Display the current boot variables.
Step 2	switch# **no boot system** **Example:** `switch# configure terminal` `switch(config)# no boot system`	Remove the current system boot variable.
Step 3	switch# **no boot kickstart** **Example:** `switch(config)# no boot kickstart`	Remove the current kickstart boot variable.
Step 4	switch# **boot system bootflash:** *system-boot-variable-name* **Example:** `switch(config)# boot system bootflash:nexus-1000v-mz.4.0.4.SV1.3a.bin`	Restore the system boot variable to the original pre-upgrade filename.
Step 5	switch# **boot kickstart bootflash:** *kickstart-boot-variable-name* **Example:** `switch(config)# boot kickstart bootflash:nexus-1000v-kickstart-mz.4.0.4.SV1.3a.bin` `switch#(config)#`	Restore the kickstart boot variable to the original pre-upgrade filename.
Step 6	switch# **copy run start** **Example:** `switch(config)# copy run start` `[########################################]`	Copy the running configuration to the startup configuration.

	Command or Action	Purpose
	100%e switch#(config)#	
Step 7	switch# **show boot** **Example:** switch(config)# **show boot** sup-1 kickstart variable = bootflash:/nexus-1000v-kickstart-mz.4.0.4.SV1.3a.bin system variable = bootflash:/nexus-1000v-mz.4.0.4.SV1.3a.bin sup-2 kickstart variable = bootflash:/nexus-1000v-kickstart-mz.4.0.4.SV1.3a.bin system variable = bootflash:/nexus-1000v-mz.4.0.4.SV1.3a.bin No module boot variable set switch#(config)#	Verify the change in the system and kickstart boot variables.

What to do next

Return to one of these sections:

- Recovering a Secondary VSM with Active Primary, on page 43
- Recovering a Primary VSM with Active Secondary, on page 47

Powering On the VSM

To power on the newly-created VSM, do the following:

Procedure

Step 1 From the vCenter Server left-hand panel, right-click the VSM and then choose **Power** > **Power On**.

The VSM starts.

Step 2 Return to Recovering a Primary VSM with Active Secondary, on page 47.

Changing the HA Role

To change the HA role of the VSM, do the following:

Before you begin

- Log in to the CLI in EXEC mode.
- Know the domain ID of the existing VSM.

Procedure

	Command or Action	Purpose
Step 1	**svs-domain** **Example:** `switch# config t` `switch(config)# svs-domain`	Go to the SVS Domain Configuration mode.
Step 2	**domain id** *domain id* **Example:** `switch(config-svs-domain)# domain id 1941` `Warning: Config saved but not pushed to vCenter Server due to inactive connection!`	Go to the domain of the existing VSM.
Step 3	**system redundancy role** [**primary** | **secondary** | **standalone**] **Example:** `switch(config-svs-domain)# system redundancy role secondary` `Setting will be activated on next reload.` `switch(config-svs-domain)#` **Example:** `switch(config-svs-domain)# system redundancy role primary` `Setting will be activated on next reload.` `switch(config-svs-domain)#`	Change the HA role.
Step 4	switch# **copy run start** **Example:** `switch#(config-svs-domain)# copy run start` `[########################################] 100%e` `switch#(config-svs-domain)#`	Copy the running configuration to the startup configuration.

What to do next

Return to the Recovering a Primary VSM with Active Secondary, on page 47.

Recovering a Primary VSM with Active Secondary

You can recover a primary VSM when the secondary VSM is active.

Procedure

Step 1 Stop the upgrade on the secondary VSM. For detailed procedure, see Stopping a VSM Upgrade, on page 44.

Step 2 Change the boot variables back to the previous version. For detailed procedure, see Changing Boot Variables, on page 44.

Step 3 From the vCenter Server left-hand panel, right-click the primary VSM and then choose **Delete from Disk**.

The primary VSM is deleted.

Step 4 Create a new VSM by reinstalling the software from the OVA and specifying the following:

- Manual (CLI) configuration method instead of GUI.
- The host or cluster of the existing secondary VSM.

For detailed installation procedures, see the *Cisco Nexus 1000V Installation and Upgrade Guide*.

Step 5 Make sure that the port groups between the host server and VSM are not connected when the new VSM is powered on. For detailed procedure, see Disconnecting the Port Groups, on page 48.

Step 6 Power on the newly-created VSM by completing the Powering On the VSM, on page 46.

The VSM comes up with the standalone HA role.

Step 7 Change the HA role of the newly-created standalone VSM to primary and save the configuration. For detailed procedure, see Changing the HA Role, on page 46.

Step 8 Power off the newly-created VSM. For detailed procedure, see Powering Off the VSM, on page 49.

Step 9 Make sure that the port groups between the host server and VSM are connected when the new VSM is powered on. For detailed procedure, see Connecting the Port Groups, on page 49.

Step 10 Power on the newly-created VSM. For detailed procedure, see Powering On the VSM, on page 46.

The VSM comes up, connects with the host server, and forms an HA pair with the existing primary VSM.

Disconnecting the Port Groups

You can disconnect and prevent port groups to the VSM from connecting to the host server.

Procedure

Step 1 In vCenter Server, select the VSM and then choose **Edit** > **Settings**.

The Virtual Machine Properties dialog box opens.

Step 2 Select the **Control port** group and uncheck the **Connected** and **Connect at Power On** check boxes.

The connection from the VSM to the host server through the control port is dropped and is not restored when you power on the VSM.

Step 3 Select the **Management port** group and uncheck the **Connected** and **Connect at Power On** check boxes.

The connection from the VSM to the host server through the management port is dropped and is not restored when you power on the VSM.

What to do next

Return to Recovering a Primary VSM with Active Secondary, on page 47.

Powering Off the VSM

To power off the newly-created VSM, do the following:

Procedure

Step 1 From the vCenter Server left-hand panel, right-click the VSM and then choose **Power** > **Power Off**.

The VSM shuts down.

Step 2 Return to Recovering a Primary VSM with Active Secondary, on page 47.

Connecting the Port Groups

You can make sure that the port groups to the host connect when you power on the VSM.

Procedure

Step 1 In vCenter Server, select the VSM and then choose **Edit** > **Settings**.

The Virtual Machine Properties dialog box opens.

Step 2 Select the **Control port** group and check the **Connect at Power On** check box.

When you power on the VSM, it will connect to the host server through the control port.

Step 3 Select the **Management port** group and check the **Connect at Power On** check box.

When you power on the VSM, it will connect to the host server through the management port.

What to do next

Return to Recovering a Primary VSM with Active Secondary, on page 47.

Problems with VSM-VEM Layer 2 to 3 Conversion Tool

The following is a symptom and solution for a problem with logging in to VSM when using the conversion tool:

Symptom	Solution
When you enter your VSM and VC login credentials for the first time, the VSM-VEM Layer 2 to 3 Conversion Tool might display: `Timeout error. Is device down or unreachable?? ssh_expect`	1. Open a command line window and run an ssh command on the VSM (**ssh** *username@vsmIPaddress*). 2. When prompted, Are you sure you want to continue connecting?, enter **yes**. 3. Rerun the VSM-VEM Layer 2 to 3 Conversion Tool by reopening the `.bat` file. Ensure that the error does not reappear.

Upgrade Troubleshooting Commands

Command	Description
show boot	Displays boot variable definitions, showing the names of software images used to boot the VSM. See show boot, on page 51.
show module	Displays module status for active and standby VSMs. See show module, on page 51.
show running-config | include boot	Displays the boot variables currently in the running configuration. See show running-config | include boot, on page 52.
show startup-config | include boot	Displays the boot variables currently in the startup configuration. See show startup-config | include boot, on page 52.
show svs connections	Displays the current connections between the VSM and the VMware host server. See show svs connections, on page 52.
show svs upgrade status	Displays the upgrade status. See show svs upgrade status, on page 52.
show system redundancy status	Displays the current redundancy status for the VSM. See show system redundancy status, on page 52.
show vmware vem upgrade status	Displays the upgrade status. See show vmware vem upgrade status, on page 53.

Command Examples

show boot

```
switch# show boot
sup-1
kickstart variable = bootflash:/nexus-1000v-kickstart-mz.4.0.4.SV1.3a.bin
system variable = bootflash:/nexus-1000v-mz.4.0.4.SV1.3a.bin
sup-2
kickstart variable = bootflash:/nexus-1000v-kickstart-mzg.4.2.1.SV1.4.bin
system variable = bootflash:/nexus-1000v-mzg.4.2.1.SV1.4.bin
No module boot variable set
switch#
```

show module

show module (VSM upgraded first with ISSU, VEM upgrade pending)

```
switch# show module
Mod Ports Module-Type Model Status
--- ----- -------------------------------- ------------------ ------------
1 0 Virtual Supervisor Module Nexus1000V ha-standby
2 0 Virtual Supervisor Module Nexus1000V active *
3 248 Virtual Ethernet Module NA ok
Mod Sw Hw
--- --------------- ------
1 4.2(1)SV1(4a) 0.0
2 4.2(1)SV1(4a) 0.0
3 4.2(1)SV1(4) 1.9
Mod MAC-Address(es) Serial-Num
--- -------------------------------------- ----------
1 00-19-07-6c-5a-a8 to 00-19-07-6c-62-a8 NA
2 00-19-07-6c-5a-a8 to 00-19-07-6c-62-a8 NA
3 02-00-0c-00-03-00 to 02-00-0c-00-03-80 NA
Mod Server-IP Server-UUID Server-Name
--- --------------- ------------------------------------ --------------------
1 10.78.109.43 NA NA
2 10.78.109.43 NA NA
3 10.78.109.51 4220900d-76d3-89c5-17d7-b5a7d1a2487f 10.78.109.51
switch#
```

show module (VEM and VSM upgraded)

```
switch# show module
Mod Ports Module-Type Model Status
--- ----- -------------------------------- ------------------ ------------
1 0 Virtual Supervisor Module Nexus1000V ha-standby
2 0 Virtual Supervisor Module Nexus1000V active *
3 248 Virtual Ethernet Module NA ok

Mod Sw Hw
--- --------------- ------
1 4.0(4)SV1(3) 0.0
2 4.0(4)SV1(3) 0.0
3 4.2(1)SV1(4) 1.9

Mod MAC-Address(es) Serial-Num
--- -------------------------------------- ----------
1 00-19-07-6c-5a-a8 to 00-19-07-6c-62-a8 NA
2 00-19-07-6c-5a-a8 to 00-19-07-6c-62-a8 NA
3 02-00-0c-00-03-00 to 02-00-0c-00-03-80 NA
```

```
Mod Server-IP Server-UUID Server-Name
--- --------------- ------------------------------------ --------------------
1 10.78.109.43 NA NA
2 10.78.109.43 NA NA
3 10.78.109.51 4220900d-76d3-89c5-17d7-b5a7d1a2487f 10.78.109.51
switch#
```

show running-config | include boot

```
switch# show running-config | include boot
boot kickstart bootflash:/nexus-1000v-kickstart-mzg.4.2.1.SV1.4a.bin sup-1
boot system bootflash:/nexus-1000v-mzg.4.2.1.SV1.4a.bin sup-1
boot kickstart bootflash:/nexus-1000v-kickstart-mzg.4.2.1.SV1.4a.bin sup-2
boot system bootflash:/nexus-1000v-mzg.4.2.1.SV1.4a.bin sup-2
switch#
```

show startup-config | include boot

```
switch# show startup-config | include boot
boot kickstart bootflash:/nexus-1000v-kickstart-mzg.4.2.1.SV1.4a.bin sup-1
boot system bootflash:/nexus-1000v-mzg.4.2.1.SV1.4a.bin sup-1
boot kickstart bootflash:/nexus-1000v-kickstart-mzg.4.2.1.SV1.4a.bin sup-2
boot system bootflash:/nexus-1000v-mzg.4.2.1.SV1.4a.bin sup-2
switch#
```

show svs connections

```
switch# show svs connections
connection vc:
hostname: 172.23.232.139
remote port: 80
protocol: vmware-vim https
certificate: default
datacenter name: Hamilton-DC
DVS uuid: 9b dd 36 50 2e 27 27 8b-07 ed 81 89 ef 43 31 17
dvs version: 5.0
config status: Enabled
operational status: Connected
sync status: -
version: -
switch#
```

show svs upgrade status

```
switch# show svs upgrade status
Upgrade State: Start
Upgrade mgmt0 ipv4 addr: 1.1.1.1
Upgrade mgmt0 ipv6 addr:
Upgrade control0 ipv4 addr:
switch#
```

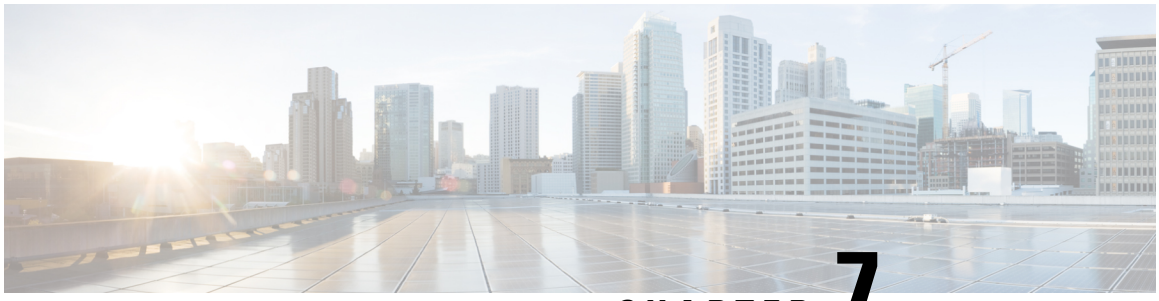
show system redundancy status

```
show system redundancy status
Redundancy role
---------------
administrative: primary
operational: primary

Redundancy mode
```

```
---------------
administrative: HA
operational: HA

This supervisor (sup-1)
-----------------------
Redundancy state: Active
Supervisor state: Active
Internal state: Active with HA standby

Other supervisor (sup-2)
------------------------
Redundancy state: Standby
Supervisor state: HA standby
Internal state: HA standby

switch#
```

show vmware vem upgrade status

```
switch# show vmware vem upgrade status
Upgrade VIBs: System VEM Image
Upgrade Status:
Upgrade Notification Sent Time:
Upgrade Status Time(vCenter):
Upgrade Start Time:
Upgrade End Time(vCenter):
Upgrade Error:
Upgrade Bundle ID:
VSM: VEM400-201007101-BG
DVS: VEM400-201007101-BG

switch#
```



CHAPTER 7

High Availability

This chapter describes how to identify and resolve problems related to high availability. This chapter contains the following sections:

Information About High Availability

The purpose of high availability (HA) is to limit the impact of failures—both hardware and software— within a system. The Cisco NX-OS operating system is designed for high availability at the network, system, and service levels.

The following Cisco NX-OS features minimize or prevent traffic disruption if a failure occurs:

- Redundancy—Redundancy at every aspect of the software architecture.
- Isolation of processes—Isolation between software components to prevent a failure within one process disrupting other processes.
- Restartability—Most system functions and services are isolated so that they can be restarted independently after a failure while other services continue to run. In addition, most system services can perform stateful restarts, which allow the service to resume operations transparently to other services.
- Supervisor stateful switchover—Active/standby dual supervisor configuration. The state and configuration remain constantly synchronized between two Virtual Supervisor Modules (VSMs) to provide a seamless and statefu1 switchover if a VSM failure occurs.

Cisco Nexus 1000V is made up of the following:

- Virtual Ethernet Modules (VEMs) running within virtualization servers. These VEMs are represented as modules within the VSM.
- A remote management component, such as VMware vCenter Server.
- One or two VSMs running within virtual machines (VMs).

System-Level High Availability

Cisco Nexus 1000V supports redundant VSM virtual machines—a primary and a secondary—running as an HA pair. Dual VSMs operate in an active/standby capacity in which only one VSM is active at any given

time; while the other VSM acts as a standby backup. The state and configuration are constantly synchronized between two VSMs to provide a stateful switchover if the active VSM fails.

Network-Level High Availability

The Cisco Nexus 1000V HA at the network level includes port channels and Link Aggregation Control Protocol (LACP). A port channel bundles physical links into a channel group to create a single logical link that provides the aggregate bandwidth of up to eight physical links. If a member port within a port channel fails, the traffic previously carried over the failed link switches to the remaining member ports within the port channel.

Additionally, LACP allows you to configure up to 16 interfaces into a port channel. A maximum of eight interfaces can be active, and a maximum of eight interfaces can be placed in a standby state.

For additional information about port channels and LACP, see the Cisco Nexus 1000V Layer 2 Switching Configuration Guide.

Problems with High Availability

Symptom	Possible Causes	Solution
The active VSM does not see the standby VSM.	MAC addresses mismatch. Check that the peer VSM MAC addresses that are learned by the active VSM by using the show system redundancy status command.	Confirm that the standby VSM MAC addresses are correctly learned by the active VSM. 1. Compare the standby VSM MAC addresses with the output MAC addresses by using the show system redundancy status command on the active VSM. 2. If the compared MAC addresses are different, use the peer-sup mac-addresses clear command to clear the stale MAC addresses that are learned by the active VSM.
	Roles are not configured properly. Check the role of the two VSMs by using the **show system redundancy status** command.	1. Confirm that the roles are the primary and secondary role, respectively. 2. If needed, use the **system redundancy role** command to correct the situation. 3. Save the configuration if roles are changed.
	Network connectivity problems. Check that the control and management VLAN connectivity between the VSM at the upstream and virtual switches.	If network problems exist, do the following: 1. From vSphere Client, shut down the VSM, which should be in standby mode. 2. From vSphere Client, bring up the standby VSM after network connectivity is restored.

Symptom	Possible Causes	Solution
The active VSM does not complete synchronization with the standby VSM.	Version mismatch between VSMs. Check that the primary and secondary VSMs are using the same image version by using the **show version** command.	If the active and the standby VSM software versions differ, reinstall the secondary VSM with the same version used in the primary.
	Fatal errors during gsync process. Check the gsyncctrl log using the **show system internal log sysmgr gsyncctrl** command and look for fatal errors.	Reload the standby VSM using the **reload module** *module-number* command, where *module-number* is the module number for the standby VSM.
	The VSM has connectivity only through the management interface. Check the output of the **show system internal redundancy info** command and verify if the `degraded_mode` flag is set to true.	Check control VLAN connectivity between the primary and the secondary VSMs.
The standby VSM reboots periodically.	The VSM has connectivity only through the management interface. Check the output of the **show system internal redundancy info** command and verify if the `degraded_mode` flag is set to true.	Check the control VLAN connectivity between the primary and the secondary VSMs.
	The VSMs have different versions. Enter the **debug system internal sysmgr all** command and look for the `active_verctrl` entry that indicates a version mismatch, as the following output shows: `2009 May 5 08:34:15.721920 sysmgr: active_verctrl: Stdby running diff version- force download the standby sup.`	Isolate the standby VSM and boot it. Use the **show version** command to check the software version in both VSMs. Install the image matching the active VSM on the standby.
Active-Active detected and resolved.	When control and management connectivity between the active and the standby goes down for 6 seconds, the standby VSM transitions to the active state. Upon restoration of control and management connectivity, both VSMs detect an active-active condition.	1. Once the system detects active-active VSMs, one VSM is automatically reloaded based on various parameters such as VEMs attached, vCenter connectivity, last configuration time, and last active time. 2. To see any configuration changes that are performed on the rebooted VSM during the active-active condition, enter the show system internal active-active remote accounting logs CLI command on the active VSM.

Symptom	Possible Causes	Solution
VSM Role Collision.	If another VSM is configured/provisioned with the same role (primary or secondary) in the system, the new VSM collides with the existing VSM. The **show system redundancy info** command displays the MAC addresses of the VSMs that collide with the working VSM.	If the problems exist, do the following: **1.** Enter the show system redundancy status command on the VSM console. **2.** Identify the VSM(s) that owns the MAC addresses that are displayed in the output of the show system redundancy status command. **3.** Move the identified VSM(s) out of the system to stop role collision.
Both VSMs are in active mode.	Network connectivity problems. Check for control and management VLAN connectivity between the VSM at the upstream and virtual switches. When the VSM cannot communicate through any of these two interfaces, they both try to become active.	If network problems exist, do the following: **1.** From vSphere Client, shut down the VSM, which should be in standby mode. **2.** From vSphere Client, bring up the standby VSM after network connectivity is restored.
	Different domain IDs in the two VSMs Check the *domain* value by using the **show system internal redundancy info** command.	If needed, update the domain ID and save it to the startup configuration. Upgrading the domain ID in a dual VSM system must be done as follows: **1.** Isolate the VSM with the incorrect domain ID so that it cannot communicate with the other VSM. **2.** Change the domain ID in the isolated VSM, save the configuration, and power off the VSM. **3.** Reconnect the isolated VSM and power it on.

High Availability Troubleshooting Commands

Command	Description
show cores	Displays information about process logs and cores. See show cores, on page 59.
show processes log	Displays the contents of the process log. See show processes log, on page 59.
show system internal active-active remote accounting logs	Displays the accounting logs that are stored on a remote VSM.

Command	Description
show system internal redundancy info	Displays connectivity between the primary and secondary VSM. See show system internal redundancy info, on page 60.
show system internal sysmgr state	Displays the state of the system manager. See show system internal sysmgr state, on page 61.
show system redundancy status	Displays the current redundancy status for the VSM(s). See show system redundancy status, on page 62.
attach module *module-number*	Attaches the standby VSM console. The standby VSM console is not accessible externally, but can be accessed from the active VSM by using this command.
reload module *module-number*	Reloads the specified VSM. **Note** Entering this command without specifying a module reloads the whole system.

show cores

```
switch# show cores
VDC No Module-num Process-name PID Core-create-time
------ ---------- ------------ --- ----------------
1 1 private-vlan 3207 Apr 28 13:29
```

show processes log

```
switch# show processes log
VDC Process PID Normal-exit Stack Core Log-create-time
--- --------------- ------ ----------- ----- ----- ---------------
1 private-vlan 3207 N Y N Tue Apr 28 13:29:48 2009

switch# show processes log pid 3207
============================================================
Service: private-vlan
Description: Private VLAN

Started at Wed Apr 22 18:41:25 2009 (235489 us)
Stopped at Tue Apr 28 13:29:48 2009 (309243 us)
Uptime: 5 days 18 hours 48 minutes 23 seconds

Start type: SRV_OPTION_RESTART_STATELESS (23)
Death reason: SYSMGR_DEATH_REASON_FAILURE_SIGNAL (2) <-- Reason for the process abort
Last heartbeat 46.88 secs ago
System image name: nexus-1000v-mzg.4.0.4.SV1.1.bin
System image version: 4.0(4)SV1(1) S25

PID: 3207
```

```
Exit code: signal 6 (core dumped) <-- Indicates that a cores for the process was generated.


CWD: /var/sysmgr/work
...
```

show system internal redundancy info

```
switch# show system internal redundancy info
My CP:
slot: 0
domain: 184 <-- Domain id used by this VSM
role: primary <-- Redundancy role of this VSM
status: RDN_ST_AC <-- Indicates redundancy state (RDN_ST) of the this VSM is Active (AC)
state: RDN_DRV_ST_AC_SB
intr: enabled
power_off_reqs: 0
reset_reqs: 0
Other CP:
slot: 1
status: RDN_ST_SB <-- Indicates redundancy state (RDN_ST) of the other VSM is Standby (SB)
active: true
ver_rcvd: true
degraded_mode: false <-- When true, it indicates that communication through the control
interface is faulty
Redun Device 0: <-- This device maps to the control interface
name: ha0
pdev: ad7b6c60
alarm: false
mac: 00:50:56:b7:4b:59
tx_set_ver_req_pkts: 11590
tx_set_ver_rsp_pkts: 4
tx_heartbeat_req_pkts: 442571
tx_heartbeat_rsp_pkts: 6
rx_set_ver_req_pkts: 4
rx_set_ver_rsp_pkts: 1
rx_heartbeat_req_pkts: 6
rx_heartbeat_rsp_pkts: 442546 <-- Counter should be increasing, as this indicates that
communication between VSM is working properly.
rx_drops_wrong_domain: 0
rx_drops_wrong_slot: 0
rx_drops_short_pkt: 0
rx_drops_queue_full: 0
rx_drops_inactive_cp: 0
rx_drops_bad_src: 0
rx_drops_not_ready: 0
rx_unknown_pkts: 0
Redun Device 1: <-- This device maps to the mgmt interface
name: ha1
pdev: ad7b6860
alarm: true
mac: ff:ff:ff:ff:ff:ff
tx_set_ver_req_pkts: 11589
tx_set_ver_rsp_pkts: 0
tx_heartbeat_req_pkts: 12
tx_heartbeat_rsp_pkts: 0
rx_set_ver_req_pkts: 0
rx_set_ver_rsp_pkts: 0
rx_heartbeat_req_pkts: 0
rx_heartbeat_rsp_pkts: 0 <-- When communication between VSM through the control interface
is interrupted but continues through the mgmt interface, the rx_heartbeat_rsp_pkts will
increase.
rx_drops_wrong_domain: 0
```

```
rx_drops_wrong_slot: 0
rx_drops_short_pkt: 0
rx_drops_queue_full: 0
rx_drops_inactive_cp: 0
rx_drops_bad_src: 0
rx_drops_not_ready: 0
rx_unknown_pkts: 0
```

show system internal sysmgr state

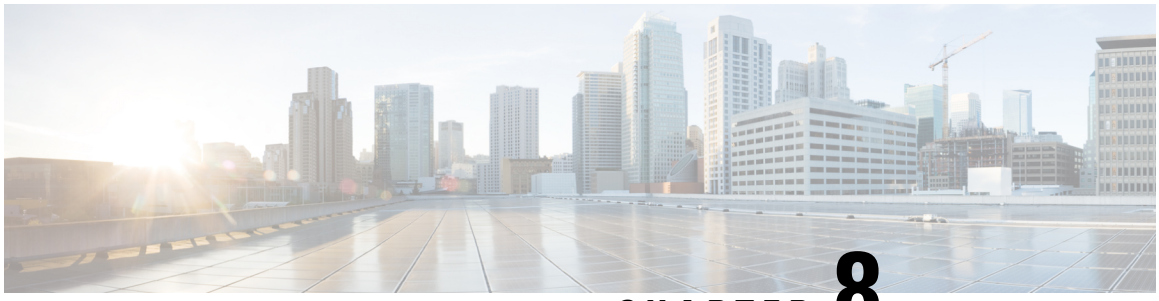
```
switch# show system internal sysmgr state

The master System Manager has PID 1988 and UUID 0x1.
Last time System Manager was gracefully shutdown.
The state is SRV_STATE_MASTER_ACTIVE_HOTSTDBY entered at time Tue Apr 28 13:09:13 2009.

The '-b' option (disable heartbeat) is currently disabled.

The '-n' (don't use rlimit) option is currently disabled.

Hap-reset is currently enabled.

Watchdog checking is currently disabled.

Watchdog kgdb setting is currently enabled.


Debugging info:

The trace mask is 0x00000000, the syslog priority enabled is 3.
The '-d' option is currently disabled.
The statistics generation is currently enabled.


HA info:


slotid = 1 supid = 0
cardstate = SYSMGR_CARDSTATE_ACTIVE.
cardstate = SYSMGR_CARDSTATE_ACTIVE (hot switchover is configured enabled).
Configured to use the real platform manager.
Configured to use the real redundancy driver.
Redundancy register: this_sup = RDN_ST_AC, other_sup = RDN_ST_SB.
EOBC device name: eth0.
Remote addresses: MTS - 0x00000201/3 IP - 127.1.1.2
MSYNC done.
Remote MSYNC not done.
Module online notification received.
Local super-state is: SYSMGR_SUPERSTATE_STABLE
Standby super-state is: SYSMGR_SUPERSTATE_STABLE
Swover Reason : SYSMGR_SUP_REMOVED_SWOVER <-- Reason for the last switchover
Total number of Switchovers: 0 <-- Number of switchovers
>> Duration of the switchover would be listed, if any.

Statistics:

Message count: 0
Total latency: 0 Max latency: 0
Total exec: 0 Max exec: 0
```

show system redundancy status

```
switch# show system redundancy status
Redundancy role
---------------
administrative: primary <-- Configured redundancy role
operational: primary <-- Current operational redundancy role

Redundancy mode
---------------
administrative: HA
operational: HA

This supervisor (sup-1)
-----------------------
Redundancy state: Active <-- Redundancy state of this VSM
Supervisor state: Active
Internal state: Active with HA standby

Other supervisor (sup-2)
------------------------
Redundancy state: Standby <-- Redundancy state of the other VSM
Supervisor state: HA standby
Internal state: HA standby <-- The standby VSM is in HA mode and in sync
```

When a role collision is detected, a warning is given in the command output.

```
switch# show system redundancy status
Redundancy role
---------------
administrative: secondary
operational: secondary
Redundancy mode
---------------
administrative: HA
operational: HA
This supervisor (sup-2)
-----------------------
Redundancy state: Active
Supervisor state: Active
Internal state: Active with HA standby
Other supervisor (sup-1)
------------------------
Redundancy state: Standby
Supervisor state: HA standby
Internal state: HA standby
WARNING! Conflicting sup-2(s) detected in same domain
-----------------------------------------------------
MAC Latest Collision Time
00:50:56:97:02:3b 2012-Sep-11 18:59:17
00:50:56:97:02:3c 2012-Sep-11 18:59:17
00:50:56:97:02:2f 2012-Sep-11 18:57:42
00:50:56:97:02:35 2012-Sep-11 18:57:46
00:50:56:97:02:29 2012-Sep-11 18:57:36
00:50:56:97:02:30 2012-Sep-11 18:57:42
00:50:56:97:02:36 2012-Sep-11 18:57:46
00:50:56:97:02:2a 2012-Sep-11 18:57:36

NOTE: Please run the same command on sup-1 to check for conflicting(if any) sup-1(s) in the
 same domain.
```



CHAPTER 8

VSM and VEM Modules

This chapter describes how to identify and resolve problems related to modules. This chapter contains the following sections:

Information About Modules

Cisco Nexus 1000V manages a data center defined by a VirtualCenter. Each server in the data center is represented as a module in Cisco Nexus 1000V and can be managed as if it were a module in a physical Cisco switch.

The Cisco Nexus 1000V implementation has two parts:

- Virtual Supervisor Module (VSM)—Control software of the Cisco Nexus 1000V distributed virtual switch. It runs on a virtual machine (VM) and is based on NX-OS software.
- Virtual Ethernet Module (VEM)—Part of the Cisco Nexus 1000V switch that actually switches data traffic. It runs on a VMware ESX host. Several VEMs are controlled by one VSM. All the VEMs that form a switch domain should be in the same virtual data center as defined by VMware VirtualCenter.

Troubleshooting a Module Not Coming Up on the VSM

Guidelines for Troubleshooting Modules

Follow these guidelines when troubleshooting a module controlled by the VSM:

- You must have a VSM VM and a VEM up and running.
- Make sure that you are running compatible versions of vCenter Server and VSM. For more information, see the Cisco Nexus 1000V Compatibility Information.
- To verify network connectivity between the VSM and vCenter Server, ping the IP address of vCenter Server. If you are using a domain name service (DNS) name, use the DNS name in the ping. If a ping to

vCenter Server fails, check to see if you can ping the gateway. Otherwise, check the mgmt0 interface configuration settings.

- In the Cisco Nexus 1000V Distributed Virtual Switch (DVS), only one vmknic with **capability l3control** is supported. If a second vmknic is added with the same capability, the host connected as VEM module on VSM in L3 mode goes offline. To recover from this scenario, remove both vmknics from the Cisco Nexus 1000V DVS or migrate them back to the vSwitch/VMware DVS. After you migrate or remove, you can recreate one vmknic on the Cisco Nexus 1000V DVS or migrate one of the vmknic from the vSwitch/VMware DVS back to the Cisco Nexus 1000V DVS.
- Make sure that the firewall settings are OFF on the vCenter Server. If you want the firewall settings, and check to see if these ports are open:
  - Port 80
  - Port 443
- If you see the following error, verify that the VSM extension was created from vCenter Server:

```
ERROR: [VMware vCenter Server 4.0.0 build-150489]
Extension key was not registered before its use
```

  To verity that the extension or plugin was created, see Finding the Extension Key on Cisco Nexus 1000V, on page 24. For more information about extension keys or plugins, see the *Installation* chapter.
- If you see the `ERROR: Datacenter not found` error, see Checking the vCenter Server Configuration, on page 71.

Process for Troubleshooting Modules

1. Verify the VSM and VEM Image versions.
2. Verify that the VSM is configured correctly.
3. Check the vCenter Server configuration.
4. Check network connectivity between the VSM and the VEM.
5. Recover management and control connectivity of a host when a VSM is running on a VEM.
6. Check the VEM configuration.
7. Collect logs.

Problems with the VSM

The following are symptoms, possible causes, and solutions for problems with the VSM.

Symptom	Possible Causes	Solution
You see the following error on the VSM: `ERROR: [VMware vCenter Server 4.0.0 build-150489] Extension key was not registered before its use`	A extension or plug-in was not created for the VSM.	1. Verify that the extension or plug-in was created. For more information, see Finding the Extension Key Tied to a Specific DVS, on page 24. 2. If the plug-in is not found, create a plug-in.
After boot, VSM is in loader prompt.	VSM kickstart image is corrupt.	1. Boot the VSM from the CD ROM. 2. From the CD Boot menu, choose **Option 1, Install Nexus1000v**, and bring up new image. 3. Follow the VSM installation procedure.
	Boot variables are not set.	1. Boot the VSM from the CD ROM. 2. From the CD Boot menu, choose **Option 3, Install Nexus1000v** only if the disk unformatted and bring up new image. 3. Set the boot variables used to boot the VSM: **boot system bootflash:** *system-boot-variable-name* **boot kickstart bootflash:** *kickstart-boot-variable-name* 4. Reload the VSM using the **reload** command.
After boot, VSM is in boot prompt.	VSM system image is corrupt.	1. Boot the VSM from the CD ROM. 2. From the CD Boot menu, choose **Option 1, Install Nexus1000v**, and bring up new image. 3. Follow the VSM installation procedure.

Symptom	Possible Causes	Solution
After boot, VSM is reconfigured.	Startup configuration is deleted.	Do one of the following: • If you have a saved backup copy of your configuration file, restore the configuration on the VSM by using the **copy** *source filesystem:filename* **system:running-config** command. • If you have not a saved backup copy of your configuration file, reconfigure the VSM.
After boot, VSM is stopped at `Loader Loading`.	Boot menu file is corrupt.	1. Boot the VSM from the CD ROM. 2. From the CD Boot menu, choose **Option 3, Install Nexus1000v** only if the disk is unformatted and bring up new image. 3. Do one of the following: • If you have a saved backup copy of your configuration file, restore the configuration on the VSM by using the **copy** *source filesystem:filename* **system:running-config** command. • If you have not a saved backup copy of your configuration file, reconfigure the VSM.
After boot, the secondary VSM reboots continuously.	Control VLAN or control interface down.	Check control connectivity between the active and the standby VSM.
	Active and standby VSMs fail to synchronize.	From the active VSM, check system manager errors to identify which application caused the failure by running the **show system internal sysmgr event-history errors** or **show logging** command.

Symptom	Possible Causes	Solution
After a host reboot, the absence of a VLAN, or the wrong system VLAN on the VSM management port profile, the control and management connectivity of the VSM is lost.	The VSM is running on a VEM that it manages, but the VSM ports are not configured with system port profiles.	Run the VEM connect script locally in the ESX host where the VEM is running. Go to the VSM and configure the system VLAN in the port profile used for management. For more information, see Recovering Management and Control Connectivity of a Host When a VSM is Running on a VEM, on page 73.

Verifying the VSM Is Connected to vCenter Server

Procedure

Step 1 Verify the connection between the VSM and vCenter Server by using the **show svs connections** command.

The output should indicate that the operational status is Connected.

Example:

```
switch# show svs connections
connection vc:
ip address: 172.23.231.223
protocol: vmware-vim https
certificate: user-installed
datacenter name: hamilton-dc
DVS uuid: 92 7a 14 50 05 11 15 9c-1a b0 f2 d4 8a d7 6e 6c
dvs version: 5.0
config status: Disabled
operational status: Disconnected
```

Step 2 Do one of the following:

a) If the status is Connected, go to Verifying the VSM Is Configured Correctly, on page 68.

b) If not, continue with the next step.

Step 3 Connect to the vCenter Server.

Example:

```
switch# conf t
switch(config)# svs connection HamiltonDC
switch(config-svs-conn)# connect
```

Step 4 Do one of the following:

a) If you see an error message about the Extension key as shown in the following example, continue with the next step.

Example:

```
switch# conf t
switch(config)# svs connection HamiltonDC
switch(config-svs-conn)# connect
ERROR: [VMWARE-VIM] Extension key was not registered before its use.
```

b) If not, go to Step 6.

Step 5 Do the following and then go to Step 6.

a) Unregister the extension key. For more information, see Unregistering the Extension Key in vCenter Server, on page 26.

b) Install a new extension key.

Step 6 Verify the connection between the VSM and the vCenter Server by using the **show svs connections** command. The output should indicate that the operational status is Connected. If not, go to Process for Troubleshooting Modules, on page 64.

Example:

```
switch# show svs connections
connection vc:
ip address: 172.23.231.223
protocol: vmware-vim https
certificate: user-installed
datacenter name: hamilton-dc
DVS uuid: 92 7a 14 50 05 11 15 9c-1a b0 f2 d4 8a d7 6e 6c
dvs version: 5.0
config status: Disabled
operational status: Disconnected
```

Verifying the VSM Is Configured Correctly

Verifying that the VSM is configured correctly consists of the following tasks:

- Verifying the Domain Configuration, on page 68
- Verifying the System Port Profile Configuration, on page 69
- Verifying the Control and Packet VLAN Configuration, on page 69

Verifying the Domain Configuration

To verify the domain configuration, log in to the CLI in EXEC mode and run the **show svs domain** command on the VSM.

Verify that the output of this command indicates the following:

- A control VLAN and a packet VLAN are present.
- The domain configuration was successfully pushed to VC.

```
switch# show svs domain
SVS domain config:
Domain id: 682
Control vlan: 3002
Packet vlan: 3003
L2/L3 Control VLAN mode: L2
L2/L3 Control VLAN interface: mgmt0
Status: Config push to VC successful
```

Verifying the System Port Profile Configuration

To verify the system port profile configuration, log in to the CLI in EXEC mode and run the **show port-profile name** *system-port-profile-name* command on the VSM.

Verify that the output of this command indicates the following:

- The control and packet VLANs are assigned.
- The port profile is enabled.
- If you have configured a non-default system MTU setting, check that it has the correct size.

```
switch# show port-profile name SystemUplink
port-profile SystemUplink
description:
type: ethernet
status: enabled
capability l3control: no
pinning control-vlan: -
pinning packet-vlan: -
system vlans: 114,115
port-group: SystemUplink
max ports: 32
inherit:
config attributes:
switchport mode trunk
switchport trunk allowed vlan all
system mtu 1500
no shutdown
evaluated config attributes:
switchport mode trunk
switchport trunk allowed vlan all
no shutdown
assigned interfaces:
```

Verifying the Control and Packet VLAN Configuration

You can verify that the control and packet VLANs are configured on the VSM.

Note This procedure is applicable for troubleshooting VSM and VEM connectivity with Layer 2 mode.

Before you begin

Log in to the CLI in EXEC mode.

Procedure

Step 1 On the VSM, verify that the control and packet VLANs are present. Check that the output of the **show running-config** command shows the control and packet VLAN ID numbers among the VLANs configured.

Example:

```
switch# show running-config vlan 260-261
version 4.0(4)SV1(3)
vlan 260
```

```
name cp_control
vlan 261
name cp_packet

switch#
...
```

Step 2 Find the AIPC MAC address of the VSM on the VSM.

Example:

```
switch(config-svs-domain)# show svs neighbors

Active Domain ID: 27

AIPC Interface MAC: 0050-56bc-74f1 <-------------
inband/outband Interface MAC: 0050-56bc-62bd

Src MAC Type Domain-id Node-id Last learnt (Sec. ago)
--------------------------------------------------------------------------------

0050-56bc-6a3d VSM 27 0201 771332.97
0002-3d40-1b02 VEM 27 0302 51.60
0002-3d40-1b03 VEM 27 0402 51.60
```

Step 3 Find the DPA MAC address of the VEM on the ESX host.

Example:

```
switch# vemcmd show card
Card UUID type 2: 24266920-d498-11e0-0000-00000000000f
Card name:
Switch name: Nexus1000v
Switch alias: DvsPortset-0
Switch uuid: ee 63 3c 50 04 b1 6d d6-58 61 ff ba 56 05 14 fd
Card domain: 27
Card slot: 3
VEM Tunnel Mode: L2 Mode
VEM Control (AIPC) MAC: 00:02:3d:10:1b:02
VEM Packet (inband/outband) MAC: 00:02:3d:20:1b:02
VEM Control Agent (DPA) MAC: 00:02:3d:40:1b:02 <-------------
VEM SPAN MAC: 00:02:3d:30:1b:02
Primary VSM MAC : 00:50:56:bc:74:f1
Primary VSM PKT MAC : 00:50:56:bc:62:bd
Primary VSM MGMT MAC : 00:50:56:bc:0b:d5
Standby VSM CTRL MAC : 00:50:56:bc:6a:3d
Management IPv4 address: 14.17.168.1
Management IPv6 address: 0000:0000:0000:0000:0000:0000:0000:0000
Primary L3 Control IPv4 address: 0.0.0.0
Secondary VSM MAC : 00:00:00:00:00:00
Secondary L3 Control IPv4 address: 0.0.0.0
Upgrade : Default
Max physical ports: 32
Max virtual ports: 216
Card control VLAN: 168
Card packet VLAN: 168
Control type multicast: No
Card Headless Mode : No
Processors: 16
Processor Cores: 8
Processor Sockets: 2
Kernel Memory: 25102148
Port link-up delay: 5s
Global UUFB: DISABLED
Heartbeat Set: True
```

```
PC LB Algo: source-mac
Datapath portset event in progress : no
Licensed: Yes
```

Step 4 Check the upstream switches for these MAC addresses in the correct VLANs.

Example:

```
switch1 # show mac address-table | grep 1b02
* 168 0002.3d20.1b02 dynamic 20 F F Veth854
* 168 0002.3d40.1b02 dynamic 0 F F Veth854
* 1 0002.3d40.1b02 dynamic 1380 F F Veth854

switch2 # show mac address-table | grep 74f1
* 168 0050.56bc.74f1 dynamic 0 F F Eth1/1/3
```

Checking the vCenter Server Configuration

You can verify the configuration on vCenter Server.

Procedure

Step 1 Confirm that the host is added to the data center and the Cisco Nexus 1000V DVS in that data center.

Step 2 Confirm that at least one pNIC of the host is added to the DVS, and that pNIC is assigned to the **system-uplink** profile.

Step 3 Confirm that the three VSM vNICS are assigned to the port groups that contain the control VLAN, packet VLAN, and management network.

Checking Network Connectivity Between the VSM and the VEM

You can verify Layer 2 network connectivity between the VSM and the VEM.

Procedure

Step 1 On the VSM, find its MAC address by using the **show svs neighbors** command.

The VSM MAC address displays as the AIPC Interface MAC. The user VEM Agent MAC address of the host displays as the Src MAC.

Example:

```
switch# show svs neighbors

Active Domain ID: 1030

AIPC Interface MAC: 0050-568e-58b7
inband/outband Interface MAC: 0050-568e-2a39

Src MAC Type Domain-id Node-id Last learnt (Sec. ago)
--------------------------------------------------------------------------------
```

```
0002-3d44-0602 VEM 1024 0302 261058.59
```

Step 2 Do one of the following:

a) If the output of the **show svs neighbors** command in Step 1 does not display the VEM MAC address, there is a problem with connectivity between the server hosting the VSM and the upstream switch. Recheck the VSM configuration and vCenter Server configuration.

b) Otherwise, continue with the next step.

Step 3 On the VEM, run the **vem-health check** *vsm_mac_address* script using the VSM MAC address that you found in Step 1.

Note If the vem-health script is not in the *PATH*, you can find it under `/usr/lib/ext/cisco/nexus/vem*/sbin/`.

The vem-health script output shows the cause of the connectivity problem and recommends the next steps for troubleshooting the problem.

Example:

```
~ # vem-health check 00:50:56:a3:36:90
VSM Control MAC address: 00:50:56:a3:36:90
Control VLAN: 90
DPA MAC: 00:02:3d:40:5a:03

VSM heartbeats are not reaching the VEM.
Your uplink configuration is correct.
Recommended action:
Check if the VEM's upstream switch has learned the VSM's Control MAC.
```

Step 4 Do one of the following:

a) If the VEM health check in Step 3 indicates a problem with connectivity to the upstream switch, continue with the next step.

b) Otherwise, go to Step 7.

Step 5 On the upstream switch, display the MAC address table using the **show mac address-table interface** command to verify the network configuration.

Example:

```
switch# show mac address-table interface Gi3/1 vlan 3002
Legend: * - primary entry
age - seconds since last seen
n/a - not available

vlan mac address type learn age ports
------+----------------+--------+-----+----------+--------------------------
Active Supervisor:
* 3002 0050.56be.7ca7 dynamic Yes 0 Gi3/1

switch# show mac address-table interface Gi3/2 vlan 3002
Legend: * - primary entry
age - seconds since last seen
n/a - not available

vlan mac address type learn age ports
------+----------------+--------+-----+----------+--------------------------
Active Supervisor:
* 3002 00:02:3d:40:0b:0c dynamic Yes 0 Gi3/2
```

Step 6 Do one of the following:

a) If the output from Step 5 does not display the MAC address of the VSM, then there is a problem with connectivity between the server hosting the VSM and the upstream switch. Recheck the VSM configuration and vCenter Server configuration.

b) Otherwise, continue with the next step.

Step 7 On the VSM, verify that the VSM MAC appears in the control and packet VLANs by using the **module vem** *module_number* **execute vemcmd show l2** *control_vlan_id* and **module vem** *module_number* **execute vemcmd show l2** *packets_vlan_id* commands.

The VSM eth0 and eth1 MAC addresses should display in the host control and packet VLANs.

Example:

```
switch# config t
switch(config)# module vem 3 execute vemcmd show l2 3002
Bridge domain 3002 brtmax 100, brtcnt 3, timeout 120
Dynamic MAC 00:50:56:be:7c:a7 LTL 16 pvlan 0 timeout 110
Dynamic MAC 00:02:3d:40:0b:0c LTL 10 pvlan 0 timeout 110

switch(config)# module vem 3 execute vemcmd show l2 3003
Bridge domain 3002 brtmax 100, brtcnt 3, timeout 120
Dynamic MAC 00:50:56:be:7c:a7 LTL 16 pvlan 0 timeout 110
Dynamic MAC 00:02:3d:20:0b:0c LTL 10 pvlan 0 timeout 110
```

Step 8 If the MAC address of the VSM does not appear in the output of Step 7, check the VEM configuration as explained in Checking the VEM Configuration, on page 75.

Recovering Management and Control Connectivity of a Host When a VSM is Running on a VEM

When the VSM is running on a VEM that it manages, but the VSM ports are not configured with system port profiles, the control and management connectivity of the VSM can be lost after a host reboot or similar event. To recover from the loss, you can run the VEM connect script locally in the ESX host where the VEM is running, and then go to the VSM and configure the system VLANs in the port profile used for management.

Procedure

Step 1 Display the VEM ports by using the **vemcmd show port** command.

Example:

```
~ # vemcmd show port
LTL VSM Port Admin Link State PC-LTL SGID Vem Port Type
18 Eth9/2 UP UP F/B* 305 1 vmnic1
20 Eth9/4 UP UP F/B* 305 3 vmnic3
49 Veth1 UP UP FWD 0 3 VM-T-125.eth0
50 Veth10 UP UP FWD 0 1 vmk1
305 Po2 UP UP F/B* 0


* F/B: The port is blocked on some of the VLANs.
```

Note The output `*F/B The port is blocked on some of the VLANs` means that the trunk is not forwarding all VLANs. This situation might be normal depending on the port profile allowed VLAN list. Compare the output of the **vemcmd show port vlans** command against the list of allowed VLANs in the trunk port profile. If the lists match, all of the expected VLANs are forwarding and Cisco Nexus 1000V is blocking non-allowed VLANs.

Step 2 Display details about the system VLANs by using the **vemcmd show port vlans system** command.

Example:

```
~ # vemcmd show port vlans system
Native VLAN Allowed
LTL VSM Port Mode VLAN/ State Vlans/SegID
SegID
6 Internal A 1 FWD 1
8 Internal A 3969 FWD 3969
9 Internal A 3969 FWD 3969
10 Internal A 210 FWD 210
11 Internal A 3968 FWD 3968
12 Internal A 211 FWD 211
13 Internal A 1 BLK 1
14 Internal A 3971 FWD 3971
15 Internal A 3971 FWD 3971
16 Internal A 1 FWD 1
18 Eth9/2 T 1 FWD 210-211
20 Eth9/4 T 1 FWD 210-211
49 Veth1 A 1 FWD 1
50 Veth10 A 1 FWD 1
305 Po2 T 1 FWD 210-211
```

Step 3 Recover connectivity by using the VEM connect script. For information about VEM connect script, see Using the VEM Connect Script, on page 75.

Example:

```
~ # vem-connect -i 172.23.232.67 -v 232 -p vmnic3
ltl 50 and veth Veth10 vmk1
Uplink port Po2 carries vlan 232
Set System Vlan 232 port Po2 305
Uplink port Eth9/2 carries vlan 232
Set System Vlan 232 port Eth9/2 18
Uplink port Eth9/4 carries vlan 232
Set System Vlan 232 port Eth9/4 20
Set System 232 for vmk
```

Step 4 Confirm management connectivity by running the **vemcmd show port vlans system** command.

Example:

```
~ # vemcmd show port vlans system
Native VLAN Allowed
LTL VSM Port Mode VLAN/ State Vlans/SegID
SegID
6 Internal A 1 FWD 1
8 Internal A 3969 FWD 3969
9 Internal A 3969 FWD 3969
10 Internal A 210 FWD 210
11 Internal A 3968 FWD 3968
12 Internal A 211 FWD 211
13 Internal A 1 BLK 1
14 Internal A 3971 FWD 3971
15 Internal A 3971 FWD 3971
16 Internal A 1 FWD 1
18 Eth9/2 T 1 FWD 210-211,232
```

```
20 Eth9/4 T 1 FWD 210-211,232
49 Veth1 A 1 FWD 1
50 Veth10 A 232 FWD 232
305 Po2 T 1 FWD 210-211,232
```

Using the VEM Connect Script

The VEM connect script sets a given VLAN as a system VLAN on the VTEP that has the given IP address and also sets the VLAN on all the required uplinks.

If no uplink is carrying this VLAN, you also need to specify the uplink (vmnicN) on which this VLAN needs to be applied. The uplink can be a single port or a port-channel member. If it is the latter, then the script applies the VLANs as a system VLAN to all member uplinks of that port channel.

vem-connect -i *ip_address* **-v** *vlan* [**-p** *vmnicN*]

The **-p** parameter to the script is optional. If you run the script without the **-p** parameter, it tries to locate an uplink that carries this VLAN. If no such uplink exists, it reports this as an error. You need to specify the **-p** parameter and rerun the script.

Checking the VEM Configuration

You can verify that the ESX host received the VEM configuration and setup.

Procedure

Step 1 On the ESX host, run the **vem status** command to confirm that the VEM agent is running and that the correct host uplinks are added to the DVS.

Example:

```
~ # vem status
VEM modules are loaded

Switch Name Num Ports Used Ports Configured Ports MTU Uplinks
vSwitch0 64 3 64 1500 vmnic0
DVS Name Num Ports Used Ports Configured Ports Uplinks
switch 256 9 256 vmnic1 VEM Agent is running
```

Step 2 Restore connectivity that is lost because of an incorrect MTU value on an uplink by running the **vemcmd show port** *port-LTL-number* and **vemcmd set mtu** *value* **ltl** *port-ltl-number* commands.

Note Use these commands only as a recovery measure and then update the MTU value in the port-profile configuration for system uplinks or in the interface configuration for non-system uplinks.

Example:

```
~ # vemcmd show port 48
LTL IfIndex Vlan Bndl SG_ID Pinned_SGID Type Admin State CBL Mode Name
...
17 1a030100 1 T 304 1 32 PHYS UP UP 1 Trunk vmnic1
~# vemcmd set mtu 9000 ltl 17
```

Step 3 Verify that the domain ID, control VLANs, and packet VLANs are configured correctly on the host by running the **vemcmd show card** command.

Example:

```
~ # vemcmd show card
Card UUID type 2: 58f8afd7-e1e3-3c51-85e2-6e6f2819a7b8
Card name: sfish-srvr-1
Switch name: switch
Switch alias: DvsPortset-0
Switch uuid: 56 e0 36 50 91 1c 32 7a-e9 9f 31 59 88 0c 7f 76
Card domain: 1024
Card slot: 4
VEM Control (Control VLAN) MAC: 00:02:3d:14:00:03
VEM Packet (inband/outband) MAC: 00:02:3d:24:00:03
VEM Control Agent (DPA) MAC: 00:02:3d:44:00:03
VEM SPAN MAC: 00:02:3d:34:00:03
Management IP address: 172.23.232.102
Max physical ports: 32
Max virtual ports: 216
Card control VLAN: 3002
Card packet VLAN: 3003
Processors: 4
Processor Cores: 4
Processor Sockets: 2
Physical Memory: 4290351104
```

Step 4 Verify that the ports of the host added to the DVS are listed and that the ports are correctly configured as access or trunk on the host by running the **vemcmd show port** command.

The last line of output indicates that vmnic1 should be in Trunk mode, with the CBL value of 1. The CBL value of the native VLAN does not have to be 1. It will be 0 if it is not allowed, or 1 if it is VLAN 1 and not allowed. This issue is not a problem unless the native VLAN is the Control VLAN.The Admin state and Port state should be UP.

Example:

```
~ # 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 1 Access l20
9 0 3969 0 2 2 VIRT UP UP 1 Access l21
10 0 3002 0 2 2 VIRT UP UP 1 Access l22
11 0 3968 0 2 2 VIRT UP UP 1 Access l23
12 0 3003 0 2 2 VIRT UP UP 1 Access l24
13 0 1 0 2 2 VIRT UP UP 0 Access l25
14 0 3967 0 2 2 VIRT UP UP 1 Access l26
16 1a030100 1 T 0 2 2 PHYS UP UP 1 Trunk vmnic1
```

Step 5 Verify that the vmnic port that is supposed to carry the control VLAN and packet VLAN is present by running the **vemcmd show bd** *control_vlan* and **vemcmd show bd** *packet_vlan* commands.

Example:

```
~ # vemcmd show bd 3002
BD 3002, vdc 1, vlan 3002, 2 ports
Portlist:
10 l22
16 vmnic1
~ # vemcmd show bd 3003
BD 3003, vdc 1, vlan 3003, 2 ports
Portlist:
12 l24
16 vmnic1
```

Step 6 Verify the following by running the **vemcmd show trunk** command:

- The control and packet VLANs are shown in the command output, indicating that the DV port groups are successfully pushed from the vCenter Server to the host.
- The correct physical trunk port vmnic is used.
- At least one physical uplink is carrying the control and packet VLANs. If more than one uplink is carrying the control and packet VLANs, the uplinks must be in a port channel profile. The port channel itself would not be visible because the VEM is not yet added to the VSM.

Example:

```
~ # vemcmd show trunk
Trunk port 16 native_vlan 1 CBL 1vlan(1) cbl 1, vlan(3002) cbl 1, vlan(3003) cbl 1,
```

Step 7 Restore connectivity that is lost because of incorrect port and system VLAN settings by running the **vemcmd show port** *port-LTL-number* and **vemcmd set system-vlan** *vlan_id* **ltl** *port-ltl-number* commands.

Note Use these commands only as a recovery measure and then update the port-profile configuration with the correct system VLANs.

Example:

```
~ # vemcmd show port 48
LTL IfIndex Vlan Bndl SG_ID Pinned_SGID Type Admin State CBL Mode Name
...
48 1b030000 1 0 32 1 VIRT UP DOWN 0 Access vmk1
~# vemcmd set system-vlan 99 ltl 48
```

Collecting Logs

After you have verified the network connectivity between the VEM and the VSM, you can use the following procedure to collect log files to help identify the problem.

Procedure

Step 1 On the VEM, verify its UUID by running the **vemcmd show card info** command.

Example:

```
~ # vemcmd show card info
Card UUID type 0: 4908a717-7d86-d28b-7d69-001a64635d18
Card name: sfish-srvr-7
Switch name: switch
Switch uuid: 50 84 06 50 81 36 4c 22-9b 4e c5 3e 1f 67 e5 ff
Card domain: 11
Card slot: 12
Control VLAN MAC: 00:02:3d:10:0b:0c
inband/outband MAC: 00:02:3d:20:0b:0c
SPAN MAC: 00:02:3d:30:0b:0c
USER DPA MAC: 00:02:3d:40:0b:0c
Management IP address: 172.28.30.56
Max physical ports: 16
Max virtual ports: 32
Card control VLAN: 3002
Card packet VLAN: 3003
```

Step 2 On the VSM, verify the module number to which the corresponding UUID entry is mapped by running the **show module vem mapping** command.

Example:

```
~ # show module vem mapping
Mod Status UUID License Status
--- ----------- ------------------------------------ --------------
60 absent 33393935-3234-5553-4538-35314e355400 unlicensed
66 powered-up 33393935-3234-5553-4538-35314e35545a licensed
switch#
```

Step 3 Using the module number from Step 2, collect the output of the following commands:

- **show system internal vem_mgr event-history module** *module-number*
- **show module internal event-history module** *module-number*
- **show system internal im event-history module** *module-number*
- **show system internal vmm event-history module** *module-number*
- **show system internal ethpm event-history module** *module-number*

Note To contact Cisco TAC for assistance in resolving an issue, you need the output of the commands listed in this step.

VSM and VEM Troubleshooting Commands

Command	Description
show svs neighbors	Displays all neighbors.
show svs connections	Displays the Cisco Nexus 1000V connections.
show svs domain	Displays the domain configuration.
show port-profile name *name*	Displays the configuration for a named port profile.
show running-config vlan *vlanID*	Displays the VLAN information in the running configuration.
vem-health check *vsm_mac_address*	Displays the cause of a connectivity problem and recommends how to troubleshoot the problem.
show mac address-table interface	Displays the MAC address table on an upstream switch to verify the network configuration.
module vem *module-number* **execute vemcmd show l2** [*control_vlan_id* | *packet_vlan_id*]	Displays the VLAN configuration on the VEM to verify that the VSM MAC appears in the control and packet VLANs.

Command	Description
vem status	Displays the VEM status to confirm that the VEM agent is running and the correct host uplinks are added to the DVS.
vemcmd show card	Displays information about cards on the VEM to verify that the domain ID, control VLANs, and packet VLANs are configured correctly on the host.
vemcmd show port [*port-ltl-number*]	Displays configured information on the VEM to verify that the VM NIC port that is supposed to carry the control VLAN and packet VLAN is present. **Note** The output `*F/B The port is blocked on some of the VLANs` means that the trunk is not forwarding all VLANs. This might be a normal situation depending on the port profile allowed VLAN list. Compare the output of the **vemcmd show port vlans** command against the port profile trunk allowed VLANs. If the lists match, all of the expected VLANs are forwarding and Cisco Nexus 1000V is blocking non-allowed VLANs.
vemcmd show bd [*control_vlan_id*|*packet_vlan_id*]	Displays configured information on the VEM to verify that the VM NIC port that is supposed to carry the control VLAN and packet VLAN is present.
vemcmd show trunk	Displays configured information on the VEM to verify that the DV port groups are successfully pushed from vCenter Server to the host and that the correct physical trunk port VM NIC is used.
vem-connect -i *ip_address* **-v vlan** [**-pnic** *vmnicN*]	Recovers management and control connectivity of a host when a VSM is running on a VEM.
show module vem mapping	Displays information about the VEM that a VSM maps to, including the VEM module number, status, UUID, and license status.
show system internal vem_mgr event-history module *module-number*	Displays module FSM event information.
show module internal event-history module *module-number*	Displays the event log for a module.
show system internal im event-history module *module-number*	Displays the module IM event logs for the system.
system internal vmm event-history module *module-number*	Displays the module VMM event logs for the system.

Command	Description
system internal ethpm event-history module *module-number*	Displays the module Ethernet event logs for the system.
system internal ethpm event-history module *type slot*	Displays the Ethernet interface logs for the system.

Command Examples

show svs neighbors

```
switch# show svs neighbors

Active Domain ID: 113

AIPC Interface MAC: 0050-56b6-2bd3
inband/outband Interface MAC: 0050-56b6-4f2d

Src MAC Type Domain-id Node-id Last learnt (Sec. ago)
--------------------------------------------------------------------------

0002-3d40-7102 VEM 113 0302 71441.12
0002-3d40-7103 VEM 113 0402 390.77

switch#
```

show svs connections

```
switch# show svs connections
connection vc:
ip address: 172.23.231.223
protocol: vmware-vim https
certificate: user-installed
datacenter name: hamilton-dc
DVS uuid: 92 7a 14 50 05 11 15 9c-1a b0 f2 d4 8a d7 6e 6c
dvs version: 5.0
config status: Disabled
operational status: Disconnected
```

show svs domain

```
switch# show svs domain
SVS domain config:
Domain id: 682
Control vlan: 3002
Packet vlan: 3003
L2/L3 Control VLAN mode: L2
L2/L3 Control VLAN interface: mgmt0
Status: Config push to VC successful
```

show port-profile

```
switch# show port-profile name SystemUplink
port-profile SystemUplink
description:
type: ethernet
status: enabled
```

```
capability l3control: no
pinning control-vlan: -
pinning packet-vlan: -
system vlans: 114,115
port-group: SystemUplink
max ports: 32
inherit:
config attributes:
switchport mode trunk
switchport trunk allowed vlan all
system mtu 1500
no shutdown
evaluated config attributes:
switchport mode trunk
switchport trunk allowed vlan all
no shutdown
assigned interfaces:
```

show running-configuration vlan

```
switch# show running-config vlan 260-261
version 4.0(4)SV1(3)
vlan 260
name cp_control
vlan 261
name cp_packet

switch#
```

vem-health check

```
~ # vem-health check 00:50:56:a3:36:90
VSM Control MAC address: 00:50:56:a3:36:90
Control VLAN: 90
DPA MAC: 00:02:3d:40:5a:03

VSM heartbeats are not reaching the VEM.
Your uplink configuration is correct.
Recommended action:
Check if the VEM's upstream switch has learned the VSM's Control MAC.
```

show mac address-table interface

```
switch# show mac address-table interface Gi3/1 vlan 3002
Legend: * - primary entry
age - seconds since last seen
n/a - not available

vlan mac address type learn age ports
------+----------------+--------+-----+----------+--------------------------
Active Supervisor:
* 3002 0050.56be.7ca7 dynamic Yes 0 Gi3/1
```

module vem execute vemcmd show l2

```
switch(config)# module vem 3 execute vemcmd show l2 3002
Bridge domain 3002 brtmax 100, brtcnt 3, timeout 120
Dynamic MAC 00:50:56:be:7c:a7 LTL 16 pvlan 0 timeout 110
Dynamic MAC 00:02:3d:40:0b:0c LTL 10 pvlan 0 timeout 110

switch(config)# module vem 3 execute vemcmd show l2 3003
Bridge domain 3002 brtmax 100, brtcnt 3, timeout 120
```

```
Dynamic MAC 00:50:56:be:7c:a7 LTL 16 pvlan 0 timeout 110
Dynamic MAC 00:02:3d:20:0b:0c LTL 10 pvlan 0 timeout 110
```

vem status

```
~ # vem status
VEM modules are loaded

Switch Name Num Ports Used Ports Configured Ports MTU Uplinks
vSwitch0 64 3 64 1500 vmnic0
DVS Name Num Ports Used Ports Configured Ports Uplinks
switch 256 9 256 vmnic1 VEM Agent is running
```

vemcmd show card

```
~ # vemcmd show card
Card UUID type 2: 58f8afd7-e1e3-3c51-85e2-6e6f2819a7b8
Card name: sfish-srvr-1
Switch name: switch
Switch alias: DvsPortset-0
Switch uuid: 56 e0 36 50 91 1c 32 7a-e9 9f 31 59 88 0c 7f 76
Card domain: 1024
Card slot: 4
VEM Control (Control VLAN) MAC: 00:02:3d:14:00:03
VEM Packet (inband/outband) MAC: 00:02:3d:24:00:03
VEM Control Agent (DPA) MAC: 00:02:3d:44:00:03
VEM SPAN MAC: 00:02:3d:34:00:03
Management IP address: 172.23.232.102
Max physical ports: 32
Max virtual ports: 216
Card control VLAN: 3002
Card packet VLAN: 3003
Processors: 4
Processor Cores: 4
Processor Sockets: 2
Physical Memory: 4290351104
```

vemcmd show port

```
~ # 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 1 Access l20
9 0 3969 0 2 2 VIRT UP UP 1 Access l21
10 0 3002 0 2 2 VIRT UP UP 1 Access l22
11 0 3968 0 2 2 VIRT UP UP 1 Access l23
12 0 3003 0 2 2 VIRT UP UP 1 Access l24
13 0 1 0 2 2 VIRT UP UP 0 Access l25
14 0 3967 0 2 2 VIRT UP UP 1 Access l26
16 1a030100 1 T 0 2 2 PHYS UP UP 1 Trunk vmnic1

~ # vemcmd show port 48
LTL IfIndex Vlan Bndl SG_ID Pinned_SGID Type Admin State CBL Mode
Name...
17 1a030100 1 T 304 1 32 PHYS UP UP 1 Trunk vmnic1

~ # vemcmd show port
LTL VSM Port Admin Link State PC-LTL SGID Vem Port
17 Eth5/1 UP UP FWD 305 0 vmnic0
18 Eth5/2 UP UP FWD 305 1 vmnic1
49 Veth11 UP UP FWD 0 0 vmk0
50 Veth14 UP UP FWD 0 1 vmk1
```

```
51 Veth15 UP UP FWD 0 0 vswif0
305 Po1 UP UP FWD 0

* F/B: Port is BLOCKED on some of the vlans.
Please run "vemcmd show port vlans" to see the details.
```

vemcmd show port vlans

Note The output `*F/B The port is blocked on some of the VLANs` means that the trunk is not forwarding all VLANs. This might be a normal situation depending on the port profile allowed VLAN list. Compare the output of the **vemcmd show port vlans** command against the port profile trunk allowed VLANs. If the lists match, all of the expected VLANs are forwarding and the Cisco Nexus 1000V is blocking nonallowed VLANs.

```
~ # vemcmd show port vlans
Native VLAN Allowed
LTL VSM Port Mode VLAN State Vlans
17 Eth5/1 T 1 FWD 1,100,119,219,319
18 Eth5/2 T 1 FWD 1,100,119,219,319
49 Veth11 A 119 FWD 119
50 Veth14 A 119 FWD 119
51 Veth15 A 119 FWD 119
305 Po1 T 1 FWD 1,100,119,219,319
```

vemcmd show bd

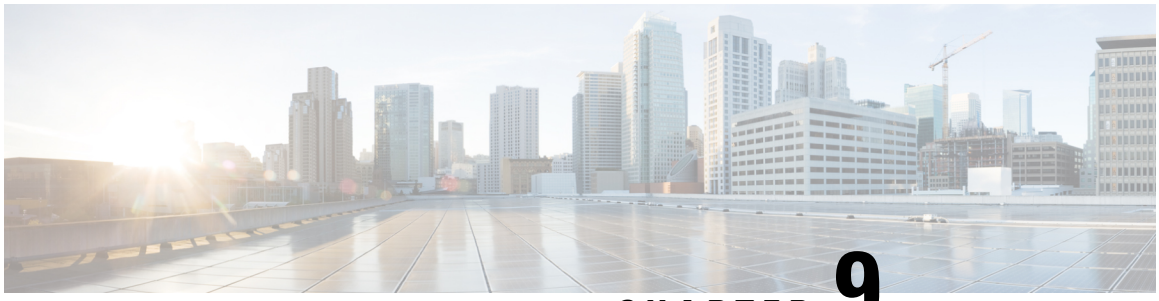
```
~ # vemcmd show bd 3002
BD 3002, vdc 1, vlan 3002, 2 ports
Portlist:
10 l22
16 vmnic1
```

vemcmd show trunk

```
~ # vemcmd show trunk
Trunk port 16 native_vlan 1 CBL 1vlan(1) cbl 1, vlan(3002) cbl 1, vlan(3003) cbl 1,
```

show module vem mapping

```
switch# show module vem mapping
Mod Status UUID License Status
--- ---------- ------------------------------------ --------------
60 absent 33393935-3234-5553-4538-35314e355400 unlicensed
66 powered-up 33393935-3234-5553-4538-35314e35545a licensed
switch#
```



CHAPTER 9

L3Sec

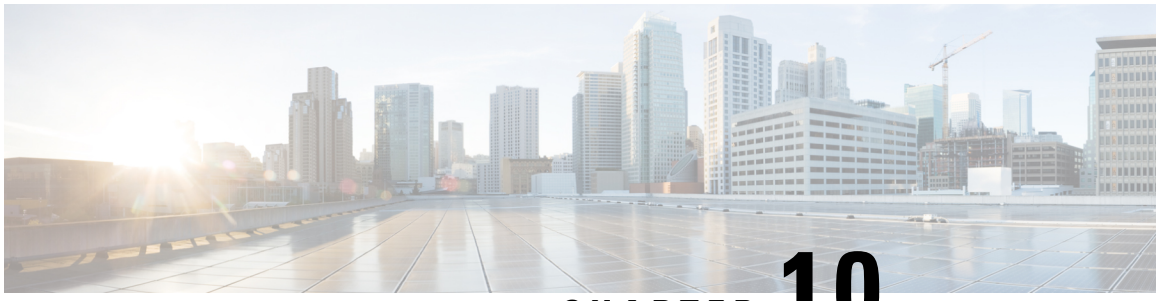
This chapter describes how to secure the internal control plane communications (Control and Packet traffic) of Cisco Nexus 1000V. It operates only in the Layer 3 Control mode. This chapter contains the following sections:

Troubleshooting L3Sec

The following are symptoms, possible causes, and solutions identified while troubleshooting L3Sec.

Table 5: Troubleshooting L3Sec

Possible Causes	Solution
SVS connection is not up	1. Verify SVS connection using the **show svs connection** command. 2. If the connection status is `not connected`, create the connection.
Key mismatch between the VSM and the VEM	1. Verify the key fields mismatch between the switch opaque data and the VEM. 2. Check the keys present using the **show vms internal info dvs** command. 3. On VEM, run the **vemcmd show sod** command and check if the chunk1, chunk2, and chunk3 fields are matching. 4. If there is a mismatch, disable and then enable L3Sec using the **[no] enable l3sec** command under svs-domain.
Boot variables are not set	1. Verify the running configuration using the **show running config** command. 2. Check if `enable l3sec` is present under svs-domain. If it is not present, run the **enable l3sec** command and check for any error messages and accordingly perform the action.



CHAPTER 10

Ports

This chapter describes how to identify and resolve problems related to ports. This chapter contains the following sections:

Information about Ports

Information About Interface Characteristics

Before a switch can relay frames from one data link to another, you must define the characteristics of the interfaces through which the frames are received and sent. The configured interfaces can be Ethernet (physical) interfaces, virtual Ethernet interfaces, and the management interface.

Each interface has the following:

- Administrative Configuration—The administrative configuration does not change unless you modify it. This configuration has attributes that you can configure in administrative mode.
- Operational State—The operational state of a specified attribute, such as the interface speed. This state cannot be changed and is read-only. Some values might not be valid when the interface is down (such as the operation speed).

For detailed information about port modes, administrative states, and operational states, see the *Cisco Nexus 1000V Interface Configuration Guide*.

Information About Interface Counters

Port counters are used to identify synchronization problems. Counters can show a significant disparity between received and transmitted frames. To display interface counters, use the **show interface ethernet counters** command shown in show interface ethernet counters, on page 97.

Values stored in counters can be meaningless for a port that has been active for an extended period. Clearing the counters provides a better idea of the actual link behavior at the present time. Create a baseline first by clearing the counters using the **clear counters interface ethernet** command.

Information About Link Flapping

When a port continually goes up and down, it is said to be flapping, or link flapping. When a port is flapping, it cycles through the following states in this order and then starts over again:

1. Initializing—The link is initializing.
2. Offline—The port is offline.
3. Link failure or not connected—The physical layer is not operational and there is no active device connection.

To troubleshoot link flapping, see Link Flapping, on page 90.

Information About Port Security

The port security feature allows you to secure a port by limiting and identifying the MAC addresses that can access the port. Secure MAC addresses can be manually configured or dynamically learned.

For detailed information about port security, see the *Cisco Nexus 1000V Security Configuration Guide*.

Type of Port	Is Port Security Supported?
vEthernet access	Yes
vEthernet trunk	Yes
vEthernet SPAN destination	No
Standalone Ethernet interfaces	No
Port channel members	No

To troubleshoot problems related to port security, see the following:

- VM Cannot Ping a Secured Port, on page 92
- Port Security Violations, on page 93

Port Diagnostic Checklist

Use the following checklist to diagnose port interface activity.

For more information about port states, see the *Cisco Nexus 1000V Interface Configuration Guide*.

Table 6: Port Diagnostic Checklist

Checklist	Example
Verify that the module is active. **show module**	See show module, on page 95.

Checklist	Example
Verify that the VSM is connected to vCenter Server. **show svs connections**	See show svs, on page 96.
On vSphere Client connected to vCenter Server, verify that the required port profiles are assigned to the physical NICs and the virtual NICs.	—
Verify that the ports have been created. **show interface brief**	See show interface brief, on page 97.
Verify the state of the interface. **show interface ethernet**	See show interface ethernet, on page 97.

Problems with Ports

An Interface Cannot be Enabled

Possible Cause	Solution
A layer 2 port is not associated with an access VLAN or the VLAN is suspended.	1. Verify that the interface is configured in a VLAN by using the **show interface brief** command. 2. If not already, associate the interface with an access VLAN. 3. Determine the VLAN status by using the **show vlan brief** command. 4. If not already active, configure the VLAN as active by using the following commands: 1. **config t** 2. **vlan** *vlan-id* 3. **state active**

Port Link Failure or Port Not Connected

Possible Cause	Solution
The port connection is bad.	1. Verify the port state by using the **show system internal ethpm info** command. 2. Disable and then enable the port. 1. **shut** 2. **no shut** 3. Move the connection to a different port on the same module or a different module. 4. Collect the ESX-side NIC configuration by using the **vss-support** command.
The link is stuck in initialization state or the link is in a point-to-point state.	1. Check for the link failure system message `Link Failure, Not Connected` by using the **show logging** command. 2. Disable and then enable the port. 1. **shut** 2. **no shut** 3. Move the connection to a different port on the same module or a different module. 4. Collect the ESX-side NIC configuration by using the **vss-support** command.

Link Flapping

When you are troubleshooting unexpected link flapping, it is important to have the following information:

- Who initiated the link flap?
- The actual reason for the link being down.

For information about link flapping, see Information About Link Flapping, on page 88.

Possible Cause	Solution
The bit rate exceeds the threshold and puts the port into an error-disabled state.	Disable and then enable the port. 1. **shut** 2. **no shut** The port should return to the normal state.

Possible Cause	Solution
One of the following: • A hardware failure or intermittent hardware error causes a packet drop in the switch. • A software error causes a packet drop. • A control frame is erroneously sent to the device.	An external device might choose to initialize the link again when encountering the error. If so, the exact method of link initialization varies by device. 1. Determine the reason for the link flap as indicated by the MAC driver. 2. Use the debug facilities on the end device to troubleshoot the problem.
ESX errors or link flapping occurs on the upstream switch.	Use the troubleshooting guidelines in the documentation for your ESX or upstream switch.

Port ErrDisabled

Possible Cause	Solution
The cable is defective or damaged.	1. Verify the physical cabling. 2. Replace or repair defective cables. 3. Re-enable the port. 1. **shut** 2. **no shut**
You attempted to add a port to a port channel that was not configured identically and the port is then errdisabled.	1. Display the switch log file and identify the exact configuration error in the list of port state changes by using the **show logging logfile** command. 2. Correct the error in the configuration and add the port to the port channel. 3. Re-enable the port. 1. **shut** 2. **no shut**
A VSM application error has occurred.	1. Identify the component that had an error while you were bringing up the port by using the **show logging logfile | grep** *interface_number* command. See show logging logfile, on page 96. 2. Identify the error transition by using the **show system internal ethpm event-history interface** *interface_number* command. 3. Open a support case and submit the output of the above commands. For more information, see Cisco Support Information, on page 235.

VM Cannot Ping a Secured Port

Possible Cause	Solution
The vEthernet interface is not up.	1. Verify the state of the vEthernet interface. **show interface vethernet** *number* 2. If the interface is down, enable it. 1. **shut** 2. **no shut**
One of the following: • Drop on Source Miss (DSM) is set. • New MAC addresses cannot be learned by this port.	1. Verify the port security configuration. **module vem 3 execute vemcmd show portsec stats** 2. If DSM is set, clear the DSM bit on the VSM. **no port-security stop learning**
The packet VLAN is not allowed on the port.	1. Identify the packet VLAN ID. **show svs domain** 2. Verify that the packet VLAN is allowed on VEM uplink ports. **show port-profile na uplink-all** 3. If the packet VLAN is not allowed on the uplink port profile, add it to the allowed VLAN list.
The packet VLAN is not allowed on the upstream switch port.	1. Identify the upstream neighbors connected to the interface. **show cdp neighbors** 2. Log in to the upstream switch and verify that the packet VLAN is allowed on the port. **show running-config interface gigabitEthernet** *slot/port* 3. If the packet VLAN is not allowed on the port, add it to the allowed VLAN list.

Port Security Violations

Possible Cause	Solution
The configured maximum number of secured addresses on the port is exceeded.	1. Display the secure addresses. **show port-security address vethernet** *number* **show port-security address interface vethernet** *number* 2. Identify ports with security violation. **show logging |** **inc "PORT-SECURITY-2-** **ETH_PORT_SEC_SECURITY** **_VIOLATION_MAX_MAC_VLAN"** 3. Correct the security violation. 4. Enable the interface. 1. **shut** 2. **no shut**

For detailed information about port security, see the *Cisco Nexus 1000V for VMware vSphere Security Configuration Guide*.

Port State is Blocked on a VEM

Possible Cause	Solution
The VLAN is not created on the VSM.	1. Verify the status of the vEthernet interface by using the **show interface vethernet number** command. It should be up and not inactive. 2. Verify that the VLAN on the VSM is created by using the **show vlan** *vlan-id* command. 3. On the VEM module, do the following: 1. Verify that the VLAN is programmed by using the **vemcmd show vlan** *vlan-id* command. 2. Verify that the VLAN is allowed on the ports by using the **vemcmd show port vlan** command. 3. Create the VLAN on the VSM by using the **vlan** *vlan-id* command.

Possible Cause	Solution
The VEM modules are unlicensed.	1. Verify that all modules are in licensed state by using the **show module** command. 2. Verify the status of the vEthernet interface by using the **show interface vethernet number** command. It should be up and not `VEM Unlicensed`. 3. Verify the license status of VEM modules by using the **show module vem license-info** command. 4. On the VEM module, do the following: 1. Verify that the card details show `Licensed: Yes` by using the **vemcmd show card** command. 2. Install the necessary licenses or move the switch to essential mode by using the **svs switch edition essential** command.

Port Troubleshooting Commands

Command	Purpose	Examples
show module *module-number*	Displays the state of a module.	show module, on page 95
show svs domain	Displays the domain configuration.	show svs, on page 96
show svs connections	Displays the Cisco Nexus 1000V connections.	show svs, on page 96
show cdp neighbors	Displays the neighbors connected to an interface.	show cdp neighbors, on page 96
show port internal event-history interface	Displays information about the internal state transitions of the port.	show port internal event-history interface, on page 96
show logging logfile	Displays logged system messages.	show logging logfile, on page 96
show logging logfile | grep *interface_number*	Displays logged system messages for a specified interface.	show logging logfile, on page 96
show interface brief	Displays a table of interface states.	show interface brief, on page 97

Command	Purpose	Examples
show interface ethernet	Displays the configuration for a named Ethernet interface, including the following: • Administrative state • Speed • Trunk VLAN status • Number of frames sent and received • Transmission errors, including discards, errors, CRCs, and invalid frames	show interface ethernet, on page 97
show interface ethernet counters	Displays port counters for identifying synchronization problems.	show interface ethernet counters, on page 97
show interface vethernet	Displays the vEthernet interface configuration.	show interface vEthernet, on page 98
show interface status	Displays the status of the named interface.	—
show interface capabilities	Displays a tabular view of all configured port profiles.	show interface capabilities, on page 98
show interface virtual port-mapping	Displays the virtual port mapping for all vEthernet interfaces.	show interface virtual port-mapping, on page 100
module vem execute vemcmd show portsec status	Displays the port security status of the port. If enabled, the output shows an LTL connected to the VM network adapter.	module vem execute vemcmd show portsec status, on page 100
show port-security interface veth	Displays secure vEthernet interfaces.	show port-security, on page 100
show port-security address interface vethernet	Displays information about secure addresses on an interface.	show port-security, on page 100

Command Examples

show module

```
switch# show mod 3
Mod Ports Module-Type Model Status
--- ----- -------------------------------- ------------------ ------------
3 248 Virtual Ethernet Module ok
Mod Sw Hw
--- -------------- ------
3 NA 0.0
Mod MAC-Address(es) Serial-Num
--- -------------------------------------- ----------
3 02-00-0c-00-03-00 to 02-00-0c-00-03-80 NA
Mod Server-IP Server-UUID Server-Name
```

```
--- --------------- ----------------------------------- --------------------
3 192.168.48.20 496e48fa-ee6c-d952-af5b-001517136344 frodo
```

show svs

```
switch# show svs domains
SVS domain config:
Domain id: 559
Control vlan: 3002
Packet vlan: 3003
L2/L3 Aipc mode: L2
L2/L3 Aipc interface: management interface0
Status: Config push to VC successful.
switch#
```

```
switch# show svs connections
connection VC:
ip address: 192.168.0.1
protocol: vmware-vim https
certificate: default
datacenter name: Hamilton-DC
DVS uuid: ac 36 07 50 42 88 e9 ab-03 fe 4f dd d1 30 cc 5c
dvs version: 5.0
config status: Enabled
operational status: Connected
switch#
```

show cdp neighbors

```
switch# show cdp neighbors
Capability Codes: R - Router, T - Trans-Bridge, B - Source-Route-Bridge
S - Switch, H - Host, I - IGMP, r - Repeater,
V - VoIP-Phone, D - Remotely-Managed-Device,
s - Supports-STP-Dispute
Device ID Local Intrfce Hldtme Capability Platform Port ID
swordfish-6k-2 Eth3/2 149 R S I WS-C6506-E Gig1/38
switch#
```

show port internal event-history interface

```
switch# show port internal event-history interface e1/7
>>>>FSM: <e1/7> has 86 logged transitions<<<<<
1) FSM:<e1/7> Transition at 647054 usecs after Tue Jan 1 22:44..
Previous state: [PI_FSM_ST_IF_NOT_INIT]
Triggered event: [PI_FSM_EV_MODULE_INIT_DONE]
Next state: [PI_FSM_ST_IF_INIT_EVAL]
2) FSM:<e1/7> Transition at 647114 usecs after Tue Jan 1 22:43..
Previous state: [PI_FSM_ST_IF_INIT_EVAL]
Triggered event: [PI_FSM_EV_IE_ERR_DISABLED_CAP_MISMATCH]
Next state: [PI_FSM_ST_IF_DOWN_STATE]
```

show logging logfile

```
switch# show logging logfile
. . .
Jan 4 06:54:04 switch %PORT_CHANNEL-5-CREATED: port-channel 7 created
Jan 4 06:54:24 switch %PORT-5-IF_DOWN_PORT_CHANNEL_MEMBERS_DOWN: Interface port-channel 7
is down (No operational members)
Jan 4 06:54:40 switch %PORT_CHANNEL-5-PORT_ADDED: e1/8 added to port-channel 7
Jan 4 06:54:56 switch %PORT-5-IF_DOWN_ADMIN_DOWN: Interface e1/7 is down (Admnistratively
down)
Jan 4 06:54:59 switch %PORT_CHANNEL-3-COMPAT_CHECK_FAILURE: speed is not compatible
```

```
Jan 4 06:55:56 switch%PORT_CHANNEL-5-PORT_ADDED: e1/7 added to port-channel 7
switch#
```

```
switch# show logging logfile | grep Vethernet3626
2011 Mar 25 10:56:03 n1k-bl %VIM-5-IF_ATTACHED: Interface Vethernet3626
is attached to Network Adapter 8 of gentoo-pxe-520 on port 193 of module
13 with dvport id 6899
2011 Mar 25 11:10:06 n1k-bl %ETHPORT-2-IF_SEQ_ERROR: Error ("Client data
inconsistency") while communicating with component MTS_SAP_ACLMGR for
opcode MTS_OPC_ETHPM_PORT_PRE_CFG (RID_PORT: Vethernet3626)
2011 Mar 25 11:10:06 n1k-bl %ETHPORT-2-IF_DOWN_ERROR_DISABLED: Interface
Vethernet3626 is down (Error disabled. Reason:Client data inconsistency)
```

show interface brief

```
switch# show int brief
--------------------------------------------------------------------------------
Port VRF Status IP Address Speed MTU
--------------------------------------------------------------------------------
management interface0 -- up 172.23.232.141 1000 1500
--------------------------------------------------------------------------------
Ethernet VLAN Type Mode Status Reason Speed Port
Interface Ch #
--------------------------------------------------------------------------------
Eth3/2 1 eth trunk up none 1000(D) --
Eth3/3 1 eth access up none 1000(D) --
switch#
```

show interface ethernet

```
switch# show interface e1/14
e1/7 is down (errDisabled)
```

```
switch# show interface eth3/2
Ethernet3/2 is up
Hardware: Ethernet, address: 0050.5653.6345 (bia 0050.5653.6345)
MTU 1500 bytes, BW -598629368 Kbit, DLY 10 usec,
reliability 0/255, txload 0/255, rxload 0/255
Encapsulation ARPA
Port mode is trunk
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
  18775 Input Packets 10910 Unicast Packets
  862 Multicast Packets 7003 Broadcast Packets
  2165184 Bytes
Tx
  6411 Output Packets 6188 Unicast Packets
  216 Multicast Packets 7 Broadcast Packets 58 Flood Packets
  1081277 Bytes
  1000 Input Packet Drops 0 Output Packet Drops
1 interface resets
switch#
```

show interface ethernet counters

```
switch# show interface eth3/2 counters
--------------------------------------------------------------------------------
Port InOctets InUcastPkts InMcastPkts InBcastPkts
```

```
--------------------------------------------------------------------------------
Eth3/2 2224326 11226 885 7191
--------------------------------------------------------------------------------
Port OutOctets OutUcastPkts OutMcastPkts OutBcastPkts
--------------------------------------------------------------------------------
Eth3/2 1112171 6368 220 7
```

show interface vEthernet

```
switch# show interface veth1
Vethernet1 is up
Port description is gentoo1, Network Adapter 1
Hardware is Virtual, address is 0050.56bd.42f6
Owner is VM "gentoo1", adapter is Network Adapter 1
Active on module 33
VMware DVS port 100
Port-Profile is vlan48
Port mode is access
Rx
491242 Input Packets 491180 Unicast Packets
7 Multicast Packets 55 Broadcast Packets
29488527 Bytes
Tx
504958 Output Packets 491181 Unicast Packets
1 Multicast Packets 13776 Broadcast Packets 941 Flood Packets
714925076 Bytes
11 Input Packet Drops 0 Output Packet Drops
switch#
```

show interface capabilities

```
switch# show interface capabilities
management interface0
Model: --
Type: --
Speed: 10,100,1000,auto
Duplex: half/full/auto
Trunk encap. type: 802.1Q
Channel: no
Broadcast suppression: none
Flowcontrol: rx-(none),tx-(none)
Rate mode: none
QOS scheduling: rx-(none),tx-(none)
CoS rewrite: yes
ToS rewrite: yes
SPAN: yes
UDLD: yes
Link Debounce: no
Link Debounce Time: no
MDIX: no
Port Group Members: none
port-channel1
Model: unavailable
Type: unknown
Speed: 10,100,1000,10000,auto
Duplex: half/full/auto
Trunk encap. type: 802.1Q
Channel: yes
Broadcast suppression: percentage(0-100)
Flowcontrol: rx-(off/on/desired),tx-(off/on/desired)
Rate mode: none
QOS scheduling: rx-(none),tx-(none)
CoS rewrite: yes
```

```
ToS rewrite: yes
SPAN: yes
UDLD: no
Link Debounce: no
Link Debounce Time: no
MDIX: no
Port Group Members: none
port-channel2
Model: unavailable
Type: unknown
Speed: 10,100,1000,10000,auto
Duplex: half/full/auto
Trunk encap. type: 802.1Q
Channel: yes
Broadcast suppression: percentage(0-100)
Flowcontrol: rx-(off/on/desired),tx-(off/on/desired)
Rate mode: none
QOS scheduling: rx-(none),tx-(none)
CoS rewrite: yes
ToS rewrite: yes
SPAN: yes
UDLD: no
Link Debounce: no
Link Debounce Time: no
MDIX: no
Port Group Members: none
port-channel12
Model: unavailable
Type: unknown
Speed: 10,100,1000,10000,auto
Duplex: half/full/auto
Trunk encap. type: 802.1Q
Channel: yes
Broadcast suppression: percentage(0-100)
Flowcontrol: rx-(off/on/desired),tx-(off/on/desired)
Rate mode: none
QOS scheduling: rx-(none),tx-(none)
CoS rewrite: yes
ToS rewrite: yes
SPAN: yes
UDLD: no
Link Debounce: no
Link Debounce Time: no
MDIX: no
Port Group Members: none
control0
Model: --
Type: --
Speed: 10,100,1000,auto
Duplex: half/full/auto
Trunk encap. type: 802.1Q
Channel: no
Broadcast suppression: none
Flowcontrol: rx-(none),tx-(none)
Rate mode: none
QOS scheduling: rx-(none),tx-(none)
CoS rewrite: yes
ToS rewrite: yes
SPAN: yes
UDLD: yes
Link Debounce: no
Link Debounce Time: no
MDIX: no
```

```
Port Group Members: none
switch#
```

show interface virtual port-mapping

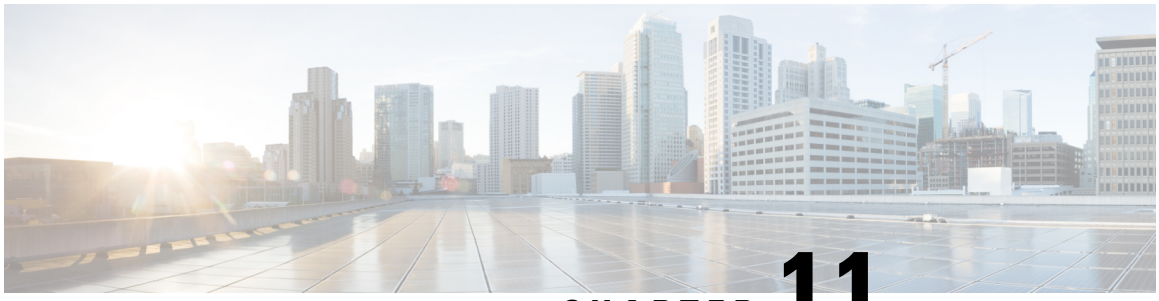
```
switch# show interface virtual port-mapping
------------------------------------------------------------------------------
Port Hypervisor Port Binding Type Status Reason
------------------------------------------------------------------------------
Veth1 DVPort5747 static up none
Veth2 DVPort3361 static up none
switch#
```

show port-security

```
switch# show port-security
Total Secured Mac Addresses in System (excluding one mac per port) : 0
Max Addresses limit in System (excluding one mac per port) : 8192
------------------------------------------------------------------------------
Secure Port MaxSecureAddr CurrentAddr SecurityViolation Security Action
(Count) (Count) (Count)
------------------------------------------------------------------------------
Vethernet1 1 0 0 Shutdown
==============================================================================


switch# show port-security address interface vethernet 11
Secure Mac Address Table
------------------------------------------------------------------------
Vlan/Vxlan Mac Address Type Ports Configured Age
(mins)
---------- ----------- ------ ----- ---------------
50 0050.56a4.38ec STATIC Vethernet11 0
50 0000.0000.0011 DYNAMIC Vethernet11
```

module vem execute vemcmd show portsec status

```
cyp1-switch# module vem 3 execute vemcmd show portsec status
LTL if_index Max Aging Aging DSM Sticky VM
Secure Time Type Bit Enabled Name
Addresses
56 1c0000a0 5 0 Absolute Clr No Ostinato-Upgrade-VM1.eth1
```



CHAPTER 11

Port Profiles

This chapter describes how to identify and resolve problems related to port profiles. This chapter contains the following sections:

Information About Port Profiles

Port profiles are used to configure interfaces. A port profile can be assigned to multiple interfaces to give them the same configuration. Changes to the port profile are automatically propagated to the configuration of any interface assigned to it.

In VMware vCenter Server, a port profile is represented as a port group. The vEthernet or Ethernet interfaces are assigned in vCenter Server to a port profile for the following reasons:

- Defining a port configuration by policy.
- Applying a single policy across a large number of ports.
- Supporting both vEthernet and Ethernet ports.

vEthernet port profiles can be assigned by the server administrator to physical ports (a VMNIC or a PNIC). Port profiles not configured as vEthernet can be assigned to a VM virtual port.

Note While a manual interface configuration overrides the configuration of the port profile, we do not recommend that you do so. Manual interface configuration is only used for tasks such as to quickly test a change or allow a port to be disabled without having to change the inherited port profile.

For more information about assigning port profiles to physical or virtual ports, see your VMware documentation.

To verify that the profiles are assigned as expected to physical or virtual ports, use the following **show** commands:

- **show port-profile virtual usage**
- **show running-config interface** *interface-id*

  You can also use this command to verify port profile inheritance.

Note Inherited port profiles cannot be changed or removed from an interface from the Cisco Nexus 1000V CLI. This action can only be done from vCenter Server.

Inherited port profiles are automatically configured by Cisco Nexus 1000V when the ports are attached on the hosts. This action is done by matching up the VMware port group assigned by the system administrator with the port profile that created it.

For detailed information about port profiles, see the *Cisco Nexus 1000V for VMware vSphere Port Profile Configuration Guide*.

Problems with Port Profiles

The following are symptoms, possible causes, and solutions for problems with port profiles.

Symptom	Possible Causes	Solution
You do not see the port group on vCenter Server or the following message is displayed: `Warning: Operation succeeded locally but update failed on vCenter server. Please check if you are connected to vCenter Server.`	The connection to vCenter Server is down.	1. Verify that the connection to vCenter Server is Enabled and Connected by using the **show svs connections** command. 2. Reconnect to vCenter Server. For information about the procedure for connecting to vCenter Server, see the *Cisco Nexus 1000V for VMware vSphere System Management Configuration Guide*.
	The domain configuration was not successfully pushed to vCenter Server.	1. Verify that the domain configuration was successfully pushed to vCenter Server by using the **show svs domain** command. 2. Fix any problems with the domain configuration. For information about configuring the domain, see the *Cisco Nexus 1000V for VMware vSphere System Management Configuration Guide*.
	The port profile is incorrectly configured.	1. Verify that the **vmware port-group** is configured for the port profile and that the port profile is enabled by using the **show port profile name** *name* 2. Fix the port profile using the procedures in the *Cisco Nexus 1000V for VMware vSphere Port Profile Configuration Guide*.

Symptom	Possible Causes	Solution
A port configuration is not applied to an interface.	Management connectivity between vCenter Server and the VSM has prevented the port profile assignment from being sent or received.	1. Display the port profile usage by interface by using the **show port-profile virtual usage** command. 2. Verify that the interface level configuration did not overwrite the port profile configuration by using the following commands: • **show run** • **show port-profile expand-interface** 3. If the **show** command output is incorrect, then on vCenter Server, reassign the port group to the interface.
An Ethernet interface or vEthernet interface is administratively down. A system message similar to the following is logged: `%VMS-3-DVPG_NICS_MOVED: '1' nics have been moved from port-group 'Access483' to 'Unused_Or_Quarantine_Veth'.`	The interface is inheriting a quarantined port profile. A configuration was not saved prior to rebooting the VSM, the configuration was lost, and the interfaces were moved to one of the following port profiles: • Unused_Or_Quarantine_Uplink for ethernet types • Unused_Or_Quarantine_Veth for Vethernet types	1. Verify the port profile-to-interface mapping by using the **show port-profile virtual usage** command. 2. Reassign the VMNIC or PNIC to a non-quarantined port group to enable the interface to be up and forward the traffic. This requires changing the port group in vCenter Server.

Symptom	Possible Causes	Solution
After applying a port profile, an online interface is quarantined. A system message similar to the following is logged: `%PORT-PROFILE-2-INTERFACE_QUARANTINED:` `Interface Ethernet3/3 has been quarantined due to Cache Overrun`	The assigned port profile is incorrectly configured. The incorrect command fails when the port profile is applied to an interface. Although a specific command fails, the port profile-to-interface mapping is created.	1. Identify the command that failed by using the **show accounting log | grep FAILURE** command. 2. Verify that the interface is quarantined by using the **show port-profile sync-status** command. 3. Verify the port profile-to-interface mapping by using the **show port-profile virtual usage** command. 4. Fix the error in the port profile using the procedures in the *Cisco Nexus 1000V for VMware vSphere Port Profile Configuration Guide*. 5. Bring the interface out of quarantine by using the **no shutdown** command. 6. Return shutdown control to the port profile by using the **default shutdown** command.
After modifying a port profile, an assigned offline interface is quarantined. A system message similar to the following is logged: `%PORT-PROFILE-2-INTERFACE_QUARANTINED:` `Interface Ethernet4/3 has been quarantined due to Cache Overrun`	The interface has been removed from the DVS.	To bring the interface back online, see Recovering a Quarantined Offline Interface, on page 106.

Symptom	Possible Causes	Solution
A module and all associated interfaces are offline. A system message similar to the following is logged: `2011 Mar 2 22:28:50 switch %VEM_MGR-2-VEM_MGR_REMOVE _NO_HB: Removing VEM 3 (heartbeats lost)` `2011 Mar 2 22:29:00 switch %VEM_MGR-2-MOD_OFFLINE : Module 3 is offline`	The interface carrying system VLANs for the module has gone down for one of the following reasons: • System interfaces were removed from the DVS on vCenter Server. • The module was powered down. • There is a general loss of connectivity to the module.	Follow VEM troubleshooting guidelines to bring the module back online. To bring the interface back online, see Recovering a Quarantined Offline Interface, on page 106.

Recovering a Quarantined Offline Interface

You can recover and bring online an interface that is offline and has been quarantined.

Before you begin

- Log in to the CLI in EXEC mode.

Procedure

Step 1 Verify that the interface has been quarantined. The interface appears in the **show** command output.

show port-profile sync-status

Step 2 On vCenter Server, add or associate the PNIC to a port profile (either the original port profile or a different port profile).

The interface comes back online.

Step 3 Verify that the interface has come back online.

show interface brief

Step 4 Verify the port profile-to-interface mapping.

show port-profile virtual usage

Step 5 Verify the interface has come out of quarantine automatically. The interface should no longer appear in the **show** command output.

show port-profile sync-status

Step 6 Return shutdown control to the port profile.

default shutdown

Port Profile Logs

To enable and collect detailed logs for port profiles, use the following commands:

- **debug port-profile trace**
- **debug port-profile error**
- **debug port-profile all**
- **debug msp all**

After enabling the debug log, the results of any subsequent port profile configuration are captured in the log file.

Port Profile Troubleshooting Commands

Command	Purpose	Example
show port-profile	Displays the state of a module.	show port-profile, on page 108
show port-profile name *name*	Displays the configuration for a named port profile.	show port-profile, on page 108
show port-profile brief	Displays a tabular view of all configured port profiles.	show port-profile, on page 108
show port-profile expand-interface	Displays all configured port profiles expanded to include the interfaces assigned to them.	show port-profile expand-interface, on page 109
show port-profile expand-interface name *name*	Displays a named port profile expanded to include the interfaces assigned to it.	show port-profile expand-interface, on page 109
show running-config port-profile *interface_number*	Displays the port profile configuration.	show running-config port-profile, on page 110
show port-profile-role	Displays the port profile role configuration, including role names, descriptions, assigned users, and assigned groups.	show port-profile-role, on page 110
show port-profile-role users	Displays the available users and groups.	show port-profile-role, on page 110
show port-profile sync-status	Displays the interfaces that are not synchronized with the port profile.	show port-profile sync-status, on page 110
show port-profile virtual usage	Displays the port profile usage by interface.	show port-profile virtual usage, on page 111

Command	Purpose	Example
show msp internal info	Displays the port profile mappings on vCenter Server and configured roles.	show msp internal info, on page 111
show system internal port-profile profile-fsm	Displays the port profile activity on Cisco Nexus 1000V, including transitions such as inherits and configurations. If the following message is displayed, then all inherits are processed: `Curr state: [PPM_PROFILE_ST_SIDLE]`	show system internal port-profile, on page 113
show system internal port-profile event-history msgs	Displays the messages logged about port profile events within Cisco Nexus 1000V.	show system internal port-profile, on page 113

Command Examples

show port-profile

```
switch# show port-profile
port-profile 1
type: Vethernet
description:
status: enabled
max-ports: 1
min-ports: 1
inherit:
config attributes:
switchport mode access
ip port access-group acl1 in
capability vxlan
no shutdown
evaluated config attributes:
switchport mode access
ip port access-group acl1 in
capability vxlan
no shutdown
assigned interfaces:
port-group: 1
system vlans: none
capability l3control: no
capability iscsi-multipath: no
capability vxlan: yes
capability l3-vservice: no
port-profile role: none
port-binding: static
switch#
```

```
switch# show port-profile name vEthProfile3
port-profile 1
type: Vethernet
description:
status: enabled
max-ports: 1
min-ports: 1
inherit:
```

```
config attributes:
switchport mode access
ip port access-group acl1 in
capability vxlan
no shutdown
evaluated config attributes:
switchport mode access
ip port access-group acl1 in
capability vxlan
no shutdown
assigned interfaces:
port-group: 1
system vlans: none
capability l3control: no
capability iscsi-multipath: no
capability vxlan: yes
capability l3-vservice: no
port-profile role: none
port-binding: static
switch#
```

```
switch# show port-profile brief
VM_PP_NIC8_VLAN_1338 Vethernet 1 3 3 374 0
VM_PP_NIC9_VLAN_1339 Vethernet 1 3 3 374 0
--------------------------------------------------------------------------------
Profile Assigned Total Sys Parent Child UsedBy
Type Intfs Prfls Prfls Prfls Prfls Prfls
--------------------------------------------------------------------------------
Vethernet 3549 1524 7 1524 0 18
Ethernet 10 11 4 11 0 8
DAO-VSM#
Vethernet 8
Ethernet 10
switch#
```

show port-profile expand-interface

```
switch# show port-profile expand-interface
port-profile 50
Vethernet6
switchport mode access
switchport access vlan 50
no shutdown
Vethernet27
switchport mode access
switchport access vlan 50
no shutdown
Vethernet30
switchport mode access
switchport access vlan 50
no shutdown
Vethernet31
switchport mode access
switchport access vlan 50
no shutdown
Vethernet32
switchport mode access
switchport access vlan 50
no shutdownport-profile AccessProf
id: 1
capability: 0x0
state: 0x0
switch#
```

```
switch# show port-profile expand-interface name UplinkProfile1
port-profile UplinkProfile1
Ethernet2/2
     switchport mode trunk
     switchport trunk allowed vlan 110-119
     no shutdown
switch#
```

show running-config port-profile

```
switch# show running-config port-profile
port-profile type ethernet UplinkProfile1
description "Profile for critical system ports"
vmware port-group
switchport mode access
switchport access vlan 113
switchport trunk native vlan 113
channel-group auto mode on
no shutdown
port-profile type vethernet vEthProfile2
vmware port-group
vmware max-ports 5
switchport mode trunk
switchport trunk native vlan 112
channel-group auto mode on sub-group cdp
no shutdown
switch#
```

show port-profile-role

```
switch# show port-profile-role name adminUser
Name: adminUser
Description: adminOnly
Users:
hdbaar (user)
Assigned port-profiles:
allaccess2
switch#
```

```
switch# show port-profile-role users
Groups:
Administrators
TestGroupB
Users:
hdbaar
fgreen
suchen
mariofr
switch#
```

show port-profile sync-status

```
switch# show port-profile sync-status interface ethernet 3/2
Ethernet3/2
port-profile: uplink
interface status: quarantine
sync status: out of sync
cached commands:
errors:
command cache overrun
recovery steps:
bring interface online
switch#
```

show port-profile virtual usage

```
switch# show port-profile virtual usage
--------------------------------------------------------------------------------
Port Profile Port Adapter Owner
--------------------------------------------------------------------------------
n1kv-uplink0 Po1
Eth3/2 vmnic1 localhost.
Eth3/3 vmnic2 localhost.
vlan1767 Veth7 Net Adapter 1 all-tool-7
Veth8 Net Adapter 1 all-tool-8
aipc1765 Veth4 Net Adapter 1 bl-h-s
inband/outband interface 1766 Veth6 Net Adapter 3 bl-h-s
mgmt1764 Veth5 Net Adapter 2 bl-h-s
vpc-mac-uplink Po7
Eth5/2 vmnic1 localhost.
Eth5/3 vmnic2 localhost.
ch-vpc-mac-uplink Po2
Po3
Eth4/2 vmnic1 VDANIKLNCOS
Eth4/3 vmnic2 VDANIKLNCOS
ch-aipc1765 Veth1 Net Adapter 1 bl-h-p
ch-mgmt1764 Veth2 Net Adapter 2 bl-h-p
ch-inband/outband interface1766 Veth3 Net Adapter 3 bl-h-p
switch#
```

show msp internal info

```
switch# show msp internal info
port-profile Access484
id: 5
capability: 0x0
state: 0x1
type: 0x1
system vlan mode: -
system vlans:
port-binding: static
max ports: 256
vmware config information
pg name: Access484
dvs: (ignore)
port-profile role:
alias information:
pg id: Access484
dvs uuid:
type: 1
pg id: dvportgroup-3285
dvs uuid: 44 dc 3b 50 53 11 b7 ac-ef ed ef 46 ee df c2 d5
type: 2
pg id: dvportgroup-3292
dvs uuid: 44 dc 3b 50 53 11 b7 ac-ef ed ef 46 ee df c2 d5
type: 2
port-profile Unused_Or_Quarantine_Uplink
id: 1
capability: 0x1
state: 0x1
type: 0x1
system vlan mode: -
system vlans:
port-binding: static
max ports: 32
vmware config information
pg name: Unused_Or_Quarantine_Uplink
```

```
dvs: (ignore)
port-profile role:
alias information:
pg id: Unused_Or_Quarantine_Uplink
dvs uuid:
type: 1
pg id: dvportgroup-2444
dvs uuid: 44 dc 3b 50 53 11 b7 ac-ef ed ef 46 ee df c2 d5
type: 2
port-profile Unused_Or_Quarantine_Veth
id: 2
capability: 0x0
state: 0x1
type: 0x1
system vlan mode: -
system vlans:
port-binding: static
max ports: 32
vmware config information
pg name: Unused_Or_Quarantine_Veth
dvs: (ignore)
port-profile role:
alias information:
pg id: Unused_Or_Quarantine_Veth
dvs uuid:
type: 1
pg id: dvportgroup-2445
dvs uuid: 44 dc 3b 50 53 11 b7 ac-ef ed ef 46 ee df c2 d5
type: 2
port-profile eth-break-deinherit
id: 10
capability: 0x1
state: 0x1
type: 0x1
system vlan mode: -
system vlans:
port-binding: static
max ports: 32
vmware config information
pg name: eth-break-deinherit
dvs: (ignore)
port-profile role:
alias information:
pg id: eth-break-deinherit
dvs uuid:
type: 1
pg id: dvportgroup-3286
dvs uuid: 44 dc 3b 50 53 11 b7 ac-ef ed ef 46 ee df c2 d5
type: 2
pg id: dvportgroup-3293
dvs uuid: 44 dc 3b 50 53 11 b7 ac-ef ed ef 46 ee df c2 d5
type: 2
port-profile uplink
id: 3
capability: 0x3
state: 0x1
type: 0x1
system vlan mode: trunk
system vlans: 480-481
port-binding: static
max ports: 32
vmware config information
pg name: uplink
dvs: (ignore)
```

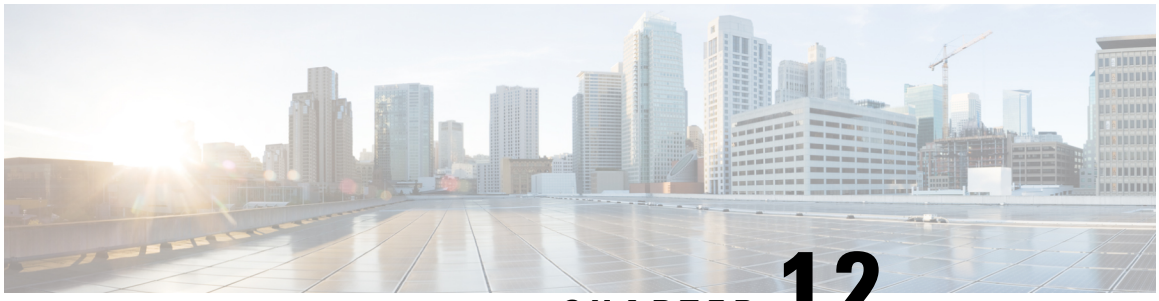
```
port-profile role:
alias information:
pg id: uplink
dvs uuid:
type: 1
pg id: dvportgroup-3283
dvs uuid: 44 dc 3b 50 53 11 b7 ac-ef ed ef 46 ee df c2 d5
type: 2
...
```

show system internal port-profile

```
switch# show system internal port-profile profile-fsm
>>>>FSM: <PROFILE_FSM:1> has 4 logged transitions<<<<<
1) FSM:<PROFILE_FSM:1> Transition at 856903 usecs after Tue Mar 8 19:11:47 2011
Previous state: [PPM_PROFILE_ST_SIDLE]
Triggered event: [PPM_PROFILE_EV_EIF_STATUS_CHANGE]
Next state: [PPM_PROFILE_ST_SIDLE]
2) FSM:<PROFILE_FSM:1> Transition at 858442 usecs after Tue Mar 8 19:11:47 2011
Previous state: [PPM_PROFILE_ST_SIDLE]
Triggered event: [PPM_PROFILE_EV_ELEARN]
Next state: [PPM_PROFILE_ST_SIF_CREATE]
3) FSM:<PROFILE_FSM:1> Transition at 842710 usecs after Tue Mar 8 19:12:04 2011
Previous state: [PPM_PROFILE_ST_SIF_CREATE]
Triggered event: [PPM_PROFILE_EV_EACKNOWLEDGE]
Next state: [FSM_ST_NO_CHANGE]
4) FSM:<PROFILE_FSM:1> Transition at 873872 usecs after Tue Mar 8 19:12:04 2011
Previous state: [PPM_PROFILE_ST_SIF_CREATE]
Triggered event: [PPM_PROFILE_EV_ESUCCESS]
Next state: [PPM_PROFILE_ST_SIDLE]
Curr state: [PPM_PROFILE_ST_SIDLE]
switch#
```

```
switch# show system internal port-profile event-history msgs
1) Event:E_MTS_RX, length:60, at 538337 usecs after Tue Mar 8 19:13:02 2011
[NOT] Opc:MTS_OPC_IM_IF_CREATED(62467), Id:0X0000B814, Ret:SUCCESS
Src:0x00000101/175, Dst:0x00000101/0, Flags:None
HA_SEQNO:0X00000000, RRtoken:0x00000000, Sync:UNKNOWN, Payloadsize:120
Payload:
0x0000: 00 00 00 02 00 00 00 02 00 00 00 0c 00 00 00 29
2) Event:E_MTS_RX, length:60, at 515030 usecs after Tue Mar 8 19:13:02 2011
[NOT] Opc:MTS_OPC_LC_ONLINE(1084), Id:0X0000B7E8, Ret:SUCCESS
Src:0x00000101/744, Dst:0x00000101/0, Flags:None
HA_SEQNO:0X00000000, RRtoken:0x00000000, Sync:UNKNOWN, Payloadsize:234
Payload:
0x0000: 02 00 00 03 00 00 00 00 00 00 03 02 03 02 00 00
3) Event:E_MTS_RX, length:60, at 624319 usecs after Tue Mar 8 19:12:05 2011
[NOT] Opc:MTS_OPC_PPM_INTERFACE_UPDATE(152601), Id:0X00003908, Ret:SUCCESS
Src:0x00000101/489, Dst:0x00000101/0, Flags:None
HA_SEQNO:0X00000000, RRtoken:0x00000000, Sync:UNKNOWN, Payloadsize:107
Payload:
0x0000: 00 00 00 02 00 00 00 02 00 00 00 0c 00 00 00 26
4) Event:E_MTS_RX, length:60, at 624180 usecs after Tue Mar 8 19:12:05 2011
[NOT] Opc:MTS_OPC_PPM_INTERFACE_UPDATE(152601), Id:0X00003905, Ret:SUCCESS
Src:0x00000101/489, Dst:0x00000101/0, Flags:None
HA_SEQNO:0X00000000, RRtoken:0x00000000, Sync:UNKNOWN, Payloadsize:107
Payload:
0x0000: 00 00 00 02 00 00 00 02 00 00 00 0c 00 00 00 26
5) Event:E_MTS_RX, length:60, at 624041 usecs after Tue Mar 8 19:12:05 2011
[NOT] Opc:MTS_OPC_PPM_INTERFACE_UPDATE(152601), Id:0X00003903, Ret:SUCCESS
Src:0x00000101/489, Dst:0x00000101/0, Flags:None
HA_SEQNO:0X00000000, RRtoken:0x00000000, Sync:UNKNOWN, Payloadsize:107
Payload:
```

```
0x0000: 00 00 00 02 00 00 00 02 00 00 00 0c 00 00 00 26
...
```



CHAPTER 12

Port Channels and Trunking

This chapter describes how to identify and resolve problems related to port channels and trunking. This chapter contains the following sections:

Information About Port Channels and Trunking

Port Channel Overview

Port channels aggregate multiple physical interfaces into one logical interface to provide higher bandwidth, load balancing, and link redundancy.

A port channel performs the following functions:

- Increases the aggregate bandwidth on a link by distributing traffic among all functional links in the channel.
- Balances load across multiple links and maintains optimum bandwidth usage.
- Provides high availability. If one link fails, traffic carried previously on this link is switched to the remaining links. If a link goes down in a port channel, the upper protocol is not aware of it. To the upper protocol, the link is still there although the bandwidth is diminished. The MAC address tables are not affected by link failures.

Port Channel Restrictions

The following are port channel restrictions:

- Port channels do not support ACLs.
- Port channels do not support NetFlow.

Trunking Overview

Trunking, also known as VLAN trunking, enables interconnected ports to transmit and receive frames through more than one VLAN over the same physical link. Trunking and port channels function as follows:

- Port channels enable several physical links to be combined into one aggregated logical link.
- Trunking enables a link to carry (trunk) the traffic for multiple VLANs.

Guidelines for Troubleshooting Asymmetric Port Channels

When you are troubleshooting asymmetric port channels, follow these guidelines:

- Use APC when you want to configure a port channel whose members are connected to two different upstream switches.
- APC depends on Cisco Discovery Protocol (CDP). Make sure CDP is enabled on the VSM and upstream switches.
- Physical ports within an APC get assigned subgroup IDs based on the CDP information received from upstream switches.
- You can manually configure subgroup IDs in interface configuration submode.
- Make sure that you configure subgroup CDP either with a port profile or on the port channel interface.
- Ports in APC come up only when they are assigned subgroup IDs manually or through CDP.
- Enter the **show cdp neighbors** command on the VSM and check the output.
- After the ports come up, check that ports are put in the correct subgroups by entering the **module vem** *module-number* **execute vemcmd show pc** command on the VEM.
- Use the **debug port-channel trace** command to collect information.

Initial Troubleshooting Checklist

Use the following checklist to begin troubleshooting port channel and trunking issues:

Checklist	Completion Status
Use the **show port-channel compatibility-parameters** command to determine the port channel requirements.	
Ensure that all interfaces in the port channel have the same destination device for Link Aggregation Control Protocol (LACP) channels. By using the Asymmetric Port Channel (APC) feature in Cisco Nexus 1000V, the ports in ON mode channel can be connected to two different destination devices. **Note** APC is supported only on mode channels. It is not supported for LACP channels.	
Verify that either side of a port channel is connected to the same number of interfaces.	
Verify that each interface is connected to the same type of interface on the other side.	
Verify that all required VLANs on a trunk port are in the allowed VLAN list.	
Verify that all the members trying to form a port channel are on the same module.	

Checklist	Completion Status
Verify that the port channel configuration is present in the profile used by the physical ports.	
Configure APC if the ports are connected to different upstream switches.	
If the upstream switch does not support port channels, make sure that you configure APC in the profile. In addition, make sure that you have no more than two ports in the APC.	

Problems with Port Channels and Trunking

A Port Channel Cannot be Created

Possible Cause	Solution
The maximum number of port channels has been reached for the system.	Enter the **show port-channel summary** command to verify the number of port channels already configured. You can have a maximum of 256 port channels on Cisco Nexus 1000V.

Newly-Added Interface Does Not Come Online In a Port Channel

Possible Cause	Solution
The port channel mode is on.	1. Make sure that you have the port channel configuration in the port profile (port group) used by that interface. 2. Check if a port channel is already present on the module that is using the same port profile. If there is, check the running configuration on the port channel and the newly added interface. The interface does not come up if the port channel configurations are different. 3. If the port channel configuration is different, apply the difference on the newly added interface. Remove the port and then add it back.
Interface parameters are not compatible with those of the existing port.	To force the physical interface to take on the parameters of the port channel, see Forcing Port Channel Characteristics onto an Interface, on page 117. Use this procedure only if you want to configure the port channel manually and not through the port profile.

Forcing Port Channel Characteristics onto an Interface

You can force the physical interface to take on the characteristics of the port channel. Use this procedure only if you want to configure the port channel manually and not through the port profile.

Before you begin

- Log in to the CLI in configuration mode.

- Make sure that the forced interface has the same speed, duplex, and flow control settings as the channel group.

Procedure

Step 1 Enter the interface configuration mode using the **interface ethernet** *slot/port* command.

You are placed into interface configuration mode.

Example:

```
switch(config)# interface ethernet 1/4
switch(config-if)
```

Step 2 Force the physical interface with an incompatible configuration to join the channel group using the **channel-group** *channel-number* **force** command.

The physical interface with an incompatible configuration is forced to join the channel group.

Example:

```
switch(config-if)# channel-group 5 force
switch(config-if)
```

Verifying a Port Channel Configuration

You can debug port channels configured through a port profile.

Before you begin

Log in to the CLI in configuration mode.

Procedure

Step 1 Verify that you have configured a port channel in the profile.

switch# **show port-profile name** *profile-name*

Step 2 Display summary port channel information.

switch# **show port-channel summary**

Step 3 Debug the port channel configuration.

switch# **debug port-channel trace**

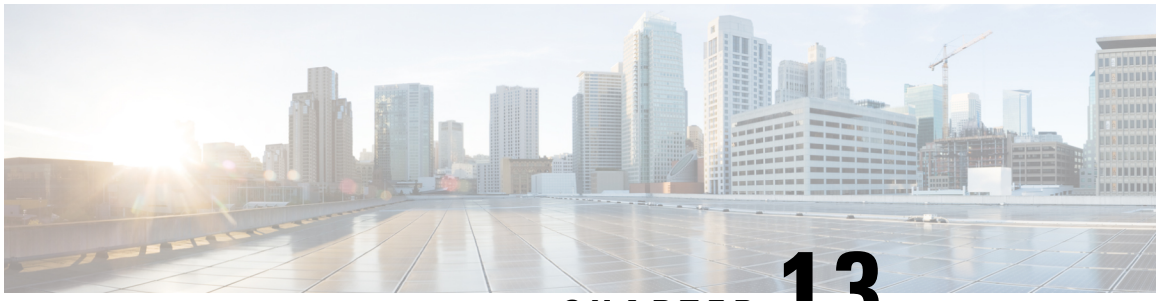
VLAN Traffic Does Not Traverse Trunk

Possible Cause	Solution
A VLAN is not in the allowed VLAN list.	Add the VLAN to the allowed VLAN list. Use the **switchport trunk allowed vlan add** *vlan-id* command in the profile used by the interface.

Port Channels and Trunking Troubleshooting Commands

The following commands help you to troubleshoot port channels and trunking:

- **show port-channel summary**
- **show port-channel internal event-history interface port-channel** *channel-number*
- **show port-channel internal event-history interface ethernet** *slot-number*
- **show system internal ethpm event-history interface port-channel** *channel-number*
- **show system internal ethpm event-history interface ethernet** *slot-number*
- **show vlan internal trunk interface ethernet** *slot-number*
- **show vlan internal trunk interface port-channel** *channel-number*
- **debug port-channel error**
- **module vem** *module-number* **execute vemcmd show port**
- **module vem** *module-number* **execute vemcmd show pc**
- **module vem** *module-number* **execute vemcmd show trunk**



CHAPTER 13

Layer 2 Switching

This chapter describes how to identify and resolve problems related to Layer 2 switching. This chapter contains the following sections:

Information About Layer 2 Ethernet Switching

Cisco Nexus 1000V is a distributed Layer 2 virtual switch that extends across many virtualized hosts.

It consists of two components:

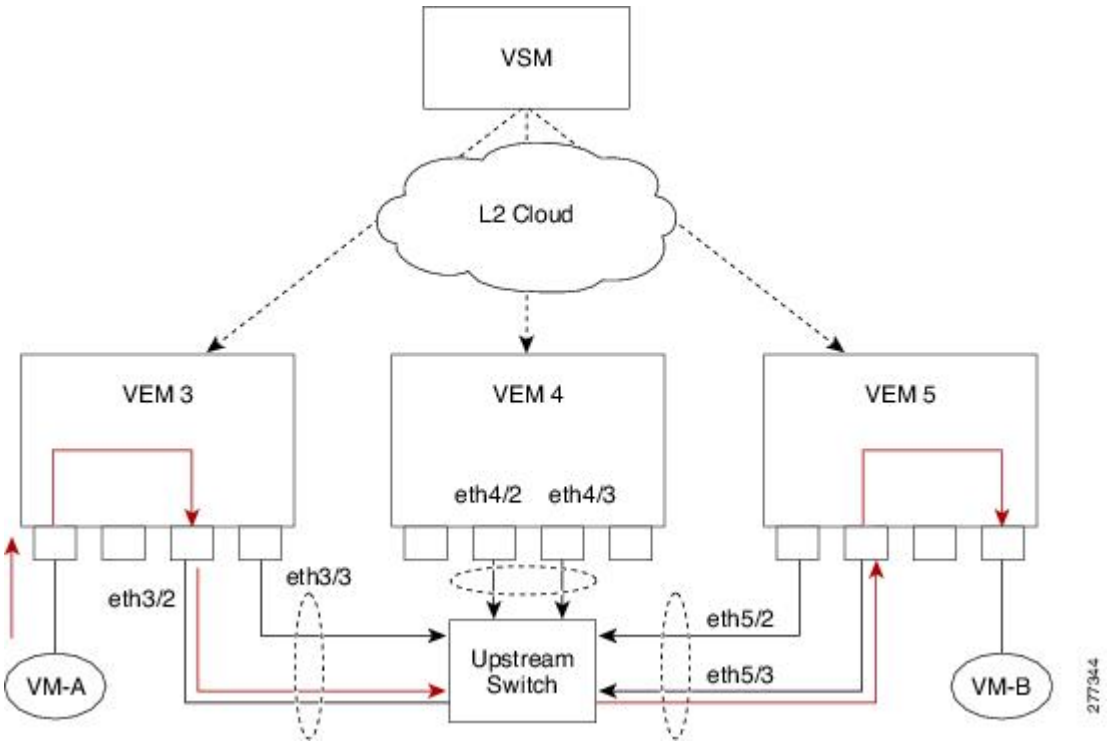
- The Virtual Supervisor Module (VSM), which is also known as the control plane (CP). The VSM acts as the supervisor and contains the Cisco CLI, configuration, and high-level features.
- The Virtual Ethernet Module (VEM), which is also known as the data plane (DP). The VEM acts as a line card and runs in each virtualized server to handle packet forwarding and other localized functions.

Port Model

Viewing Ports from the VEM

Cisco Nexus 1000V differentiates between virtual and physical ports on each of the VEMs. The following figure shows how ports on Cisco Nexus 1000V are bound to physical and virtual VMware ports within a VEM.

Figure 1: VEM View of Ports



On the virtual side of the switch, the following three layers of ports are mapped together:

- Virtual NICs—Three types of Virtual NICs are in VMware. The virtual NIC (vnic) is part of the VM and represents the physical port of the host that is plugged into the switch. The virtual kernel NIC (VTEP) is used by the hypervisor for management, VMotion, iSCSI, network file system (NFS), and other network access needed by the kernel. This interface carries the IP address of the hypervisor itself and is also bound to a virtual Ethernet port. The vswif (not shown) appears only in CoS-based systems and is used as the VMware management port. Each type maps to a virtual Ethernet port within Cisco Nexus 1000V.
- Virtual Ethernet Ports (VEth)—A vEth port is a port on Cisco Nexus 1000V. Cisco Nexus 1000V has a flat space of vEth ports 0..N. The virtual cable plugs into these vEth ports that are moved to the host running the VM.

  Virtual Ethernet ports are assigned to port groups.
- Local Virtual Ethernet Ports (lveth)—Each host has a number of local vEth ports. These ports are dynamically selected for vEth ports that are needed on the host.

  These local ports do not move and are addressable by the module/port number method.

On the physical side of the switch, from bottom to top, are the following:

- Each physical NIC in VMware is represented by an interface called a vmnic. The vmnic number is allocated during VMware installation, or when a new physical NIC is installed, and remains the same for the life of the host.
- Each uplink port on the host represents a physical interface. It acts like an lveth port, but because physical ports do not move between hosts, the mapping is 1:1 between an uplink port and a vmnic.

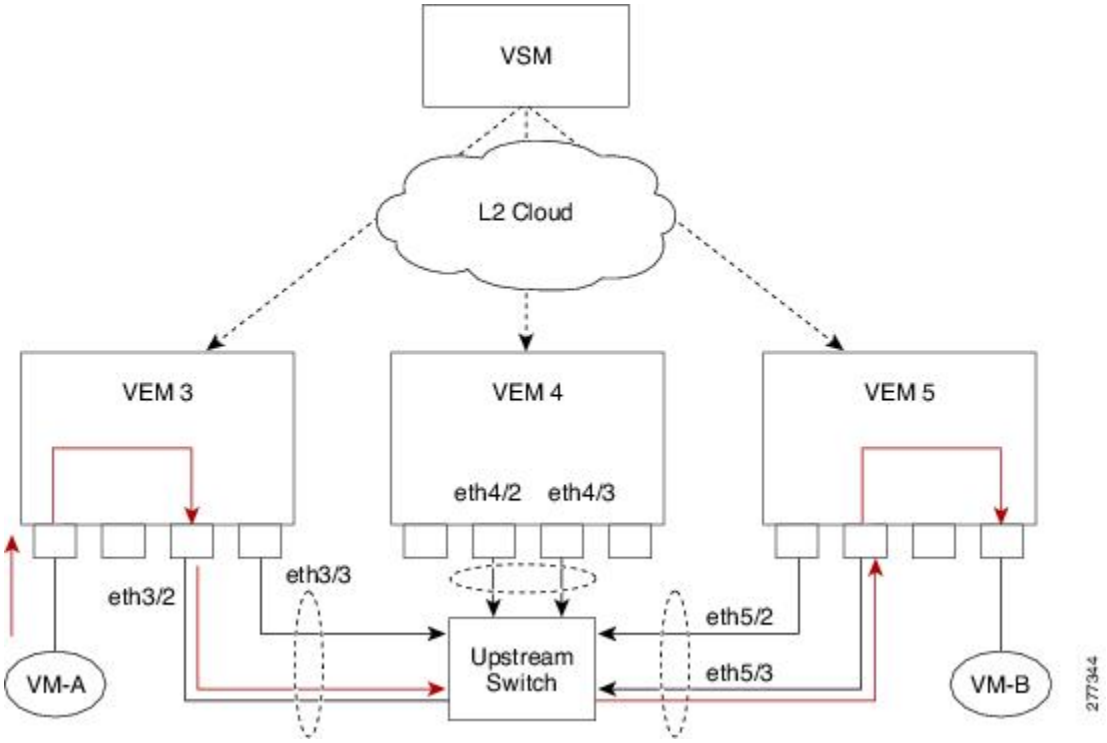
- Each physical port added to Cisco Nexus 1000V switch appears as a physical Ethernet port, just as it would on a hardware-based switch.

The uplink port concept is handled entirely by VMware and is used to associate port configuration with vmnics. There is no fixed relationship between the uplink number and vmnic number. These can be different on different hosts and can change throughout the life of the host. On the VSM, the Ethernet interface number, such as ethernet 2/4, is derived from the vmnic number, not the uplink number.

Viewing Ports from the VSM

The following figure shows the VSM view ports.

Figure 2: VEM View of Ports



Port Types

The following types of ports are available:

- vEths can be associated with any one of the following:
  - VNICs of a Virtual Machine on the ESX host.
  - VTEPs of the ESX Host
  - VSWIFs of an ESX COS Host.
- Eths (physical Ethernet interfaces)—Correspond to the Physical NICs on the ESX host.
- Po (port channel interfaces)—The physical NICs of an ESX Host can be bundled into a logical interface. This logical bundle is referred to as a port channel interface.

For more information about Layer 2 switching, see the *Cisco Nexus 1000V Layer 2 Switching Configuration Guide*.

Layer 2 Switching Problems

Verifying a Connection Between VEM Ports

You can verify a connection between two vEth ports on a VEM.

Procedure

Step 1 View the state of the VLANs associated with the port. If the VLAN associated with a port is not active, the port may be down. In this case, you must create the VLAN and activate it.

switch# **show vlan** *vlan-id*

Step 2 View the state of the ports on the VSM.

switch# **show interface brief**

Step 3 Display the ports that are present on the VEM, their local interface indices, VLAN, type (physical or virtual), port mode and port name.

switch# **module vem** *module-number* **execute vemcmd show port**

The key things to look for in the output are as follows:

- State of the port. Make sure that the state of the port is up. If not, verify the configuration of the port on the VSM.
- CBL.
- Mode.
- Attached device name.
- The LTL of the port that you are trying to troubleshoot. It will help you to identify the interface quickly in other VEM commands where the interface name is not displayed.

Step 4 View the VLANs and port lists on a particular VEM.

switch# **module vem** *module-number* **execute vemcmd show bd**

If you are trying to verify that a port belongs to a particular VLAN, make sure that you see the port name or LTL in the port list of that VLAN.

Verifying a Connection Between VEMs

You can verify a connection between vEth ports on two separate VEMs.

Procedure

Step 1 Check if the VLAN associated with the port is created on the VSM.

switch# **show vlan**

Step 2 Check if the ports are up in the VSM.

switch# **show interface brief**

Step 3 On the VEM, check if the CBL state of the two ports is set to the value of 1 for forwarding (active).

switch# **module vem 3 execute vemcmd show port**

Step 4 On the VEM, check if the two vEth ports are listed in the flood list of the VLAN with which they are trying to communicate.

switch# **module vem 3 execute vemcmd show bd**

Step 5 Verify that the uplink switch to which the VEMs are connected is carrying the VLAN to which the ports belong.

Step 6 Find out the port on the upstream switch to which the PNIC (that is supposed to be carrying the VLAN) on the VEM is connected to.

switch# **show cdp neighbors**

Example:

```
switch# show cdp neighbors
Capability Codes: R - Router, T - Trans-Bridge, B - Source-Route-Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater,
                  V - VoIP-Phone, D - Remotely-Managed-Device,
                  s - Supports-STP-Dispute
Device ID              Local Intrfce   Hldtme Capability  Platform      Port ID
swordfish-6k-2         Eth5/2        168    R S I       WS-C6506-E    Gig1/38
```

The PNIC (Eth 5/2) is connected to swordfish-6k-2 on port Gig1/38.

Step 7 Log in to the upstream switch and make sure that the port is configured to allow the VLAN that you are looking for.

Example:

```
switch# show running-config interface gigabitEthernet 1/38
Building configuration...
Current configuration : 161 bytes
!
interface GigabitEthernet1/38
 description Srvr-100:vmnic1
 switchport
 switchport trunk allowed vlan 1,60-69,231-233
 switchport mode trunk
end
```

As this output shows, VLANs 1, 60-69, 231-233 are allowed on the port. If a particular VLAN is not in the allowed VLAN list, make sure to add it to the allowed VLAN list of the port.

Isolating Traffic Interruptions

You can isolate the cause for no traffic passing across VMs on different VEMs.

Procedure

Step 1 In the output of the **show port-profile name** command, verify the following information:

- The control and packet VLANs that you configured are present (in the example, these are 3002 and 3003).
- If the physical NIC in your configuration carries the VLAN for the VM, that VLAN is also present in the allowed VLAN list.

Example:

```
switch# show port-profile name alluplink
port-profile alluplink
  description:
  status: enabled
  system vlans: 3002,3003
  port-group: alluplink
  config attributes:
    switchport mode trunk
    switchport trunk allowed vlan 1,80,3002,610,620,630-650
    no shutdown
  evaluated config attributes:
    switchport mode trunk
    switchport trunk allowed vlan 1,80,3002,3003,610,620,630-650
    no shutdown
  assigned interfaces:
    Ethernet2/2
```

Step 2 Inside the VM, verify that the Ethernet interface is up by using the **ifconfig -a** command.

If not, delete that NIC from the VM, and add another NIC.

Step 3 Using any sniffer tool, verify that ARP requests and responses are received on the VM interface.

Step 4 On the upstream switch, look for the association between the IP and the MAC address by using the **debug arp** and **show arp** commands.

Example:

```
switch# debug arp
ARP packet debugging is on
11w4d: RARP: Rcvd RARP req for 0050.56b7.3031
11w4d: RARP: Rcvd RARP req for 0050.56b7.3031
11w4d: RARP: Rcvd RARP req for 0050.56b7.4d35
11w4d: RARP: Rcvd RARP req for 0050.56b7.52f4
11w4d: IP ARP: rcvd req src 10.78.1.123 0050.564f.3586, dst 10.78.1.24 Vlan3002
11w4d: RARP: Rcvd RARP req for 0050.56b7.3031
switch#

switch# show arp
Protocol  Address          Age (min)  Hardware Addr   Type   Interface
Internet  10.78.1.72             -   001a.6464.2008  ARPA
Internet  7.114.1.100            -   0011.bcac.6c00  ARPA   Vlan140
Internet  41.0.0.1               -   0011.bcac.6c00  ARPA   Vlan410
Internet  7.61.5.1               -   0011.bcac.6c00  ARPA   Vlan1161
Internet  10.78.1.5              -   0011.bcac.6c00  ARPA   Vlan3002
Internet  7.70.1.1               -   0011.bcac.6c00  ARPA   Vlan700
```

```
Internet  7.70.3.1               -   0011.bcac.6c00  ARPA   Vlan703
Internet  7.70.4.1               -   0011.bcac.6c00  ARPA   Vlan704
Internet  10.78.1.1              0   0011.bc7c.9c0a  ARPA   Vlan3002
Internet  10.78.1.15             0   0050.56b7.52f4  ARPA   Vlan3002
Internet  10.78.1.123           0   0050.564f.3586  ARPA   Vlan3002
```

Layer 2 Switching Troubleshooting Commands

You can use the commands in this section to troubleshoot problems related to the Layer 2 MAC address configuration.

Command	Purpose
show mac address-table	Displays the MAC address table to verify all MAC addresses on all VEMs controlled by the VSM. See show mac address-table, on page 128.
show mac address-table module *module-number*	Displays all the MAC addresses on the specified VEM.
show mac address-table static *HHHH.WWWW.HHHH*	Displays the MAC address table static entries.
show mac address-table address *HHHH.WWWW.HHHH*	Displays the interface on which the MAC address specified is learned or configured. • For dynamic MAC addresses, if the same MAC address appears on multiple interfaces, each of them is displayed separately. • For static MAC addresses, if the same MAC address appears on multiple interfaces, only the entry on the configured interface is displayed. See show mac address-table address, on page 129
show mac address-table static | inc veth	Displays the static MAC address of vEthernet interfaces in case a VEM physical port learns a dynamic MAC address and the packet source is in another VEM on the same VSM. See show mac address-table static | inc veth, on page 129.
show running-config vlan *vlan-id*	Displays VLAN information in the running configuration.
show vlan [**all-ports** | **brief** | **id** *vlan-id* | **name** *name* | **dot1q tag native**]	Displays VLAN information as specified. See show vlan, on page 129.
show vlan summary	Displays a summary of VLAN information.
show interface brief	Displays a table of interface states. See show interface brief, on page 130.
show interface *interface_id* **mac**	Displays the MAC addresses and the burn-in MAC address for an interface.

Command	Purpose
module vem *module-number* **execute vemcmd show port**	On the VEM, displays the port state on a particular VEM. This command can only be used from the VEM. See module vem module-number execute vemcmd show, on page 130.
module vem *module-number* **execute vemcmd show bd**	For the specified VEM, displays its VLANs and their port lists. See module vem module-number execute vemcmd show, on page 130.
module vem *module-number* **execute vemcmd show trunk**	For the specified VEM, displays the VLAN state on a trunk port. • If a VLAN is forwarding (active) on a port, its CBL state should be 1. • If a VLAN is blocked, its CBL state is 0. See module vem module-number execute vemcmd show, on page 130.
module vem *module-number* **execute vemcmd show l2** *vlan-id*	For the specified VEM, displays the VLAN forwarding table for a specified VLAN. See module vem module-number execute vemcmd show, on page 130.

Command Examples

show mac address-table

The following is an example of the **show mac address-table** command. The "N1KV Internal Port" refers to an internal port created on the VEM. This port is used for control and management of the VEM and is not used for forwarding packets. The "Module" indicates the VEM on which this MAC address is seen.

Note Cisco Nexus 1000V MAC address table does not display multicast MAC addresses.

```
switch# show mac address-table
VLAN MAC Address Type Age Port Module
---------+----------------+-------+---------+------------------------------+---------
1 0002.3d11.5502 static 0 N1KV Internal Port 3
1 0002.3d21.5500 static 0 N1KV Internal Port 3
1 0002.3d21.5502 static 0 N1KV Internal Port 3
1 0002.3d31.5502 static 0 N1KV Internal Port 3
1 0002.3d41.5502 static 0 N1KV Internal Port 3
1 0002.3d61.5500 static 0 N1KV Internal Port 3
1 0002.3d61.5502 static 0 N1KV Internal Port 3
1 0002.3d81.5502 static 0 N1KV Internal Port 3
3 12ab.47dd.ff89 static 0 Eth3/3 3
342 0002.3d41.5502 static 0 N1KV Internal Port 3
342 0050.568d.5a3f dynamic 0 Eth3/3 3
343 0002.3d21.5502 static 0 N1KV Internal Port 3
343 0050.568d.2aa0 dynamic 9 Eth3/3 3
```

```
Total MAC Addresses: 13
switch#
```

show mac address-table address

The **show mac address-table address** command shows all interfaces on which a MAC is learned dynamically. In this example, the same MAC appears on Eth3/3 and Eth4/3.

```
switch# show mac address-table address 0050.568d.5a3f
VLAN MAC Address Type Age Port Module
---------+-----------------+-------+---------+------------------------------+---------
342 0050.568d.5a3f dynamic 0 Eth3/3 3
342 0050.568d.5a3f dynamic 0 Eth4/3 4
Total MAC Addresses: 1
switch#
```

show mac address-table static | inc veth

```
switch# show mac address-table static | inc veth
460 0050.5678.ed16 static 0 Veth2 3
460 0050.567b.1864 static 0 Veth1 4
switch#
```

show vlan

Tip This command shows the state of each VLAN created on the VSM.

```
switch# show vlan

VLAN Name Status Ports
---- -------------------------------- --------- -------------------------------
1 default active Eth3/3, Eth3/4, Eth4/2, Eth4/3
110 VLAN0110 active
111 VLAN0111 active
112 VLAN0112 active
113 VLAN0113 active
114 VLAN0114 active
115 VLAN0115 active
116 VLAN0116 active
117 VLAN0117 active
118 VLAN0118 active
119 VLAN0119 active
800 VLAN0800 active
801 VLAN0801 active
802 VLAN0802 active
803 VLAN0803 active
804 VLAN0804 active
805 VLAN0805 active
806 VLAN0806 active
807 VLAN0807 active
808 VLAN0808 active
809 VLAN0809 active
810 VLAN0810 active
811 VLAN0811 active
812 VLAN0812 active
813 VLAN0813 active
814 VLAN0814 active
815 VLAN0815 active
816 VLAN0816 active
```

```
817 VLAN0817 active
818 VLAN0818 active
819 VLAN0819 active
820 VLAN0820 active
VLAN Name Status Ports
---- -------------------------------- --------- -------------------------------
---- -------------------------------- --------- -------------------------------

Remote SPAN VLANs
------------------------------------------------------------------------------

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

show interface brief

```
switch# show interface brief

--------------------------------------------------------------------------------
Port VRF Status IP Address Speed MTU
--------------------------------------------------------------------------------
mgmt0 -- up 172.23.232.143 1000 1500

--------------------------------------------------------------------------------
Ethernet VLAN Type Mode Status Reason Speed Port
Interface Ch #
--------------------------------------------------------------------------------
Eth3/4 1 eth trunk up none 1000(D) --
Eth4/2 1 eth trunk up none 1000(D) --
Eth4/3 1 eth trunk up none 1000(D) --
```

module vem module-number execute vemcmd show

module vem module-number execute vemcmd show port

Tip Look for the state of the port.

```
~ # 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 1 Access l20
9 0 3969 0 2 2 VIRT UP UP 1 Access l21
10 0 115 0 2 0 VIRT UP UP 1 Access l22
11 0 3968 0 2 2 VIRT UP UP 1 Access l23
12 0 116 0 2 0 VIRT UP UP 1 Access l24
13 0 1 0 2 2 VIRT UP UP 0 Access l25
14 0 3967 0 2 2 VIRT UP UP 1 Access l26
16 1a030100 1 T 0 0 2 PHYS UP UP 1 Trunk vmnic1
17 1a030200 1 T 0 2 2 PHYS UP UP 1 Trunk vmnic2
```

module vem module-number execute vemcmd show bd

Tip If a port belongs to a particular VLAN, the port name or LTL should be in the port list for the VLAN.

```
~ # module vem 5 execute vemcmd show bd
Number of valid BDS: 8
BD 1, vdc 1, vlan 1, 2 ports
```

```
Portlist:
16 vmnic1
17 vmnic2
BD 100, vdc 1, vlan 100, 0 ports
Portlist:
BD 110, vdc 1, vlan 110, 1 ports
Portlist:
16 vmnic1
BD 111, vdc 1, vlan 111, 1 ports
Portlist:
16 vmnic1
BD 112, vdc 1, vlan 112, 1 ports
Portlist:
16 vmnic1
BD 113, vdc 1, vlan 113, 1 ports
Portlist:
16 vmnic1
BD 114, vdc 1, vlan 114, 1 ports
Portlist:
16 vmnic1
BD 115, vdc 1, vlan 115, 2 ports
Portlist:
10 l22
16 vmnic1
```

module vem module-number execute vemcmd show trunk

Tip If a VLAN is active on a port, its CBL state should be 1. If a VLAN is blocked, its CBL state is 0.

```
~ # module vem 5 execute vemcmd show trunk
Trunk port 16 native_vlan 1 CBL 1
vlan(1) cbl 1, vlan(110) cbl 1, vlan(111) cbl 1, vlan(112) cbl 1, vlan(113) cbl 1, vlan(114)
 cbl 1,vlan(115) cbl 1, vlan(116) cbl 1, vlan(117) cbl 1, vlan(118) cbl 1, vlan(119) cbl
1,
Trunk port 17 native_vlan 1 CBL 0
vlan(1) cbl 1, vlan(117) cbl 1,
~ #
```

module vem module-number execute vemcmd show l2

```
~ # module vem 5 execute vemcmd show l2
Bridge domain 115 brtmax 1024, brtcnt 2, timeout 300
Dynamic MAC 00:50:56:bb:49:d9 LTL 16 timeout 0
Dynamic MAC 00:02:3d:42:e3:03 LTL 10 timeout 0
~ #
```

Troubleshooting Microsoft NLB Unicast Mode

Microsoft Network Load Balancing (MS-NLB) is a clustering technology offered by Microsoft as part of the Windows server operating systems. Clustering enables a group of independent servers to be managed as a single system for higher availability, easier manageability, and greater scalability.

For more information about Microsoft Network Load Balancing, go to http://technet.microsoft.com/en-us/library/bb742455.aspx.

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Limitations and Restrictions for Disabling Automatic Static MAC Learning

A syslog is generated if one of the following configurations exists when you try to disable automatic static MAC learning for MS-NLB because they do not support this feature:

- PVLAN port
- Ports configured with unknown unicast flood blocking (UUFB)
- Ports configured with switchport port-security mac-address sticky

Disabling Automatic Static MAC Learning on a vEthernet Interface

You must disable automatic static MAC learning before you can successfully configure NLB on a vEthernet (vEth) interface. In interface configuration mode, enter the following commands:

```
switch(config)# int veth 1
switch(config-if)# no mac auto-static-learn
```

In port profile configuration mode, enter the following commands:

```
switch(config)# port-profile type vethernet ms-nlb
switch(config-port-prof)# no mac auto-static-learn
```

Checking Status on a VSM

If the NLB unicast mode configuration does not function, check the status of the Virtual Supervisor Module (VSM). Confirm that the **no mac auto-static-learn** command is listed in the vEth and/or port profile configurations.

In interface configuration mode, enter the following command to generate the VSM status:

```
switch(config-if)# show running-config int veth1
interface Vethernet1
inherit port-profile vm59
description Fedora117, Network Adapter 2
no mac auto-static-learn
vmware dvport 32 dvswitch uuid "ea 5c 3b 50 cd 00 9f 55-41 a3 2d 61 84 9e 0e c4"
```

In port profile configuration mode, enter the following command to generate the VSM status:

```
switch(config-port-prof)# show running-config port-profile ms-nlb
port-profile type vethernet ms-nlb
vmware port-group
switchport mode access
```

```
switchport access vlan 59
no mac auto-static-learn
no shutdown
state enabled
```

Checking Status on a VEM

If the NLB unicast mode configuration does not function, do the following to check the status of the Virtual Ethernet Module (VEM).

Procedure

Step 1 Generate the VEM status and confirm that the MS-NLB vEths are disabled.

Example:

```
~ # vemcmd show port auto-smac-learning
  LTL   VSM Port  Auto Static MAC Learning
   49      Veth4   DISABLED
   50      Veth5   DISABLED
   51      Veth6   DISABLED
```

Step 2 Generate the Layer 2 MAC address table for VLAN 59 and confirm that the MS-NLB shared-MAC (starting with 02:BF) is not listed in the Layer 2 (L2) MAC table.

Example:

```
~ # vemcmd show l2 59
Bridge domain 15 brtmax 4096, brtcnt 6, timeout 300

VLAN 59, swbd 59, ""

Flags: P - PVLAN S - Secure D - Drop

Type MAC Address LTL timeout Flags PVLAN
Dynamic 00:15:5d:b4:d7:02 305 4
Dynamic 00:15:5d:b4:d7:04 305 25
Dynamic 00:50:56:b3:00:96 51 4
Dynamic 00:50:56:b3:00:94 305 5
Dynamic 00:0b:45:b6:e4:00 305 5
Dynamic 00:00:5e:00:01:0a 51 0
```

Configuring MS NLB for Multiple VM NICs in the Same Subnet

When MS NLB VMs have more than one port on the same subnet, a request is flooded, which causes both ports to receive it. The server cannot manage this situation. As a workaround for this situation, enable Unknown Unicast Flood Blocking (UUFB).

Enabling UUFB

To enable UUFB, enter these configuration commands, one on each line. At the end, press **Cntl-Z**.

```
switch# configure terminal
```

```
switch (config)# uufb enable
switch (config)#
```

This configuration conceals the requests from the non-NLB ports and allows the system to function as it expected.

Disabling UUFB for VMs That Use Dynamic MAC Addresses

Issues might occur for VMs that use dynamic MAC addresses, other than those MAC addresses assigned by VMware. For ports that host these types of VMs, disable UUFB. To disable UUFB, enter the following commands:

```
switch(config)# int veth3
switch(config-if)# switchport uufb disable
switch(config-if)#
```

Troubleshooting BPDU Guard

BPDU Guard is one of the Spanning Tree Protocol (STP) enhancements. This feature enhances switch network reliability, manageability, and security. It prevent loops and broadcast radiation. We recommend that you enable BPDU guard on access ports so that any end user devices on these ports that have BPDU guard enabled cannot influence the topology. Any malfunctioning device connected to a virtual Ethernet port can flood the Layer 2 network with unwanted BPDUs and causes STP to break down. When you enable BPDU guard on the access-ports, it shuts down the port in the event that it receives a BPDU. To bring up a port disabled by BDPU guard, you must remove the device from the network and then restart the port by entering the **shut/no shut** command.

BPDU Guard Troubleshooting Commands

You can use the commands in this section to troubleshoot problems related to the Layer 2 MAC address configuration.

Command	Purpose
show switch edition	Displays the license edition. You must have the ADVANCED 3.0 license for BPDU guard to be enabled in DAOX. See show switch edition, on page 135.
show spanning-tree bpduguard info	Displays the switch edition and license information. See show spanning-tree bpduguard info, on page 135.
show run interface *name*	Displays the BPDU guard status on a port profile. See show run interface, on page 135.
show interface virtual spanning-tree bpduguard status	Displays the status or BPDU guard status on vEths. See show interface virtual spanning-tree bpduguard status, on page 135.

Command	Purpose
show system internal cdm info port-profile name *vm*	Displays the status of CDM push for port profile. See show system internal cdm info port-profile, on page 135.
show system internal cdm info interface *name*	Displays the status of CDM push for a vEth. See show system internal cdm info interface, on page 136.
vemcmd show card	Displays the global status of BPDU guard on a VEM. See vemcmd show card, on page 136.
vemcmd show port bpduguard	Displays the status of BPDU guard on a VSM. See vemcmd show port bpdugard, on page 136.

Command Examples

show switch edition

```
switch(config)# show switch edition
Switch Edition: ADVANCED (3.0)
Feature Status
Name State Licensed In version
------------------------------------------------------------
bpduguard enabled Y 3.0
Dynamic 00:00:5e:00:01:0a 51 0
```

show spanning-tree bpduguard info

```
switch(config)# show spanning-tree bpduguard info
Global spanning-tree bpduguard status: Enabled
```

show run interface

```
switch(config-if)# show run interface veth77
interface 77
inherit port-profile vm
description fedora20-i386-70, Network Adapter 2
spanning-tree bpduguard enable
```

show interface virtual spanning-tree bpduguard status

```
switch(config)# show interface virtual spanning-tree bpduguard status
49 Veth36 Enabled
50 Veth68 Enabled
51 Veth73 Enabled
52 Veth77 Enabled
```

show system internal cdm info port-profile

```
switch(config-if)# show system internal cdm info port-profile name vm
port-profile vm
ppid: 4
eval config:
spanning-tree bpduguard enable
no shutdown
switchport access vlan 59
switchport mode access
```

show system internal cdm info interface

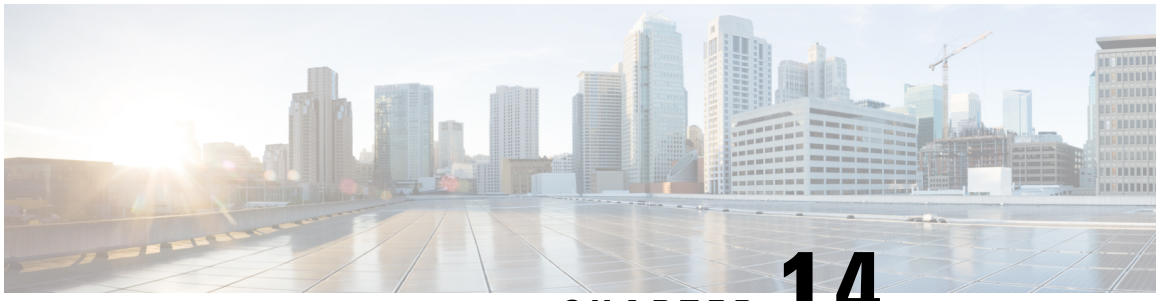
```
switch(config-if)# show system internal cdm info interface vethernet 77
interface Veth77
if_index: 0x1c0004a0
attached: vem 4
profile: vm (4)
network: none
config:
spanning-tree bpduguard enable
```

vemcmd show card

```
switch# vemcmd show card
Card UUID type 2: 35958c78-bce9-11e0-bd1d-30e4dbc2c276
Card name:
Switch name: switch
…
Licensed: Yes
Global BPDU Guard: Disabled
```

vemcmd show port bpdugard

```
switch# vemcmd show port bpduguard
LTL VSM Port BPDU-Guard
49 Veth36 -
50 Veth68 -
51 Veth73 Enabled
52 Veth77 Enabled
53 Veth9 Disabled
Debugs
vemlogs & DPA logs
Config related:


~ # vemlog debug sfport_orch all
~ # echo "debug sfcdmagent all" > /tmp/dpafifo
~ # echo "debug sfportagent all" > /tmp/dpafifo


Packet path:

# vemlog debug sflayer2 all
~ # echo "debug sfportagent all" > /tmp/dpafifo
```



CHAPTER 14

VLANs

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

Information About VLANs

VLANs can isolate devices that are physically connected to the same network but are logically considered to be part of different LANs that do not need to be aware of one another.

Guidelines for VLANs

Following are the guidelines for VLANs:

- We recommend that you use only the following characters in a VLAN name:
  - a–z or A–Z
  - 0–9
  - - (hyphen)
  - _ (underscore)
- Keep the user traffic off the management VLAN; keep the management VLAN separate from user data.
- We recommend that you enable sticky Address Resolution Protocol (ARP) when you configure private VLANs. ARP entries are learned on Layer 3 private VLAN interfaces that are sticky ARP entries. For security reasons, private VLAN port sticky ARP entries do not age out.
- IGMP runs only on the primary VLAN and uses the configuration of the primary VLAN for all secondary VLANs. Any IGMP join request in the secondary VLAN is treated as if it is received in the primary VLAN.
- Private VLANs support these Switched Port Analyzer (SPAN) features:
  - You can configure a private VLAN port as a SPAN source port.

  - You can use VLAN-based SPAN (VSPAN) on primary, isolated, and community VLANs or use SPAN on only one VLAN to separately monitor egress or ingress traffic.

- A private VLAN host or promiscuous port cannot be a SPAN destination port. If you configure a SPAN destination port as a private VLAN port, the port becomes inactive.
- A destination SPAN port cannot be an isolated port. However, a source SPAN port can be an isolated port.
- SPAN could be configured to span both primary and secondary VLANs or to span either one if you are interested only in the ingress or egress traffic.
- A MAC address learned in a secondary VLAN is placed in the shared table of the primary VLAN. When the secondary VLAN is associated to the primary VLAN, their MAC address tables are merged into one, shared MAC table.

Process for Troubleshooting VLANs

Troubleshooting a VLAN problem involves gathering information about the configuration and connectivity of individual devices and the entire network. Begin your troubleshooting activity as follows:

1. Verify the physical connectivity for any problem ports or VLANs.
2. Verify that both end devices are in the same VLAN.

A VLAN Cannot be Created

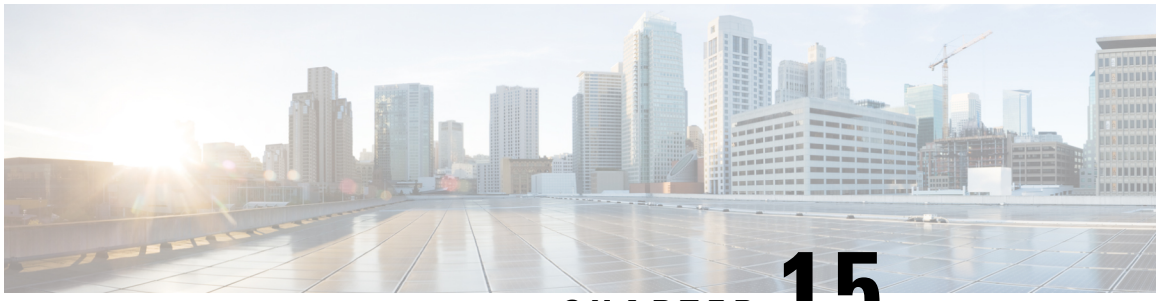
Possible Cause	Solution
Using a reserved VLAN ID	VLANs 3968 to 4047 and 4094 are reserved for internal use and cannot be changed.

VLANs Troubleshooting Commands

The following CLI commands display VLAN information:

- **show system internal private-vlan info**
- **show system internal private-vlan event-history errors**
- **show system internal private-vlan event-history traces**
- **show vlan id** *vlan-id*
- **show vlan private-vlan**
- **show vlan all-ports**
- **show vlan private-vlan type**

- **show vlan internal bd-info vlan-to-bd 1**
- **show vlan internal errors**
- **show vlan internal info**
- **show vlan internal event-history errors**



CHAPTER 15

Private VLANs

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

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
show vlan private-vlan	Displays that a private VLAN is correctly configured.
show interface *slot-port*	Displays that a physical Ethernet interface in a private VLAN trunk promiscuous mode is up.
show interface *veth-name*	Displays that a virtual Ethernet interface in private VLAN host mode is up.
module vem *module-number* **execute vemcmd show port**	Displays that a VEM is correctly configured.
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	

Command Examples

show vlan private-vlan

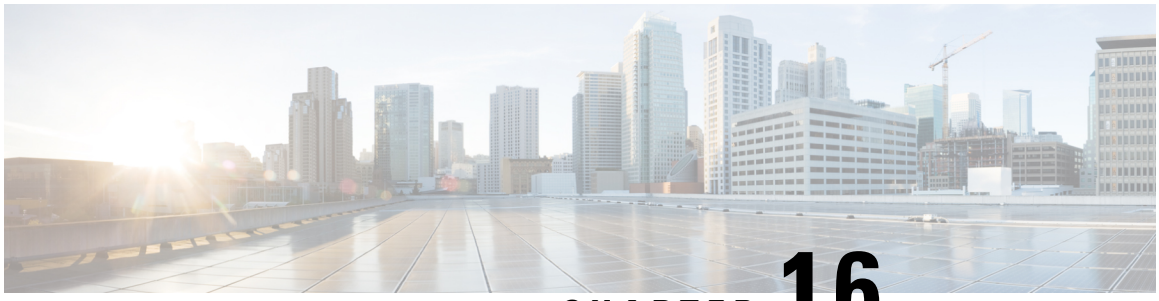
```
switch# show vlan private-vlan
Primary Secondary Type Ports
------- --------- --------------- -----------------------------------------
152 157 community
152 158 isolated
156 153 community
156 154 community
156 155 isolated
```

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
```



CHAPTER 16

NetFlow

This chapter describes how to identify and resolve problems related to NetFlow. This chapter contains the following sections:

Information About NetFlow

NetFlow allows you to evaluate IP traffic and understand how and where it flows. NetFlow gathers data that can be used in accounting, network monitoring, and network planning.

A flow is a one-directional stream of packets that arrives on a source interface (or subinterface), matching a set of criteria. You create a flow using a flow record to define the criteria for your flow. All criteria must match for the packet to count in the given flow. Flows are stored in the NetFlow cache. Flow information tells you the following:

- The source address tells you who is originating the traffic.
- The destination address tells you who is receiving the traffic.
- Ports characterize the application using the traffic.
- Class of service (CoS) examines the priority of the traffic.
- The device interface tells how traffic is being used by the network device.
- Tallied packets and bytes show the amount of traffic.

A flow record defines the information that NetFlow gathers, such as packets in the flow and the types of counters gathered per flow. You can define new flow records or use the predefined Cisco Nexus 1000V flow records.

For detailed information about configuring NetFlow, see the *Cisco Nexus 1000V System Management Configuration Guide*.

Netflow Troubleshooting Commands

Use the following commands to collect information about NetFlow process runtime configuration errors. The VEM commands (vemlog and vemcmd) are accessible on the VEM. These commands can be executed from the VSM by preceding them with **module vem** *vem-number* **execute**. Following are the examples:

- VSM command: **module vem 4 execute vemcmd show netflow monitor**
- VEM command: **vemcmd show netflow monitor**

Command	Purpose
show flow internal event-history errors	Displays event history errors.
show flow internal event-history msgs	Displays event history messages.
show flow internal ddb b	
show flow internal pdl detailed	Displays internal flow details.
module vem *module-number* **execute vemcmd show port**	Displays that a VEM is correctly configured.
show flow internal mem-stats	Displays flow memory statistics to debug memory usage and leaks.
debug logfile *filename*	Redirects the output of the following debug commands to a file stored in bootflash. • **debug nfm all** • **vemlog debug sfnetflow_cache all** • **vemlog debug sfnetflow_config all** • **vemlog debug sfnetflow_flowapi all** Enables NetFlow debugging for policy installation on the Virtual Ethernet Module (VEM). Debug messages are printed for every PDL session open, verify, and commit requests that come from the DPA.
vemlog debug sfnetflow_flowmon all	
vemlog debug sfnetflow_ager all	
vemlog debug sfnetflow all	Enables packet path debugging for NetFlow policies on the VEM. Debug messages are printed for every packet that hits a NetFlow policy. Use this command with caution. High traffic could result in lot of debug messages.
vemcmd show netflow monitor	Prints the monitor configuration.

Command	Purpose
vemcmd show netflow interface	Prints the interface configuration.
vemcmd show netflow stats	Prints the tracked configuration failures.

Common NetFlow Problems

Common NetFlow configuration problems on the VSM can occur if you attempt to do the following:

- Use undefined records, exporters, samplers, or monitors.
- Use invalid records, exporters, samplers, or monitors.
- Modify records, exporters, samplers, or monitors after they are applied to an interface.
- Configure a monitor on an interface that causes the VEM to run out of memory and results in a verification error.
- Use NetFlow in a port channel. NetFlow is not supported in port channels.
- Configure a monitor at multiple levels of a port-profile inheritance tree.

In addition, a configuration error can occur if there is a mismatch between the UDP port configured on the exporter and the port NetFlow Collector has listening turned on. A solution is to provide the version number of the original command to clear the configuration and then reattempt the command.

Debugging a Policy Verification Error

You can debug a policy verification failure due to some processing on the VSM. You can also use the policy verification procedure to collect logs for operations such as defining a flow record or tracing exporter functionality.

Procedure

Step 1 Enter the **debug nfm all** command.

Step 2 Save the Telnet SSH session buffer to a file.

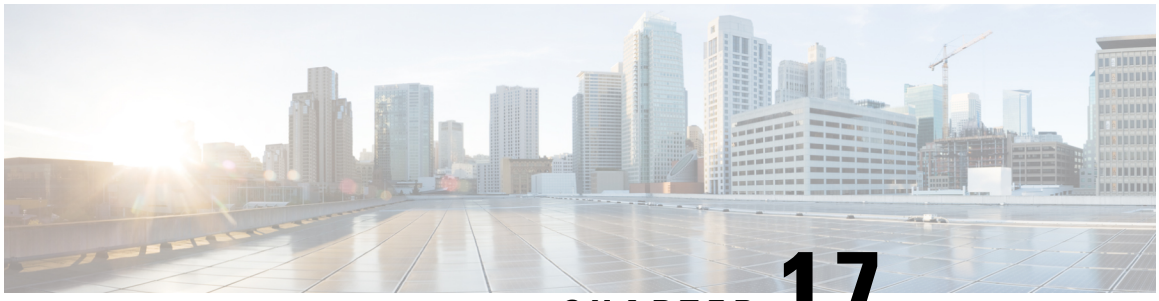
Step 3 Enter the **ip flow mon** *monitor-name direction* command.

The command executes once again and the debug traces are output to the console.

Debugging Statistics Export

When debugging a NetFlow statistics export problem, follow these guidelines:

- Ensure that the destination IP address is reachable from the VEMs and the VSM.
- Ensure that the UDP port configured on the exporter matches that used by the NetFlow Collector.
- View statistics for the exporter and identify any drops by entering the **show flow exporter** command.



CHAPTER 17

ACLs

This chapter describes how to identify and resolve problems related to Access Control Lists (ACLs). This chapter contains the following sections:

Information About Access Control Lists

An ACL is an ordered set of rules for filtering traffic. When the device determines that an ACL applies to a packet, it tests the packet against the rules. The first matching rule determines whether the packet is permitted or denied. If there is no match, the device applies a default rule. The device processes packets that are permitted and drops packets that are denied.

ACLs protect networks and specific hosts from unnecessary or unwanted traffic. For example, ACLs are used to disallow HTTP traffic from a high-security network to the Internet. ACLs also allow HTTP traffic but only to specific sites, using the IP address of the site to identify it in an IP ACL.

The following types of ACLs are supported for filtering traffic:

- IP ACLs—The device applies IP ACLs only to IP traffic.
- MAC ACLs—The device applies MAC ACLs only to non-IP traffic.
- IPv6—The device applies IPv6 ACLs only to IPv6 traffic

For detailed information about how ACL rules are used to configure network traffic, see the *Cisco Nexus 1000V Security Configuration Guide*.

ACL Configuration Limits

The following configuration limits apply to ACLs:

- You cannot have more that 128 rules in an ACL.
- The maximum number of ACLs is 128 (spread across all the ACLs) in one VEM.

ACL Restrictions

The following restrictions apply to ACLs:

- More than one IP ACL and one MAC ACL in each direction cannot be applied on an interface.
- A MAC ACL applies only to Layer 2 packets.
- VLAN ACLs are not supported.
- IP fragments are not supported on ACL rules.
- Noninitial fragments are not subject to the ACL lookup.
- In the same rule, you cannot have two not-equal-to (neq) operators.
- ACL is not supported in port channels.

Displaying ACL Policies on the VEM

Use the following commands to display configured ACL policies on the Virtual Ethernet Module (VEM):

- Command to list the ACLs installed on a server:

```
switch(config-if)# module vem 3 execute vemcmd show acl
AclId RefCnt Type Rules StatId AclName (Stats: Permit/Deny/NoMatch)
----- ------ ---- ----- ------ -----------------------------------
1 0 IPv4 1 1 v4 (Enb: 0/0/0)
2 0 IPv6 0 2 v6 (Dis: 0/0/0)
```

  AclId is the local ACL ID for this VEM. RefCnt refers to the number of instances of this ACL in this VEM.

- Command to list the interfaces on which ACLs have been installed:

```
~ # module vem 3 execute vemcmd show acl pinst
LTL    Acl-id    Dir
16       1      ingress
```

Debugging Policy Verification Issues

To debug a policy verification failure, do the following:

Note This section is applicable only to VEMs that are available in older releases. The VEMs in the latest release do not have any policy verification failure issue.

Procedure

Step 1 On the VSM, enter the **debug logfile** *filename* command to redirect the output to a file in bootflash.

Step 2 Enter the **debug aclmgr all** command.

Step 3 Enter the **debug aclcomp all** command.

For the VEMs where the policy exists, or is being applied, enter the commands in the following steps from the VSM. The output goes to the console.

Step 4 Enter the **module vem** *module-number* **execute vemdpalog debug sfaclagent all** command.

Step 5 Enter the **module vem** *module-number* **execute vemdpalog debug sfpdlagent all** command.

Step 6 Enter the **module vem** *module-number* **execute vemlog debug sfacl all** command.

Step 7 Enter the **module vem** *module-number* **execute vemlog start** command.

Step 8 Configure the policy that was causing the verification error.

Step 9 Enter the **module vem** *module-number* **execute vemdpalog show all** command.

Step 10 Enter the **module vem** *module-number* **execute vemlog show all** command.

Step 11 Save the Telnet or SSH session buffer to a file. Copy the logfile created in bootflash.

Troubleshooting ACL Logging

Using the CLI to Troubleshoot ACL Logging on a VEM

Viewing Current Flows

You can view the current flows on a VEM by using the **vemcmd show aclflows stats** command.

```
[root@esx /]# vemcmd show aclflows stats
Current Flow stats:
Permit Flows: 1647
Deny Flows: 0
Current New Flows: 419 --- current new flows yet to be reported.
```

Viewing Active Flows

You can view the active flows on a VEM by using the **vemcmd show aclflows** [**permit** | **deny**] command. If you do not specify permit or deny, the command displays both.

```
[root@esx /]# vemcmd show aclflows permit
If SrcIP DstIP SrcPort DstPort Proto Direction Action Stats
Veth4 192.168.1.20 192.168.1.10 5345 8080 6 Ingress permit 1
Veth4 192.168.1.10 192.168.1.20 8080 5769 6 Egress permit 1
Veth4 192.168.1.20 192.168.1.10 6256 8080 6 Ingress permit 1
Veth4 192.168.1.10 192.168.1.20 8080 5801 6 Egress permit 1
Veth4 192.168.1.20 192.168.1.10 5217 8080 6 Ingress permit 1
Veth4 192.168.1.10 192.168.1.20 8080 57211 6 Egress permit 1
Veth4 192.168.1.10 192.168.1.20 8080 5865 6 Egress permit 1
Veth4 192.168.1.10 192.168.1.20 8080 5833 6 Egress permit 1
Veth4 192.168.1.20 192.168.1.10 5601 8080 6 Ingress permit 1
Veth4 192.168.1.10 192.168.1.20 8080 5705 6 Egress permit 1
Veth4 192.168.1.10 192.168.1.20 8080 5737 6 Egress permit 1
Veth4 192.168.1.20 192.168.1.10 5473 8080 6 Ingress permit 1
Veth4 192.168.1.20 192.168.1.10 57211 8080 6 Ingress permit 1
```

Flushing All ACL Flows

You can use the **vemcmd flush aclflows** command to detect any new flows that affect the VEM. Clear all the existing flows, and then you can detect new flows that match any expected traffic. Syslog messages are not sent when you do this action.

Showing Flow Debug Statistics

To display internal ACL flow statistics, enter the **vemcmd show aclflows dbgstats** command. To clear all internal ACL flow debug statistics, enter the **vemcmd clear aclflows dbgstats** command.

ACL Logging Troubleshooting Scenarios

Troubleshooting a Syslog Server Configuration

If syslog messages are not being sent from the VEM, you can check the syslog server configuration and check if ACL logging is configured by entering the commands shown in the following procedure.

Before you begin

Log in to the VSM and VEM CLI.

Procedure

	Command or Action	Purpose
Step 1	**show logging ip access-list status**	Verifies that the remote syslog server is configured properly.
Step 2	**vemcmd show acllog config**	Verifies ACL logging on the VEM.
Step 3	**vemcmd show aclflows dbgstats**	Checks to see if any errors occurred.

Troubleshooting an ACL Rule That Does Not Have a Log Keyword

If the ACL rule does not have a **log** keyword, any flow that matches the ACL is not reported although the ACL statistics continue to advance. You can verify a **log** keyword.

Before you begin

Log in to the VSM and VEM CLI.

Procedure

	Command or Action	Purpose
Step 1	**show running-config aclmg**	Verifies that the **log** keyword is enabled.
Step 2	**show logging ip access-list status**	Verifies that ACL logging is configured properly.
Step 3	**vemcmd show acllog config**	Verifies ACL logging on the VEM.

Troubleshooting a Maximum Flow Limit Value That is Too Low

If the number of flows does not reach 5000 for either permit or deny flows, you can increase the maximum flows.

Before you begin

Log in to the VSM and VEM CLI.

Procedure

	Command or Action	Purpose
Step 1	**show logging ip access-list status**	Verifies that ACL logging is configured properly.
Step 2	**vemcmd show acllog config**	Verifies ACL logging on the VEM.
Step 3	**logging ip access-list cache max-deny-flows** *num*	Increases maximum flows to the desired value.

Troubleshooting a Mismatched Configuration Between a VSM and a VEM

If syslog messages are not being sent and the flow information counters are invalid, the configuration between a VSM and a VEM might be mismatched.

Modify any mismatched configurations by using the appropriate configuration command. If the problem persists, enable acllog debugging on both the VSM and the VEM and retry the commands.

Before you begin

Log in to the CLI in EXEC mode.

Procedure

	Command or Action	Purpose
Step 1	**show logging ip access-list status**	Verifies that ACL logging is configured properly.
Step 2	**vemcmd show acllog config**	Verifies ACL logging on the VEM.

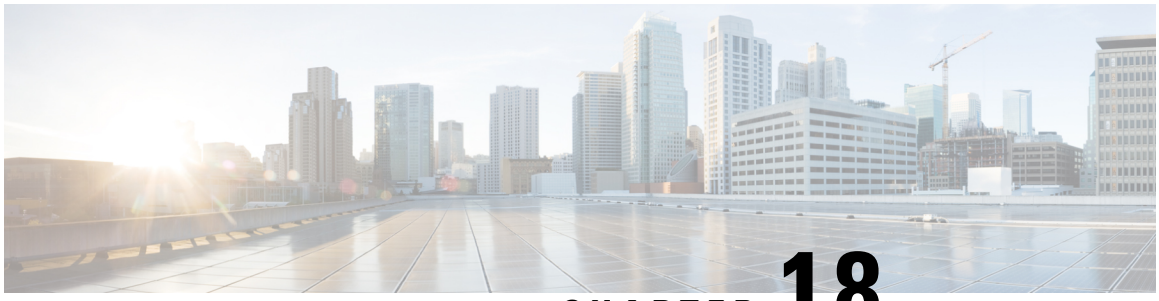
ACL Troubleshooting Commands

You can use the following commands on the VSM to see the policies that are configured and applied on the interfaces:

- Command to display configured ACLs: **show access-list summary**
- Commands to collect the run-time information of the ACLMGR during configuration errors:
  - **show system internal aclmgr event-history errors**
  - **show system internal aclmgr event-history msgs**

- **show system internal aclmgr ppf**
- **show system internal aclmgr mem-stats**
- **show system internal aclmgr status**
- **show system internal aclmgr dictionary**

- Commands to collect the run-time information of the ACLCOMP during configuration errors:
  - **show system internal aclcomp event-history errors**
  - **show system internal aclcomp event-history msgs**
  - **show system internal aclcomp pdl detailed**
  - **show system internal aclcomp mem-stats**



CHAPTER 18

Quality of Service

This chapter describes how to identify and resolve problems related to Quality of Service. This chapter contains the following sections:

Information About Quality of Service

Quality of Service (QoS) lets you classify network traffic so that it can be policed and prioritized in a way that prevents congestion. Traffic is processed based on how you classify it and the QoS policies that you put in place. Classification, marking, and policing are the three main features of QoS.

- Traffic Classification—Groups network traffic based on defined criteria.
- Traffic Marking—Modifies traffic attributes such as DSCP, COS, and Precedence by class.
- Policing —Monitors data rates and burst sizes for a particular class of traffic. QoS policing on a network determines whether network traffic is within a specified profile (contract).

For detailed information about QoS, see the *Cisco Nexus 1000V Quality of Service Configuration Guide*.

QoS Configuration Limits

The following tables list the configuration limits for QoS.

Table 7: QoS Configuration Limits

Item	DVS Limit	Per Server Limit
Class map	1024	1024 (with policies)
Policy map	128	128
Policy instances	12288	1024

Table 8: QoS Configuration Limits

Item	Limit
Match criteria per class map	32
Classes per policy map can be of type qos or queuing	64
Match rules under policy map	200

Note We recommend that the class-map should be applied on a maximum of 2000 interfaces. If you apply class maps on more than 2000 interfaces, the **service-policy** command could fail.

Debugging Policy Configuration Errors

Debugging Policy Configuration Errors on VSM

If you are debugging a policy on a port profile, it might be easier to first install it directly on an interface. To debug a policy configuration error on the VSM, do the following:

Procedure

Step 1 Enter the **debug aclmgr all** command if the policy references an ACL.
Step 2 Enter the **debug ipqos all** command.
Step 3 Enter the **policy-map** and **class** commands to collect logs for all operations.
Step 4 Save the Telnet SSH session buffer to a file.

Debugging Policy Configuration Errors on VEM

To debug a policy configuration error on the VEM, do the following:

Procedure

Step 1 Enter the **module vem** *module-number* **execute vemdpalog clear** command.
Step 2 Enter the **module vem** *module-number* **execute vemdpalog sfqosagent all** command.
Step 3 Enter the **module vem** *module-number* **execute vemdpalog start** command.
Step 4 Enter the **policy-map** command to execute the command once again with the DPA debug traces output to vemdpalog.
Step 5 Enter the **module vem** *module-number* **execute vemdpalog stop** command.
Step 6 Enter the **module vem** *module-number* **execute vemdpalog show all** command to display the logs on console.

The VEM-side output logs contain the following:

```
The policy gets added first
add plcy node - calling add policy 8eb5c20 sf_qos_policy_len(policy) 4 classmaps 0, Policy
 name <p_name>
This will be followed by addition of class-map filter nodes. Please note that the same is
done via multiple sessions. Hence there could be a replace policy, before the addition of
filter nodes.
A noticeable thing in the log is the class-map counter could be updated.

replace plcy node - calling replace policy 8eb47d8 sf_qos_policy_len(policy) 92 classmaps
1, Policy <p_name>
…
Adding classmap 1 (108) with op 1 and 2 filters
…
Adding classmap 2 (116) with op 2 and 2 filters
…
Adding classmap 3 (56) with op 0 and 0 filters
…

Every session should end with the log

Debug qosagent: Session commit complete and successful
```

Debugging Policy Verification Issues

To debug a policy verification failure on the VEM, do the following:

Procedure

Step 1 Enter the **module vem** *module-number* **execute vemdpalog clear** command.

Step 2 Enter the **module vem** *module-number* **execute vemdpalog sfqosagent all** command.

Step 3 Enter the **module vem** *module-number* **execute vemdpalog start** command.

Step 4 Enter the **service-policy** command to execute the command once again with the DPA debug traces output to vemdpalog.

Step 5 Enter the **module vem** *module-number* **execute vemdpalog stop** command.

Step 6 Enter the **module vem** *module-number* **execute vemdpalog show all** command to display the logs on console..

The VEM-side output logs contain the following:

```
add pinst - add_pinst policy_id 0
add pinst - add_pinst gpolicy_id 72352041

verify - installing pinst type 0 49 for policy 0

verify - returned 0

commit - adding pinst ltl 49 use 2 to policy 0

Session commit complete and successful
```

Debugging Policing Configuration Errors

Debugging Policing Configuration Errors on VSM

If you are debugging a policy on a port profile, it may be easier to first install it directly on an interface. To debug a policing configuration error on the VSM, do the following:

Procedure

Step 1 Enter the **debug aclmgr all** command if the policy references an ACL.

Step 2 Enter the **debug ipqos all** command.

Step 3 Enter the **debug aclcomp all** command.

Step 4 Enter the **service-policy** command to execute the command once again with debug traces output to the console.

Step 5 Save the Telnet SSH session buffer to a file.

Debugging Policing Configuration Errors on VEM

To debug a policing configuration error on the VEM, do the following:

Procedure

Step 1 Enter the **module vem** *module-number* **execute vemdpalog clear** command.

Step 2 Enter the **module vem** *module-number* **execute vemdpalog sfqosagent all** command.

Step 3 Enter the **module vem** *module-number* **execute vemdpalog start** command.

Step 4 Enter the **service-policy** command to execute the command once again with the DPA debug traces output to vemdpalog.

Step 5 Enter the **module vem** *module-number* **execute vemdpalog stop** command.

Step 6 Enter the **module vem** *module-number* **execute vemdpalog show all** command to display the logs on console.

The VEM-side output logs contain the following:

```
calling add policy 81610ac len 220 classmaps 3- --> Session actions
…
Adding classmap 1 (108) with op 1 and 2 filters
…
Adding classmap 2 (116) with op 2 and 2 filters
…
Adding classmap 3 (56) with op 0 and 0 filters
…
init pinst ltl 11 policy id 0 if_index 1a020200 --> Service-policy being applied
installing pinst type 0 17 for policy 0
dpa_sf_qos_verify returned 0
```

```
…
Session commit complete and successful --> Session ending
```

QoS Troubleshooting Commands

You can use the following QoS troubleshooting commands on the VSM:

- Command to display policies that are configured and applied on the interfaces:
  - **show policy-map** [**policy-map-name**]

    Displays the configured policies.
  - **show class-map** [**class-map-name**]

    Displays the configured class-maps.
  - **show policy-map interface**

    Displays the number of packets hitting the configured policies.
  - **show policy-map interface** [**input** | **output**]

    Displays only the installed policies based on the input or output type.
  - **show policy-map interface type** [**qos** | **queuing**]

    Displays the installed policies based on the type.
  - **show system internal cdm info app sap 377 detail**

    Checks the (class map/policy map) configuration delivered by VSM to the connected modules.
  - **show resource-availability qos-queuing**

    Checks whether the QoS configuration is not exceeding the recommended resource limits.
  - **show policy-map interface brief**

    Displays the installed policies.
- Commands to see the run-time information of the IPQOS during configuration errors:
  - **show system internal ipqos event-history errors**
  - **show system internal ipqos event-history msgs**
  - **show system internal ipqos mem-stats**
  - **show system internal ipqos status**
  - **show system internal ipqos log**
  - **show system internal ipqos**

You can use the following QoS troubleshooting commands on the VEM:

- **module vem** *module-number* **execute vemcmd show qos node**

  Displays all class maps and polices in use on the server.
- **module vem** *module-number* **execute vemcmd show qos policy**

Displays all the installed policy maps in use on the server.

- **module vem** *module-number* **execute vemcmd show qos pinst**

  Displays all service policies installed on the server.

Command Examples

show system internal cdm info app sap 377 detail

```
switch# show system internal cdm info app sap 377 detail
policy/377/1/<policy-map/class-map name>
id: 34
flags: 0x00000000
app: Qosmgr SAP (377)
app_od: 00000af178daed963b0ec2301044c78e81f0cdf70814102aae80a0474ac14...
app_od_sz: 203
md5: 16dd64cc7e63fc8681b9357510194fac
```

module vem module-number execute vemcmd show qos

The following example shows the output of the **module vem** *module-number* **execute vemcmd show qos node** command.

```
~ # module vem 3 execute vemcmd show qos node
nodeid type details
-------- -------- --------
0 policer
cir:50 pir:50
bc:200000 be:200000
cir/pir units 1 bc/be units 3 flags 2
1 class op_AND
DSCP
2 class op_DEFAULT
```

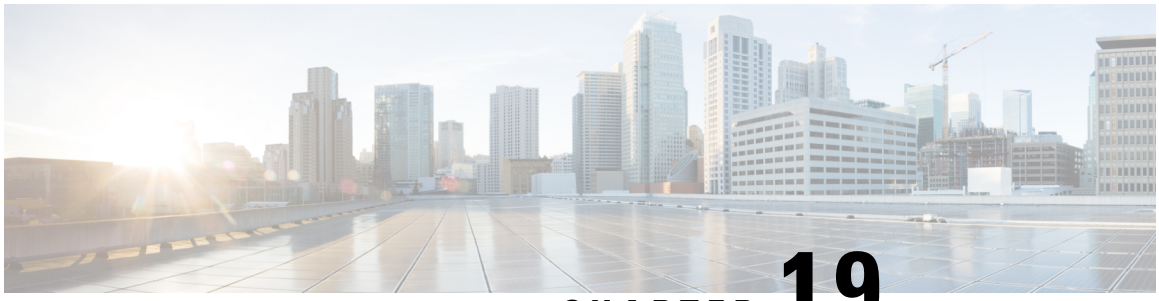
The following example shows the output of the **module vem** *module-number* **execute vemcmd show qos policy** command.

```
~ # module vem 3 execute vemcmd show qos policy
policyid classid policerid set_type value
-------- -------- -------- -------- --------
0 1 -1 dscp 5
2 0 dscp 0
```

The following example shows the output of the **module vem** *module-number* **execute vemcmd show qos pinst** command.

```
~ # module vem 3 execute vemcmd show qos pinst
id type
-------- --------
17 Ingress
class bytes matched pkts matched
-------- -------------------- --------------------
1 0 0

2 85529 572
0
```

```
policer stats: conforming (85529, 572)
policer stats: exceeding (0, 0)
policer stats: violating (0, 0)
```



CHAPTER 19

SPAN

This chapter describes how to identify and resolve problems related to SPAN. This chapter contains the following sections:

Information About SPAN

The Switched Port Analyzer (SPAN) feature (sometimes called port mirroring or port monitoring) selects network traffic for analysis by a network analyzer. The network analyzer can be a Cisco SwitchProbe or other Remote Monitoring (RMON) probe.

Cisco Nexus 1000V supports two types of SPAN:

- SPAN (local SPAN) that can monitor sources within a host or VEM.
- Encapsulated remote SPAN (ERSPAN) that can send monitored traffic to an IP destination.

For detailed information about how to configure local SPAN or ERSPAN, see the *Cisco Nexus 1000V System Management Configuration Guide*.

SPAN Session Guidelines

The following are SPAN session guidelines:

- When a SPAN session contains multiple transmit source ports, packets that these ports receive might be replicated even though they are not transmitted on the ports. Examples include the following:
  - Traffic that results from flooding
  - Broadcast and multicast traffic
- For VLAN SPAN sessions with both receive and transmit configured, two packets (one from receive and one from transmit) are forwarded from the destination port if the packets get switched on the same VLAN.
- After VMotion, the following might occur:
  - A session is stopped if the source and destination ports are separated.

- A session resumes if the source and destination ports end up on the same host.

- The following are required for a running SPAN session:
  - The limit of 64 SPAN sessions is not exceeded.
  - At least one operational source is configured.
  - At least one operational destination is configured.
  - The configured source and destination are on the same host.
  - The session is enabled with the **no shut** command.
- A session is stopped if any of the following occurs:
  - All the source ports go down or are removed.
  - All the destination ports go down or are removed.
  - All the source and destination ports are separated by VMotion.
  - The session is disabled by a **shut** command.

Problems with SPAN

The following are symptoms, possible causes, and solutions for problems with SPAN.

Symptom	Possible Causes	Solution
You observe issues with VM traffic after configuring a session with Ethernet destinations.	—	Ensure that the Ethernet destination is not connected to the same uplink switch. The SPAN packets might cause problems with the IP tables, the MAC tables, or both on the uplink switch, which can cause problems with the regular traffic.
A session state is up and the packets are not received at the destination ports.	—	Verify that the correct VLANs are allowed on the trunk destination ports.
The session displays an error.	—	1. Make sure that VSM-VEM connectivity is working correctly. 2. Force reprogramming of the session on the VEM. 1. **shut** 2. **no shut**

Symptom	Possible Causes	Solution
The ERSPAN session is up, but does not see packets at the destination.	The ERSPAN ID is not configured.	Make sure that the ERSPAN ID is configured at the destination.
	An ERSPAN-enabled VMKernel NIC is not configured on the host or VEM.	Make sure that you create a VMKernel NIC on the host using a port profile configured for ERSPAN.
	The ERSPAN-enabled VMKernel NIC is not configured with a proper IP, gateway, or both.	Ping the ERSPAN IP destination from the host VMKernel NIC. **vmkping** *dest-id* Use the **vempkt** command to capture packets on the VMKernel NIC LTL and ensure ERSPAN packets are being sent. Use the **vemlog debug sfspan d** command so that the ERSPAN packets appear in the vempkt capture log.

SPAN Troubleshooting Commands

You can use following the commands to troubleshoot problems related to SPAN:

- **show monitor**
- **show monitor session**
- **module vem** *module-number* **execute vemcmd show span**
- **show monitor internal errors**
- **show monitor internal event-history msgs**
- **show monitor internal info global-info**
- **show monitor internal mem-stats**

Command Examples

show monitor

```
switch# show monitor
Session State Reason Description
------- ----------- ---------------------- --------------------------------
17 down Session admin shut folio
```

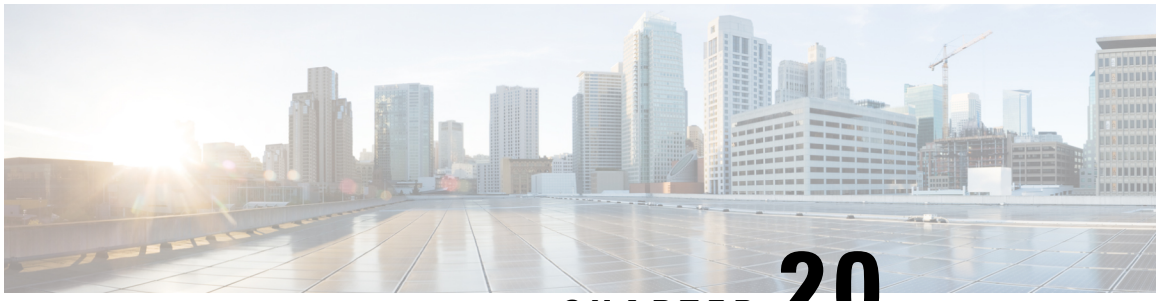
show monitor session

```
switch(config)# show monitor session 1
session 1
---------------
type : erspan-source
```

```
state : up
source intf :
rx : Eth3/3
tx : Eth3/3
both : Eth3/3
source VLANs :
rx :
tx :
both :
filter VLANs : filter not specified
destination IP : 10.54.54.1
ERSPAN ID : 999
ERSPAN TTL : 64
ERSPAN IP Prec. : 0
ERSPAN DSCP : 0
ERSPAN MTU : 1000
```

module vem module-number execute vemcmd show span

```
switch# vemcmd show span
RX Ltl Sources :52,
TX Ltl Sources :52,
RX Vlan Sources :
TX Vlan Sources :
Source Filter :
2 local 50
RX Ltl Sources :51,
TX Ltl Sources :51,
RX Vlan Sources :
TX Vlan Sources :
Source Filter :
```



CHAPTER 20

Multicast IGMP

This chapter describes how to identify and resolve problems that relate to multicast Internet Group Management Protocol (IGMP) snooping. This chapter contains the following sections:

Information About Multicast

IP multicast is a method of forwarding the same set of IP packets to a number of hosts within a network. You can use multicast in an IPv4 network to provide efficient delivery of data to multiple destinations.

Multicast involves both a method of delivery and discovery of senders and receivers of multicast data, which is transmitted on IP multicast addresses called groups. A multicast address that includes a group and source IP address is often referred to as a channel.

Multicast IGMP Snooping

IGMP snooping software examines Layer 2 IP multicast traffic within a VLAN to discover the ports where interested receivers reside. Using the port information, IGMP snooping can reduce bandwidth consumption in a multi-access LAN environment to avoid flooding the entire VLAN. The IGMP snooping feature tracks which ports are attached to multicast-capable routers to help the routers forward IGMP membership reports. The IGMP snooping software responds to topology change notifications.

In general, IGMP snooping works as follows:

- Ethernet switches, such as Cisco Catalyst 6000 Series switches, parse and intercept all IGMP packets and forward them to a CPU, such as a supervisor module, for protocol processing.
- Router ports are learned using IGMP queries. The switch returns IGMP queries, it remembers which port the query comes from, and marks the port as a router port.
- IGMP membership is learned using IGMP reports. The switch parses IGMP report packets and updates its multicast forwarding table to keep track of IGMP membership.
- When the switch receives multicast traffic, it check its multicast table and forwards the traffic only to those ports interested in the traffic.

- IGMP queries are flooded to the whole VLAN.
- IGMP reports are forwarded to the uplink port (the router ports).
- Multicast data traffic is forwarded to uplink ports (the router ports).

Multicast IGMP Troubleshooting Guidelines

Follow these guidelines when troubleshooting multicast IGMP issues:

- Verify that IGMP snooping is enabled by using the **show ip igmp snooping** command.
- Verify that the upstream switch has IGMP configured.
- Verify that the Cisco Nexus 1000V is configured correctly and is ready to forward multicast traffic by using the **show ip igmp snooping groups** command. In the displayed output of the command, look for the letter R under the port heading. The R indicates that the Virtual Supervisor Module (VSM) has learned the uplink router port from the IGMP query that was sent by the upstream switch, and means that the Cisco Nexus 1000V is ready to forward multicast traffic.

Note When high CPU utilization occurs on Cisco Nexus 1000V due to igmp and netstack processes, it is possible that it is caused by the UCS server looping a high amount of IGMP queries. For more troubleshooting information, see *UCS Troubleshooting Guide* or *UCS Release Notes*.

Upstream Switch Configuration for Multicast IGMP Snooping

The operation of multicast IGMP snooping depends on the correct configuration of the upstream switch. Because the IGMP process needs to know which upstream port connects to the router that supports IGMP routing, you must turn on the IP multicast routing on the upstream switch by entering the **ip multicast-routing** command.

The following example shows how to turn on global multicast routing, configure an SVI interface, and turn on the PIM routing protocol:

```
switch# conf terminal
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# ip multicast-routing
switch(config)# end

switch# conf terminal
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# int vlan159
switch(config-if)# ip pim dense-mode
switch(config-if)# end
```

The following example shows a sample Cisco Nexus 5000 Series configuration that has an IGMP querier configured on a VLAN:

```
n5k-sw1(config)# vlan configuration 59
n5k-sw1(config-vlan-config)# ip igmp snooping querier 7.59.59.1
n5k-sw1(config-vlan-config)# ip igmp snooping query-interval 60
n5k-sw1(config-vlan-config)# ip igmp snooping version 3
n5k-sw1(config-vlan-config)#
```

Problems with Multicast IGMP Snooping

The following are symptoms, possible causes, and solutions for problems with multicast IGMP snooping.

Symptom	Solution
A VM is interested in the multicast traffic but is not receiving the multicast traffic.	Use the **debug ip igmp snooping vlan** command to determine if IGMP snooping is working as expected. Examine the output to see if the port is receiving the IGMP report and if the interface has been added to the multicast traffic interface list for the VM.
	Use the **module vem** *module-number* **execute vemcmd show vlan** command to verify that the multicast distribution table in the VEM has the correct information in it.
	Use the **module vem** *module-number* **execute vemcmd show port** command to see the port table. Make sure that the table has the correct information in it. Make sure that the state of the trunk port and the access port is UP/UP.

Enabling Debugging Commands for IGMP Snooping

You can enable debugging commands for IGMP snooping:

Procedure

Step 1 Enable logs files on the module that hosts the preferred VMs/Veths.

Example:

```
switch(config)# module vem 4 execute vemdpalog debug sfigmp_snoop d
switch(config)# module vem 4 execute vemlog debug sfigmp_snoop d
```

Step 2 (Optional) Clear existing log data.

Example:

```
switch(config)# module vem 4 execute vemlog clear
Cleared log
```

Step 3 Start collecting log data.

Example:

```
switch(config)# module vem 4 execute vemlog start
Started log
```

Step 4 Wait for the IGMP queries and reports to hit the VEM ports.

Step 5 Stop and verify the log data.

Example:

```
switch(config)# module vem 4 execute vemlog stop
Will suspend log after next 0 entries
switch(config)# module vem 4 execute vemlog show all
Timestamp                  Entry CPU  Mod Lv         Message
Jul 15 18:19:27.000679        0  0  99  16   Debug sf_igmp_snoop_thread: IGMP Snoop Thread
 waken up
```

```
Jul 15 18:19:27.000706        1  0  99  16   Debug sf_igmp_snoop_thread: Check timed-out
members in 0.0.0.0, BD: 52
Jul 15 18:19:27.000718        2  0  99  16   Debug sf_igmp_snoop_thread: Check timed-out
members in 0.0.0.0, BD: 55
Jul 15 18:19:27.000726        3  0  99  16   Debug sf_igmp_snoop_thread: Check timed-out
members in 0.0.0.0, BD: 59
Jul 15 18:19:27.000734        4  0  99  16   Debug sf_igmp_snoop_thread: Check timed-out
members in 224.6.7.8, BD: 59
Jul 15 18:19:27.112144        5  2   1  16   Debug IGMP pkt (snoop OFF): orig_src_ltl 0x15,
 src_ltl 0x40f vlan 232
Jul 15 18:19:27.603386        6  3   1  16   Debug IGMP pkt (snoop ON): orig_src_ltl 0x15,
 src_ltl 0x40f vlan 52
Jul 15 18:19:27.603390        7  3   1  16   Debug Notification size: 68
Jul 15 18:19:27.603393        8  3   1  16   Debug Sending IGMP pkt notif: swbd 52, pkt_size
 56, notif_size 68
Jul 15 18:19:27.609442        9  0  99  16   Debug sf_igmp_snoop_v4_pkt_notify_handler:
IGMP notify message from DP:
Jul 15 18:19:27.609459       10  0  99  16   Debug sf_igmp_snoop_v4_pkt_notify_handler:
SRC_LTL: 1039, SWBD: 52, pkt_size: 56
Jul 15 18:19:27.609470       11  0  99  16   Debug sf_igmp_snoop_v4_pkt_notify_handler: Got
 IGMP Query.
Jul 15 18:19:27.609479       12  0  99  16   Debug sf_igmp_snoop_handle_query: Received v3
 query.
Jul 15 18:19:27.609485       13  0  99  16   Debug sf_igmp_snoop_handle_query: Adding v3
router entry in BD 52 (len: 12).
Jul 15 18:19:27.609494       14  0  99  16   Debug sf_igmp_snoop_add_update_v4_grp: Existing
 Group 0.0.0.0 in BD 52.
Jul 15 18:19:27.609502       15  0  99  16   Debug sf_igmp_snoop_add_update_v4_grp: Existing
 Member 1039 in Group 0.0.0.0 in BD 52.
Jul 15 18:19:28.011257       16  5   1  16   Debug IGMP pkt (snoop OFF): orig_src_ltl 0x15,
 src_ltl 0x40f vlan 232
Jul 15 18:19:29.058442       17  0   1  16   Debug IGMP pkt (snoop OFF): orig_src_ltl 0x15,
 src_ltl 0x40f vlan 180
Jul 15 18:19:30.480455       18  3   1  16   Debug IGMP pkt (snoop OFF): orig_src_ltl 0x15,
 src_ltl 0x40f vlan 233
Jul 15 18:19:30.623668       19  2   0   0         Started log
Jul 15 18:19:32.002081       20  0  99  16   Debug sf_igmp_snoop_thread: IGMP Snoop Thread
 waken up
Jul 15 18:19:32.002103       21  0  99  16   Debug sf_igmp_snoop_thread: Check timed-out
members in 0.0.0.0, BD: 52
Jul 15 18:19:32.002111       22  0  99  16   Debug sf_igmp_snoop_thread: Check timed-out
members in 0.0.0.0, BD: 55
Jul 15 18:19:32.002117       23  0  99  16   Debug sf_igmp_snoop_thread: Check timed-out
members in 0.0.0.0, BD: 59
Jul 15 18:19:32.002122       24  0  99  16   Debug sf_igmp_snoop_thread: Check timed-out
members in 224.6.7.8, BD: 59
Jul 15 18:19:34.418381       25 12   1  16   Debug IGMP pkt (snoop ON): orig_src_ltl 0x0,
src_ltl 0x66 vlan 59
Jul 15 18:19:34.418385       26 12   1  16   Debug Notification size: 72
Jul 15 18:19:34.418389       27 12   1  16   Debug Sending IGMP pkt notif: swbd 59, pkt_size
 60, notif_size 72
Jul 15 18:19:34.418400       28 12   1  16   Debug Forward report to router port: 10347
.Jul 15 18:19:34.448932       29  0  99  16   Debug sf_igmp_snoop_v4_pkt_notify_handler:
IGMP notify message from DP:
Jul 15 18:19:34.448949       30  0  99  16   Debug sf_igmp_snoop_v4_pkt_notify_handler:
SRC_LTL: 102, SWBD: 59, pkt_size: 60
Jul 15 18:19:34.448961       31  0  99  16   Debug sf_igmp_snoop_v4_pkt_notify_handler: Got
 IGMP v1/v2 Report
Jul 15 18:19:34.448970       32  0  99  16   Debug Handle IGMPv2 report in BD 59, LTL:102,
 group: 224.3.4.5.
Jul 15 18:19:34.448978       33  0  99  16   Debug Handle IGMPv2 JOIN in BD 59, LTL:102,
group: 224.3.4.5.
Jul 15 18:19:34.448986       34  0  99  16   Debug sf_igmp_snoop_add_update_v4_grp: Adding
 Group 224.3.4.5 to BD 59.
```

```
Jul 15 18:19:34.448996       35  0  99  16   Debug sf_igmp_snoop_notify_vsm: Sending to
VSM: opcode : 1, swbd 59, grp_ip: 0xe0030405.
Jul 15 18:19:34.449087       36  0  99  16   Debug sf_igmp_snoop_add_update_v4_grp: Adding
 Member 102 to Group 224.3.4.5 in BD 59.
Jul 15 18:19:34.449102       37  0  99  16   Debug sf_igmp_snoop_update_dp: group update
for BD 59: IP: 224.3.4.5, with 2 members
Jul 15 18:19:34.449111       38  0  99  16   Debug sf_igmp_snoop_update_dp: Sending group
update to DP for BD 59: IP: 224.3.4.5, with 2 members
Jul 15 18:19:34.938394       39 14   1  16   Debug IGMP pkt (snoop ON): orig_src_ltl 0x0,
src_ltl 0x66 vlan 59
Jul 15 18:19:34.938400       40 14   1  16   Debug Notification size: 72
Jul 15 18:19:34.938406      41 14   1  16   Debug Sending IGMP pkt notif: swbd 59, pkt_size
 60, notif_size 72
Jul 15 18:19:34.938419       42 14   1  16   Debug Forward report to router port: 10347
.Jul 15 18:19:34.968621       43  0  99  16   Debug sf_igmp_snoop_v4_pkt_notify_handler:
IGMP notify message from DP:
Jul 15 18:19:34.968634       44  0  99  16   Debug sf_igmp_snoop_v4_pkt_notify_handler:
SRC_LTL: 102, SWBD: 59, pkt_size: 60
Jul 15 18:19:34.968645      45  0  99  16   Debug sf_igmp_snoop_v4_pkt_notify_handler: Got
 IGMP v1/v2 Report
Jul 15 18:19:34.968654       46  0  99  16   Debug Handle IGMPv2 report in BD 59, LTL:102,
 group: 224.3.4.5.
Jul 15 18:19:34.968661       47  0  99  16   Debug Handle IGMPv2 JOIN in BD 59, LTL:102,
group: 224.3.4.5.
Jul 15 18:19:34.968669      48  0  99  16   Debug sf_igmp_snoop_add_update_v4_grp: Existing
 Group 224.3.4.5 in BD 59.
Jul 15 18:19:34.968677      49  0  99  16   Debug sf_igmp_snoop_add_update_v4_grp: Existing
 Member 102 in Group 224.3.4.5 in BD 59.
Jul 15 18:19:37.000827       50  0  99  16   Debug sf_igmp_snoop_thread: IGMP Snoop Thread
 waken up
Jul 15 18:19:37.000853       51  0  99  16   Debug sf_igmp_snoop_thread: Check timed-out
members in 0.0.0.0, BD: 52
Jul 15 18:19:37.000895       52  0  99  16   Debug sf_igmp_snoop_thread: Check timed-out
members in 0.0.0.0, BD: 55
Jul 15 18:19:37.000905       53  0  99  16   Debug sf_igmp_snoop_thread: Check timed-out
members in 0.0.0.0, BD: 59
Jul 15 18:19:37.000912       54  0  99  16   Debug sf_igmp_snoop_thread: Check timed-out
members in 224.3.4.5, BD: 59
Jul 15 18:19:37.000919       55  0  99  16   Debug sf_igmp_snoop_thread: Check timed-out
members in 224.6.7.8, BD: 59
Jul 15 18:19:37.085327       56  8   1  16   Debug IGMP pkt (snoop ON): orig_src_ltl 0x0,
src_ltl 0x66 vlan 59
Jul 15 18:19:37.085331       57  8   1  16   Debug Notification size: 72
Jul 15 18:19:37.085335      58  8   1  16   Debug Sending IGMP pkt notif: swbd 59, pkt_size
 60, notif_size 72
Jul 15 18:19:37.085345       59  8   1  16   Debug Forward report to router port: 10347
.Jul 15 18:19:37.085998       60  1   1  16   Debug IGMP pkt (snoop ON): orig_src_ltl 0x15,
 src_ltl 0x40f vlan 59
Jul 15 18:19:37.086002       61  1   1  16   Debug Notification size: 68
Jul 15 18:19:37.086006      62  1   1  16   Debug Sending IGMP pkt notif: swbd 59, pkt_size
 56, notif_size 68
Jul 15 18:19:37.134375       63  0  99  16   Debug sf_igmp_snoop_v4_pkt_notify_handler:
IGMP notify message from DP:
Jul 15 18:19:37.134390       64  0  99  16   Debug sf_igmp_snoop_v4_pkt_notify_handler:
SRC_LTL: 102, SWBD: 59, pkt_size: 60
Jul 15 18:19:37.134400      65  0  99  16   Debug sf_igmp_snoop_v4_pkt_notify_handler: Got
 IGMP v1/v2 Report
Jul 15 18:19:37.134409       66  0  99  16   Debug Handle IGMPv2 report in BD 59, LTL:102,
 group: 224.3.4.5.
Jul 15 18:19:37.134416       67  0  99  16   Debug Handle IGMPv2 LEAVE in BD 59, LTL:102,
group: 224.3.4.5.
Jul 15 18:19:37.134439       68  0  99  16   Debug sf_igmp_snoop_v4_pkt_notify_handler:
IGMP notify message from DP:
Jul 15 18:19:37.134446       69  0  99  16   Debug sf_igmp_snoop_v4_pkt_notify_handler:
```

```
SRC_LTL: 1039, SWBD: 59, pkt_size: 56
Jul 15 18:19:37.134453       70  0  99  16   Debug sf_igmp_snoop_v4_pkt_notify_handler: Got
 IGMP Query.
Jul 15 18:19:37.134461       71  0  99  16   Debug sf_igmp_snoop_handle_query: Received v2
 query.
Jul 15 18:19:37.134467       72  0  99  16   Debug sf_igmp_snoop_handle_query: Got group
specific query for 0x50403e0.
Jul 15 18:19:37.134475       73  0  99  16   Debug sf_igmp_snoop_start_leave_timers: Found
 group 0xe0030405.
Jul 15 18:19:37.134482       74  1   1  16   Debug IGMP pkt (snoop ON): orig_src_ltl 0x15,
 src_ltl 0x40f vlan 59
Jul 15 18:19:37.134486       75  1   1  16   Debug Notification size: 68
Jul 15 18:19:37.134488      76  1   1  16   Debug Sending IGMP pkt notif: swbd 59, pkt_size
 56, notif_size 68
Jul 15 18:19:37.134483       77  0  99  16   Debug sf_igmp_snoop_start_leave_timers: Start
 leave timer on member 102 for 2 secs.
Jul 15 18:19:37.134504       78  0  99  16   Debug sf_igmp_snoop_v4_pkt_notify_handler:
IGMP notify message from DP:
Jul 15 18:19:37.134511       79  0  99  16   Debug sf_igmp_snoop_v4_pkt_notify_handler:
SRC_LTL: 1039, SWBD: 59, pkt_size: 56
Jul 15 18:19:37.134518       80  0  99  16   Debug sf_igmp_snoop_v4_pkt_notify_handler: Got
 IGMP Query.
Jul 15 18:19:37.134524       81  0  99  16   Debug sf_igmp_snoop_handle_query: Received v2
 query.
Jul 15 18:19:37.134530       82  0  99  16   Debug sf_igmp_snoop_handle_query: Got group
specific query for 0x50403e0.
Jul 15 18:19:37.134536       83  0  99  16   Debug sf_igmp_snoop_start_leave_timers: Found
 group 0xe0030405.
Jul 15 18:19:37.610484       84  5   1  16   Debug IGMP pkt (snoop ON): orig_src_ltl 0x15,
 src_ltl 0x40f vlan 52
Jul 15 18:19:37.610489       85  5   1  16   Debug Notification size: 68
Jul 15 18:19:37.610492      86  5   1  16   Debug Sending IGMP pkt notif: swbd 52, pkt_size
 56, notif_size 68
Jul 15 18:19:37.648380       87  0  99  16   Debug sf_igmp_snoop_v4_pkt_notify_handler:
IGMP notify message from DP:
Jul 15 18:19:37.648396       88  0  99  16   Debug sf_igmp_snoop_v4_pkt_notify_handler:
SRC_LTL: 1039, SWBD: 52, pkt_size: 56
Jul 15 18:19:37.648406       89  0  99  16   Debug sf_igmp_snoop_v4_pkt_notify_handler: Got
 IGMP Query.
Jul 15 18:19:37.648415       90  0  99  16   Debug sf_igmp_snoop_handle_query: Received v3
 query.
Jul 15 18:19:37.648422       91  0  99  16   Debug sf_igmp_snoop_handle_query: Adding v3
router entry in BD 52 (len: 12).
Jul 15 18:19:37.648431      92  0  99  16   Debug sf_igmp_snoop_add_update_v4_grp: Existing
 Group 0.0.0.0 in BD 52.
Jul 15 18:19:37.648439      93  0  99  16   Debug sf_igmp_snoop_add_update_v4_grp: Existing
 Member 1039 in Group 0.0.0.0 in BD 52.
Jul 15 18:19:42.002071       94  0  99  16   Debug sf_igmp_snoop_thread: IGMP Snoop Thread
 waken up
Jul 15 18:19:42.002099       95  0  99  16   Debug sf_igmp_snoop_thread: Check timed-out
members in 0.0.0.0, BD: 52
Jul 15 18:19:42.002112       96  0  99  16   Debug sf_igmp_snoop_thread: Check timed-out
members in 0.0.0.0, BD: 55
Jul 15 18:19:42.002121       97  0  99  16   Debug sf_igmp_snoop_thread: Check timed-out
members in 0.0.0.0, BD: 59
Jul 15 18:19:42.002128       98  0  99  16   Debug sf_igmp_snoop_thread: Check timed-out
members in 224.3.4.5, BD: 59
Jul 15 18:19:42.002135       99  0  99  16   Debug sf_igmp_snoop_thread: Check timed-out
members in 224.6.7.8, BD: 59
Jul 15 18:19:43.301931      100  6   0   0         Suspending log
switch(config)#
```

Multicast IGMP Snooping Troubleshooting Commands

Command	Description
show cdp neighbor	Displays if IGMP uses the packet VLAN to forward IGMP packets to the VSM, which is the same mechanism that CDP uses. However, if you have disabled the CDP protocol on the upstream switch using the **no cdp enable** command, the **show cdp neighbor** command does not display any information.
show ip igmp groups	Displays whether IGMP snooping is enabled on the VLAN.
show ip igmp snooping vlan	Displays IGMP snooping configuration by VLAN.
show ip igmp snooping groups vlan	Displays IGMP snooping group information.
debug ip igmp snooping vlan	Enables debugging for IGMP shopping. **Note** Even if you enable the **debug** command for IGMP snooping, log details are not available for multicast groups and their members.
module vem *module-number* **execute vemcmd show vlan**	
module vem *module-number* **execute vemcmd show igmp** *vlan* [**detail**]	

Command Examples

show cdp neighbor

```
switch# show cdp neighbor
Capability Codes: R - Router, T - Trans-Bridge, B - Source-Route-Bridge
S - Switch, H - Host, I - IGMP, r - Repeater,
V - VoIP-Phone, D - Remotely-Managed-Device,
s - Supports-STP-Dispute

Device ID Local Intrfce Hldtme Capability Platform Port ID
switch Eth3/2 179 R S I WS-C6506-E Gig5/16
switch Eth3/4 179 R S I WS-C6506-E Gig5/23
```

show ip igmp snooping vlan

```
switch# show ip igmp snooping vlan 159
IGMP Snooping information for vlan 159
IGMP snooping enabled <-- IGMP SNOOPING is enabled for vlan 159
IGMP querier none
Switch-querier disabled
```

```
IGMPv3 Explicit tracking enabled (initializing, time-left: 00:03:20)
IGMPv2 Fast leave disabled
IGMPv1/v2 Report suppression enabled
IGMPv3 Report suppression disabled
Router port detection using PIM Hellos, IGMP Queries
Number of router-ports: 0
Number of groups: 0
```

show ip igmp snooping groups

```
switch# show ip igmp snooping groups vlan 1784
Type: S - Static, D - Dynamic, R - Router port

Vlan Group Address Ver Type Port list
1784 */* - R Po1 Po2 Eth5/31
1784 227.0.0.1 v2 D Veth79 Veth80

VSM-DAO# show ip igmp snooping querier vlan 1784
Vlan IP Address Version Expires Port
1784 184.184.0.12 v3 00:04:14 Po1
1784 184.184.0.12 v3 00:04:14 Po2
1784 184.184.0.12 v3 00:04:14 Eth5/31

switch# show ip igmp snooping groups vlan 1784 detail
IGMP Snooping group membership for vlan 1784
Group addr: 227.0.0.1
Group ver: v2 [old-host-timer: not running]
report-timer: not-running
Last reporter: 184.184.0.11
IGMPv1/v2 memb ports:
Veth79 [0 GQ missed]
Veth80 [0 GQ missed]


switch# show ip igmp snooping groups vlan 1784 summary
Legend: E - Enabled, D - Disabled

Vlan Snoop (*,G)-Count
1784 E 2
Total number of (*,G) entries: 2
switch#
```

debug ip igmp snooping vlan

```
switch(config)# debug ip igmp snooping vlan
2014 Jul 8 23:49:16.633077 igmp[3157]: SNOOP: Switchport interface Veth43 (308) has been
created,
obtaining any static mrouter/oif configs
2014 Jul 8 23:49:16.683929 igmp[3157]: SNOOP: Switchport interface Veth37 (128) has been
created,
obtaining any static mrouter/oif configs
2014 Jul 8 23:49:16.748355 igmp[3157]: SNOOP: <vlan 1> clear port:Veth43, vlan:1
2014 Jul 8 23:49:16.789832 igmp[3157]: SNOOP: Switchport interface Veth47 (428) has been
created,
obtaining any static mrouter/oif configs
2014 Jul 8 23:49:16.797079 igmp[3157]: SNOOP: Switchport interface Veth38 (158) has been
created,
obtaining any static mrouter/oif configs
2014 Jul 8 23:49:16.824702 igmp[3157]: SNOOP: <vlan 11> Added Veth43 to active ports for
vlan 11
2014 Jul 8 23:49:16.824854 igmp[3157]: SNOOP: Mode for if(Vethernet43): 0x80000 vlan: 11
2014 Jul 8 23:49:16.862531 igmp[3157]: SNOOP: <vlan 1> clear port:Veth37, vlan:1
2014 Jul 8 23:49:16.950490 igmp[3157]: SNOOP: <vlan 11> Added Veth37 to active ports for
```

```
vlan 11
2014 Jul 8 23:49:16.950638 igmp[3157]: SNOOP: Mode for if(Vethernet37): 0x80000 vlan: 11
2014 Jul 8 23:49:16.998800 igmp[3157]: SNOOP: <vlan 1> clear port:Veth38, vlan:1
2014 Jul 8 23:49:16.999030 igmp[3157]: SNOOP: <vlan 1> clear port:Veth47, vlan:1
2014 Jul 8 23:49:17.089056 igmp[3157]: SNOOP: Switchport interface Veth40 (218) has been
created,
obtaining any static mrouter/oif configs
2014 Jul 8 23:49:17.121007 igmp[3157]: SNOOP: Switchport interface Veth39 (188) has been
created,
obtaining any static mrouter/oif configs
2014 Jul 8 23:49:17.131549 igmp[3157]: SNOOP: <vlan 11> Added Veth38 to active ports for
vlan 11
2014 Jul 8 23:49:17.131693 igmp[3157]: SNOOP: Mode for if(Vethernet38): 0x80000 vlan: 11
2014 Jul 8 23:49:17.156004 igmp[3157]: SNOOP: <vlan 11> Added Veth47 to active ports for
vlan 11
2014 J
```

module vem execute vemcmd show vlan

```
switch# module vem 3 execute vemcmd show vlan 159
BD 159, vdc 1, vlan 159, 3 ports
Portlist:
18 vmnic3
47 fedora8.eth0

Multicast Group Table:
Group 224.1.2.3 RID 1 Multicast LTL 4408
47
18
Group 0.0.0.0 RID 2 Multicast LTL 4407
18
```

This example shows that LTL 18 corresponds to vmnic3, and LTL 47 corresponds to VM fedora8, interface eth0.

The multicast group table for 224.1.2.3 shows the interfaces that the VEM forwards to when it receives multicast traffic for group 224.1.2.3. If fedora8 has multicast group 224.1.2.3 on its eth0 interface, LTL 47 should be in the multicast group table for 224.1.2.3.

LTL 18 is also in multicast group 224.1.2.3, which means it is a VM and generates multicast traffic to 224.1.2.3. The traffic is forwarded to vmnic3, which is the uplink to the upstream switch.

The multicast group table entry for 0.0.0.0 serves as a default route. If any multicast group traffic does not match any of the multicast group, the address uses the default route, which means that the traffic is forwarded to an upstream switch through vmnic3.

module vem execute vemcmd show igmp

module vem 3 execute vemcmd show igmp 1784

In show ip igmp snooping groups , on page 174, global IGMP snooping is enabled on VLAN 1784 (the disabled global state takes precedence).

Multicast group table values are as follows:

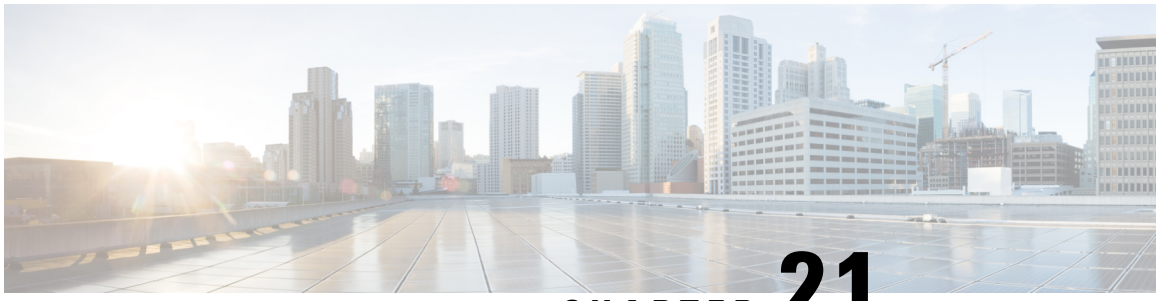
```
Group 227.0.0.1, Multicast LTL: 10363

Group */*, Multicast LTL: 10358
```

module vem 3 execute vemcmd show igmp 1784 detail

In show ip igmp snooping groups , on page 174, global IGMP snooping is enabled on VLAN 1784 (the disabled global state takes precedence)

Multicast group table values are as follows:

```
Group 227.0.0.1, Multicast LTL: 10363

Members: 59, 1039

Group */*, Multicast LTL: 10358

Members: 1039

Querier Info -

IP Address: 184.184.0.12

Uptime: 241955 seconds

Version: 3

Timeout: 8 seconds
```



CHAPTER 21

DHCP, DAI, and IPSG

This chapter describes how to identify and resolve problems related to Dynamic Host Configuration Protocol, Dynamic ARP Inspection, and IP Source Guard. This chapter contains the following sections:

Information About DHCP Snooping

Dynamic Host Configuration Protocol (DHCP) snooping acts like a firewall between untrusted hosts and trusted DHCP servers by doing the following:

- Validates DHCP messages received from untrusted sources and filters out invalid response messages from DHCP servers.
- Builds and maintains the DHCP snooping binding database, which contains information about untrusted hosts with leased IP addresses.
- Uses the DHCP snooping binding database to validate subsequent requests from untrusted hosts.

Dynamic ARP inspection (DAI) and IP Source Guard (IPSG) also use information stored in the DHCP snooping binding database.

For detailed information about configuring DHCP snooping, see the *Cisco Nexus 1000V Security Configuration Guide*.

Information About DAI

DAI is used to validate ARP requests and responses as follows:

- Intercepts all ARP requests and responses on untrusted ports.

- Verifies that a packet has a valid IP-to-MAC address binding before updating the ARP cache or forwarding the packet.
- Drops invalid ARP packets.

DAI can determine the validity of an ARP packet based on valid IP-to-MAC address bindings stored in a DHCP snooping binding database. This database is built by DHCP snooping when it is enabled on the VLANs and on the device. It might also contain static entries that you have created.

For detailed information about configuring DAI, see the *Cisco Nexus 1000V Security Configuration Guide*.

Information About IPSG

IPSG is a per-interface traffic filter that permits IP traffic only when the IP address and MAC address of each packet matches the IP and MAC address bindings of dynamic or static IP source entries in the DHCP snooping binding table.

For detailed information about configuring IP Source Guard, see the *Cisco Nexus 1000V Security Configuration Guide*.

Guidelines and Limitations for Troubleshooting DHCP Snooping, DAI, or IPSG

The following guidelines and limitations apply when troubleshooting DHCP snooping, DAI, or IPSG:

- A maximum of 12,000 DHCP entries can be snooped and learned system-wide in the DVS. This combined total is for both entries learned dynamically and entries configured statically.
- Rate limits on interfaces must be set to high values for trusted interfaces such as VSD SVM ports or vEthernet ports that connect to DHCP servers.
- Rate limits for trusted interfaces will be ignored.
- A maximum of 2000 DHCP entries per host can be learned dynamically and configured statically.
- A maximum of 1000 static DHCP entries per interface can be configured.

For detailed guidelines and limitations used in configuring these features, see the *Cisco Nexus 1000V Security Configuration Guide*.

Problems with DHCP Snooping

The following are symptoms, possible causes, and solutions for problems with DHCP snooping.

Symptom	Possible Causes	Solution
With snooping configured, the DHCP client is not able to obtain an IP address from the server.	The IP address was not added to the binding database. A faulty connection is between the DHCP server and client.	1. Verify the connection between the DHCP server(s) and the host connected to the client by using the **vmkping** command. 2. If the connection between the DHCP server and the host is broken, do the following: 1. Check the configuration in the upstream switch, for example, verifying that the VLAN is allowed. 2. Make sure that the server is up and running.
	The interface of the DHCP server(s) connected to the DVS as a VM is not trusted.	Do the following on the VSM: 1. Verify that the interface is trusted by using the **show ip dhcp snooping** command. 2. Verify that the vEthernet interface attached to the server is trusted by using the **module vem** *module-number* **execute vemcmd show dhcps interfaces** command.
	DHCP requests from the VM are not reaching the server for acknowledgment.	On the DHCP server, log in and use a packet capture utility to verify requests and acknowledgments in packets.
	DHCP requests and acknowledgments are not reaching Cisco Nexus 1000V.	• From the client vEthernet interface, SPAN the packets to verify they are reaching the client. • On the host connected to the client, enable VEM packet capture to verify incoming requests and acknowledgments in packets.
	Cisco Nexus 1000V is dropping packets.	On the VSM, verify DHCP statistics by using the following commands: • **show ip dhcp snooping statistics** • **module vem** *module-number* **execute vemcmd show dhcps interfaces**

Troubleshooting Dropped ARP Responses

The following are possible causes, and solutions for dropped ARP responses.

Possible Causes	Solution
ARP inspection is not configured on the VSM	On the VSM, verify that ARP inspection is configured as expected by using the **show ip arp inspection** command. For detailed information about configuring DAI, see the *Cisco Nexus 1000V Security Configuration Guide*.

Possible Causes	Solution
DHCP snooping is not enabled globally on the VSM or is not enabled on the VLAN.	On the VSM, verify the DHCP snooping configuration by using the **show ip dhcp snooping** command. For detailed information about enabling DHCP and configuring DAI, see the *Cisco Nexus 1000V Security Configuration Guide*.
DHCP snooping is not enabled on the VEM or is not enabled on the VLAN.	**1.** From the VSM, verify the VEM DHCP snooping configuration by using the **module vem** *module-number* **execute vemcmd show dhcps vlan** command. **2.** Do one of the following: • Correct any errors in the VSM DHCP configuration. For detailed information, see the *Cisco Nexus 1000V Security Configuration Guide*. • If the configuration appears correct on the VSM but fails on the VEM, capture and analyze the error logs from both the VSM and the VEM to identify the reason for the failure.
If snooping is disabled, the binding entry is not statically configured in the binding table.	**1.** On the VSM, display the binding table by using the **show ip dhcp snooping binding** command. **2.** Correct any errors in the static binding table. For detailed information about clearing entries from the table, enabling DHCP, and configuring DAI, see the *Cisco Nexus 1000V Security Configuration Guide*.
The binding that corresponds to the VM sending the ARP response is not present in the binding table.	**1.** On the VSM, display the binding table by using the **show ip dhcp snooping binding** command. **2.** Correct any errors in the static binding table. For detailed information about clearing entries from the table, enabling DHCP, and configuring DAI, see the *Cisco Nexus 1000V Security Configuration Guide*. **3.** If all configurations are correct, make sure to turn on DHCP snooping before DAI or IPSG to make sure the Cisco Nexus 1000V has enough time to add the binding in the snooping database. For more information, see the *Cisco Nexus 1000V Security Configuration Guide*.

Problems with IP Source Guard

The following are symptoms, possible causes, and solutions for problems with IPSG.

Symptom	Possible Causes	Solution
Traffic disruptions	ARP inspection is not configured on the VSM.	On the VSM, verify that IPSG is configured as expected by using the following commands: • **show port-profile name** *profile_name* • **show running interface** *interface_ID* • **show ip verify source** For detailed information about configuring IP Source Guard, see the *Cisco Nexus 1000V Security Configuration Guide*.
	The IP address that corresponds to the vEthernet interface is not in the snooping binding table.	1. On the VSM, display the binding table by using the **show ip dhcp snooping binding** command. 2. Configure the missing static entry or renew the lease on the VM. 3. On the VSM, display the binding table again to verify that the entry is added correctly by using the **show ip dhcp snooping binding**.

Collecting and Evaluating Logs

VSM Logging Commands

You can use the commands in this section from the VSM to collect and view logs related to DHCP, DAI, and IPSG.

VSM Command	Description
debug dhcp all	Enables debug all for dhcp configuration flags.
debug dhcp cdm-errors	Enables debugging of cdm errors.
debug dhcp cdm-events	Enables debugging of cdm events.
debug dhcp errors	Enables debugging of errors.
debug dhcp mts-errors	Enables debugging of mts errors.
debug dhcp mts-events	Enables debugging of mts events.
debug dhcp pkt-events	Enables debugging of pkt events.
debug dhcp pss-errors	Enables debugging of pss errors.
debug dhcp pss-events	Enables debugging of pss events.

Host Logging Commands

You can use the commands in this section from the ESX host to collect and view logs related to DHCP, DAI, and IPSG.

ESX Host Command	Description
echo "logfile enable" > /tmp/dpafifo	Enables DPA debug logging. Logs are output to `/var/log/vemdpa.log` file.
echo "debug sfdhcpsagent all" > /tmp/dpafifo	Enables DPA DHCP agent debug logging. Logs are output to `/var/log/vemdpa.log` file.
vemlog debug sfdhcps all	Enables data path debug logging and captures logs for the data packets sent between the client and the server.
vemlog debug sfdhcps_pod all	Captures Port Opaque Data (POD) logging for the feature.
vemlog debug sfdhcps_config all	Enables data path debug logging and captures logs for configuration coming from the VSM.
vemlog debug sfdhcps_binding_table all	Enables data path debug logging and captures logs that correspond to binding database changes.

DHCP, DAI, and IPSG Troubleshooting Commands

You can use the commands in this section to troubleshoot problems related to DHCP snooping, DAI, and IPSG.

Command	Description
show running-config dhcp	Displays the DHCP snooping, DAI, and IPSG configuration. See show running-config dhcp, on page 183.
show ip dhcp snooping	Displays general information about DHCP snooping. See show ip dhcp snooping, on page 183.
show ip dhcp snooping binding	Displays the contents of the DHCP snooping binding table. See show ip dhcp snooping binding, on page 183.
show feature	Displays the features available, such as DHCP, and whether they are enabled. See show feature, on page 183.
show ip arp inspection	Displays the status of DAI. See show ip arp inspection, on page 184.
show ip arp inspection interface vethernet *interface-number*	Displays the trust state and ARP packet rate for a specific interface. See show ip arp inspection interface vethernet, on page 184.
show ip arp inspection vlan *vlan-ID*	Displays the DAI configuration for a specific VLAN. See show ip arp inspection vlan, on page 184.

Command	Description
show ip verify source	Displays the IP-MAC address bindings and the interfaces where IPSG is enabled. See show ip verify source, on page 184.
show system internal dhcp {event-history | mem-stats | msgs}	Debugs any issues in the filter-mode configuration. See show system internal dhcp, on page 185.
debug dhcp all	Enables debug all for DHCP configuration flags on the VSM.

Command Examples

show running-config dhcp

```
switch# show running-config dhcp

!Command: show running-config dhcp
!Time: Wed Feb 16 14:20:36 2011

version 4.2(1)SV1(4)
feature dhcp

no ip dhcp relay

switch#
```

show ip dhcp snooping

```
switch# show ip dhcp snooping
DHCP snooping service is enabled
Switch DHCP snooping is enabled
DHCP snooping is configured on the following VLANs:
1,13
DHCP snooping is operational on the following VLANs:
1
Insertion of Option 82 is disabled
Verification of MAC address is enabled
DHCP snooping trust is configured on the following interfaces:
Interface Trusted
------------ -------
vEthernet 3 Yes

switch#
```

show ip dhcp snooping binding

```
switch# show ip dhcp snooping binding
MacAddress IpAddress LeaseSec Type VLAN Interface
------------------ --------------- -------- ---------- ---- -------------
0f:00:60:b3:23:33 10.3.2.2 infinite static 13 vEthernet 6
0f:00:60:b3:23:35 10.2.2.2 infinite static 100 vEthernet 10
switch#
```

show feature

```
switch# show feature
Feature Name Instance State
```

```
-------------------- -------- --------
dhcp-snooping 1 enabled
http-server 1 enabled
ippool 1 enabled
lacp 1 enabled
lisp 1 enabled
lisphelper 1 enabled
netflow 1 disabled
port-profile-roles 1 enabled
private-vlan 1 disabled
sshServer 1 enabled
tacacs 1 enabled
telnetServer 1 enabled
switch#
```

show ip arp inspection

```
switch(config)# show ip arp inspection

Source Mac Validation : Disabled
Destination Mac Validation : Disabled
IP Address Validation : Disabled

Filter Mode(for static bindings): IP-MAC

Vlan : 1
-----------
Configuration : Disabled
Operation State : Inactive

Vlan : 40
-----------
Configuration : Disabled
Operation State : Inactive
```

show ip arp inspection interface vethernet

```
switch# show ip arp inspection interface vethernet 6

Interface Trust State
------------- -----------
vEthernet 6 Trusted
switch#
```

show ip arp inspection vlan

```
switch# show ip arp inspection vlan 13

Source Mac Validation : Disabled
Destination Mac Validation : Enabled
IP Address Validation : Enabled

switch#
```

show ip verify source

```
switch# show ip verify source
Filter Mode(for static bindings): IP-MAC
IP source guard is enabled on the following interfaces:
---------------------------------------------------
Vethernet11
```

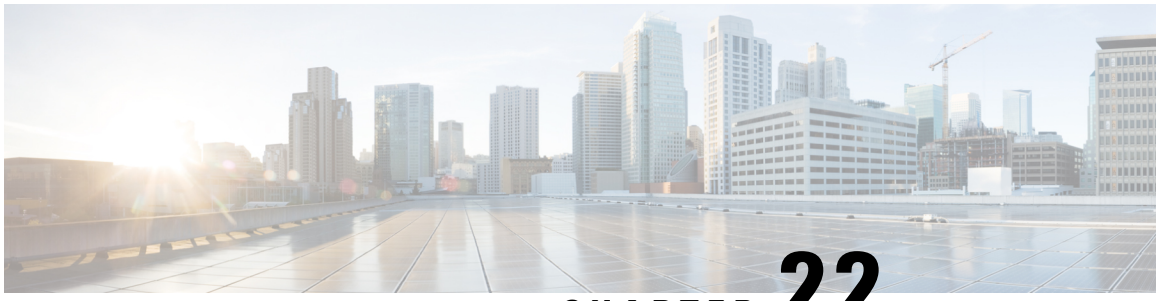
```
IP source guard operational entries:
-----------------------------------
Interface Filter-mode IP-address Mac-address Vlan
------------ ----------- ---------- -------------- ----
Vethernet11 active 205.2.5.80 00:50:56:a4:38:ec 5
```

show system internal dhcp

```
switch# show system internal dhcp msgs
1) Event:E_DEBUG, length:75, at 409832 usecs after Mon Oct 8 20:57:48 2012
[16843009] Session close, handle -767541913, sess-id 0xff0101ba02812d08, state 3

2) Event:E_DEBUG, length:62, at 399944 usecs after Mon Oct 8 20:57:48 2012
[16843009] PPF session open session-id 0xff0101ba02812d08, msg_id 0

3) Event:E_DEBUG, length:30, at 399866 usecs after Mon Oct 8 20:57:48 2012
[16843009] PPF goto setting state 1

4) Event:E_DEBUG, length:23, at 682346 usecs after Mon Oct 8 20:57:11 2012
[16843009] Processed log-mts
...
```

```
VSM-N1k# show system internal dhcp mem-stats detail

Private Mem stats for UUID : Malloc track Library(103) Max types: 5
--------------------------------------------------------------------------------
TYPE NAME ALLOCS BYTES
CURR MAX CURR MAX
2 MT_MEM_mtrack_hdl 33 34 19236 19384
3 MT_MEM_mtrack_info 588 880 9408 14080
4 MT_MEM_mtrack_lib_name 882 1174 42246 56230
--------------------------------------------------------------------------------
Total bytes: 70890 (69k)
--------------------------------------------------------------------------------

Private Mem stats for UUID : Non mtrack users(0) Max types: 149
--------------------------------------------------------------------------------
TYPE NAME ALLOCS BYTES
CURR MAX CURR MAX
11 [r-xp]/isan/plugin/0/isan/lib/libavl.so 3421 3421 68360 68360
26 [r-xp]/isan/plugin/0/isan/lib/libddbcom 116 141 302445 308307
47 [r-xp]/isan/plugin/0/isan/lib/libindxob 6 6 456 456
50 [r-xp]/isan/plugin/0/isan/lib/libip.so. 1 1 212 212
64 [r-xp]/isan/plugin/0/isan/lib/libmpmts. 0 9 0 785
66 [r-xp]/isan/plugin/0/isan/lib/libmts.so 10 11 972 984
68 [r-xp]/isan/plugin/0/isan/lib/libnetsta 1 2 704 1350
81 [r-xp]/isan/plugin/0/isan/lib/libpss.so 158 262 101579 204281
85 [r-xp]/isan/plugin/0/isan/lib/libsdb.so 44 44 3914 3914
89 [r-xp]/isan/plugin/0/isan/lib/libsmm.so 3 3 216 216
111 [r-xp]/isan/plugin/0/isan/lib/libutils. 4 7 69 349
112 [r-xp]/isan/plugin/0/isan/lib/libvdc_mg 0 1 0 20
118 [r-xp]/isan/plugin/2/isan/bin/dhcp_snoo 0 2 0 64
121 [r-xp]/isan/plugin/2/isan/lib/libpdlser 4 29 208 1016
128 [r-xp]/lib/ld-2.3.3.so 33 33 5363 5371
131 [r-xp]/lib/tls/libc-2.3.3.so 51 51 1347 1637
134 [r-xp]/lib/tls/libpthread-2.3.3.so 1 1 33 33
138 [r-xp]/usr/lib/libglib-2.0.so.0.600.1 15 16 10372 10392
145 [r-xp]/isan/plugin/1/isan/lib/libvem_mg 0 1 0 1940
--------------------------------------------------------------------------------
Total bytes: 496250 (484k)
```

```
--------------------------------------------------------------------------------
...



switch# show system internal dhcp event-history msgs
1) Event:E_MTS_RX, length:60, at 809122 usecs after Mon Oct 8 20:59:08 2012
[RSP] Opc:MTS_OPC_PDL32(148511), Id:0X00F132AB, Ret:SUCCESS
Src:0x00000302/747, Dst:0x00000201/360, Flags:None
HA_SEQNO:0X00000000, RRtoken:0x00009498, Sync:UNKNOWN, Payloadsize:132
Payload:
0x0000: 00 00 00 03 00 00 00 01 00 00 00 64 00 00 00 07

2) Event:E_MTS_RX, length:60, at 809100 usecs after Mon Oct 8 20:59:08 2012
[RSP] Opc:MTS_OPC_PDL32(148511), Id:0X00E01555, Ret:SUCCESS
Src:0x00000502/747, Dst:0x00000201/360, Flags:None
HA_SEQNO:0X00000000, RRtoken:0x00009497, Sync:UNKNOWN, Payloadsize:132
Payload:
0x0000: 00 00 00 03 00 00 00 01 00 00 00 64 00 00 00 07

3) Event:E_MTS_RX, length:60, at 809079 usecs after Mon Oct 8 20:59:08 2012
[RSP] Opc:MTS_OPC_PDL32(148511), Id:0X006BE1FC, Ret:SUCCESS
Src:0x00000602/747, Dst:0x00000201/360, Flags:None
HA_SEQNO:0X00000000, RRtoken:0x00009496, Sync:UNKNOWN, Payloadsize:132
Payload:
0x0000: 00 00 00 03 00 00 00 01 00 00 00 64 00 00 00 07

4) Event:E_MTS_RX, length:60, at 809028 usecs after Mon Oct 8 20:59:08 2012
[RSP] Opc:MTS_OPC_PDL32(148511), Id:0X00F132AA, Ret:SUCCESS
Src:0x00000302/747, Dst:0x00000201/360, Flags:None
HA_SEQNO:0X00000000, RRtoken:0x00009474, Sync:UNKNOWN, Payloadsize:132
Payload:
0x0000: 00 00 00 03 00 00 00 01 00 00 00 64 00 00 00 07
contd.
```



CHAPTER 22

Storm Control

This chapter describes how to identify and resolve problems related to storm control. This chapter contains the following sections:

Information About Storm Control

A traffic storm occurs when packets flood the LAN, creating excessive traffic and degrading network performance. You can use the traffic storm control feature to prevent disruptions from a broadcast, multicast, or unknown-unicast traffic storm.

Storm Control Troubleshooting Commands

Storm Control VSM Commands

Use the following commands to display detailed storm control statistics on an interface:

- **show storm-control statistics interface** *interface-type module-number/port-number*
- **show storm-control statistics module** *module-number*

Storm Control VEM Commands

Command	Description
vemcmd show storm stats	Displays all statistics related to the broadcast, multicast, and unknown unicast traffic.
vemcmd show storm-rate ltl *ltl*	Displays the configured storm rate on a VEM.
vemcmd show storm status	Displays the storm control status of whether the port is dropping or allowing traffic on a VEM.

Debugging Storm Control on VEM

To debug storm control on VEM, run the following commands:

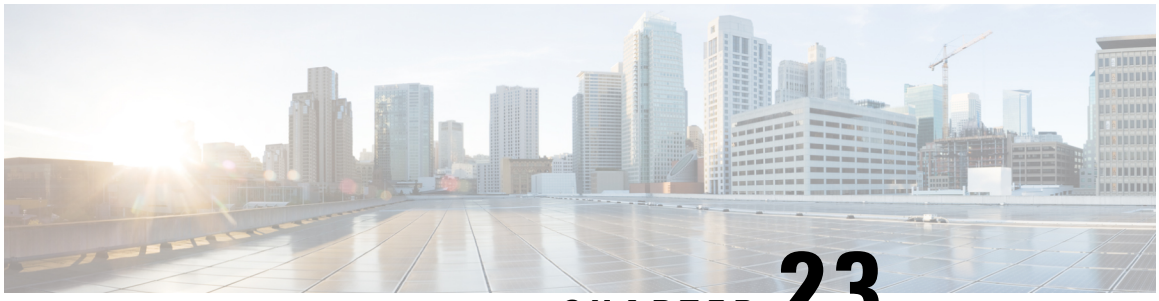
Procedure

Step 1 **vemlog clear**

Step 2 **vemlog start**

Step 3 **vemlog debug sfstormcontrol all**

Step 4 **vemlog show all**



CHAPTER 23

System

This chapter describes how to identify and resolve problems related to Cisco Nexus 1000V system. This chapter contains the following sections:

Information About the System

Cisco Nexus 1000V provides Layer 2 switching functions in a virtualized server environment. Cisco Nexus 1000V replaces virtual switches within ESX servers and allows you to configure and monitor the virtual switch using the Cisco NX-OS command line interface. Cisco Nexus 1000V also gives you visibility into the networking components of the ESX servers and access to the virtual switches within the network.

Cisco Nexus 1000V manages a datacenter defined by the vCenter Server. Each server in the datacenter is represented as a linecard in Cisco Nexus 1000V and can be managed as if it were a line card in a physical Cisco switch. Cisco Nexus 1000V implementation has two components:

- Virtual supervisor module (VSM): This is the control software of the Cisco Nexus 1000V distributed virtual switch. It runs on a virtual machine (VM) and is based on NX-OS.
- Virtual Ethernet module (VEM): This is the part of Cisco Nexus 1000V that actually switches data traffic. It runs on a VMware ESX host. Several VEMs are controlled by one VSM. All VEMs that form a switch domain should be in the same virtual data center as defined by VMware vCenter Server.

General Restrictions for vCenter Server

When you are troubleshooting issues related to vCenter Server, make sure that you observe the following restrictions:

- The name of a distributed virtual switch (DVS) name must be unique across datacenters
- You create a DVS in a network folder
- A datacenter cannot be removed unless the DVS folder or the underlying DVS is deleted.
- A DVS can be deleted only with the help of VSM using the **no vmware dvs** command in config-svs-conn mode.
- The **no vmware dvs** command can succeed only if there are no VMs using the DVS port-groups.
- A port group on vCenter Server can be deleted only if there are no interfaces associated with it.
- A sync operation performed in conjunction with the **connect** command helps VSM keep in sync with vCenter Server.
- Each VSM uses a unique extension key to communicate with vCenter Server and perform operations on a DVS.

Extension Key

The VSM uses the extension key when communicating with the vCenter Server. Each VSM has its own unique extension key, such as Cisco_Nexus_1000V_32943215. The same extension key cannot be used to create more than one DVS on the vCenter Server.

Use the **show vmware vc extension-key** command to find the extension key of the VSM. It is also listed in the .xml file.

The extension key registered on the vCenter Server can be found through the MOB. For more information, see Finding the Extension Key Tied to a Specific DVS, on page 24.

Recovering a DVS

Recovering a DVS With a Saved Copy of the VSM

You can use this procedure to recover a DVS when you have previously saved a back up copy of the VSM configuration file.

Before you begin

Before starting this procedure, you must know or do the following:

- Use this procedure if you have previously saved a back up copy of the VSM configuration file. If you have not previously saved a back up copy, see Recovering a DVS Without a Saved Copy of the VSM, on page 191.
- Make sure that the VSM VM switch name is the same as the DVS switch name on the vCenter Server. This allows the VSM configuration to synchronize with the correct DVS on the vCenter Server.

  To change the VSM switch name, use the **switchname** *newname* command.

Procedure

Step 1 From the MOB, find the DVS extension key. For more information, see Finding the Extension Key Tied to a Specific DVS, on page 24.

Step 2 On the VSM, add the DVS extension key found in Step 1.

The extension key allows the VSM to log in to the vCenter server.

Example:

```
switch# config t
switch(config)#vmware vc extension-key Cisco_Nexus_1000V_32943215
```

Step 3 From the MOB, unregister the extension key found in Step 1.

For more information, see Unregistering the Extension Key in vCenter Server, on page 26.

Step 4 From the VC client, register the extension (plug-in) for the VSM.

For more information see the Cisco Nexus 1000V vCenter Plug-in Configuration Guide.

Step 5 On the VSM, restore the configuration using a previously-saved copy of the VSM configuration file.

copy *path/filename* **running-config**

Example:

```
switch# copy sftp://user1@172.22.36.10/backup/hamilton_cfg running-config
```

Step 6 Do one of the following:

- If the vCenter server connection is not part of the previously-saved configuration, go to Step 7.
- Otherwise, go to Step 8.

Step 7 On the VSM, restore the configuration for the vCenter server connection.

Example:

```
switch# config t
switch(config)# svs connection VC
switch(config-svs-conn#) protocol vmware-vim
switch(config-svs-conn#) remote ip address 192.168.0.1
switch(config-svs-conn#) vmware dvs datacenter-name Hamilton-DC
```

Step 8 Connect to vCenter Server.

Example:

```
switch(config-svs-conn#) connect
```

You can now use the old DVS or remove it.

Recovering a DVS Without a Saved Copy of the VSM

You can use this procedure to recover a DVS when you have not previously saved a back up copy of the VSM configuration file.

Before you begin

Before starting this procedure, you must know or do the following:

- The folder in which the VSM resides must be:
  - At the root-level of the Data Center in which it resides. It cannot be embedded in another folder.
  - Of the same name as the VSM.

  If the folder does not meet the above criteria, the connection to vCenter server fails with the error, the VSM already exists.
- Use this procedure if you have not previously saved a back up copy of the VSM configuration file. If you have previously saved a back up copy, then see Recovering a DVS With a Saved Copy of the VSM, on page 190.
- If you have not previously saved a back up copy of the VSM configuration file, then you may try recreating the old port profiles before connecting to the VC. This procedure has a step for recreating port profiles. If you do not recreate these before connecting to VC, then all the port groups present on the VC are removed and all ports in use are moved to the quarantine port groups.
- Make sure that the VSM VM switch name is the same as the DVS switch name on the vCenter Server. This allows the VSM configuration to synchronize with the correct DVS on the vCenter Server.

  To change the VSM switch name, use the **switchname** *newname* command.

Procedure

Step 1 From the MOB, find the DVS extension key. For more information, see Finding the Extension Key Tied to a Specific DVS, on page 24.

Step 2 On the VSM, add the DVS extension key found in Step 1.

The extension key allows the VSM to log in to the vCenter server.

Example:

```
switch# config t
switch(config)#vmware vc extension-key Cisco_Nexus_1000V_32943215
```

Step 3 From the MOB, unregister the extension key found in Step 1.

For more information, see Unregistering the Extension Key in vCenter Server, on page 26.

Step 4 From the VC client, register the extension (plug-in) for the VSM.

For more information, see the Cisco Nexus 1000V vCenter Plug-in Configuration Guide.

Step 5 Manually recreate the old port profiles from your previous configuration.

For information about how to configure system port profiles for VSM-VEM communication, uplink port profile and data port profile for VM traffic, see the Cisco Nexus 1000V for VMware vSphere Port Profile Configuration Guide.

Note If you do not manually recreate the port profiles, then all port groups on the vCenter Server are removed when the VSM connects.

Step 6 On the VSM, restore the configuration for the vCenter server connection.

Example:

```
switch# config t
switch(config)# svs connection VC
switch(config-svs-conn)# protocol vmware-vim
switch(config-svs-conn)# remote ip address 192.168.0.1
switch(config-svs-conn)# vmware dvs datacenter-name Hamilton-DC
```

Step 7 Connect to vCenter Server.

Example:

```
switch(config-svs-conn)# connect
```

You can now use the old DVS or remove it.

Problems Related to VSM and vCenter Server Connectivity

Symptom	Solution
Connections are not supported between Release 4.0(4)SV1(3a) VSMs and VMware vCenter Server 5.0.	Upgrade to a compatible version of the Cisco Nexus 1000V software.
The vCenter Server connection seems to succeed, but does not.	Make sure that the domain ID is configured correctly.
The **svs connection** command fails.	• Make sure you have configured all parameters for the **svs connection** command. • Make sure you can ping the vCenter Server IP address. • Make sure that the `proxy.xml` file is correct for both the IP address and length. • Restart the vCenter Server.
The connection fails after an ESX reboot.	See Connection Failure After ESX Reboot, on page 194.
The host does not show up in the Add host to DVS screen.	Make sure that the Host is installed with VMware Enterprise plus license containing the Distributed Virtual Switch feature.
Add host to DVS returns an error.	Verify that the VEM software is installed on the ESX server,
The server name column of the **show module** command output shows the IP address.	The server name shows the host-name or IP address, whichever was used to add the host to the DVS on the vCenter Server.

show vms internal event-history error

The **show vms internal event-history errors** command is useful for examining VC errors in detail. It shows whether an error is caused by a VSM (client) or the server.

```
switch# show vms internal event-history errors

Event:E_DEBUG, length:239, at 758116 usecs after Tue Feb 3 18:21:58 2009
[102] convert_soap_fault_to_err(1179): SOAP 1.1 fault: "":ServerFaultCode [VMWARE-VIM] A
DVS n1000v with spec.name as n1000v already exists, cannot create DVS n1000v. A specified
parameter was not correct.spec.name

Event:E_DEBUG, length:142, at 824006 usecs after Tue Feb 3 18:18:30 2009
[102] convert_soap_fault_to_err(1179): SOAP 1.1 fault: SOAP-ENV:Client [VMWARE-VIM] Operation
 could not be completed due to connection failure.

Event:E_DEBUG, length:134, at 468208 usecs after Tue Feb 3 18:15:37 2009
[102] convert_soap_fault_to_err(1179): SOAP 1.1 fault: "":ServerFaultCode [VMWARE-VIM]
Extension key was not registered before its use.
```

Connection Failure After ESX Reboot

To prevent a loss of connectivity between the VSM and VEM, and preserve a non-default MTU setting for a physical NIC across reboots of the ESX, you must configure a system MTU in the system port profile.

If you use an MTU other than 1500 (the default) for a physical NIC attached to the Cisco Nexus 1000V, then reboots of the ESX can result in a mismatch with the VMware kernel NIC MTU and failure of the VSM and VEM. For example, you may manually configure an MTU of other than 1500 in networks with jumbo frames. During a power cycle, the ESX reboots and the MTU of the physical NIC reverts to the default of 1500 but the VMware kernel NIC does not. To prevent a loss of connectivity in resulting from an MTU mismatch, see Setting the System MTU, on page 194. To recover connectivity if you have not configured system MTU in the system uplink port profile, see Recovering Lost Connectivity Due to MTU Mismatch, on page 195.

Setting the System MTU

To set a system MTU in your existing system uplink port profiles, do the following:

Before you begin

Before beginning this procedure, you must know or do the following:

- You are logged in to the CLI in EXEC mode.
- The system port profiles are already configured and you know the uplink profile names. For more information, see the *Cisco Nexus 1000V Port Profile Configuration Guide*.
- The MTU size you set for the system mtu on the port profile must be less than the size of the **system jumbomtu** configured on the interface. For more information about configuring MTU on the interface, see the *Cisco Nexus 1000V Interface Configuration Guide*.
- When you configure a system MTU on a system port profile, it takes precedence over an MTU you may have configured on the interface.
- To verify the ESX MTU settings for corresponding PNICs, use the **ESXcfg-nics -l** command.

Procedure

	Command or Action	Purpose
Step 1	**config t** **Example:** `switch# config t` `switch(config)#`	Enters global configuration mode.
Step 2	**port-profile** *name* **Example:** `switch(config)# port-profile AccessProf` `switch(config-port-prof)#`	Enters port profile configuration mode for the named system uplink port profile.
Step 3	**system mtu** *mtu-size* **Example:** `switch(config-port-prof)# system mtu 4000` `switch(config-port-prof)#`	Designates the MTU size. The MTU size must meet the following requirements: • Must be an even number between 1500 and 9000. • Must be less than the size of the **system jumbomtu** on the interface.
Step 4	(Optional) **port-profile** [**brief** | **expand-interface** | **usage**] [**name** *profile-name*] **Example:** `switch(config-port-prof)# show port-profile name AccessProf`	Displays the configuration for verification.
Step 5	(Optional) **copy running-config startup-config** **Example:** `switch(config-port-prof)# copy running-config startup-config`	Saves the running configuration persistently through reboots and restarts by copying it to the startup configuration.

Recovering Lost Connectivity Due to MTU Mismatch

To recover lost connectivity due to an MTU mismatch between the physical NIC and the VMware kernel NIC after an ESX reboot, do the following:

Before you begin

Before beginning this procedure, you must know or do the following:

- You are logged in to the CLI in EXEC mode.
- To verify the ESX MTU settings for corresponding PNICs, use the **ESXcfg-nics -l** command.

Note Use **vemcmds** only as a recovery measure and then update the MTU value in the port profile configuration for system uplinks or in the interface configuration for non-system uplinks.

Procedure

	Command or Action	Purpose
Step 1	**config t** **Example:** `switch# config t` `switch(config)#`	Enters global configuration mode.
Step 2	**module vem** *module_number* **execute vemcmd show port** *port-LTL-number* **Example:** `switch(config)# module vem 3 execute vemcmd show port 48` `LTL IfIndex Vlan Bndl SG_ID Pinned_SGID Type Admin State CBL Mode Name` `17 1a030100 1 T 304 1 32 PHYS UP UP 1 Trunk vmnic1` `switch(config)#`	Displays the port configuration including the LTL number needed for Step 3.
Step 3	**module vem** *module_number* **execute vemcmd set mtu** *size* **ltl** *port-LTL-number* **Example:** `switch(config)# module vem 3 execute vemcmd set mtu 9000 ltl 17` `switch(config)#`	Designates the MTU size for the port, using the LTL number obtained in Step 2.

Problems with VSM Creation

Symptom	Solution
The VSM VM is stuck at the boot prompt.	Make sure that you have three e1000 NICs.
The VSM VM cannot ping itself.	Configure the management0 interface.
The VSM VM can ping itself, but not the gateway.	Make sure the NIC order is correct: control, management, inband/outband.
The VSM VM can ping the gateway, but not the outside subnet.	Configure vrf context management.

Problems with Port Profiles

When creating a port profile, use the **vmware port-group** and **state enabled** commands to create the corresponding port groups on the vCenter Server.

Profiles that have the system VLAN configuration allow the VEM to communicate with the VSM. Make sure that the system port-profile is defined with the right system VLANS. Use the **show port-profile** and **show port-profile usage** commands to collect basic required information.

Symptom	Possible Causes	Solution
You receive the following error message: `Possible failure in communication with vCenter Server`	The VSM is not connected to the vCenter Server.	Issue the **svs connection vc** command to connect to the vCenter Server.
	The port group name is not unique.	Port group names must be unique within a vCenter Server Datacenter.
Port profile or port groups do not appear on the vCenter Server.	—	Make sure you have issued the **vmware port-group** command and **state enable** command.

Problems with Hosts

Symptom	Solution
You receive the following error message: `DVS Operation failed for one or more members`	Issue the **vem status -v** command to verify if the VEM is running on the host.
	Issue the **vem unload** command to unload the VEM.
	In the vSphere Client, remove the stale DVS: 1. Click **Host** > **Configuration** > **Networking** > **Distributed Virtual Switch**. 2. Click **Remove**.
The host is visible on the vCenter Server, but not the VSM.	Issue the **vemcmd show trunk** command to verify that there is an uplink carrying the control VLAN. The profile applied to the uplink must be a system profile with a control VLAN as a system VLAN.
	Verify the control VLAN in the upstream switch port and the path to the VSM VM. Make sure that one uplink at most carries the control VLAN, or that all uplinks and upstream ports carrying the control VLAN are in port channels.

Symptom	Solution
A module flap occurs.	The VSM may be overloaded. Make sure that you have 1 GB of memory and CPU shares for the VSM VM on the vCenter Server.

Problems with VM Traffic

Problems with Intra-Host VM Traffic

When troubleshooting problems with intra-host VM traffic, follow these guidelines:

- Make sure that at least one of the VMware virtual NICs is on the correct DVS port group and is connected.
- If the VMware virtual NIC is down, determine if there is a conflict between the MAC address configured in the OS and the MAC address assigned by VMware. You can see the assigned MAC addresses in the vmx file.

Problems with Inter-Host VM Traffic

When troubleshooting problems with inter-host VM traffic, follow these guidelines:

- Determine if there is exactly one uplink sharing a VLAN with the VMware virtual NIC. If there is more than one, they must be in a port channel.
- Ping a SVI on the upstream switch using the **show intX counters** command.

Error Messages

On the vSphere Client, you can see error messages under the **Recent Tasks** tab. You can find detailed description of the error under the **Tasks and Events** tab. The same messages are also propagated to the VSM. The following table lists error messages that you might see on the VSM.

Error	Description
ERROR: [VMWARE-VIM] Extension key was not registered before its use	This error indicates that VSM extension key is not registered.
ERROR: [VMWARE-VIM] A DVS switch with spec.name as switch already exists, cannot create DVS switch. A specified parameter was not correct. spec.name.	This error is displayed after you enter the first **connect** command, and indicates that a DVS already exists with the same name.
ERROR: [VMWARE-VIM] A DVS switch with spec.extensionKey as Cisco_Nexus_1000V_2055343757 already exists, cannot create DVS new-switch. A specified parameter was not correct. spec.extensionKey	This error is displayed when the VSM tries to create a different DVS after changing the switch name.

Error	Description
ERROR: [VMWARE-VIM] A DVS switch with name as switch already exists, cannot reconfigure DVS test. A specified parameter was not correct. Spec.name	This error indicates that a DVS with the same name already exists.
Warning: Operation succeeded locally but update failed on vCenter server.[VMWARE-VIM] DVPortgroup test port 0 is in use. The resource vim.dvs.DistributedVirtualPort 0 is in use.	This warning is displayed when the VSM tries to delete the port profile if the VSM is not aware of the nics attached to the port groups.

System Troubleshooting Commands

Command	Description
vemlog	Displays and controls VEM kernel logs. Use the following commands to control and display the VEM kernel logs: • **vemlog stop**—Stops the log. • **vemlog clear**—Clears the log. • **vemlog start** *number-of-entries*— Starts the log and stops it after the specified number of entries. • **vemlog stop** *number-of-entries*—Stops the log after the next specified number of entries. • **vemlog resume**—Starts the log but does not clear the stop value. • **vemlog show last** *number-of-entries*—Displays the circular buffer. • **vemcmd show info**—Displays information about entries in the log.
vemcmd	Displays configuration and status information. Use the **vemcmd help** command to view the type of information you can display.
vem-support all	Collects support information.
vem status	Collects status information.
vem version	Collects version information.

Command Examples

vemlog show last

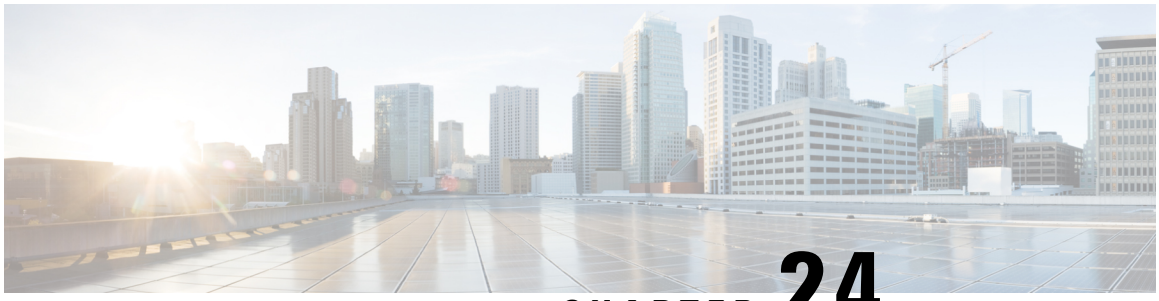
```
[root@ESX-cos1 ~]# vemlog show last 5
Timestamp Entry CPU Mod Lv Message
Oct 13 13:15:52.615416 1095 1 1 4 Warning vssnet_port_pg_data_ …
Oct 13 13:15:52.620028 1096 1 1 4 Warning vssnet_port_pg_data_ …
Oct 13 13:15:52.630377 1097 1 1 4 Warning svs_switch_state …
Oct 13 13:15:52.633201 1098 1 1 8 Info vssnet new switch …
Oct 13 13:16:24.990236 1099 1 0 0 Suspending log
```

vemcmd show info

```
[root@ESX-cos1 ~]# vemlog show info
Enabled: Yes
Total Entries: 1092
Wrapped Entries: 0
Lost Entries: 0
Skipped Entries: 0
Available Entries: 6898
Stop After Entry: Not Specified
```

vemcmd help

```
[root@ESX-cos1 ~]# vemcmd help
show card Show the card's global info
show vlan [vlan] Show the VLAN/BD table
show bd [bd] Show the VLAN/BD table
show l2 <bd-number> Show the L2 table for a given BD/VLAN
show l2 all Show the L2 table
show port [priv|vsm] Show the port table
show pc Show the port channel table
show portmac Show the port table MAC entries
show trunk [priv|vsm] Show the trunk ports in the port table
show stats Show port stats
```



CHAPTER 24

Network Segmentation Manager

This chapter describes how to identify and resolve problems related with Network Segmentation Manager. This chapter contains the following sections:

Information About Network Segmentation Manager

Cisco Network Segmentation Manager (NSM) integrates VMware's vCloud Director with Cisco Nexus 1000V for networking management.

For information about the NSM feature, see Cisco Nexus 1000V Network Segmentation Manager Configuration Guide.

Problems with NSM

The following table describes symptoms, possible causes, and solutions for the following problems with NSM. The system messages for the majority of the problems are logged in vShield Manager or vCloud Director. For information about a system message, see the *Cisco Nexus 1000V Series and Cisco VSG NX-OS System Messages Reference Guide for VMware vSphere*.

Symptom	Possible Causes	Verification and Solution
Registration failure of vShield Manager with Network Segmentation Manager has occurred. A system message is logged in vShield Manager.	vShield Manager is unable to reach NSM.	1. Verify that the connection between Cisco Nexus 1000V and VMware vShield Manager is enabled. 2. Check that vShield Manager is able to ping Cisco Nexus 1000V. If not, re-establish the Layer 2 or Layer 3 connectivity between the vShield Manager and Cisco Nexus 1000V. For more information, see the *Cisco Nexus 1000V Network Segmentation Manager Configuration Guide*.
	vShield Manager is unable to authenticate with NSM.	Verify if the username and password are accurate by checking the VSM system logs. The following system log is displayed if the username and password are inaccurate. `2012 Jan 20 00:49:59 switch %USER-3-SYSTEM_MSG: VALIDATE: user: admin, Authentication failure - validate` If not, replace the username and password in the networking configuration on the vShield Manager.
	NSM feature is not enabled on Cisco Nexus 1000V.	Verify if the NSM feature is enabled on Cisco Nexus 1000V by using the **show feature** command. If not, enable the NSM feature by using the **feature network-segmentation-manager** command.
	HTTPS is not enabled on Cisco Nexus 1000V.	Check if the browser can connect to https://<vsm-ip>/? If not, enable the HTTPS server on the VSM by using the **feature http-server** command.

Symptom	Possible Causes	Verification and Solution
The network creation triggered from vCloud Director fails. A system message similar to the following is logged in the vCloud Director: `Failed to create network segment`	vCloud Director is unable to create the VLAN associated with the network.	1. Verify that the resources are available to create a VLAN by checking the existing number of VLAN by using the **show vlan summary** command. If the number of existing VLANs exceeds the number of supported VLANs (2048), then evaluate if there are any of the VLANs that can be removed from the system. 2. Verify that the VLAN pool in vCloud Director does not contain more than 2048 available VLANs.
The network creation triggered from vCloud Directors fails. A system message similar to the following is logged in vCloud Director: `Template could not be inherited on port-profile`	vCloud Director is unable to inherit the port profile associated with the network segment policy onto the port profile created for the network.	1. Verify if the port profile exists by using the **show running-config port-profile** *name* command. To identify the name of the port profile, you need to determine the network segment policy the network was attempting to use. You need information about the tenant/organization UUID and the type of network pool the network was being created from (VXLAN or VLAN) to find the corresponding network segment policy that has these values configured. If no network segment policy is configured with these values, then use the default network segment policy to identify the name of the port profile. 2. Check the system logs for a port profile inheritance failure message reported by NSM. For more information, see the *Cisco Nexus 1000V Series and Cisco VSG NX-OS System Messages Reference Guide for VMware*.
The network creation triggered from vCloud Director fails. A system message similar to the following is logged in the vCloud Director: `Failed to set max-ports`	vCloud Director is unable to set the max ports on the port profile.	Check system logs for a maximum number of port failure message reported by NSM. For more information, see the *Cisco Nexus 1000V Series and Cisco VSG NX-OS System Messages Reference Guide for VMware*.

Symptom	Possible Causes	Verification and Solution
The network creation triggered from vCloud Director fails. A system message similar to the following is logged in vCloud Director: `Network already exists`	A network with the same name already exists in the vCloud Director.	1. Delete the existing network that has the same name by using the **no port-profile network** *name* command. 2. Delete the bridge domain with the same name (if it exists) by using the **no bridge-domain** *name* command.
The network creation triggered from vCloud Director fails. A system message similar to the following is logged in vCloud Director: `Failed to create port-profile`	Cisco Nexus 1000V is unable to create the port profile required for the network.	Check system logs for a port profile failure message reported by NSM. For more information, see the *Cisco Nexus 1000V Series and Cisco VSG NX-OS System Messages Reference Guide for VMware*.
The network creation triggered from vCloud Directors fails. A system message similar to the following is logged in the vCloud Director: `Template does not exist`	vCloud Director is unable to find the port profile associated with the network segment policy associated with the network.	1. Verify if the port profile exists by using the **show running-config port-profile** *name* command . To identify the name of the port profile, you need to determine the network segment policy the network was attempting to use. You need information about the tenant/organization UUID and the type of network pool the network was being created from (VXLAN or VLAN) to find the corresponding network segment policy that has these values configured. If no network segment policy is configured with these values, then use the default network segment policy to identify the name of the port profile. 2. Check the system logs for a port profile failure message reported by NSM. For more information, see the *Cisco Nexus 1000V Series and Cisco VSG NX-OS System Messages Reference Guide for VMware*.
The network creation triggered from vCloud Director fails. A system message similar to the following is logged in vCloud Director: `Alias ID not found`	vCloud Director is unable to retrieve the port group ID associated with the port profile created for the network.	Verify that the VSM has an active SVS connection by using the **show svs connection** command. When you enter this command, the output must display the following: `operational status: connected`

Symptom	Possible Causes	Verification and Solution
The network creation triggered from vCloud Director fails. A system message similar to the following is logged in vCloud Director: `Failed to set port-binding`	vCloud Director is unable to set the port binding on the port profile associated with the network.	Check system logs for a port binding failure message reported by NSM. For more information, see the *Cisco Nexus 1000V Series and Cisco VSG NX-OS System Messages Reference Guide for VMware*.
The network creation triggered from vCloud Director fails. A system message similar to the following is logged in vCloud Director: `Failed to set vlan`	vCloud Director is unable to set the access VLAN on the port profile associated with the network.	Check system logs for a set VLAN failure message reported by NSM. For more information, see the *Cisco Nexus 1000V Series and Cisco VSG NX-OS System Messages Reference Guide for VMware*.
The network creation triggered from vCloud Director fails. A system message similar to the following is logged in vCloud Director: `Failed to set vmware port-group`	vCloud Director is unable to set Vmware port group property on the port profile.	Check system logs for a port group property failure message reported by NSM. For more information, see the *Cisco Nexus 1000V Series and Cisco VSG NX-OS System Messages Reference Guide for VMware*.
The network creation triggered from vCloud Director fails. A system message similar to the following is logged in vCloud Director: `Failed to set state enabled`	vCloud Director is unable to set the property state on the port profile to enabled.	Check system logs for a state enabled property failure message reported by NSM. For more information, see the *Cisco Nexus 1000V Series and Cisco VSG NX-OS System Messages Reference Guide for VMware*.
The network creation triggered from vCloud Director fails. A system message similar to the following is logged in vCloud Director: `Failed to collect svs configuration`	vCloud Director is unable to execute the **show svs connection** command.	Verify that the VSM has an active SVS connection by using the **show svs connection** command. When you enter the command, the output must display the following: `operational status: connected`

Symptom	Possible Causes	Verification and Solution
The network creation triggered from vCloud Director fails. A system message similar to the following is logged in vCloud Director: `Operational status is missing`	vCloud Director is unable to locate the operational status in the SVS connection.	1. Verify that the VSM has an active SVS connection by using the **show svs connection** command. When you enter the command, the output must display the following: `operational status: connected` 2. Check system logs for an operational status failure message. For more information, see the *Cisco Nexus 1000V Series and Cisco VSG NX-OS System Messages Reference Guide for VMware*.
The network creation triggered from vCloud Director fails. A system message similar to the following is logged in vCloud Director: `SVS connection is disconnected`	SVS connection is disconnected.	Verify that the VSM has an active SVS connection by using the **show svs connection** command. When you enter the command, the output must display the following: `operational status: connected`
The network creation triggered from vCloud Director fails. A system message similar to the following is logged in vCloud Director: `Failed to create bridge domain`	vCloud Director is unable to create the bridge domain associated with the network.	Verify that the segmentation feature is enabled by using the **show feature** command. If not, enable the segmentation feature by using the **feature segmentation** command.
The network creation triggered from vCloud Director fails. A system message similar to the following is logged in vCloud Director: `Failed to set segment ID`	vCloud Director is unable to set the segment ID associated with the network.	Verify that the segment ID is not already in use by another bridge domain by using the **show bridge-domain** command. Check the error message on the system log to retrieve the segment ID.
The network creation triggered from vCloud Director fails. A system message similar to the following is logged in vCloud Director: `Failed to set group IP`	vCloud Director is unable to set the group IP associated with the network.	Verify that the group IP is a valid multicast IP address by checking the system logs for invalid IP address error message reported by NSM. For more information, see the *Cisco Nexus 1000V Series and Cisco VSG NX-OS System Messages Reference Guide for VMware*.

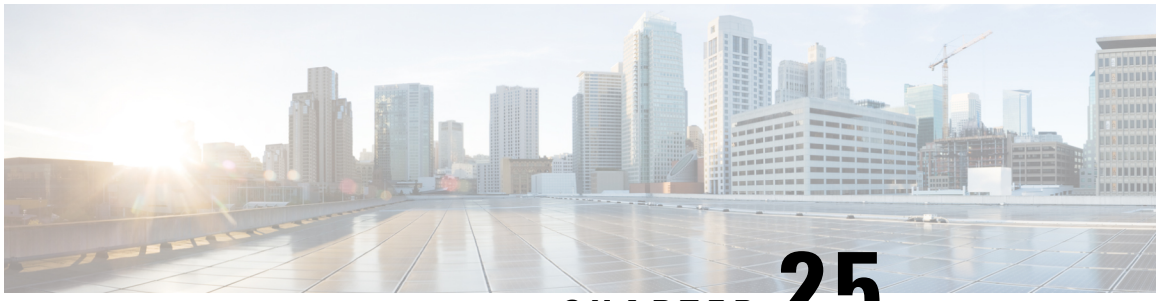
Symptom	Possible Causes	Verification and Solution
The network creation triggered from vCloud Director fails. A system message similar to the following is logged in vCloud Director: `Failed to set port-profile description`	vCloud Director is unable to set the description for the port profile associated with the network.	Check system logs for a port profile description failure message reported by NSM. For more information, see the *Cisco Nexus 1000V Series and Cisco VSG NX-OS System Messages Reference Guide for VMware*.
The network deletion triggered from vCloud Director fails. A system message similar to the following is logged in vCloud Director: `Failed to delete interface using the port-profile`	vCloud Director is unable to delete the interfaces inheriting the port profile.	1. Manually delete the interfaces. 2. In vCenter Server, ensure that the VMs associated with the vApp are powered down. 3. In the VSM enter the **no interface vethernet** *vethernet number* command.
The network deletion triggered from vCloud Director fails. A system message similar to the following is logged in vCloud Director: `Failed to delete the port-profile`	vCloud Director is unable to delete the port profile associated with the network.	1. Manually delete the port profile. 2. Check system logs for a port profile deletion failure message reported by NSM. For more information, see the *Cisco Nexus 1000V Series and Cisco VSG NX-OS System Messages Reference Guide for VMware*.
An vEthernet interface is administratively down. The interface will be in the NoPortProfile state.	The vEthernet interface is in a quarantine state.	1. Verify the interface is quarantined by using the **show port-profile sync-status** command. 2. Bring the interface out of quarantine by using the **no shutdown** command. 3. Verify if the interface is online by using the **show interface vethernet** command.

NSM Troubleshooting Commands

You can use the commands in this section to troubleshoot problems related to the NSM. For detailed information about the **show** command output, see the Cisco Nexus 1000V Command Reference.

Command	Purpose
show network-segment manager switch	Displays Cisco Nexus 1000V configured with NSM.

Command	Purpose
show running-config port-profile	Displays the port profile configuration.
show running-config network-segment policy	Displays the NSM policy configuration.
show network-segment policy usage	Displays the network segmentation policy usage by networks.
show network-segment network	Displays the networks associated with a network segmentation policy.
show network-segment network id *id*	Displays the network IDs associated with a network segmentation policy.
show network-segment network name *name*	Displays the name of the networks associated with a network segmentation policy.
show logging logfile | grep NSMGR	Displays the system logs from the NSM.



CHAPTER 25

VXLANs

This chapter describes how to identify and resolve problems that might occur when implementing Virtual Extensible Local Area Networks (VXLANs). This chapter contains the following sections:

Information About VXLANs

Overview

A VXLAN creates LAN segments by using an overlay approach with MAC-in-UDP encapsulation and a 24-bit segment identifier in the form of a VXLAN ID. The encapsulation carries the original Layer 2 frame from the virtual machine (VM) that is encapsulated from within the Virtual Ethernet Module (VEM). Each VEM is assigned an IP address that is used as the source IP address when encapsulated MAC frames are sent over the network. You can have multiple VTEPs per VEM that are used as sources for this encapsulated traffic. The encapsulation carries the VXLAN identifier used to scope the MAC address of the payload frame. The VXLAN ID to which a VM belongs is indicated within the port profile configuration of the vNIC and is applied when the VM connects to the network. A VXLAN supports three different modes for broadcast, multicast, and MAC distribution mode transport.

For information about the VXLAN feature and how to configure it, see the Cisco Nexus 1000V for VMware vSphere VXLAN Configuration Guide. For detailed information about the **show** commands mentioned in this chapter, see the Cisco Nexus 1000V for VMware vSphere Command Reference.

Bridge Domains Scalability

Cisco Nexus 1000V supports a total of 4000 and 6144 bridge domains.

```
switch(config-port-prof-srv)# show resource-availability vlan

Maximum number of user VLANs supported: 4093
Number of user VLANs created : 3968
Total number of available user VLANs : 125
Note: Total number of available user VLANs additionally depend on number of
bridge-domains under usage. Please verify the usage of bridge-domains too.

VSM-DAOX(config-port-prof-srv)# show resource-availability bridge-domain
Maximum number of bridge-domains per DVS: 6144
```

```
Number of bridge-domains currently created: 5004
Number of bridge-domains available*: 1140
* available bridge-domains do not account for created VLANs
```

VXLAN Feature Disabled

As a safety precaution, do not use the **no feature segmentation** command if there are any ports associated with a VXLAN port profile. You must remove all associations before you can disable this feature. You can use the **no feature segmentation** command to remove all the VXLAN bridge domain configurations on the Cisco Nexus 1000V.

Vempkt

Use vempkt to trace the packet path through the VEM.

- Encapsulated: Capture ingress on Seg-VEth LTL and Egress on uplink
- Decapsulated: Capture ingress on uplink and Egress on Seg-VEth LTL

VXLAN Troubleshooting Commands

VSM Show Commands

Command	Purpose
show system internal seg_bd info segment *segment-id*	Displays the ports belonging to a specific segment. See show system internal seg_bd info segment, on page 211.
show system internal seg_bd info port vethernet	Displays the vEthernet bridge domain configuration. See show system internal seg_bd info port vethernet, on page 211.
show system internal seg_bd info port ifindex	Displays the vEthernet bridge configuration with ifindex as an argument. See show system internal seg_bd info port ifindex, on page 211.
show system internal seg_bd info port_count	Displays the total number of bridge domain ports. See show system internal seg_bd info port_count, on page 211.
show system internal seg_bd info bd vxlan-home	Displays the bridge domain internal configuration. See show system internal seg_bd info bd vxlan-home, on page 211.

Command	Purpose
show system internal seg_bd info port	Displays the VXLAN vEthernet information. See show system internal seg_bd info port, on page 211.

show system internal seg_bd info segment

```
switch(config)# show system internal seg_bd info segment 10000
Bridge-domain: A
Port Count: 11
Veth1
Veth2
Veth3
```

show system internal seg_bd info port vethernet

```
show system internal seg_bd info port vethernet 1
Bridge-domain: A
segment_id = 10000
Group IP: 225.1.1.1
```

show system internal seg_bd info port ifindex

```
switch(config)# show system internal seg_bd info port ifindex 0x1c000050
Bridge-domain: A
segment_id = 10000
Group IP: 225.1.1.1
```

show system internal seg_bd info port_count

```
switch(config)# show system internal seg_bd info port_count
Number of ports: 11
```

show system internal seg_bd info bd vxlan-home

```
switch(config)# show system internal seg_bd info bd vxlan-home

Bridge-domain vxlan-home (2 ports in all)
Segment ID: 5555 (Manual/Active)
Group IP: 235.5.5.5
State: UP Mac learning: Enabled
is_bd_created: Yes
current state: SEG_BD_FSM_ST_READY
pending_delete: 0
port_count: 2
action: 4
hwbd: 28
pa_count: 0
Veth2, Veth5
switch(config)#
```

show system internal seg_bd info port

```
switch# show system internal seg_bd info port
if_index = <0x1c000010>
Bridge-domain vxlan-pepsi
rid = 216172786878513168
swbd = 4098
```

```
if_index = <0x1c000040>
Bridge-domain vxlan-pepsi
rid = 216172786878513216
swbd = 4098

switch#
```

BGP Show Commands

The following table describes the BGP show commands. For detailed information about these commands, see the Cisco Nexus 1000V Command Reference.

For information about how to configure BGP and peer templates, see the Cisco Nexus 1000V for VMware vSphere VXLAN Configuration Guide.

Command	Purpose
show bgp session	Displays the BGP sessions.
show bgp l2vpn evpn	Displays the VTEPs that are learned through the BGP.
show bgp l2vpn evpn rd	Displays the detailed output for a specific segment ID or RD.
show bgp convergence	Displays the BGP convergence time.
show bgp l2vpn evpn evi all VTEP	Displays the VTEP list for a specific VXLAN segment ID or all segments.
show bridge-domain VTEPs	Displays the bridge domain-to-VTEP mappings that are maintained by the VSM and are pushed to all VEMs.
show bgp l2vpn evpn summary	Displays the BGP evpn summary.
show bgp l2vpn evpn neighbors	Displays the detailed state for a neighbor.
show bgp internal evi	Displays the detailed state for a VXLAN segment.
show bgp event-history msgs	Displays various message logs of BGP.
show bgp event-history events	Displays event logs.

VEM Show Commands

Command	Purpose
vemcmd show port segments	Displays VXLAN vEthernet programming.
vemcmd show vxlan interfaces	Displays the VXLAN encapsulated interfaces.
vemcmd show port vlans	Checks the port programming and CBL state for the bridge domain.

Command	Purpose
vemcmd show bd	Displays the bridge domain segment ID, group, or list of ports.
vemcmd show bd bd-name *bd-name-string*	Displays one segment bridge domain.
vemcmd show l2 all	Displays the remote IP being learned.
vemcmd show l2 bd-name *bd-name-string*	Displays the layer 2 table for one segment bridge domain.
vemcmd show arp all	Displays the IP-MAC mapping for the outer encapsulated header.

VXLAN Gateway Commands

Note Starting with Release 5.2(1)SV3(1.15), Cisco Nexus 1000V does not support the VXLAN Gateway feature.

Command	Purpose
show module vem	Displays VXLAN Gateway information that is attached to the VSM.
attach vem	Displays VXLAN Gateway information that is not attached to the VSM.
vemcmd show vxlan-gw-mappings	Displays VXLAN Gateway mappings. See vemcmd show vxlan-gw-mappings, on page 214.
vemcmd show vxlan-stats	Displays VXLAN Gateway statistics. See vemcmd show vxlan-stats , on page 214.
vemlog show all	Displays the VXLAN Gateway packet path.
show bridge-domain	Displays the bridge-domain configuration on the VSM.
show bridge-domain VTEPs	Displays the bridge-domain VTEPs on the VSM.
show bridge-domain mapping	Displays the VLAN-VXLAN mappings programmed on the VSM.
show module vteps	Displays the interfaces on the VSM.
show bridge-domain vteps	Displays the bridge domain-to-VTEP mappings that are maintained by the VSM and are pushed to all VEMs
show int switchport	Displays the port configuration on the VSM.
show bridge-domain segment-cisco VTEPs	Displays the VTEP distribution on the VSM.

Command	Purpose
show bridge-domain mac	Displays VXLAN mac-distribution.
show platform fwm	Displays the VTEPs information.

vemcmd show vxlan-gw-mappings

```
VXGW-switch(vem-attach)# vemcmd show vxlan-gw-mappings
VLAN Segment NumProbes State
--------------------------------------
1821 9001 3 Active
1822 9002 3 Active
Linux(debug)#
Linux(debug)#
Linux(debug)# vemcmd show vxlan
LTL VSM Port IP Seconds since Last Vem Port
Netmask IGMP Query Received
Gateway
(* = IGMP Join Interface/Designated VTEP)
------------------------------------------------------------
20 Veth7 17.17.19.111 33 vxlannic0 *
255.255.255.0
17.17.19.1
```

vemcmd show vxlan-stats

```
switch(vem-attach)# vemcmd show vxlan-stats
LTL Ucast Mcast/Repl Ucast Mcast Total
Encaps Encaps Decaps Decaps Drops
17 8717 173 8334 0 242
switch(vem-attach)#
switch(vem-attach)# vemcmd show vxlan-stats ltl 17
VXLAN Port Stats for LTL 17
Unicast Encapsulations: 8756
Multicast Encapsulations/HeadEnd Replications: 173
Unicast Decapsulations: 8372
Multicast Decapsulations: 0
IP Pre-fragmentations: 0
TSO Processed Packets: 0
ICMP Pkt Too Big msgs from upstream: 0
ICMP Pkt Too Big msgs sent to VM: 0
Packets generated by Head End Replication: 172
```

VEM Packet Path Debugging Commands

Use the following commands to debug VXLAN traffic from a VM on VEM1 to a VM on VEM2.

VEM	Command	Purpose
VEM 1	**vempkt capture ingress ltl vxlan_veth**	Verifies that packets are coming into the switch from the segment vEthernet.
VEM1	**vemlog debug sflisp all** **vemlog debug sfvnsegment all**	Verifies VXLAN encapsulation.

VEM	Command	Purpose
VEM1	**vemcmd show l2 bd-name segbdname**	Verifies that the remote IP address is learned. If the remote IP is not learned, packets are sent multicast encapsulated.
VEM1	**vemcmd show vxlan-encap ltl** **vempkt capture egress ltl uplink**	Verifies that encapsulated packets go out on an uplink. Use the **vemcmd show vxlan-encap ltl** command to find out which uplink is being used.
VEM1	**vemcmd show vxlan-stats all** **vemcmd show vxlan-stats ltl veth/vxlanVTEP**	Displays statistics that can be used to find information about any failures.
VEM2	**vempkt capture ingress ltl uplink**	Verifies encapsulated packets are arriving on the uplink.
VEM2	**vemlog debug sflisp all** **vemlog debug sfvnsegment all**	Verifies VXLAN decapsulation.
VEM2	**vempkt capture egress ltl vxlan_veth**	Verifies that the decapsulated packets go out on a VXLAN vEthernet interface.
VEM2	**vemcmd show vxlan-stats all** **vemcmd show vxlan-stats ltl veth/vxlanVTEP**	Displays statistics that can be used to find information about any failures.

VEM Multicast Debugging Commands

Commands	Purpose
vemcmd show igmp *vxlan_transport_vlan* **detail**	Verifies the IGMP state on the VEM. **Note** This command does not show any output for the segment multicast groups. To save multicast table space, segment groups are not tracked by IGMP snooping on the VEM.
vemcmd show vxlan interfaces	Verifies that the IGMP queries are being received.
vempkt capture ingress ltl *first_vxlan_VTEP_ltl*	Verifies that the VMware stack is sending joins.
vempkt capture egress ltl *uplink_ltl*	Verifies that the joins are being sent out to the upstream switch.

VXLAN Data Path Debugging

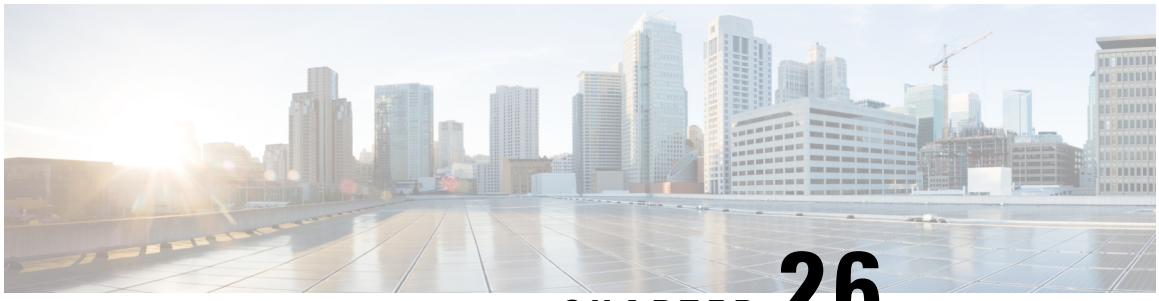
vemlog Debugging Commands

Command	Purpose
vemlog debug sfbd all	Debugs the bridge domain setup or configuration.
vemlog debug sfporttable all	Debugs the port configuration, CBL, vEthernet LTL pinning.
vemlog debug sfvnsegment all	Debugs the encapsulated/decapsulated setup.
vemlog debug sflisp all	Debugs for actual packet editing, VXLAN interface handling, and multicast handling.
echo "debug dpa_allplatform all" > /tmp/dpafifo	Debugs the multicast joins or leaves on the DPA socket.
echo "debug sfl2agent all" > /tmp/dpafifo	Debugs the bridge domain configuration.
echo "debug sfportagent all" > /tmp/dpafifo	Debugs the port configuration.
echo "debug sfportl2lisp_cache all" > /tmp/dpafifo	Debugs the hitless reconnect (HR) for capability l2-lisp.
echo "debug sfpixmagent all" > /tmp/dpafifo	Debugs CBL programming.
echo "debug sfvxlanagent all" > /tmp/dpafifo	Debugs a VXLAN agent that interacts with the VSM.

VEM Statistics Commands

Command	Purpose
vemcmd show vxlan-stats	Displays a summary of per-port statistics.
vemcmd show vxlan-stats ltl *vxlan_VTEP_ltl*	Displays detailed per-port statistics for VXLAN VTEP.
vemcmd show vxlan-stats ltl *vxlan_veth_ltl*	Displays detailed per-port statistics for the vEthernet interface in a VXLAN.
vemcmd show vxlan-stats ltl *vxlan_VTEP_ltl* **bd-all**	Displays detailed per-port-per-bridge domain statistics for a VXLAN VTEP for all bridge domains.
vemcmd show vxlan-stats ltl *vxlan_VTEP_ltl* **bd-name** *bd-name*	Displays detailed per-port-per-bridge domain statistics for a VXLAN VTEP for the specified bridge domain.
vemcmd show vxlan-encap ltl *vxlan_veth_ltl*	Displays which VXLAN VTEP is used for encapsulation and subsequent pinning to the uplink port channel for static MAC addresses learned on port.

Command	Purpose
vemcmd show vxlan-encap mac *vxlan_vm_mac*	Displays which VXLAN VTEP is used for encapsulation and subsequent pinning to the uplink port channel.



CHAPTER 26

VSI Discovery and Configuration Protocol

This chapter describes how to identify and resolve problems that might occur when implementing the VSI Discovery and Configuration Protocol (VDP). This chapter contains the following sections:

Information About VDP

VDP on Cisco Nexus 1000V is an implementation of the IEEE standard 802.1Qbg/D2.2 (Edge Virtual Bridging). VDP can detect and signal the presence of end hosts and exchange capability with an adjacent VDP-capable bridge. VDP serves as a reliable first-hop protocol and communicates the presence of end-host Virtual Machines (VMs) to adjacent leaf nodes on the Cisco Dynamic Fabric Automation (DFA) architecture. In addition to detecting the MAC and IP addresses of the end-host VMs when a host comes up, or during VM mobility events, the VDP triggers auto-configuration of leaf nodes on the DFA architecture to make them ready for more VM traffic.

VDP enables network-based overlays that are a more scalable alternative when compared to the host-based overlays for segmentation and enable access to more than 4000 VLANs in a multi-tenant network. With the VDP configured on Cisco Nexus 1000V, segmentation support for bridge domains is extended to native encapsulated bridge domains. The original VXLAN-based bridge domains can also coexist with these bridge domains.

For more information about the Cisco DFA architecture, see the Cisco DFA Solutions Guide.

Problems with VDP

The following are symptoms, possible causes, and solutions for problems with VDP.

Symptom	Possible Causes	Solution
VDP packets are not received by a leaf switch.	The connected port on the VEM does not have the trunk dynamic port profile.	1. Verify that the connected port on the VEM has the trunk dynamic port profile: **show interface ethernet** *slot/port* 2. If the output of the show interface ethernet command does not contain dynamic VLANs, configure the port profile for trunk dynamic mode: 1. switch# **configure terminal** 2. switch(config)# **port-profile name** 3. switch(config-port-prof)# **switchport mode trunk** 4. switch(config-port-prof)# **switchport trunk dynamic**
VM is associated but it is not pinging.	The encapsulation mode is not native.	Verify that the encapsulation mode is native and a valid VLAN value is returned by the leaf switch: **module vem** *module_number* **execute vemcmd show bd** **module vem** *module_number* **execute vemcmd show segment** *segment_id*

VDP Troubleshooting Commands

VDP VSM Commands

You can use the commands in this section to troubleshoot problems related to VDP.

Command	Purpose
show evb vsi interface vethernet *interface-number*	Displays if the VDP association sequence is complete for a vEthernet interface. Identify the vEthernet port of the VM and use this command. A VSI state of 3 means that it is associated. See show evb vsi interface vethernet, on page 221.
show evb	Displays configured information in the EVB process. See show evb, on page 221.
show run evb	Displays the running configuration for the EVB segmentation. See show run evb, on page 221.
show ecp	Displays the configured information for ECP. See show ecp, on page 221.

Examples

show evb vsi interface vethernet

```
switch(config)# show evb vsi interface vethernet 40
LTL : 135 [module: 2]
Segment : 30000
MAC : 0050.5693.63A1
IP : 30.0.1.2
VSI State : 3
State Machine State : 7
Rwd Expiry Count : 4621
Last CMD Time : 125
Last RSP Time : 125
```

show evb

```
switch(config)# show evb
Edge Virtual Bridging
Role : VDP Station
VDP Mac Address : 0180.0000.0000
VDP Resource Wait Delay : 22(66 secs)
VDP Reinit Keep Alive : 21(20 secs)
```

show run evb

```
switch(config)# show run evb
evb resource-wait-delay 24
evb reinit-keep-alive 25
ecp retransmission-timer-exponent 15
ecp max-retries 6
```

show ecp

```
switch(config)# show ecp
ECP Max ReTries : 3
ECP Retransmition Timer Exp : 14(163840 micro seconds)
```

VDP VEM Commands

You can use the VEM commands in this section to troubleshoot problems related to VDP.

Command	Purpose
vemcmd show segment *segment-id*	Displays a list of VM interfaces that are a part of a segment and indicates if a segment is configured as VDP (native encapsulation mode). See vemcmd show segment, on page 222.
vemcmd show bd *hwbd*	Displays a list of VM interfaces that are a part of an internal bridge domain and indicates if the bridge domain is configured as VDP (native encapsulation mode). See vemcmd show bd, on page 223.
vemcmd show bd bd-name *bd-name*	Displays a list of VM interfaces that are a part of a configured bridge domain and indicates if the bridge domain is configured as VDP (native encapsulation mode). See vemcmd show bd bd-name, on page 223.

Examples

vemcmd show segment

```
~ # vemcmd show segment 8000
BD 21, vdc 1, segment id 8000, segment group IP 224.9.19.10, encap NATIVE, vff_mode
Anycast,swbd 4098, VLAN 0, 28 ports, "BD-Mcast"
Segment Mode: Multicast
Portlist:
52 VM-L-13-25-10.eth7
62 VM-L-13-25-2.eth7
72 VM-L-13-25-1.eth7
82 VM-L-13-25-3.eth7
92 VM-L-13-25-7.eth7
102 VM-L-13-25-5.eth7
112 VM-L-13-25-4.eth7
122 VM-L-13-25-6.eth7
132 VM-L-13-25-8.eth7
144 VM-L-14-25-1.eth7

145 VM-L-14-25-2.eth7
162 VM-L-14-25-10.eth7
172 VM-L-14-25-3.eth7
182 VM-L-13-25-9.eth7
192 VM-L-14-25-4.eth7
202 VM-L-14-25-8.eth7
212 VM-L-14-25-7.eth7
222 VM-L-14-25-6.eth7
232 VM-L-14-25-5.eth7
242 VM-L-14-25-9.eth7

252 VM-L-15-25-10.eth7
262 VM-L-15-25-3.eth7
272 VM-L-15-25-2.eth7
282 VM-L-15-25-1.eth7
294 VM-L-15-25-7.eth7
295 VM-L-15-25-4.eth7
```

```
312 VM-L-15-25-5.eth7
322 VM-L-15-25-6.eth7
```

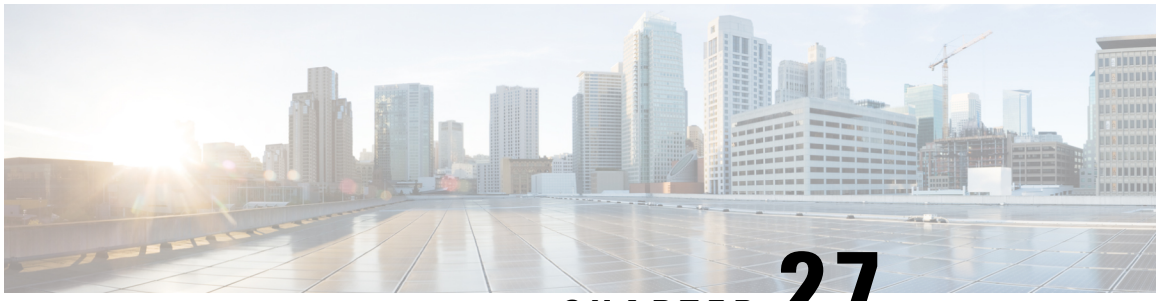
vemcmd show bd

```
~ # vemcmd show bd 21
BD 21, vdc 1, segment id 8000, segment group IP 224.9.19.10, encap NATIVE, vff_mode
Anycast,swbd 4098, VLAN 0, 28 ports, "BD-Mcast"
Segment Mode: Multicast
Portlist:
52 VM-L-13-25-10.eth7
62 VM-L-13-25-2.eth7
72 VM-L-13-25-1.eth7
82 VM-L-13-25-3.eth7
92 VM-L-13-25-7.eth7
102 VM-L-13-25-5.eth7
112 VM-L-13-25-4.eth7
122 VM-L-13-25-6.eth7
132 VM-L-13-25-8.eth7
144 VM-L-14-25-1.eth7

145 VM-L-14-25-2.eth7
162 VM-L-14-25-10.eth7
172 VM-L-14-25-3.eth7
182 VM-L-13-25-9.eth7
192 VM-L-14-25-4.eth7
202 VM-L-14-25-8.eth7
212 VM-L-14-25-7.eth7
222 VM-L-14-25-6.eth7
232 VM-L-14-25-5.eth7
242 VM-L-14-25-9.eth7

252 VM-L-15-25-10.eth7
262 VM-L-15-25-3.eth7
272 VM-L-15-25-2.eth7
282 VM-L-15-25-1.eth7
294 VM-L-15-25-7.eth7
295 VM-L-15-25-4.eth7
312 VM-L-15-25-5.eth7
322 VM-L-15-25-6.eth7
```

vemcmd show bd bd-name

```
~ # vemcmd show bd bd-name BD-Mcast
BD 21, vdc 1, segment id 8000, segment group IP 224.9.19.10, encap NATIVE, vff_mode
Anycast,swbd 4098, VLAN 0, 28 ports, "BD-Mcast"
Segment Mode: Multicast
Portlist:
52 VM-L-13-25-10.eth7
62 VM-L-13-25-2.eth7
72 VM-L-13-25-1.eth7
82 VM-L-13-25-3.eth7
92 VM-L-13-25-7.eth7
102 VM-L-13-25-5.eth7
112 VM-L-13-25-4.eth7
122 VM-L-13-25-6.eth7
132 VM-L-13-25-8.eth7
144 VM-L-14-25-1.eth7

145 VM-L-14-25-2.eth7
162 VM-L-14-25-10.eth7
172 VM-L-14-25-3.eth7
182 VM-L-13-25-9.eth7
192 VM-L-14-25-4.eth7
```

```
202 VM-L-14-25-8.eth7
212 VM-L-14-25-7.eth7
222 VM-L-14-25-6.eth7
232 VM-L-14-25-5.eth7
242 VM-L-14-25-9.eth7

252 VM-L-15-25-10.eth7
262 VM-L-15-25-3.eth7
272 VM-L-15-25-2.eth7
282 VM-L-15-25-1.eth7
294 VM-L-15-25-7.eth7
295 VM-L-15-25-4.eth7
312 VM-L-15-25-5.eth7
322 VM-L-15-25-6.eth7
```



CHAPTER 27

Cisco TrustSec

This chapter describes how to identify and resolve problems that might occur when configuring Cisco TrustSec. This chapter contains the following sections:

Information About Cisco TrustSec

The Cisco TrustSec security architecture builds secure networks by establishing clouds of trusted network devices. Each device in the cloud is authenticated by its neighbors. Communication on the links between devices in the cloud is secured with a combination of encryption, message integrity checks, and data-path replay protection mechanisms.

Cisco TrustSec also uses the device and user identification information acquired during authentication for classifying, or coloring, the packets as they enter the network. This packet classification is maintained by tagging packets on ingress to the Cisco TrustSec network so that they can be properly identified for the purpose of applying security and other policy criteria along the data path. The tag, also called the security group tag (SGT), allows the network to enforce the access control policy by enabling the endpoint device to act upon the SGT to filter traffic.

See the *Cisco Nexus 1000V Security Configuration Guide* for more information about the Cisco TrustSec feature on Cisco Nexus 1000V.

Cisco TrustSec Troubleshooting Commands

Debugging Commands

Command	Purpose
debug cts authentication	Collects and displays logs related to Cisco TrustSec authentication.
debug cts authorization	Collects and displays logs related to Cisco TrustSec authorization.

Command	Purpose
debug cts errors	Collects and displays logs related to Cisco TrustSec errors and warning messages.
debug cts messages	Collects and displays logs related to Cisco TrustSec messages.
debug cts packets	Collects and displays logs related to Cisco TrustSec packets.
debug cts relay	Collects and displays logs related to Cisco TrustSec relay functionality.
debug cts sxp	Collects and displays logs related to Cisco TrustSec SXP.
debug cts sap	Collects and displays logs related to the Cisco TrustSec Security Association Protocol (SAP).
debug cts trace	Collects and displays logs related to Cisco TrustSec trace functionality.
show cts internal debug-info	Displays Cisco TrustSec debug information.

Host Logging Commands

ESX Host Command	Description
echo "logfile enable" > /tmp/dpafifo	Enables DPA debug logging. Logs are output to the `/var/log/vemdpa.log` file.
echo "debug sfctsagent all" > /tmp/dpafifo	Enables TrustSec SXP agent debug logging. Logs are output to the `/var/log/vemdpa.log` file.
vemlog debug sfcts_config all	Enables the data path debug logging and captures logs for the data packets sent between the client and the server.
vemlog debug sfdhcps_config all	Enables the data path debug logging and captures logs for DHCP snooping configuration coming from the VSM. To view the logs, enable DHCP snooping on Cisco Nexus 1000V.
vemlog debug sfdhcps_binding_table all	Enables the data path debug logging and captures logs corresponding to the binding database changes. To view the logs, enable DHCP snooping on Cisco Nexus 1000V.

ESX Host Command	Description
vemlog debug sfipdb all	Enables the data path debug logging and captures logs corresponding to the IP database that maintains the IP addresses for all the virtual machines that are being tracked using Cisco TrustSec device tracking. To view the logs, enable Cisco TrustSec device tracking on Cisco Nexus 1000V.
vemcmd show learnt ip	Displays the Cisco TrustSec configuration on Cisco Nexus 1000V. Following is an example of this command: `switch# vemcmd show learnt ip` `IP Address LTL VLAN BD` `/SegID` `10.78.1.76 49 353 7` `switch#`
vemcmd show cts global	Displays if Cisco TrustSec is enabled on Cisco Nexus 1000V. Following is an example of this command: `switch# vemcmd show cts global` `CTS Global Configuration:` `CTS is: Enabled` `CTS Device Tracking is: Enabled` `switch#`
vemcmd show cts ipsgt	Displays the Cisco TrustSec configuration on Cisco Nexus 1000V. Following is an example of this command: `switch# vemcmd show cts ipsgt` `IP Address LTL VLAN BD SGT Learnt` `10.78.1.76 49 353 7 6766 Device Tracking` `switch#`

show Commands

See the *Cisco Nexus 1000V Command Reference* for more information about the **show** commands for Cisco TrustSec.

Command	Purpose
show cts	Displays the Cisco TrustSec configuration.
show cts sxp	Displays the SXP configuration for Cisco TrustSec.
show feature	Displays the features available, such as CTS, and whether they are enabled.
show running-configuration cts	Displays the running configuration information for Cisco TrustSec.
show cts device tracking	Displays the Cisco TrustSec device tracking configuration.

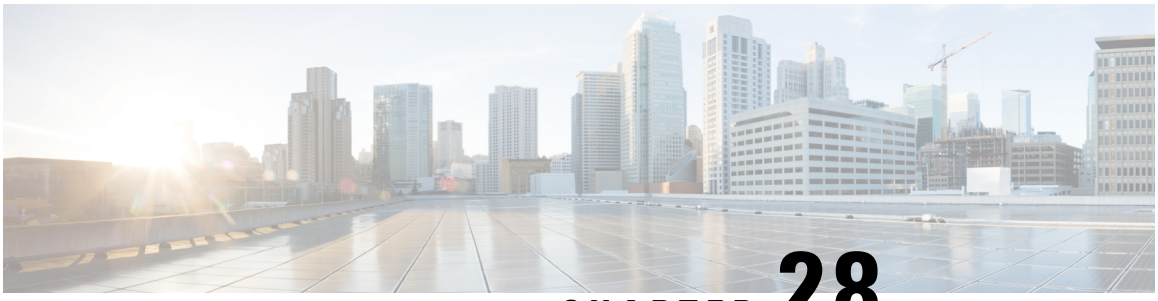
Command	Purpose
show cts ipsgt entries	Display the SXP SGT entries for Cisco TrustSec.
show cts role-based sgt-map	Displays the mapping of the IP address to SGT for Cisco TrustSec.
show cts sxp connection	Displays SXP connections for Cisco TrustSec.
show cts interface delete-hold timer	Displays the interface delete hold timer period for Cisco TrustSec.
show cts internal event-history	Displays event logs for Cisco TrustSec.

Problems with Cisco TrustSec

This section includes symptoms, possible causes, and solutions for the following problems with Cisco TrustSec.

Symptom	Possible Causes	Verification and Solution
Cisco Nexus 1000V is unable to form an SXP session with Cisco TrustSec.	There is no connection between Cisco Nexus 1000V and its peer.	Verify if Cisco Nexus 1000V is connected to its peer. **ping**
	The Cisco TrustSec SXP is not enabled on Cisco Nexus 1000V.	Verify if the Cisco TrustSec SXP is enabled on Cisco Nexus 1000V. **show cts sxp** If not, enable the Cisco TrustSec SXP. **cts sxp enable**
	The password configured on Cisco Nexus 1000V does not match the password configured on its peer.	Verify if the passwords configured onCisco Nexus 1000V matches its peer. **show cts sxp**
	The default source IPv4 address is not configured on Cisco Nexus 1000V.	Verify if the default source IPv4 address is not configured on Cisco Nexus 1000V. **show cts sxp**
	The SXP peer is not configured as the listener.	Verify that the SXP peer is configured as the listener. **show cts sxp connection**

Symptom	Possible Causes	Verification and Solution
Cisco TrustSec SXP is unable to learn any IP-SGT mappings on Cisco Nexus 1000V.	The Cisco TrustSec device tracking is not enabled on Cisco Nexus 1000V.	Verify if the Cisco TrustSec device tracking is enabled on Cisco Nexus 1000V. **show cts device tracking** If not, enable the Cisco TrustSec device tracking. **cts sxp device tracking**
	DHCP snooping is not enabled globally on Cisco Nexus 1000V.	Verify if DHCP snooping feature is enabled globally on Cisco Nexus 1000V. **show feature** If not, enable DHCP snooping globally. **feature dhcp** Verify if DHCP snooping is enabled on a VLAN on Cisco Nexus 1000V. **show ip dhcp snooping** If not, enable DHCP snooping on a VLAN. **ip dhcp snooping vlan** *vlan-list*



CHAPTER 28

vCenter Plug-in

This chapter describes the troubleshooting tools available for the vCenter Plug-in functionality. This chapter contains the following sections:

Information About vCenter Plug-in

Cisco Nexus 1000V is a software-based Layer 2 switch for the virtualized server environments that are running VMware ESX. Cisco Nexus 1000V provides a consistent networking experience across the physical and the virtual environments. It consists of two components: the Virtual Ethernet Module (VEM) that is embedded in the hypervisor and a Virtual Supervisor Module (VSM) that manages the networking policies and the quality of service QoS for the virtual machines.

With earlier releases of Cisco Nexus 1000V, the system administrators had no visibility into the networking aspects of Cisco Nexus 1000V. Starting with Cisco NX-OS Release 4.2(1)SV2(1.1), the Cisco Nexus 1000V Plug-in for the VMware vCenter Server (vCenter Plug-in) is supported on Cisco Nexus 1000V. It provides the server administrators with a holistic view of the virtual network and a visibility into the networking aspects of Cisco Nexus 1000V.

Starting with Cisco NX-OS Release 4.2(1)SV2(1.1), the vCenter Plug-in is supported only on the vSphere Web Clients. The VMware vSphere Web Client enables you to connect to a VMware vCenter Server system to manage Cisco Nexus 1000V through a browser. The vCenter Plug-in is installed as a new tab called Cisco Nexus 1000V as a part of the user interface in the vSphere Web Client.

With the vCenter Plug-in, the server administrators can export the networking details from the vCenter server, investigate the root cause of and prevent the networking issues, and deploy the virtual machines with the policies. The server administrators can monitor and manage the resources effectively with the network details provided in the vCenter Plug-in.

Note Currently the login to the vCenter Plug-in is available only through the administrator account.

Prerequisites for VMware vSphere Web Client

Refer to the following prerequisites before configuring the vCenter Plug-in functionality on Cisco Nexus 1000V:

- VMware vCenter Server 5.0 and/or later release.
- VMware vCenter Web Client 5.1. The vCenter Plug-in does not work with the vSphere 5.0 Web Client.
- The following browsers are supported for version 5.1 of the vSphere Web Client:
  - Microsoft Internet Explorer 7, 8, and 9.
  - Mozilla Firefox 3.6 and later.
  - Google Chrome 14 and later.
- vSphere Web Client requires the Adobe Flash Player version 11.1.0 or later to be installed.
- Make sure that Cisco Nexus 1000V, Release 4.2(1)SV2(1.1) is installed and configured to a vCenter.

Generating a Log Bundle

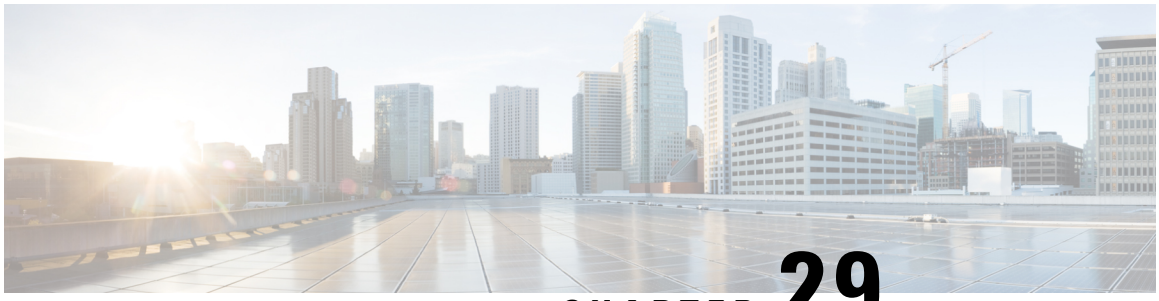
You can collect the diagnostic information for VMware vCenter Server by collecting vSphere log files into a single location.

Procedure

Step 1 Log in to the Windows server where the VMware vCenter Server is installed.

Step 2 Choose **Start > All Programs > VMware > Generate vSphere Web Client Log Bundle**.

You can use this step to generate the vSphere Web Client log bundles even when you are not able to connect to the vCenter Server using the vSphere Client. The log bundle is generated as a .zip file. See VMware documentation for more information about collecting the log files.



CHAPTER 29

Ethanalyzer

This chapter describes how to use Ethanalyzer as a Cisco NX-OS protocol analyzer tool. This chapter contains the following topics:

Using Ethanalyzer

Ethanalyzer is a Cisco NX-OS protocol analyzer tool based on the Wireshark (formerly Ethereal) open source code. Ethanalyzer is a command-line version of Wireshark that captures and decodes packets.

For more information about Wireshark, see the following URL:

http://www.wireshark.org/docs/

You can use Ethanalyzer to troubleshoot your network and analyze the control-plane traffic. Ethanalyzer does not capture data traffic that Cisco NX-OS forwards in the hardware. Ethanalyzer uses the same capture filter syntax as tcpdump. For more information, see the following URL:

http://www.tcpdump.org/tcpdump_man.html

For information about the syntax of the display filter, see the following URL:

http://wiki.wireshark.org/DisplayFilters

Ethanalyzer Commands

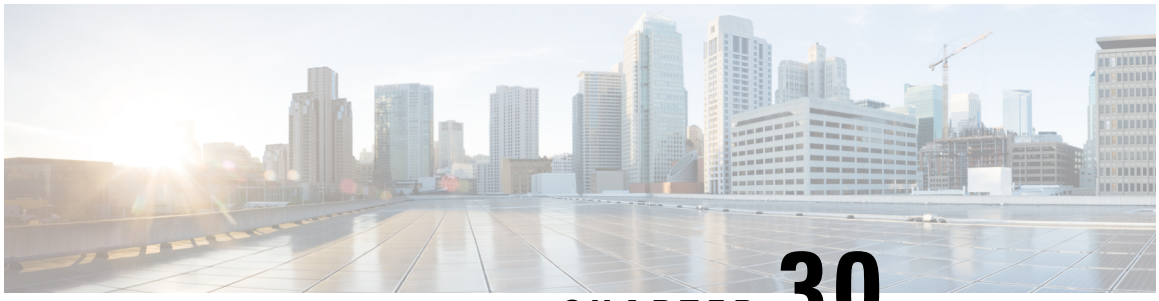
The following table lists the Ethanalyzer commands. For all commands in this table, you can use the control, ha-primary, ha-secondary, inband/outband interface (packet interface) or management interface.

Command	Purpose
ethanalyzer local interface *interface*	Captures packets sent or received by the supervisor and provides detailed protocol information.
ethanalyzer local interface *interface* **limit- captured frames**	Limits the number of frames to capture.

Command	Purpose
ethanalyzer local interface *interface* **limit-frame-size**	Limits the length of the frame to capture.
ethanalyzer local interface *interface* **capture-filter**	Filters the types of packets to capture.
ethanalyzer local interface *interface* **display-filter**	Filters the types of captured packets to display.
ethanalyzer local interface *interface* **write**	Saves the captured data to a file.
ethanalyzer local read file	Opens a captured data file and analyzes it.

This example shows captured data (limited to four packets) on the management interface:

```
switch# ethanalyzer local interface mgmt limit-captured-frames 4
Capturing on eth1
2012-10-01 19:15:23.794943 10.78.110.241 -> 72.163.145.51 SSH Encrypted response packet
len=64
2012-10-01 19:15:23.796142 10.78.110.241 -> 72.163.145.51 SSH Encrypted response packet
len=144
2012-10-01 19:15:23.796608 10.78.110.241 -> 72.163.145.51 SSH Encrypted response packet
len=144
2012-10-01 19:15:23.797060 10.78.110.241 -> 72.163.145.51 SSH Encrypted response packet
len=144
4 packets captured
switch#
```



CHAPTER 30

Contacting Technical Support

This chapter describes the steps to take for contacting technical support. This chapter contains the following topics:

Cisco Support Information

If you purchased Cisco support through a Cisco reseller, contact the reseller directly. If you purchased support directly from Cisco, contact Cisco Technical Support at this URL:

http://www.cisco.com/c/en/us/support/web/tsd-cisco-worldwide-contacts.html

Before contacting your customer support representative or Cisco TAC for assistance, you can perform the steps described in Gathering Information for Technical Support, on page 235 to reduce the amount of time spent resolving the issue.

Cisco Support Communities

For additional information, visit one of the following support communities:

- Cisco Support Community for Server Networking
- Cisco Communities: Nexus 1000V

Gathering Information for Technical Support

To prepare for contacting your customer support representative, follow these steps:

Note Do not reload the module or the switch at least until you have completed Step 1. Some logs and counters are kept in volatile storage and will not survive a reload.

Procedure

Step 1 Collect switch information and configuration before and after the issue has been resolved.

Configure your Telnet or SSH application to log the screen output to a text file. Use the **terminal length 0** command and then use the **show tech-support details** command.

Step 2 Capture the exact error codes you see in the CLI message logs.

- **show logging log**

  Displays the error messages.

- **show logging last number**

  Displays the last lines of the log.

Step 3 Answer the following questions before calling for technical support:

- On which switch or port is the problem occurring?
- Which Cisco Nexus 1000V software, driver versions, operating systems versions and storage device firmware are in your fabric?
- ESX and vCenter Server software that you are running?
- What is the network topology?
- Were any changes being made to the environment (VLANs, adding modules, upgrades) prior to or at the time of this event?
- Are there other similarly configured devices that could have this problem, but do not?
- Where was this problematic device connected (which switch and interface)?
- When did this problem first occur?
- When did this problem last occur?
- How often does this problem occur?
- How many devices have this problem?
- Were any traces or debug output captured during the problem time? What troubleshooting steps have you attempted? Which, if any, of the following tools were used?
  - Ethanalyzer, local, or remote SPAN
  - debug commands
  - traceroute, ping
- Is your problem related to a software upgrade attempt?
  - What was the original Cisco Nexus 1000V version?
  - What is the new Cisco Nexus 1000V version?

Obtaining a File of Core Memory Information

Cisco customer support engineers often use files from your system for analysis. One such file contains memory information and is referred to as a core dump. The file is sent to a TFTP server or to a flash card in `slot0:` of the local switch. You should set up your switch to generate this file under the instruction of your customer support representative and send it to a TFTP server so that it can be emailed to them.

To generate a file of core memory information, or a core dump, use the command in the following example.

```
switch# system cores tftp://10.91.51.200/jsmith_cores
switch# show system cores
Cores are transferred to tftp://10.91.51.200/jsmith_cores
```

Note The filename (indicated by jsmith_cores) must exist in the TFTP server directory.

Copying Files

You might be required to move files to or from the switch. These files might include log, configuration, or firmware files.

Cisco Nexus 1000V always acts as a client. An ftp/scp/tftp session always originates from the switch and either pushes the files to an external system or pulls the files from an external system.

```
File Server: 172.22.36.10
File to be copied to the switch: /etc/hosts
```

The **copy** command supports four transfer protocols and 12 different sources for files.

```
switch# copy ?
bootflash: Select source filesystem
core: Select source filesystem
debug: Select source filesystem
ftp: Select source filesystem
licenses Backup license files
log: Select source filesystem
modflash: Select source filesystem
nvram: Select source filesystem
running-config Copy running configuration to destination
scp: Select source filesystem
sftp: Select source filesystem
slot0: Select source filesystem
startup-config Copy startup configuration to destination
system: Select source filesystem
tftp: Select source filesystem
volatile: Select source filesystem
```

Use the following syntax to use secure copy (scp) as the transfer mechanism:

```
"scp:[//[username@]server][/path]"
```

```
switch# copy scp://user1@172.22.36.10/etc/hosts bootflash:hosts.txt
```

```
user1@172.22.36.10's password:
hosts 100% |****************************| 2035 00:00
```

Back up the startup configuration to an SFTP server.

```
switch# copy startup-config sftp://user1@172.22.36.10/test/startup-configuration.bak1
Connecting to 172.22.36.10...
User1@172.22.36.10's password:
switch#
```

Tip Back up the startup configuration to a server daily before you make any changes. You can write a short script to be run on Cisco Nexus 1000V to perform a save and then back up the configuration. The script only needs to contain two commands:

- **copy running-configuration startup-configuration**
- **copy startup-configuration** *tftp://server/name*

To execute the script, enter the **run-script** *filename* command.