CHAPTER 17

System

This chapter describes how to identify and resolve problems related to the Nexus 1000V system.

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Information About the System

Cisco Nexus 1000V provides Layer 2 switching functions in a virtualized server environment. Nexus 1000V replaces virtual switches within ESX servers and allows users to configure and monitor the virtual switch using the Cisco NX-OS command line interface. Nexus 1000V also gives you visibility into the networking components of the ESX servers and access to the virtual switches within the network.

The Nexus 1000V manages a data center defined by the vCenter Server. Each server in the Datacenter is represented as a linecard in Nexus 1000V and can be managed as if it were a line card in a physical Cisco switch. The Nexus 1000V implementation has two components:

- Virtual supervisor module (VSM) – This is the control software of the 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 4.0 host. Several VEMs are controlled by one VSM. All the VEMs that form a switch domain should be in the same virtual Datacenter as defined by VMware vCenter Server.

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See the *Cisco Nexus 1000V Getting Started Guide* for a detailed overview of how the Nexus 1000V works with VMware ESX software.

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

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 the "Finding the Extension Key Tied to a Specific DVS" procedure on page 3-8.

The same extension key cannot be used to create more than one DVS on the vCenter Server.

Recovering a DVS

You can use this procedure to recover a DVS if the VSM VM that was used to create it is lost or needs to be replaced. This section includes the following procedures:

- Recovering a DVS With a Saved Copy of the VSM, page 17-3
- Recovering a DVS Without a Saved Copy of the VSM, page 17-4

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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, the see the "Recovering a DVS Without a Saved Copy of the VSM" procedure on page 17-4.
- Make sure that the VSM VM switchname is the same as the DVS switchname on the vCenter Server. This allows the VSM configuration to synchronize with the correct DVS on the vCenter Server.

  To change the VSM switchname use the **switchname** *newname* command.

Step 1 From the MOB, find the DVS extension key.
For more information, see the "Finding the Extension Key Tied to a Specific DVS" procedure on page 3-8.

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:
n1000v# config t
n1000v(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 the "Unregistering the Extension Key in the vCenter Server" procedure on page 3-13.

Step 4 From the VC client, register the extension (plug-in) for the VSM.

For more information see the following procedure in the *Cisco Nexus 1000V Getting Started Guide, Release 4.0(4)SV1(2)*.

- Creating a Cisco Nexus 1000V Plug-In on the vCenter Server

Step 5 On the VSM, restore the configuration using a previously saved copy of the VSM configuration file.

copy *path/filename* **running-config**

```
Example:
n1000v# 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, continue with the next step.
- Otherwise, go to Step 8.

Step 7 On the VSM, restore the configuration for the vCenter server connection.

```
Example:
n1000v# config t
n1000v (config)# svs connection VC
n1000v(config-svs-conn#) protocol vmware-vim
n1000v(config-svs-conn#) remote ip address 192.168.0.1
n1000v(config-svs-conn#) vmware dvs datacenter-name Hamilton-DC
```

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Step 8 Connect to vCenter Server.

```
Example:
n1000v(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:

- 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 the "Recovering a DVS With a Saved Copy of the VSM" procedure on page 17-3.
- 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 switchname is the same as the DVS switchname on the vCenter Server. This allows the VSM configuration to synchronize with the correct DVS on the vCenter Server.

  To change the VSM switchname use the **switchname** *newname* command.

Step 1 From the MOB, find the DVS extension key.
For more information, see the "Finding the Extension Key Tied to a Specific DVS" procedure on page 3-8.

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:
n1000v# config t
n1000v(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 the "Unregistering the Extension Key in the vCenter Server" procedure on page 3-13.

Step 4 From the VC client, register the extension (plug-in) for the VSM.

For more information see the following procedure in the *Cisco Nexus 1000V Getting Started Guide, Release 4.0(4)SV1(2)*.

- Creating a Cisco Nexus 1000V Plug-In on the vCenter Server

Step 5 Manually recreate the old port profiles from your previous configuration.

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For more information, see the following procedures in the *Cisco Nexus 1000V Getting Started Guide, Release 4.0(4)SV1(2)*.

- Configuring the System Port Profile for VSM-VEM Communication
- Configuring the Uplink Port Profile for VM Traffic
- Configuring the Data Port Profile for VM Traffic

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:
n1000v# config t
n1000v (config)# svs connection VC
n1000v(config-svs-conn#) protocol vmware-vim
n1000v(config-svs-conn#) remote ip address 192.168.0.1
n1000v(config-svs-conn#) vmware dvs datacenter-name Hamilton-DC
```

Step 7 Connect to vCenter Server.

```
Example:
n1000v(config-svs-conn#) connect
```

You can now use the old DVS or remove it.

Problems Related to VSM and vCenter Server Connectivity

Symptom	Solution
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	"Connection Failure After ESX Reboot" procedure on page 17-8
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.

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Symptom	Solution
Add host to DVS returns an error.	Confirm 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.

Example 17-1 shows the **show vms internal event-history errors** command that is useful for examining VC errors in detail. It shows whether an error is caused by a VSM (client) or the server.

Example 17-1 show vms internal event-history error Command

```
n1000v# 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.
```

VSM Creation

Symptom	Possible Causes	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 mgmt0 interface.
The VSM VM can ping itself, but not the gateway.	—	Make sure the NIC order is correct: control, mgmt, inband.
The VSM VM can ping the gateway, but not the outside subnet.	—	Configure vrf context management.

Port Profiles

When creating a port profile, use the following commands to create the corresponding port groups on the vCenter Server:

- **vmware port-group**
- **state enabled**

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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.

Problems with Port Profiles

Symptom	Possible Causes	Solution
You receive an 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 an 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. Go to the **Host** tab Networking->Configuration-> Distributed Virtual Switch 2. Click **Remove**.

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Symptom	Solution
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.
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

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.

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.

Connection Failure After ESX Reboot

If the MTU for a physical NIC attached to the Cisco Nexus 1000V is not 1500, then an ESX reboot will set it back to 1500.

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. Use the following workaround to correct this.

WORKAROUND

Step 1 Move one of the physical NICS to the standard VMware vswitch.

Step 2 Set the vswitch MTU to the preferred setting.

Step 3 Move the physical NIC back to Cisco Nexus 1000V.

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VEM Troubleshooting Commands

Use the following commands to display VEM information:

- **vemlog** – displays and controls VEM kernel logs
- **vemcmd** – displays configuration and status information
- **vem-support all** – collects support information
- **vem status**– collects status information
- **vem version**– collects version information
- **vemlog show last** *number-of-entries* – displays the circular buffer

Example 17-2 vemlog show last Command

```
[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
```

- **vemlog show info** – displays information about entries in the log

Example 17-3 vemcmd show info Command

```
[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** – displays the type of information you can display

Example 17-4 vemcmd help Command

```
[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
```

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VEM Log Commands

Use the following commands to control the vemlog:

- **vemlog stop** – stops the log
- **vemlog clear** – clear s 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

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.

Table 17-1 lists error messages that you might see on the VSM.

Table 17-1 Error Messages 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 n1000v with spec.name as n1000v already exists, cannot create DVS n1000v. 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 n1000v with spec.extensionKey as Cisco_Nexus_1000V_2055343757 already exists, cannot create DVS new-n1000v. 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: [VMWARE-VIM] A DVS n1000v with name as n1000v 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.