CHAPTER 3

Configuring System-Level High Availability

This chapter describes the Cisco NX-OS HA system and application restart operations.

This chapter includes the following sections:

Information about System-Level High Availability

This section includes the following topics:

Information About Single and Dual Supervisors

The Cisco Nexus 1000V can be configured with a single VSM supervisor or dual VSM supervisors.

The Cisco Nexus 1000V system is made up of the following:

- Virtual Ethernet Modules (VEMs) running within virtualization servers. VEMs are represented as modules within the VSM.
- A remote management component, for example, VMware vCenter Server.

- One or two Virtual Supervisor Modules (VSMs) running within Virtual Machines (VMs)

Single VSM Operation	Dual VSM Operation
• Stateless—In case of failure, service restarts from the startup configuration. • Stateful—In case of failure, service resumes from previous state.	• Redundancy is provided by one active VSM and one standby VSM. • The active VSM runs all the system applications and controls the system. • On the standby VSM, the applications are started and initialized in standby mode. They are also synchronized and kept up to date with the active VSM in order to maintain the runtime context of "ready to run." • On a switchover, the standby VSM takes over for the active VSM.

HA Supervisor Roles

The redundancy role indicates not only whether the VSM interacts with other VSMs, but also the module number it occupies. Table 3-1 shows the available HA roles for VSMs:

Table 3-1 HA Supervisor Roles

Role	Module Number	Description
Standalone	1	• Does not interact with other VSMs. • Assign this role when there is only one VSM in the system. • This is the default role.
Primary	1	• Coordinates the active/standby state with the secondary VSM. • Takes precedence during bootup when negotiating active/standby mode. That is, if the secondary VSM does not have the active role at bootup, the primary VSM takes the active role. • Assign this role to the first VSM you install in a dual VSM system.
Secondary	2	• Coordinates the active/standby state with the primary VSM. • Assign this role to the second VSM you install in a dual VSM system.

Dual Supervisor Active and Standby Redundancy States

Independent of its role, the redundancy state of a VSM can be one of those described in Table 3-2.

Table 3-2 HA Supervisor Redundancy States

Redundancy State	Description
Active	Controls the system and is visible to the outside world.
Standby	Synchronizes its configuration with that of the active VSM so that it is continuosly ready to take over in case of failure or manual switchover. **Note** You cannot Telnet/SSH to the standby VSM. Instead, you can use the **attach module** from the active VSM to access the standby VSM console. Only a subset of the CLI commands are available from the standby VSM console.

Dual Supervisor Synchronization

The active and standby VSMs are **operationally HA** and can automatically synchronize when the internal state of one supervisor module is **Active with HA Standby** and the internal state of the other supervisor module is **HA Standby**.

If the output of the **show system redundancy** command indicates that the operational redundancy mode of the active VSM is **None**, then the active and standby VSMs are not yet synchronized.The following example shows the VSM internal state of dual supervisors as observed in the output of the **show system redundancy status** command.

```
Example:
switch# show system redundancy status
Redundancy role
---------------
      administrative:   standalone
         operational:   standalone

Redundancy mode
---------------
      administrative:   HA
         operational:   None

This supervisor (sup-1)
-----------------------
    Redundancy state:   Active
    Supervisor state:   Active
      Internal state:   Active with no standby

Other supervisor (sup-2)
------------------------
    Redundancy state:   Not present
switch#
```

Information About VSM Restarts and Switchovers

This section includes the following topics:

Restarts on Standalone VSMs

In a system with only one supervisor, when all HA policies have been unsuccessful in restarting a service, the supervisor restarts. The supervisor and all services restart with no prior state information.

Restarts on Dual VSMs

When a VSM fails in a system with dual supervisors, the system performs a switchover rather than a system restart in order to maintain stateful operation. In some cases, however, a switchover may not be possible at the time of the failure. For example, if the standby VSM is not in a stable standby state, a restart rather than a switchover is performed.

Switchovers on Dual VSMs

A dual VSM configuration allows uninterrupted traffic forwarding with stateful switchover (SSO) when a failure occurs in the VSM. The two VSMs operate in an active/standby capacity in which only one is active at any given time, while the other acts as a standby backup. The two VSMs constantly synchronize the state and configuration in order to provide a seamless and stateful switchover of most services if the active VSM fails.

This section includes the following topics:

Switchover Characteristics

A switchover occurs when the active supervisor fails if, for example, repeated failures occur in an essential service, or the system hosting the VSM fails.

A user triggered switchover could occur if, for example, you want to do some maintenance at the system hosting the active VSM.

An HA switchover has the following characteristics:

- It is stateful (non disruptive) because control traffic is not affected.
- It does not disrupt data traffic because the VEMs are not affected.

Automatic Switchover

When a stable standby VSM detects that the active VSM has failed, it initiates a switchover and transitions to active. When a switchover begins, another switchover cannot be started until a stable standby VSM is available.

If a standby VSM that is not stable detects that the active VSM has failed, then, instead of initiating a switchover, it trys to restart the system.

Manual Switchover

Before you can initiate a manual switchover from the active to the standby VSM, the standby VSM must be stable. To find out if it is, use the "Verifying that a System is Ready for a Switchover" procedure on page 3-8.

Once you have verified that the standby VSM is stable, you can manually initiate a switchover using the "Manually Switching the Active VSM to Standby" procedure on page 3-9.

Once a switchover process begins, another switchover process cannot be started until a stable standby VSM is available.

Guidelines and Limitations

- Although primary and secondary VSMs can reside in the same host, to improve redundancy, install them in separate hosts and, if possible, connected to different upstream switches.

- The console for the standby VSM is available through the vSphere client or using the command, **module attach** <x>, but configuration is not allowed and many commands are restricted. The **module attach** <x>" command would be run at the console of the active VSM.
- You cannot Telnet/SSH to the standby VSM because the mgmt interface IP is unconfigured until the VSM becomes active.

Configuring System-Level High Availability

This section includes the following topics:

Changing the VSM Role

Use this procedure to change the role of a VSM to one of the following after it is already in service:

- standalone
- primary
- secondary

BEFORE YOU BEGIN

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

Caution **Primary VSM Reset**
Changing the role of a VSM can result in a conflict between the VSM pair. If a primary and secondary VSM see each other as active at the same time, the system resolves this by resetting the primary.

- If you are changing a standalone VSM to secondary VSM, be sure to first isolate it from the other VSM in the pair. This prevents any interaction with the primary during the change. Then power the VM off from the vSphere Client before reconnecting it as standby.

  For an example of changing the port groups and port profiles assigned to the VSM interfaces in the vSphere Client, see the following document:

  – *Cisco Nexus 1000V Software Installation Guide, Release 4.0(4)SV1(1)*

  To change a standalone VSM to a secondary VSM, see the "Adding a Second VSM to a Standalone System" procedure on page 3-11.
- You are logged into the CLI in EXEC mode.

Note The Cisco Nexus 1000V VSM software installation provides an opportunity for you to designate the role for each VSM. You can use this procedure to change that initial configuration.

- The possible HA roles are standalone , primary, and secondary.

  For more information, see the "HA Supervisor Roles" section on page 3-2.
- The possible HA redundancy states are active and standby.

  For more information, see the "Dual Supervisor Active and Standby Redundancy States" section on page 3-2.
- To activate a change from primary to secondary VSM, the VSM must be reloaded by doing one of the following:
  - Using the reload command.
  - Powering the VM off and then on from the vSphere Client.
- A change from a standalone to a primaryVSM takes effect immediately.

SUMMARY STEPS

1. **system redundancy role** {**standalone** | **primary** | **secondary**}
2. **show system redundancy status**
3. **copy running-config startup-config**

DETAILED STEPS

	Command	Purpose

Step 1	**system redundancy role {standalone | primary | secondary}**
	
	Example:
	`n1000v# system redundancy role standalone`
	`n1000v#`
		Designates the HA role of the VSM.

	Command	Purpose
Step 2	**show system redundancy status** **Example:** switch# show system redundancy status Redundancy role --------------- administrative: standalone operational: standalone Redundancy mode --------------- administrative: HA operational: None This supervisor (sup-1) ----------------------- Redundancy state: Active Supervisor state: Active Internal state: Active with no standby Other supervisor (sup-2) ------------------------ Redundancy state: Not present switch#	(Optional) Displays the current redundancy status for the VSM(s). This example shows a standalone VSM redundancy configuration.
Step 3	**copy running-config startup-config** **Example:** n1000v(config)# copy running-config startup-config	Saves the running configuration persistently through reboots and restarts by copying it to the startup configuration.

Configuring a Switchover

This section includes the following procedures for configuring a switchover in a dual VSM system:

- Guidelines and Limitations, page 3-7
- "Verifying that a System is Ready for a Switchover" procedure on page 3-8
- "Manually Switching the Active VSM to Standby" procedure on page 3-9

Guidelines and Limitations

Follow these guidelines when performing a switchover:

- When you manually initiate a switchover, system messages are generated that indicate the presence of two VSMs and identify which one is becoming active.
- A switchover can only be performed when both VSMs are functioning.

Verifying that a System is Ready for a Switchover

Use this procedure to verify that both an active and standby VSM are in place and operational before proceeding with a switchover.

BEFORE YOU BEGIN

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

- You are logged into the CLI in EXEC mode.
- If the standby VSM is not in a stable state (the state must be **ha-standby**), then a manually-initiated switchover can not be performed.

SUMMARY STEPS

1. **show system redundancy status**
2. **show module**

DETAILED STEPS

	Command	Purpose

Step 1	**show system redundancy status**
	
	Example:
	`n1000v# 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`
		Displays the current redundancy status for the VSM(s).
		
		If the output indicates the following, then you can proceed with a system switchover if needed.
		• the presence of an active VSM
		• the presence of a standby VSM in the HA standby redundancy state

	Command	Purpose
Step 2	**show module**	Displays information about all available VEMs and VSMs in the system. In the command output, the Status column should display OK for switching modules and an active or ha-standby status for supervisor modules. If the output indicates the following, then you can proceed: • the presence of an active VSM • the presence of a standby VSM in the HA standby redundancy state

Example:

```
n1000v# show module
Mod  Ports  Module-Type                      Model              Status
---  -----  -------------------------------- ------------------ ------------
1    0      Virtual Supervisor Module        Nexus1000V         active *
2    0      Virtual Supervisor Module        Nexus1000V         ha-standby
3    248    Virtual Ethernet Module          NA                 ok

Mod  Sw               Hw
---  ---------------  ------
1    4.0(4)SV1(0.37)  0.0
2    4.0(4)SV1(0.37)  0.0
3    4.0(4)SV1(0.37)  0.4

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-00-21-00 to 02-00-0c-00-21-80  NA

Mod  Server-IP        Server-UUID                            Server-Name
---  ---------------  -------------------------------------  --------------------
1    192.168.48.66    NA                                     NA
2    192.168.48.66    NA                                     NA
3    192.168.48.45    b497bc96-1583-32f1-9062-de3b5d37709c   strider.cisco.com

* this terminal session
```

Manually Switching the Active VSM to Standby

Use this procedure to switch an active VSM to the standby VSM in a dual supervisor system.

BEFORE YOU BEGIN

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

- You are logged in to the active VSM CLI in EXEC mode.
- You have completed the "Verifying that a System is Ready for a Switchover" procedure on page 3-8, and have found the system to be ready for a switchover.
- A switchover can only be performed when two VSMs are functioning in the switch.
- If the standby VSM is not in a stable state (ha-standby), then you cannot initiate a manual switchover. You will see the following error message:
  - `Failed to switchover (standby not ready to takeover in vdc 1)`

- Once you enter the **system switchover** command, you cannot start another switchover process on the same system until a stable standby VSM is available.
- If a switchover does not complete successfully within 28 seconds, the supervisors will reset.
- Any unsaved running configuration that was available at active VSM is still unsaved in the new active VSM. This can be verified using the **show running-config diff** command. Users should save that configuration, if needed, as they would do in the other VSM (through "copy running-config startup-config" command)

SUMMARY STEPS

1. **system switchover**
2. **show running-config diff**
3. **copy running-config startup-config**

DETAILED STEPS

	Command	Purpose
Step 1	`system switchover`	On the active, VSM, initiates a manual switchover to the standby VSM. **Note** Once you enter this command, you cannot start another switchover process on the same system until a stable standby VSM is available. **Note** Before proceeding, wait until the switchover completes and the standby supervisor becomes active. The following example shows the output that appers on the standby VSM as it becomes the active VSM.

Example:

```
n1000v# system switchover
----------------------------
2009 Mar 31 04:21:56 n1000v %$ VDC-1 %$ %SYSMGR-2-HASWITCHOVER_PRE_START:
This supervisor is becoming active (pre-start phase).
2009 Mar 31 04:21:56 n1000v %$ VDC-1 %$ %SYSMGR-2-HASWITCHOVER_START:
This supervisor is becoming active.
2009 Mar 31 04:21:57 n1000v %$ VDC-1 %$ %SYSMGR-2-SWITCHOVER_OVER: Switchover completed.
2009 Mar 31 04:22:03 n1000v %$ VDC-1 %$ %PLATFORM-2-MOD_REMOVE: Module 1 removed (Serial
number )
```

	Command	Purpose
Step 2	**show running-config diff** **Example:** DocTeamVSM# show running-config diff *** Startup-config --- Running-config *************** *** 1,38 **** version 4.0(4)SV1(1) role feature-group name new role name testrole username admin password 5 1S7HvKc5G$aguYqHl0dPttBJAhEPwsy1 role network-admin telnet server enable ip domain-lookup	(Optional) Verify the difference between the running and startup configurations. Any unsaved running configuration in an active VSM is also unsaved in the VSM that becomes active after switchover. Save that configuration in the startup if needed.
Step 3	**copy running-config startup-config** **Example:** n1000v(config)# copy running-config startup-config	(Optional) Saves the running configuration persistently through reboots and restarts by copying it to the startup configuration.

Adding a Second VSM to a Standalone System

Use this section to change a standalone system into a dual supervisor system by adding a second VSM.

This section inlcudes the following topics:

BEFORE YOU BEGIN

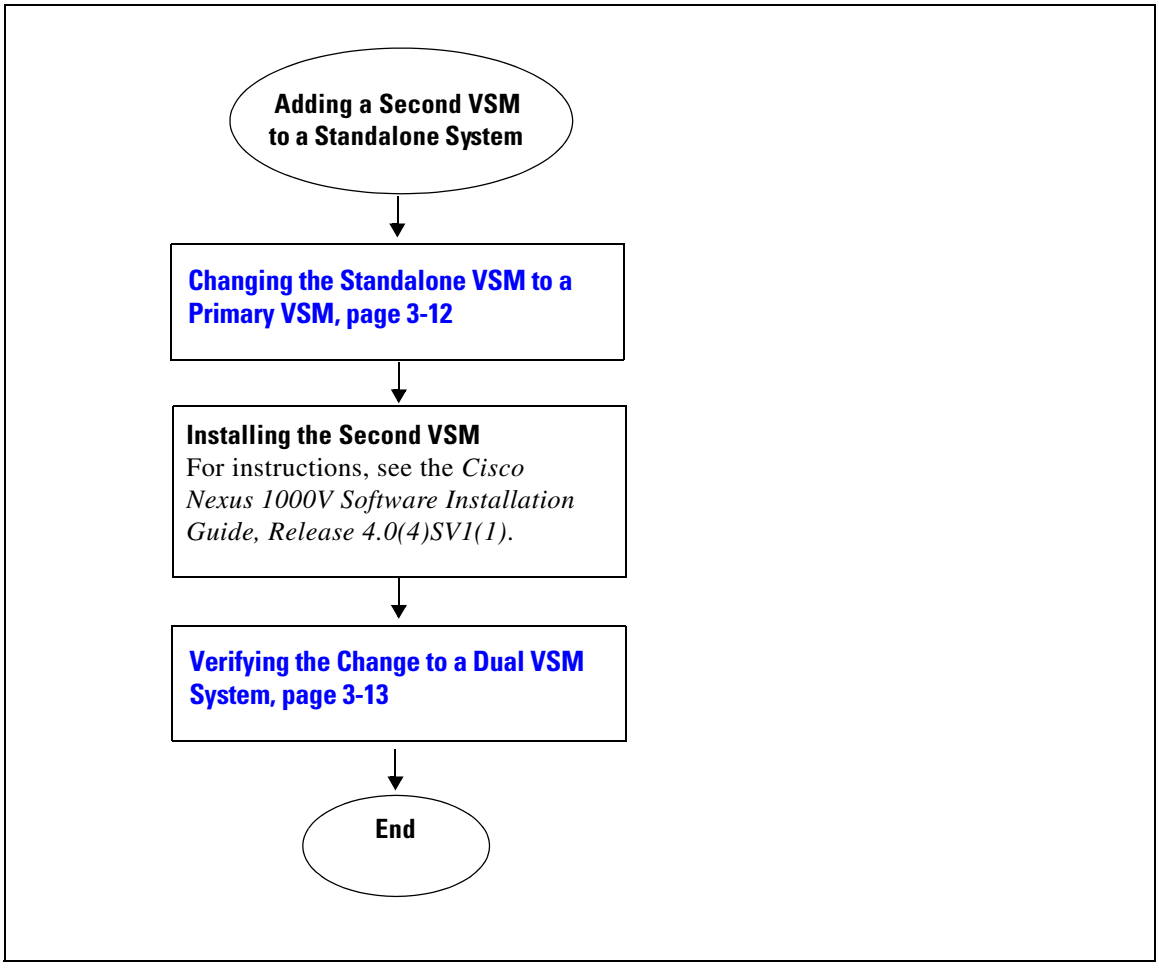
Before adding a second VSM to a standalone system, you must know or do the following:

- You are logged into the CLI in EXEC mode.
- You have the *Cisco Nexus 1000V Software Installation Guide, Release 4.0(4)SV1(1)* document available.
- Although primary and secondary VSMs can reside in the same host, to improve redundancy, install them in separate hosts and, if possible, connected to different upstream switches.
- When installing the second VSM, assign it the secondary role.
- Set up the port groups for the dual VSM VMs with the same parameters in both hosts.
- After the secondary VSM is installed, the following occurs automatically:
  - The secondary VSM is reloaded and added to the system.
  - The secondary VSM negotiates with the primary VSM and becomes the standby VSM.
  - The standby VSM synchronizes the configuration and state with the primary VSM.

Flow Chart: Adding a Second VSM to a Standalone System

The following flow chart is designed to guide you through the process of adding a second VSM to a standalone system. After completing each procedure, return to the flow chart to make sure you complete all required procedures in the correct sequence.

Figure 1 Adding a Second VSM to a Standalone System



Changing the Standalone VSM to a Primary VSM

Use this procedure to change the role of a VSM from standalone in a single VSM system to primary in a dual supervisor system.

BEFORE YOU BEGIN

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

- You are logged into the CLI in EXEC mode.
- A change from a standalone to a primaryVSM takes effect immediately.

SUMMARY STEPS

1. system redundancy role primary
2. show system redundancy status
3. copy running-config startup-config

DETAILED STEPS

	Command	Purpose

Step 1	**system redundancy role primary**
	
	Example:
	`n1000v# system redundancy role primary`
	`n1000v#`
		Changes the standalone VSM to a primary VSM.
		The role change occurs immediately.

Step 2	**show system redundancy status**
	
	Example:
	`n1000v# show system redundancy status`
	`Redundancy role`
	`---------------`
	`administrative: primary`
	`operational: primary`
	
	`Redundancy mode`
	`---------------`
	`administrative: HA`
	`operational: None`
	
	`This supervisor (sup-1)`
	`----------------------`
	`Redundancy state: Active`
	`Supervisor state: Active`
	`Internal state: Active with no standby`
	
	`Other supervisor (sup-2)`
	`------------------------`
	`Redundancy state: Not present`
		Displays the current redundancy state for the VSM.

Step 3	**copy running-config startup-config** **Example:** `n1000v(config)# copy running-config startup-config`	Saves the running configuration persistently through reboots and restarts by copying it to the startup configuration.

Verifying the Change to a Dual VSM System

Use this procedure to verify a change from a single VSM to a dual VSM system.

BEFORE YOU BEGIN

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

- You are logged into the CLI in EXEC mode.

- You have already changed the single VSM role from standalone to primary using the "Changing the Standalone VSM to a Primary VSM" procedure on page 3-12.
- You have already installed the second VSM using the *Cisco Nexus 1000V Software Installation Guide, Release 4.0(4)SV1(1)*.

SUMMARY STEPS

1. **show system redundancy status**
2. **show module**

DETAILED STEPS

	Command	Purpose

Step 1	**show system redundancy status**
	
	Example:
	`n1000v# 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`
		Displays the current redundancy status for VSMs in the system.
		
		In this example, the primary and secondary VSMs are shown following a change from a single VSM system to a dual VSM system.

Step 2	**show module**	Displays information about all available VSMs and VEMs in the system. In this example, the primary and secondary VSMs are shown following a change from a single VSM system to a dual VSM system. In addition, there is one VEM in module 3.

Command	Purpose

Example:

```
n1000v# show module
Mod  Ports  Module-Type                      Model              Status
---  -----  -------------------------------- ------------------ ------------
1    0      Virtual Supervisor Module        Nexus1000V         active *
2    0      Virtual Supervisor Module        Nexus1000V         ha-standby
3    248    Virtual Ethernet Module          NA                 ok

Mod  Sw              Hw
---  --------------  ------
1    4.0(4)SV1(0.37)  0.0
2    4.0(4)SV1(0.37)  0.0
3    4.0(4)SV1(0.37)  0.4

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-00-21-00 to 02-00-0c-00-21-80  NA

Mod  Server-IP        Server-UUID                            Server-Name
---  ---------------  -------------------------------------  --------------------
1    192.168.48.66    NA                                     NA
2    192.168.48.66    NA                                     NA
3    192.168.48.45    b497bc96-1583-32f1-9062-de3b5d37709c   strider.cisco.com
* this terminal session
```

Replacing the Standby in a Dual VSM System

Use this procedure to replace a standby/secondary VSM in a dual VSM system.

Caution **Equipment Outage**—This procedures requires powering down and reinstalling a VSM. During this time, your system will be operating with a single VSM.

Step 1 Power off the standby VSM.

Step 2 Install the new VSM as a standby, with the same domain ID as the existing VSM, using the section, *Installing and Configuring the VSM VM* in the document, *Cisco Nexus 1000V Software Installation Guide, Release 4.0(4)SV1(1)*.

Once the new VSM is added to the system, it will synchronize with the existing VSM.

Replacing the Active in a Dual VSM System

Use this procedure to replace an active/primary VSM in a dual VSM system.

BEFORE YOU BEGIN

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

- You are logged into the CLI in EXEC mode.
- This procedure requires you to configure the port groups so that the new primary VSM cannot communicate with the secondary VSM or any of the VEMs during setup. VSMs with primary or secondary redundancy role have built in mechanisms for detecting and resolving the conflict between two VSMs in the active state. In order to avoid these mechanisms during the configuration of the new primary, it must be done in isolation.

Caution **Equipment Outage**—This procedures requires powering down and reinstalling a VSM. During this time, your system will be operating with a single VSM.

Step 1 Power off the active VSM.

The secondary VSM becomes active.

Step 2 On the vSphere Client, change the port group configuration for the new primary VSM to prevent communication with the secondary VSM and the VEMs during setup.

For an example of changing the port groups and port profiles assigned to the VSM interfaces in the vSphere Client, see the *Cisco Nexus 1000V Software Installation Guide, Release 4.0(4)SV1(1)*

Step 3 Install the new VSM as a primary, with the same domain ID as the existing VSM, using the section, *Installing and Configuring the VSM VM* in the document, *Cisco Nexus 1000V Software Installation Guide, Release 4.0(4)SV1(1)*.

Step 4 Save the configuration.

Step 5 Power off the VM.

Step 6 On the vSphere Client, change the port group configuration for the new primary VSM to permit communication with the secondary VSM and the VEMs.

Step 7 Power up the new primary VSM.

The new primary VSM starts and automatically synchronizes all configuration data with the secondary, which is currently the active VSM. Since the exising VSM is active, the new primary VSM becomes the standby VSM and receives all configuration data from the existing active VSM.

Changing the Domain ID in a Dual VSM System

Use this procedure to change the domain ID in a dual VSM system.

BEFORE YOU BEGIN

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

- You have access to the console of both the active and standby VSM.

- VSMs with a primary or secondary redundancy role have built-in mechanisms for detecting and resolving the conflict between two VSMs in the active state. In order to avoid these mechanisms while changing the domain ID, you must isolate the standby VSM from the active VSM. This procedure has a step for isolating the VSMs.

Note Equipment Outage—This procedures requires powering down a VSM. During this time, your system will be operating with a single VSM.

DETAILED STEPS

Step 1 On the vSphere Client for the standby VSM, do one of the following to isolate the VSMs and prevent their communication while completing this procedure:

- Change the port group configuration for the interfaces using port groups that prevent the VSMs from communicating with each other.
- Unmark the “Connected” option for the interfaces.

The standby VSM becomes active but cannot communicate with the other active VSM or the VEM.

Step 2 At the console of the standby VSM, change the domain id and save the configuration.

```
Example:
n1000v# config t
n1000v(config)# svs-domain
n1000v(config-svs-domain)# domain id 100
n1000v(config-svs-domain)# copy running-config startup-config
```

The domain id is changed on the standby VSM and the VEM connected to it.

Step 3 Power down the standby VSM.

Step 4 At the console of the active VSM, change the domain id and save the configuration.

```
Example:
n1000v# config t
n1000v(config)# svs-domain
n1000v(config-svs-domain)# domain id 100
n1000v(config-svs-domain)# copy running-config startup-config
```

The domain id is changed on the active VSM and the VEM connected to it.

Step 5 On the vSphere Client for the standby VSM, do one of the following to permit communication with the active VSM:

- Change the port group configuration for the interfaces.
- Make sure the "Connect at power on" option is marked for the interfaces.

Once powered up, the standby VSM will be able to communicate with the active VSM.

Step 6 Power up the standby VSM.

Both VSM are now using the new domain ID and will synchronize.

Verifying HA Status

Use the following commands from the primary VSM to display and verify the HA status of the system.

Command	Purpose
show system redundancy status	Displays the HA status of the system. See Example 3-1.
show module	Displays information about all available VSMs and VEMs in the system. See Example 3-2.
show processes	Displays the state of all processes and the start count of the process. State: R(runnable), S(sleeping), Z(defunct) Type: U(unknown), O(non sysmgr) VL(vdc-local), VG(vdc-global), VU(vdc-unaware) NR(not running), ER(terminated etc) See Example 3-3.

Examples

Example 3-1 Show system redundancy status

```
n1000v# 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
```

Example 3-2 show module

```
n1000v# show module
Mod  Ports  Module-Type                      Model              Status
---  -----  -------------------------------- ------------------ ------------
1    0      Virtual Supervisor Module        Nexus1000V         active *
2    0      Virtual Supervisor Module        Nexus1000V         ha-standby
3    248    Virtual Ethernet Module          NA                 ok

Mod  Sw               Hw
---  ---------------  ------
1    4.0(4)SV1(0.37)  0.0
```

```
2    4.0(4)SV1(0.37)  0.0
3    4.0(4)SV1(0.37)  0.4

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-00-21-00 to 02-00-0c-00-21-80  NA

Mod  Server-IP        Server-UUID                           Server-Name
---  ---------------  ------------------------------------  --------------------
1    192.168.48.66    NA                                    NA
2    192.168.48.66    NA                                    NA
3    192.168.48.45    b497bc96-1583-32f1-9062-de3b5d37709c  strider.cisco.com
* this terminal session
```

Example 3-3 show processes

```
n1000v# show processes

PID    State  PC        Start_cnt    TTY   Type  Process
-----  -----  --------  -----------  ----  ----  -------------
    1      S  77f8a468            1     -     O  init
    2      S         0            1     -     O  ksoftirqd/0
    3      S         0            1     -     O  desched/0
    4      S         0            1     -     O  events/0
    5      S         0            1     -     O  khelper
   10      S         0            1     -     O  kthread
   18      S         0            1     -     O  kblockd/0
   35      S         0            1     -     O  khubd
  119      S         0            1     -     O  pdflush
  120      S         0            1     -     O  pdflush
  122      S         0            1     -     O  aio/0
  121      S         0            1     -     O  kswapd0
  707      S         0            1     -     O  kseriod
  754      S         0            1     -     O  kide/0
  762      S         0            1     -     O  scsi_eh_0
 1083      S         0            1     -     O  kjournald
 1088      S         0            1     -     O  kjournald
 1603      S         0            1     -     O  kjournald
 1610      S         0            1     -     O  kjournald
 1920      S  77f6c18e            1     -     O  portmap
 1933      S         0            1     -     O  nfsd
 1934      S         0            1     -     O  nfsd
 1935      S         0            1     -     O  nfsd
 1936      S         0            1     -     O  nfsd
 1937      S         0            1     -     O  nfsd
 1938      S         0            1     -     O  nfsd
 1939      S         0            1     -     O  nfsd
 1940      S         0            1     -     O  nfsd
 1941      S         0            1     -     O  lockd
 1942      S         0            1     -     O  rpciod
 1947      S  77f6e468            1     -     O  rpc.mountd
 1957      S  77f6e468            1     -     O  rpc.statd
 1984      S  77dfe468            1     -    VG  sysmgr
 2265      S         0            1     -     O  mping-thread
 2266      S         0            1     -     O  mping-thread
 2280      S         0            1     -     O  redun_kthread
 2281      S         0            1     -     O  redun_timer_kth
 2341      S         0            1     -     O  stun_kthread
 2817      S         0            1     -     O  sf_rdn_kthread
 2818      S  77f37468            1     -    VU  xinetd
```

```
2819      S  77f6e468           1      -    VU  tftpd
2820      S  7784f1b6           1      -    VL  syslogd
2821      S  77ec2468           1      -    VU  sdwrapd
2822      S  77dbf468           1      -    VU  platform
2830      S        0            1      -     O  ls-notify-mts-t
2842      S  77ea5be4           1      -    VU  pfm_dummy
3270      S  77f836be           1      -     O  klogd
3274      S  77d84be4           1      -    VL  vshd
3275      S  77a41f43           1      -    VL  smm
3276      S  77e41468           1      -    VL  session-mgr
3277      S  77c26468           1      -    VL  psshelper
3278      S  77f75468           1      -    VU  lmgrd
3279      S  77e5cbe4           1      -    VG  licmgr
3280      S  77eb2468           1      -    VG  fs-daemon
3281      S  77eb8468           1      -    VL  feature-mgr
3282      S  77e72468           1      -    VU  confcheck
3283      S  77e9e468           1      -    VU  capability
3284      S  77c26468           1      -    VU  psshelper_gsvc
3294      S  77f75468           1      -     O  cisco
3311      S  77856f43           1      -    VL  clis
3360      S  77cbd468           1      -    VL  xmlma
3361      S  77e5b468           1      -    VL  vmm
3362      S  77b44468           1      -    VG  vdc_mgr
3363      S  77e71468           1      -    VU  ttyd
3364      R  77e9e5f5           1      -    VL  sysinfo
3365      S  77b5a468           1      -    VL  sksd
3366      S  77e9b468           1      -    VG  res_mgr
3367      S  77e44468           1      -    VG  plugin
3368      S  77ccc468           1      -    VL  mvsh
3369      S  77dfc468           1      -    VU  module
3370      S  77ccb468           1      -    VL  evms
3371      S  77ccc468           1      -    VL  evmc
3373      S  77ec1468           1      -    VU  core-dmon
3374      S  7761c40d           1      -    VL  ascii-cfg
3375      S  77cd9be4           1      -    VL  securityd
3376      S  77ca3468           1      -    VU  cert_enroll
3377      S  77b11be4           1      -    VL  aaa
3380      S  77a38f43           1      -    VL  l3vm
3381      S  77a2ef43           1      -    VL  u6rib
3383      S  77a2ef43           1      -    VL  urib
3384      S  77e13468           1      -    VU  ExceptionLog
3385      S  77df0468           1      -    VU  bootvar
3386      S  77dbc468           1      -    VG  ifmgr
3387      S  77ea0468           1      -    VU  tcap
3390      S  77f2abe4           1      -    VU  core-client
3418      S  77a3ff43           1      -    VL  adjmgr
3431      S  77f836be           1      1     O  getty
3432      S  77a7deee           1     S0     O  vsh
3434      S  77f1deee           1      -     O  gettylogin1
3454      S  77a41f43           1      -    VL  arp
3455      S  7786d896           1      -    VL  icmpv6
3456      S  778e1f43           1      -    VL  netstack
3510      S  776c340d           1      -    VL  radius
3511      S  77f58be4           1      -    VL  ip_dummy
3512      S  77f58be4           1      -    VL  ipv6_dummy
3513      S  7780640d           1      -    VU  ntp
3514      S  77f58be4           1      -    VL  pktmgr_dummy
3515      S  7786540d           1      -    VL  snmpd
3517      S  777f540d           1      -    VL  cdp
3706      S  77f836be           1     S1     O  getty
3711      S  77b66468           1      -    VL  aclmgr
3718      S  77d18468           1      -    VU  aclcomp
3871      S  778b440d           1      -    VL  ufdm
3872      S  77d08468           1      -    VU  sf_nf_srv
```

```
3873       S  779dff43          1     -    VL  rpm
3874       S  7789340d          1     -    VG  pltfm_config
3875       S  77ef4468          1     -    VU  pixmc
3876       S  77dd5468          1     -    VG  pixm
3877       S  7786640d          1     -    VL  nfm
3878       S  77dc9468          1     -    VU  msp
3879       S  77d82468          1     -    VL  monitor
3880       S  7786240d          1     -    VL  mfdm
3881       S  7784140d          1     -    VL  l2fm
3882       S  77d90468          1     -    VL  ipqosmgr
3883       S  77bf8468          1     -    VU  copp
3885       S  75f39497          1     -    VU  vms
3891       S  779ca27b          1     -    VL  igmp
3929       S  77b3d468          1     -    VL  eth_port_channel
3930       S  77cd5468          1     -    VL  vlan_mgr
3934       S  7777e40d          1     -    VL  ethpm
3960       S  77b58468          1     -    VL  eth-port-sec
3961       S  77a93468          1     -    VL  stp
3998       S  77d7f468          1     -    VL  private-vlan
3999       S  77d4e468          1     -    VU  vim
4009       S  77da9468          1     -    VL  lacp
4016       S  77d5d468          1     -    VU  portprofile
4221       S  77f58be4          1     -    VL  tcpudp_dummy
4226       S  77c12468          1     -    VU  pdl_srv_tst
4242       S  77e55468          1     -    VU  ethanalyzer
4243       S  77afb40d          1     -    VL  dcos-thttpd
4244       S  77ad740d          1     -    VL  dcos-xinetd
4261       S  77b0240d          1     -     O  ntpd
4542       S         0          1     -     O  mts-sync-thr
7372       S  77f426be          1    S0     O  more
7373       S  77aa4be4          1    S0     O  vsh
7374       R  77f716be          1     -     O  ps
   -      NR         -          0     -    VL  tacacs+
   -      NR         -          0     -    VL  eigrp
   -      NR         -          0     -    VL  isis
   -      NR         -          0     -    VL  ospf
   -      NR         -          0     -    VL  ospfv3
   -      NR         -          0     -    VL  rip
   -      NR         -          0     -    VL  eigrp
   -      NR         -          0     -    VL  isis
   -      NR         -          0     -    VL  ospf
   -      NR         -          0     -    VL  ospfv3
   -      NR         -          0     -    VL  rip
   -      NR         -          0     -    VL  eigrp
   -      NR         -          0     -    VL  isis
   -      NR         -          0     -    VL  ospf
   -      NR         -          0     -    VL  ospfv3
   -      NR         -          0     -    VL  rip
   -      NR         -          0     -    VL  eigrp
   -      NR         -          0     -    VL  isis
   -      NR         -          0     -    VL  ospf
   -      NR         -          0     -    VL  ospfv3
   -      NR         -          0     -    VL  rip
   -      NR         -          0     -    VL  amt
   -      NR         -          0     -    VL  bgp
   -      NR         -          0     -    VL  eou
   -      NR         -          0     -    VL  glbp
   -      NR         -          0     -    VL  hsrp_engine
   -      NR         -          0     -    VU  installer
   -      NR         -          0     -    VL  interface-vlan
   -      NR         -          0     -    VU  lisp
   -      NR         -          0     -    VL  msdp
   -      NR         -          0     -    VL  pim
   -      NR         -          0     -    VL  pim6
```

```
-     NR          -            0      -    VL  scheduler
-     NR          -            0      -    VU  vbuilder

State: R(runnable), S(sleeping), Z(defunct)

Type:  U(unknown), O(non sysmgr)
       VL(vdc-local), VG(vdc-global), VU(vdc-unaware)
       NR(not running), ER(terminated etc)
```

Additional References

For additional information related to implementing system-level HA features, see the following sections:

Related Documents

Related Topic	Document Title
Software upgrades	Chapter 4, “Configuring Software Upgrades”
Cisco Nexus 1000V commands	*Cisco Nexus 1000V Command Reference, Release 4.0(4)SV1(1)*

Standards

Standards	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	—

MIBs

MIBs	MIBs Link
• CISCO-PROCESS-MIB	To locate and download MIBs, go to the following URL: http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml

RFCs

RFCs	Title
No RFCs are supported by this feature	—

Feature History for System-Level High Availability

This section provides the System-Level High Availability release history.

Feature Name	Releases	Feature Information
System-Level High Availability	4.0(4)SV1(1)	This feature was introduced.