



# System

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This chapter describes how to identify and resolve problems related to Cisco Nexus 1000V system. This chapter contains the following sections:

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## 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](#).

## 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 3](#).
- 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

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**Step 1** From the MOB, find the DVS extension key. For more information, see [Finding the Extension Key Tied to a Specific DVS](#).

**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](#).

**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)# svcs 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.

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## 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 2](#).
- 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](#).

**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](#).

**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)# svcs 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 <b>svcs connection</b> command fails.	<ul style="list-style-type: none"> <li>• Make sure you have configured all parameters for the <b>svcs connection</b> command.</li> <li>• Make sure you can ping the vCenter Server IP address.</li> <li>• Make sure that the <code>proxy.xml</code> file is correct for both the IP address and length.</li> <li>• Restart the vCenter Server.</li> </ul>
The connection fails after an ESX reboot.	See <a href="#">Connection Failure After ESX Reboot, on page 6</a> .
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 <b>show module</b> 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 6](#). 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 7](#).

## 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**

	<b>Command or Action</b>	<b>Purpose</b>
<b>Step 1</b>	<b>config t</b> <b>Example:</b> switch# <b>config t</b> switch(config)#	Enters global configuration mode.
<b>Step 2</b>	<b>port-profile name</b> <b>Example:</b> switch(config)# <b>port-profile AccessProf</b> switch(config-port-prof)#	Enters port profile configuration mode for the named system uplink port profile.
<b>Step 3</b>	<b>system mtu mtu-size</b> <b>Example:</b> switch(config-port-prof)# <b>system mtu 4000</b> switch(config-port-prof)#	Designates the MTU size. The MTU size must meet the following requirements: <ul style="list-style-type: none"> <li>• Must be an even number between 1500 and 9000.</li> <li>• Must be less than the size of the <b>system jumbomtu</b> on the interface.</li> </ul>
<b>Step 4</b>	(Optional) <b>port-profile [brief   expand-interface   usage] [name profile-name]</b> <b>Example:</b> switch(config-port-prof)# <b>show port-profile name AccessProf</b>	Displays the configuration for verification.
<b>Step 5</b>	(Optional) <b>copy running-config startup-config</b> <b>Example:</b> switch(config-port-prof)# <b>copy running-config startup-config</b>	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
<b>Step 1</b>	<b>config t</b> <b>Example:</b> <pre>switch# config t switch(config)#</pre>	Enters global configuration mode.
<b>Step 2</b>	<b>module vem <i>module_number</i> execute vemcmd</b> <b>show port <i>port-LTL-number</i></b> <b>Example:</b> <pre>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)#</pre>	Displays the port configuration including the LTL number needed for Step 3.
<b>Step 3</b>	<b>module vem <i>module_number</i> execute vemcmd</b> <b>set mtu <i>size</i> ltl <i>port-LTL-number</i></b> <b>Example:</b> <pre>switch(config)# module vem 3 execute vemcmd set mtu 9000 ltl 17 switch(config)#</pre>	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 <b>svs connection vc</b> 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 <b>vmware port-group</b> command and <b>state enable</b> command.

## Problems with Hosts

Symptom	Solution
You receive the following error message:  DVS Operation failed for one or more members	Issue the <b>vem status -v</b> command to verify if the VEM is running on the host.
	Issue the <b>vem unload</b> command to unload the VEM.
	In the vSphere Client, remove the stale DVS: <ol style="list-style-type: none"> <li>1. Click <b>Host &gt; Configuration &gt; Networking &gt; Distributed Virtual Switch</b>.</li> <li>2. Click <b>Remove</b>.</li> </ol>
The host is visible on the vCenter Server, but not the VSM.	Issue the <b>vemcmd show trunk</b> 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 <b>connect</b> 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
<b>vemlog</b>	<p>Displays and controls VEM kernel logs.</p> <p>Use the following commands to control and display the VEM kernel logs:</p> <ul style="list-style-type: none"> <li>• <b>vemlog stop</b>—Stops the log.</li> <li>• <b>vemlog clear</b>—Clears the log.</li> <li>• <b>vemlog start <i>number-of-entries</i></b>— Starts the log and stops it after the specified number of entries.</li> <li>• <b>vemlog stop <i>number-of-entries</i></b>—Stops the log after the next specified number of entries.</li> <li>• <b>vemlog resume</b>—Starts the log but does not clear the stop value.</li> <li>• <b>vemlog show last <i>number-of-entries</i></b>—Displays the circular buffer.</li> <li>• <b>vemcmd show info</b>—Displays information about entries in the log.</li> </ul>
<b>vemcmd</b>	<p>Displays configuration and status information.</p> <p>Use the <b>vemcmd help</b> command to view the type of information you can display.</p>
<b>vem-support all</b>	Collects support information.
<b>vem status</b>	Collects status information.
<b>vem version</b>	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 svcs_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 ~]# vemcmd 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
```