Upgrading the Cisco Nexus 1000V

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Information About the Software Upgrade

Upgrade Software Sources

Note An interactive upgrade tool has been provided to assist you in determining the correct upgrade steps based on your current environment and the one to which you want to upgrade.

You can obtain your upgrade-related software from the following sources listed in the following table:

Table 1: Obtaining the Upgrade Software

Source	Description
Cisco	Download the current release of the Cisco Nexus 1000V software from Cisco.com.

Source	Description
VMware	Download the VMware software from the VMware website. The current Cisco Nexus 1000V software release image for VMware Release 5.1 is at the VMware web site: **Note** **The following paths are not available for the Beta release.** • Online portal for VMware Update Manager (VUM): http://hostupdate.vmware.com/software/VUM/PRODUCTION/csco-main/esx/csco/csco-index.xml • Offline patch portal: http://www.vmware.com/patchmgr/download.portal

For information about your software and platform compatibility, see *Cisco Nexus 1000V and VMware Compatibility Information*.

Prerequisites for the Upgrade

Before You Begin

- The Upgrade Application cannot be used for the upgrade of the Virtual Supervisor Modules (VSMs) from Release 4.2(1)SV1(4) to the current release.
- A pair of VSMs in a high availability (HA) pair is required in order to support a nondisruptive upgrade.
- A system with a single VSM can only be upgraded in a disruptive manner.

The network and server administrators must coordinate the upgrade procedure with each other.

The upgrade process is irrevocable. After the software is upgraded, you can downgrade by removing the current installation and reinstalling the software. For more information, see the “Recreating the Installation” section of the *Cisco Nexus 1000V Troubleshooting Guide*.

A combined upgrade of ESX and the VEM in a single maintenance mode is supported in this release. A combined upgrade requires at least vCenter 5.0 Update 1 whether you upgrade manually or are using the VMware Update Manager.

You can manually upgrade the ESX and VEM in one maintenance mode as follows:

1. Place the host in maintenance mode.
2. Upgrade ESX to 4.1 or 5.0 as needed.
3. Install the VEM VIB while the host is still in maintenance mode.
4. Remove the host from maintenance mode.

The steps for the manual combined upgrade procedure do not apply for VUM-based upgrades.

You can abort the upgrade procedure by pressing Ctrl-C.

Prerequisites for Upgrading VSMs

Upgrading VSMs has the following prerequisites:

- Close any active configuration sessions before upgrading the Cisco Nexus 1000V software.
- Save all changes in the running configuration to the startup configuration, to be preserved through the upgrade.
- Save a backup copy of the running configuration in external storage.
- Perform a VSM backup. For more information, see the “Configuring VSM Backup and Recovery” chapter in the *Cisco Nexus 1000V System Management Configuration Guide*.
- Use the VSM management IP address to log into VSM and perform management tasks.

Important If you connect to a VSM using the VSA serial port or the "connect host" from the CIMC, do not initiate commands that are CPU intensive, such as copying image from tftp server to bootflash or generate a lot of screen output or updates. Use the VSA serial connections, including CIMC, only for operations such as debugging or basic configuration of the VSA.

Prerequisites for Upgrading VEMs

Caution If the VMware vCenter Server is hosted on the same ESX/ESXi host as a Cisco Nexus 1000V VEM, a VMware Update Manager (VUM)-assisted upgrade on the host will fail. You should manually VMotion the vCenter Server VM to another host before you perform an upgrade.

Note When you perform any VUM operation on hosts that are a part of a cluster, ensure that VMware HA, VMware fault tolerance (FT), and VMware Distributed Power Management (DPM) features are disabled for the entire cluster. Otherwise, VUM will fail to install the hosts in the cluster.

- You are logged in to the VSM command-line interface (CLI) in EXEC mode.
- You have a copy of your VMware documentation available for installing software on a host.
- You have already obtained a copy of the VEM software file from one of the sources listed in VEM Software. For more information, see the *Cisco Nexus 1000V and VMware Compatibility Information*.
- If you need to migrate a vSphere host from ESX to ESXi, do it before the Cisco Nexus 1000V upgrade.

- You have placed the VEM software file in `/tmp` on the vSphere host. Placing it in the root (/) directory might interfere with the upgrade. Make sure that the root RAM disk has at least 12 MB of free space by entering the **vdf** command.
- On your upstream switches, you must have the following configuration.
  - On Catalyst 6500 Series switches with the Cisco IOS software, enter one of the following commands:

    (config-if) **portfast trunk**

    or

    (config-if) **portfast edge trunk**
  - On Cisco Nexus 5000 Series switches with Cisco NX-OS software, enter the **spanning-tree port type edge trunk** command.
- On your upstream switches, we highly recommend that you globally enable the following:
  - Global BPDU Filtering
  - Global BPDU Guard
- On your upstream switches where you cannot globally enable BPDU Filtering and BPDU Guard, we highly recommend that you enter the following commands:
  - (config-if) **spanning-tree bpdu filter**
  - (config-if) **spanning-tree bpdu guard**
- For more information about configuring spanning tree, BPDU, or PortFast, see the documentation for your upstream switch.

Guidelines and Limitations for Upgrading the Cisco Nexus 1000V

Before attempting to migrate to any software image version, follow these guidelines:

Caution During the upgrade process, the Cisco Nexus 1000V does not support any new additions such as modules, Virtual NICs (vNICs), or VM NICs and does not support any configuration changes. VM NIC and vNIC port-profile changes might render VM NICs and vNICs in an unusable state.

Note vSphere 5.0 Update 1 or later is recommended over vSphere 5.0.

- You are upgrading the Cisco Nexus 1000V software to the current release.
- Scheduling — Schedule the upgrade when your network is stable and steady. Ensure that everyone who has access to the switch or the network is not configuring the switch or the network during this time. You cannot configure a switch during an upgrade.
- Hardware — Avoid power interruptions to the hosts that run the VSM VMs during any installation procedure.

- Connectivity to remote servers — do the following:
  - Copy the kickstart and system images from the remote server to the Cisco Nexus 1000V.
  - Ensure that the switch has a route to the remote server. The switch and the remote server must be in the same subnetwork if you do not have a router to route traffic between subnets.
- Software images — do the following:
  - Make sure that the system and kickstart images are the same version.
  - Retrieve the images in one of two ways:
    - Locally—Images are locally available on the upgrade CD-ROM/ISO image.
    - Remotely—Images are in a remote location and you specify the destination using the remote server parameters and the filename to be used locally.
- Commands to use — do the following:
  - Verify connectivity to the remote server by using the **ping** command.
  - Use the one-step **install all** command to upgrade your software. This command upgrades the VSMs.
  - Do not enter another **install all** command while running the installation. You can run commands other than configuration commands.
  - During the VSM upgrade, if you try to add a new VEM or any of the VEMs are detached due to uplink flaps, the VEM attachment is queued until the upgrade completes.

Note If the ESX hosts are not compatible with the software image that you install on the VSM, a traffic disruption occurs in those modules, depending on your configuration. The **install all** command output identifies these scenarios. The hosts must be at the right version before the upgrade.

Before upgrading the VEMs, note these guidelines and limitations:

- The VEM software can be upgraded manually using the CLI or upgraded automatically using VUM.
- During the VEM upgrade process, VEMs reattach to the VSM.
- Connectivity to the VSM can be lost during a VEM upgrade when the interfaces of a VSM VM connect to its own Distributed Virtual Switch (DVS).
- If you are upgrading a VEM using a Cisco Nexus 1000V bundle, follow the instructions in your VMware documentation. For more details about VMware bundled software, see the *Cisco Nexus 1000V and VMware Compatibility Information*.
- With ESX and ESXi 4.1, after the upgrade, the **esxupdate --vib-view query** command might show two Cisco VIBs as installed. If the upgrade has otherwise been successful, you can ignore this condition.

Caution Do not enter the **vemlog**, **vemcmd**, or **vempkt** commands during the VEM upgrade process because these commands impact the upgrade.

Note For the ESXi 5.1 release (799733), the minimum versions are as follows:

- VMware vCenter Server 5.1, 799731
- VMware Update Manager 5.1, 782803

For the ESXi 5.0.0 release, the minimum versions are as follows:

- VMware vCenter Server 5.0.0, 455964
- VMware Update Manager 5.0.0 432001

If you plan to do a combined upgrade of ESX and VEM, the minimum vCenter Server/VUM version required is 623373/639867.

For the ESX/ESXi 4.1.0 release and later, the minimum versions are as follows:

- VMware vCenter Server 4.1.0, 258902
- VMware Update Manager 4.1.0 256596

This procedure is different from the upgrade to Release 4.2(1)SV1(4). In this procedure, you upgrade the VSMs first by using the **install all** command and then you upgrade the VEMs.

Note If your hosts are running a release prior to VMware 4.1, upgrade to VMware 4.1, VMware 5.0, or VMware 5.1. See Installing and Upgrading VMware.

- You can upgrade the hosts in the DVS a few at a time across multiple maintenance windows. The only exception is if you are upgrading the VEM alone using VUM with the ESX version unchanged.

Upgrade Procedures

The following table lists the upgrade steps when upgrading to the current release.

Table 2: Upgrade Paths from Cisco Nexus 1000V Releases

If you are running this configuration	Follow these steps
Release 4.0(4)SV1(1) or 4.0(4)SV1(2)	Upgrades from these releases are not supported.
Releases 4.0(4)SV1(3), 4.0(4)SV1(3a), 4.0(4)SV1(3b), 4.0(4)SV1(3c), or 4.0(4)SV1(3d)	**1** Upgrading from Releases 4.0(4)SV1(3, 3a, 3b, 3c, 3d) to Release 4.2(1)SV1(4b) **2** Upgrading from Releases 4.2(1)SV1(4), (4a), (4b), (5.1), (5.1a), or (5.2) to Release 4.2(1)SV2(1.1)

If you are running this configuration	Follow these steps
Release 4.2(1)SV1(4, 4a, or 4b) with a vSphere release 4.0 Update 1 or later	1 Upgrading from VMware Release 4.0 to VMware Release 4.1 2 Upgrading VSMs from Releases 4.2(1)SV1(4), SV1(4a), SV1(4b), SV1(5.1), SV1(5.1a), or SV1(5.2) to Release 4.2(1)SV2(1.1), on page 14 3 VEM Upgrade Methods from Release 4.2(1)SV1(4), (4a), (4b), (5.1), (5.1a), or (5.2) to Release 4.2(1)SV2(1.1)
Release 4.2(1)SV1(4, 4a, or 4b) with a vSphere release 4.1 GA, patches, or updates	1 Upgrading VSMs from Releases 4.2(1)SV1(4), SV1(4a), SV1(4b), SV1(5.1), SV1(5.1a), or SV1(5.2) to Release 4.2(1)SV2(1.1), on page 14 2 VEM Upgrade Methods from Release 4.2(1)SV1(4), (4a), (4b), (5.1), (5.1a), or (5.2) to Release 4.2(1)SV2(1.1)
Release 4.2(1)SV1(4a) or 4.2(1)SV1(4b) with a vSphere release 5.0 GA, patches, or updates	1 Upgrading VSMs from Releases 4.2(1)SV1(4), SV1(4a), SV1(4b), SV1(5.1), SV1(5.1a), or SV1(5.2) to Release 4.2(1)SV2(1.1), on page 14 2 VEM Upgrade Methods from Release 4.2(1)SV1(4), (4a), (4b), (5.1), (5.1a), or (5.2) to Release 4.2(1)SV2(1.1)

The following table lists the upgrade steps when upgrading from Release 4.2(1)SV1(5.1), 4.2(1)SV1(5.1a), and 4.2(1)SV1(5.2) to the current release.

Table 3: Upgrade Paths from Releases 4.2(1)SV1(5.1), 4.2(1)SV1(5.1a), 4.2(1)SV1(5.2)

If you are running this configuration	Follow these steps
Release 4.2(1)SV1(5.1) or 4.2(1)SV1(5.1a) with vSphere 4.1 GA, patches, or updates.	1 Upgrading VSMs from Releases 4.2(1)SV1(4), SV1(4a), SV1(4b), SV1(5.1), SV1(5.1a), or SV1(5.2) to Release 4.2(1)SV2(1.1), on page 14 2 VEM Upgrade Methods from Release 4.2(1)SV1(4), (4a), (4b), (5.1), (5.1a), or (5.2) to Release 4.2(1)SV2(1.1)

If you are running this configuration	Follow these steps
Release 4.2(1)SV1(5.1), 4.2(1)SV1(5.1a), or 4.2(1)SV1(5.2) with vSphere 5.0 GA, patches, or updates.	1 Upgrading VSMs from Releases 4.2(1)SV1(4), SV1(4a), SV1(4b), SV1(5.1), SV1(5.1a), or SV1(5.2) to Release 4.2(1)SV2(1.1), on page 14 2 VEM Upgrade Methods from Release 4.2(1)SV1(4), (4a), (4b), (5.1), (5.1a), or (5.2) to Release 4.2(1)SV2(1.1)
Release 4.2(1)SV2(1.1) with ESX version upgrade.	Installing and Upgrading VMware

Upgrade Types

Upgrades can be one of three types:

- Upgrade of Cisco Nexus 1000V version only, with vSphere version intact. See Upgrading the Cisco Nexus 1000V Only, on page 8.
- Upgrade of both vSphere and Cisco Nexus 1000V versions together. See Combined Upgrade of vSphere and Cisco Nexus 1000V, on page 9.
- Upgrade of vSphere version only, with Cisco Nexus 1000V version intact. See the Installing and Upgrading VMware appendix.

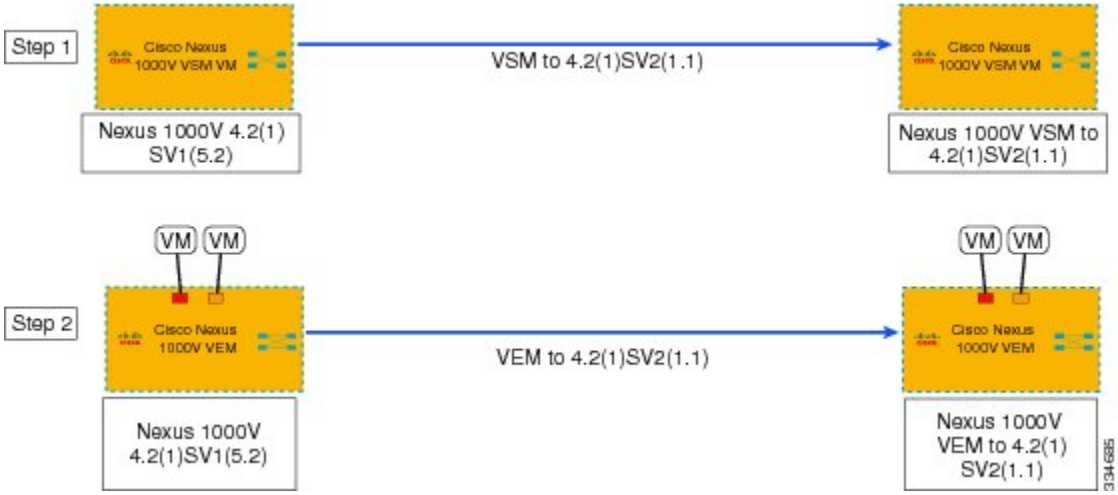
Upgrading the Cisco Nexus 1000V Only

You must complete the following procedures to upgrade the Cisco Nexus 1000V only.

1. Upgrade the VSM. See VSM Upgrade Procedures.
2. Upgrade the VEM.
   - For Stateless ESXi, see Installing the VEM Software on a Stateless ESXi Host.
   - For a VUM-based upgrade of a Stateful ESX or ESXi, use a host upgrade baseline with the VEM depot. See Upgrading the ESXi Hosts to Release 5.1.
   - For a stateful manual upgrade using the **esxupdate** or **esxcli** commands, see Installing ESXi 5.1 Host Software Using the CLI.

The following figure shows the workflow for a Cisco Nexus 1000V only upgrade.

Figure 1: Cisco Nexus 1000V Only Upgrade



Combined Upgrade of vSphere and Cisco Nexus 1000V

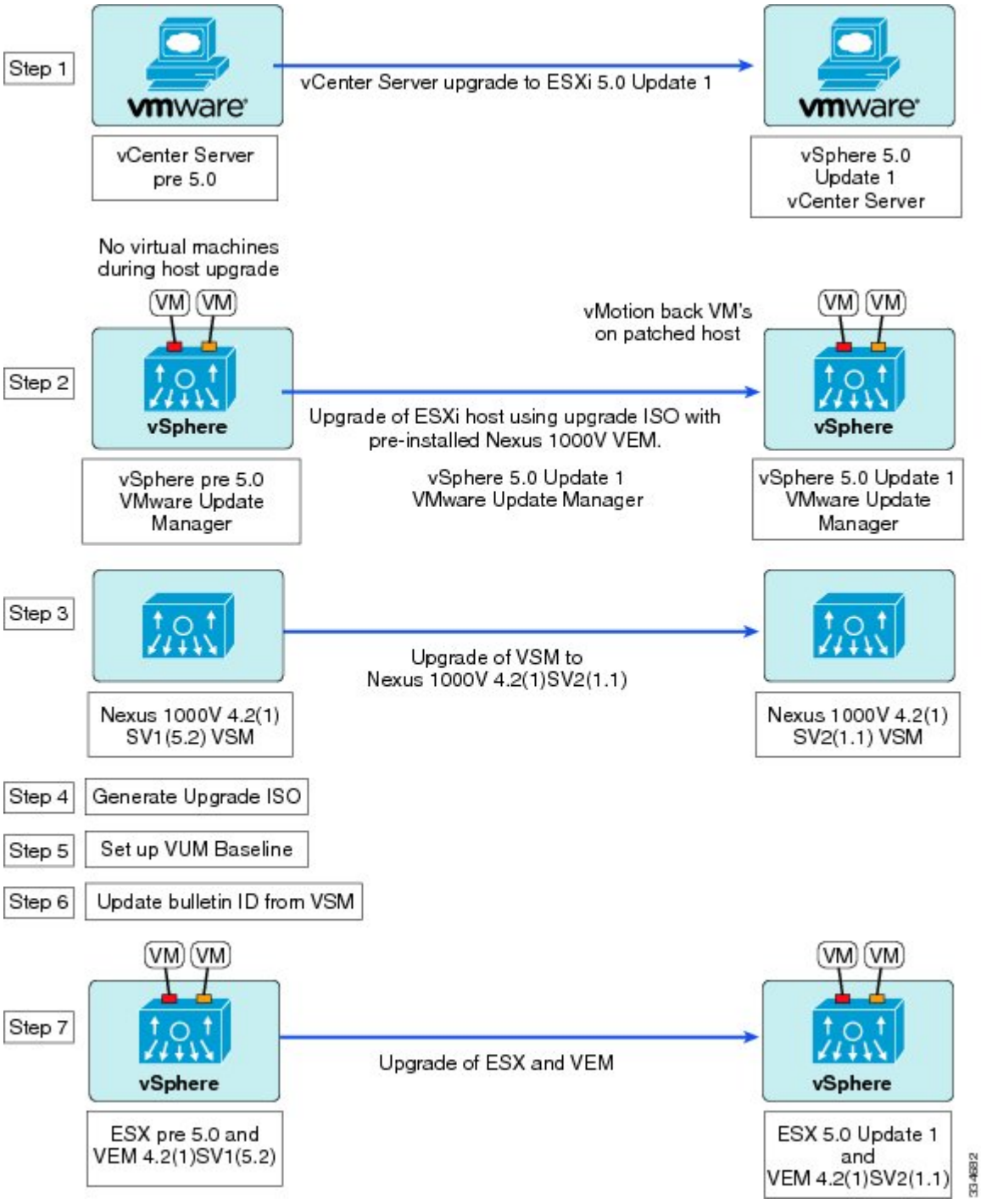
You can perform a combined upgrade of vSphere and Cisco Nexus 1000V.

If any of the hosts are running ESX 4.0 when the VSM is upgraded, the **installer** command displays that some VEMs are incompatible. You can proceed if you are planning a combined upgrade of the Cisco Nexus 1000V and ESX after the VSM upgrade completes.

Note A combined upgrade is supported only for vCenter Server 5.0 Update 1 or later.

The following figure shows the workflow for a combined upgrade.

Figure 2: Combined Upgrade Workflow



The following procedures are necessary to perform a combined upgrade.

1 Upgrading the vCenter Server to Release 5.1, on page 27
2 Upgrading the vCenter Update Manager to Release 5.1
3 Upgrading VSMs from Releases 4.2(1)SV1(4), SV1(4a), SV1(4b), SV1(5.1), SV1(5.1a), or SV1(5.2) to Release 4.2(1)SV2(1.1), on page 14
4 Creating an Upgrade ISO with a VMware ESX Image and a Cisco Nexus 1000V VEM Image, on page 24
5 Upgrading the ESXi Hosts to Release 5.1
6 Verifying the Build Number and Upgrade

VSM Upgrade Procedures

Software Images

The software image install procedure is dependent on the following factors:

- Software images—The kickstart and system image files reside in directories or folders that you can access from the Cisco Nexus 1000V software prompt.
- Image version—Each image file has a version.
- Disk—The bootflash: resides on the VSM.
- ISO file—If a local ISO file is passed to the **install all** command, the kickstart and system images are extracted from the ISO file.

In-Service Software Upgrades on Systems with Dual VSMs

Note Performing an In-Service Software Upgrade (ISSU) from Cisco Nexus 1000V Release 4.2(1)SV1(4) or Release 4.2(1)SV1(4a) to the current release of Cisco Nexus 1000V using ISO files is not supported. You must use kickstart and system files to perform an ISSU upgrade to the current release of Cisco Nexus 1000V.

The Cisco Nexus 1000V software supports in-service software upgrades (ISSUs) for systems with dual VSMs. An ISSU can update the software images on your switch without disrupting data traffic. Only control traffic is disrupted. If an ISSU causes a disruption of data traffic, the Cisco Nexus 1000V software warns you before proceeding so that you can stop the upgrade and reschedule it to a time that minimizes the impact on your network.

Note On systems with dual VSMs, you should have access to the console of both VSMs to maintain connectivity when the switchover occurs during upgrades. If you are performing the upgrade over Secure Shell (SSH) or Telnet, the connection will drop when the system switchover occurs, and you must reestablish the connection.

An ISSU updates the following images:

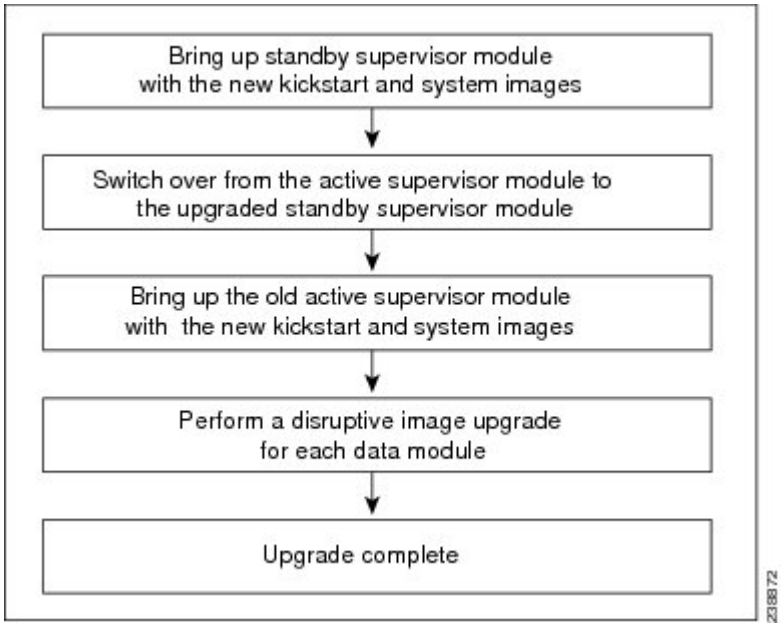
- Kickstart image
- System image
- VEM images

All of the following processes are initiated automatically by the upgrade process after the network administrator enters the **install all** command.

ISSU Process for the Cisco Nexus 1000V

The following figure shows the ISSU process.

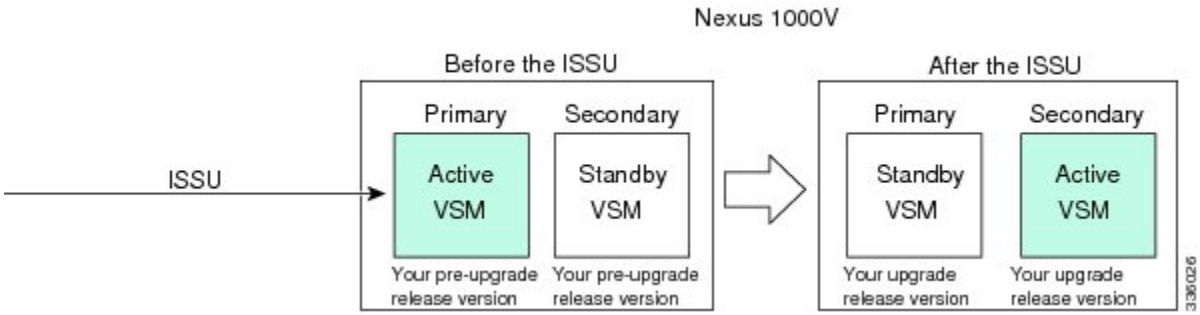
Figure 3: ISSU Process



ISSU VSM Switchover

The following figure provides an example of the VSM status before and after an ISSU switchover.

Figure 4: Example of an ISSU VSM Switchover



ISSU Command Attributes

Support

The **install all** command supports an in-service software upgrade (ISSU) on dual VSMs in an HA environment and performs the following actions:

- Determines whether the upgrade is disruptive and asks if you want to continue.
- Copies the kickstart and system images to the standby VSM. Alternatively, if a local ISO file is passed to the **install all** command instead, the kickstart and system images are extracted from the file.
- Sets the kickstart and system boot variables.
- Reloads the standby VSM with the new Cisco Nexus 1000V software.
- Causes the active VSM to reload when the switchover occurs.

Benefits

The **install all** command provides the following benefits:

- You can upgrade the VSM by using the **install all** command.
- You can receive descriptive information on the intended changes to your system before you continue with the installation.
- You have the option to cancel the command. Once the effects of the command are presented, you can continue or cancel when you see this question (the default is no):

```
Do you want to continue (y/n) [n]: y
```

- You can upgrade the VSM using the least disruptive procedure.
- You can see the progress of this command on the console, Telnet, and SSH screens:
    - After a switchover process, you can see the progress from both the VSMs.

- Before a switchover process, you can see the progress only from the active VSM.

- The **install all** command automatically checks the image integrity, which includes the running kickstart and system images.
- The **install all** command performs a platform validity check to verify that a wrong image is not used.
- The Ctrl-C escape sequence gracefully ends the **install all** command. The command sequence completes the update step in progress and returns to the switch prompt. (Other upgrade steps cannot be ended by using Ctrl-C.)
- After running the **install all** command, if any step in the sequence fails, the command completes the step in progress and ends.

Upgrading VSMs from Releases 4.2(1)SV1(4), SV1(4a), SV1(4b), SV1(5.1), SV1(5.1a), or SV1(5.2) to Release 4.2(1)SV2(1.1)

Procedure

Step 1 Log in to the active VSM.

Step 2 Log in to Cisco.com to access the links provided in this document. To log in to Cisco.com, go to the URL http://www.cisco.com/ and click **Log In** at the top of the page. Enter your Cisco username and password.

Note Unregistered Cisco.com users cannot access the links provided in this document.

Step 3 Access the Software Download Center by using this URL:
http://www.cisco.com/public/sw-center/index.shtml

Step 4 Navigate to the download site for your system.
You see links to the download images for your switch.

Step 5 Choose and download the Cisco Nexus 1000V zip file and extract the kickstart and system software files to a server.

Step 6 Ensure that the required space is available for the image file(s) to be copied.

```
switch# dir bootflash:
.
.
.
Usage for bootflash://
  485830656 bytes used
 1109045248 bytes free
 1594875904 bytes total
```

Tip We recommend that you have the kickstart and system image files for at least one previous release of the Cisco Nexus 1000V software on the system to use if the new image files do not load successfully.

Step 7 Verify that there is space available on the standby VSM.

```
switch# dir bootflash://sup-standby/
.
.
.
Usage for bootflash://
  485830656 bytes used
```

```
1109045248 bytes free
1594875904 bytes total
```

Step 8 Delete any unnecessary files to make space available if you need more space on the standby VSM.

Step 9 If you plan to install the images from the bootflash:, copy the Cisco Nexus 1000V kickstart and system images or the ISO image to the active VSM by using a transfer protocol. You can use ftp:, tftp:, scp:, or sftp:. The examples in this procedure use scp:.

Note When you download an image file, change to your FTP environment IP address or DNS name and the path where the files are located.

- Copy the ISO image.

```
switch# copy scp://user@scpserver.cisco.com/downloads/nexus-1000v.4.2.1.SV2.1.1.iso
bootflash:nexus-1000v.4.2.1.SV2.1.1.iso
```

- Copy kickstart and system images.

```
switch# copy scp://user@scpserver.cisco.com/downloads/nexus-1000v-kickstart-4.2.1.SV2.1.1.bin
bootflash:nexus-1000v-kickstart-4.2.1.SV2.1.1.bin
switch# copy scp://user@scpserver.cisco.com/downloads/nexus-1000v-4.2.1.SV2.1.1.bin
bootflash:nexus-1000v-4.2.1.SV2.1.1.bin
```

Step 10 Check on the impact of the ISSU upgrade for the kickstart and system images or the ISO image.

- ISO

```
switch# show install all impact iso bootflash:nexus-1000v.4.2.1.SV2.1.1.iso

Verifying image bootflash:/nexus-1000v-kickstart-4.2.1.SV2.1.1.bin for boot variable
"kickstart".
[####################] 100% -- SUCCESS

Verifying image bootflash:/nexus-1000v-4.2.1.SV2.1.1.bin for boot variable "system".
[####################] 100% -- SUCCESS

Verifying image type.
[####################] 100% -- SUCCESS

Extracting "system" version from image bootflash:/nexus-1000v-4.2.1.SV2.1.1.bin.
[####################] 100% -- SUCCESS

Extracting "kickstart" version from image
bootflash:/nexus-1000v-kickstart-4.2.1.SV2.1.1.bin.
[####################] 100% -- SUCCESS

Notifying services about system upgrade.
[####################] 100% -- SUCCESS



Compatibility check is done:
Module  bootable          Impact  Install-type  Reason
------  --------  --------------  ------------  ------
     1       yes  non-disruptive         reset
     2       yes  non-disruptive         reset
```

```
Images will be upgraded according to following table:
Module       Image         Running-Version             New-Version  Upg-Required
------  ----------  ----------------------  ----------------------  ------------
     1      system           4.2(1)SV1(5.2)           4.2(1)SV2(1.1)           yes
     1   kickstart           4.2(1)SV1(5.2)           4.2(1)SV2(1.1)           yes
     2      system           4.2(1)SV1(5.2)           4.2(1)SV2(1.1)           yes
     2   kickstart           4.2(1)SV1(5.2)           4.2(1)SV2(1.1)           yes


Module         Running-Version                                          ESX Version
    VSM Compatibility       ESX Compatibility
------  ----------------------  ------------------------------------------------------
 ----------------------  ----------------------
     3          4.2(1)SV1(5.2)         VMware ESXi 5.0.0 Releasebuild-469512 (3.0)
           COMPATIBLE              COMPATIBLE
     4          4.2(1)SV1(5.2)         VMware ESXi 5.0.0 Releasebuild-469512 (3.0)
           COMPATIBLE              COMPATIBLE
```

- kickstart and system

```
switch# show install all impact kickstart bootflash:nexus-1000v-kickstart.4.2.1.SV2.1.1.bin system
 bootflash:nexus-1000v.4.2.1.SV2.1.1.bin

Verifying image bootflash:/nexus-1000v-kickstart-4.2.1.SV2.1.1.bin for boot variable
"kickstart".
[####################] 100% -- SUCCESS

Verifying image bootflash:/nexus-1000v-4.2.1.SV2.1.1.bin for boot variable "system".
[####################] 100% -- SUCCESS

Verifying image type.
[####################] 100% -- SUCCESS

Extracting "system" version from image bootflash:/nexus-1000v-4.2.1.SV2.1.1.bin.
[####################] 100% -- SUCCESS

Extracting "kickstart" version from image
bootflash:/nexus-1000v-kickstart-4.2.1.SV2.1.1.bin.
[####################] 100% -- SUCCESS

Notifying services about system upgrade.
[####################] 100% -- SUCCESS



Compatibility check is done:
Module  bootable          Impact  Install-type  Reason
------  --------  --------------  ------------  ------
     1       yes  non-disruptive         reset
     2       yes  non-disruptive         reset


Images will be upgraded according to following table:
Module       Image         Running-Version             New-Version  Upg-Required
------  ----------  ----------------------  ----------------------  ------------
     1      system           4.2(1)SV1(5.2)           4.2(1)SV2(1.1)           yes
```

```
     1   kickstart           4.2(1)SV1(5.2)           4.2(1)SV2(1.1)           yes
     2      system           4.2(1)SV1(5.2)           4.2(1)SV2(1.1)           yes
     2   kickstart           4.2(1)SV1(5.2)           4.2(1)SV2(1.1)           yes


Module         Running-Version                                          ESX Version
    VSM Compatibility       ESX Compatibility
------  ----------------------  ------------------------------------------------------
 ----------------------  ----------------------
     3          4.2(1)SV1(5.2)         VMware ESXi 5.0.0 Releasebuild-469512 (3.0)
           COMPATIBLE              COMPATIBLE
     4          4.2(1)SV1(5.2)         VMware ESXi 5.0.0 Releasebuild-469512 (3.0)
           COMPATIBLE              COMPATIBLE
```

Step 11 Read the release notes for the related image file. See the *Cisco Nexus 1000V Release Notes*.

Step 12 Determine if the Virtual Security Gateway (VSG) is configured in the deployment:

- If the following output is displayed, the Cisco VSG is configured in the deployment. You must follow the upgrade procedure in the "Complete Upgrade Procedure" section in Chapter 7, "Upgrading the Cisco Virtual Security Gateway and Cisco Virtual Network Management Center" of the *Cisco Virtual Security Gateway, Release 4.2(1)VSG1(3.1)* and *Cisco Virtual Network Management Center Release 1.3 Installation and Upgrade Guide*.

```
switch# show vnm-pa status
VNM Policy-Agent status is - Installed Successfully. Version 1.2(0.689)-vsm
switch#
```

- If the following output is displayed, continue to Step 13.

```
switch# show vnm-pa status
VNM Policy-Agent status is - Not Installed
switch#
```

Step 13 Save the running configuration to the startup configuration.

```
switch# copy running-config startup-config
```

Step 14 Save the running configuration on the bootflash and externally.

```
switch# copy running-config bootflash:run-cfg-backup
switch# copy running-config scp://user@tftpserver.cisco.com/n1kv-run-cfg-backup
```

Note You can also run a VSM backup. See the "Configuring VSM Backup and Recovery" chapter of the *Cisco Nexus 1000V System Management Configuration Guide*.

Step 15 Perform the upgrade on the active VSM using the ISO or kickstart and system images.

- Upgrade using the ISO image.

```
switch# install all iso bootflash:nexus-1000v.4.2.1.SV2.1.1.iso
```

- Upgrade using the kickstart and system images.

```
switch# install all kickstart bootflash:nexus-1000v-kickstart-4.2.1.SV2.1.1.bin system
bootflash:nexus-1000v-4.2.1.SV2.1.1.bin
Verifying image bootflash:/nexus-1000v-kickstart-4.2.1.SV2.1.1.bin for boot variable
"kickstart".
[####################] 100% -- SUCCESS

Verifying image bootflash:/nexus-1000v-4.2.1.SV2.1.1.bin for boot variable "system".
[####################] 100% -- SUCCESS
```

```
Verifying image type.
[####################] 100% -- SUCCESS

Extracting "system" version from image bootflash:/nexus-1000v-4.2.1.SV2.1.1.bin.
[####################] 100% -- SUCCESS

Extracting "kickstart" version from image
bootflash:/nexus-1000v-kickstart-4.2.1.SV2.1.1.bin.
[####################] 100% -- SUCCESS

Notifying services about system upgrade.
[####################] 100% -- SUCCESS



Compatibility check is done:
Module  bootable          Impact  Install-type  Reason
------  --------  --------------  ------------  ------
     1       yes  non-disruptive         reset
     2       yes  non-disruptive         reset



Images will be upgraded according to following table:
Module       Image         Running-Version             New-Version  Upg-Required
------  ----------  ----------------------  ----------------------  ------------
     1      system           4.2(1)SV1(5.2)           4.2(1)SV2(1.1)           yes
     1   kickstart           4.2(1)SV1(5.2)           4.2(1)SV2(1.1)           yes
     2      system           4.2(1)SV1(5.2)           4.2(1)SV2(1.1)           yes
     2   kickstart           4.2(1)SV1(5.2)           4.2(1)SV2(1.1)           yes


Module         Running-Version                                          ESX Version
    VSM Compatibility       ESX Compatibility
------  ----------------------  ------------------------------------------------------
 ----------------------  ----------------------
     3           4.2(1)SV1(4a)         VMware ESXi 5.0.0 Releasebuild-469512 (3.0)
           COMPATIBLE              COMPATIBLE
     4           4.2(1)SV1(4a)         VMware ESXi 5.0.0 Releasebuild-469512 (3.0)
           COMPATIBLE              COMPATIBLE

Do you want to continue with the installation (y/n)?  [n]
```

Step 16 Continue with the installation by pressing Y.

Note If you press N, the installation exits gracefully.

```
Install is in progress, please wait.

Syncing image bootflash:/nexus-1000v-kickstart-4.2.1.SV2.1.1.bin to standby.
[####################] 100% -- SUCCESS

Syncing image bootflash:/nexus-1000v-4.2.1.SV2.1.1.bin to standby.
[####################] 100% -- SUCCESS
```

```
Setting boot variables.
[####################] 100% -- SUCCESS

Performing configuration copy.
[####################] 100%2011 Mar 31 03:49:42 BL1-VSM %SYSMGR-STANDBY-5-CFGWRITE_STARTED:
 Configuration copy started (PID 3660).
[####################] 100% -- SUCCESS
```

Note As part of the upgrade process, the standby VSM is reloaded with new images. Once it becomes the HA standby again, the upgrade process initiates a switchover. The upgrade then continues from the new active VSM with the following output:

```
Continuing with installation, please wait

Module 2: Waiting for module online
-- SUCCESS

Install has been successful
```

Step 17 After the installation operation completes, log in and verify that the switch is running the required software version.

```
switch# show version
Nexus1000v# show version
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (c) 2002-2012, Cisco Systems, Inc. All rights reserved.
The copyrights to certain works contained herein are owned by
other third parties and are used and distributed under license.
Some parts of this software are covered under the GNU Public
License. A copy of the license is available at
http://www.gnu.org/licenses/gpl.html.

Software
  loader:    version unavailable [last: loader version not available]
  kickstart: version 4.2(1)SV2(1.1) [build 4.2(1)SV2(1.1)]
  system:    version 4.2(1)SV2(1.1) [build 4.2(1)SV2(1.1)]
  kickstart image file is: bootflash:/nexus-1000v-kickstart-4.2.1.SV2.1.1.bin
  kickstart compile time:  1/11/2012 3:00:00 [01/11/2012 12:49:49]
  system image file is:    bootflash:/nexus-1000v-4.2.1.SV2.1.1.bin
  system compile time:     1/11/2012 3:00:00 [01/11/2012 13:42:57]


Hardware
  cisco Nexus 1000V Chassis ("Virtual Supervisor Module")
  Intel(R) Xeon(R) CPU         with 2075740 kB of memory.
  Processor Board ID T5056B1802D

  Device name: Nexus1000v
  bootflash:    1557496 kB

Kernel uptime is 4 day(s), 8 hour(s), 31 minute(s), 3 second(s)


plugin
  Core Plugin, Ethernet Plugin, Virtualization Plugin
...
```

Step 18 Copy the running configuration to the startup configuration to adjust the startup-cgf size.

```
switch# copy running-config startup-config
[########################################] 100%
switch#
```

Step 19 Display the log of the last installation.

```
switch# show install all status
This is the log of last installation.

Verifying image bootflash:/nexus-1000v-kickstart-4.2.1.SV2.1.1.bin for boot variable
"kickstart".

 -- SUCCESS

Verifying image bootflash:/nexus-1000v-4.2.1.SV2.1.1.bin for boot variable "system".

 -- SUCCESS

Verifying image type.

 -- SUCCESS

Extracting "system" version from image bootflash:/nexus-1000v-4.2.1.SV2.1.1.bin.

 -- SUCCESS

Extracting "kickstart" version from image bootflash:/nexus-1000v-kickstart-4.2.1.SV2.1.1.bin.


 -- SUCCESS

Notifying services about system upgrade.

 -- SUCCESS


Compatibility check is done:
Module  bootable          Impact  Install-type  Reason
------  --------  --------------  ------------  ------
     1       yes  non-disruptive         reset
     2       yes  non-disruptive         reset



Images will be upgraded according to following table:
Module       Image         Running-Version             New-Version  Upg-Required
------  ----------  ----------------------  ----------------------  ------------
     1      system           4.2(1)SV1(5.2)         4.2(1)SV2(1.1)           yes
     1   kickstart           4.2(1)SV1(5.2)         4.2(1)SV2(1.1)           yes
     2      system           4.2(1)SV1(5.2)         4.2(1)SV2(1.1)           yes
     2   kickstart           4.2(1)SV1(5.2)         4.2(1)SV2(1.1)           yes


Images will be upgraded according to following table:
Module         Running-Version                                       ESX Version
```

```
VSM Compatibility       ESX Compatibility
------  ----------------------  ------------------------------------------------------
----------------------  ----------------------
     3           4.2(1)SV1(5.2)         VMware ESXi 5.0.0 Releasebuild-469512 (3.0)
       COMPATIBLE              COMPATIBLE
     4           4.2(1)SV1(5.2)         VMware ESXi 5.0.0 Releasebuild-469512 (3.0)
       COMPATIBLE              COMPATIBLE


Install is in progress, please wait.

Syncing image bootflash:/nexus-1000v-kickstart-4.2.1.SV2.1.1.bin to standby.
 -- SUCCESS

Syncing image bootflash:/nexus-1000v-4.2.1.SV2.1.1.bin to standby.
 -- SUCCESS

Setting boot variables.
 -- SUCCESS

Performing configuration copy.
 -- SUCCESS

Module 2: Waiting for module online.
 -- SUCCESS

Notifying services about the switchover.
 -- SUCCESS


"Switching over onto standby".
switch#
switch#
switch#

switch# attach module 2
Attaching to module 2 ...
To exit type 'exit', to abort type '$.'
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (c) 2002-2011, Cisco Systems, Inc. All rights reserved.
The copyrights to certain works contained in this software are
owned by other third parties and used and distributed under
license. Certain components of this software are licensed under
the GNU General Public License (GPL) version 2.0 or the GNU
Lesser General Public License (LGPL) Version 2.1. A copy of each
such license is available at
http://www.opensource.org/licenses/gpl-2.0.php and
http://www.opensource.org/licenses/lgpl-2.1.php
switch(standby)#
switch(standby)# show install all status
This is the log of last installation.

Continuing with installation, please wait
Trying to start the installer...
```

```
Module 2: Waiting for module online.
 -- SUCCESS

Install has been successful.
switch(standby)#
```

VEM Upgrade Procedures

- VUM Upgrade Procedures
  - Generate an upgrade ISO. See Creating an Upgrade ISO with a VMware ESX Image and a Cisco Nexus 1000V VEM Image, on page 24.
  - Set up VUM baselines. See Upgrading the ESXi Hosts to Release 5.1.
  - Initiate an upgrade from VUM. See Upgrading the VEMs Using VMware Update Manager from Release 4.2(1)SV1(4), (4a), (4b), (5.1), (5.1a), or (5.2) to Release 4.2(1)SV2(1.1), on page 29.
  - Upgrade VEM from VSM. See Upgrading the VEMs Using VMware Update Manager from Release 4.2(1)SV1(4), (4a), (4b), (5.1), (5.1a), or (5.2) to Release 4.2(1)SV2(1.1), on page 29.
- Manual upgrade procedures
  - Upgrading VIB Manually from the CLI. See Upgrading the VEMs Manually from Release 4.2(1)SV1(4), (4a), (4b), (5.1), (5.1a), or (5.2) to Release 4.2(1)SV2(1.1), on page 36
- Installing or upgrading stateless ESXi. See Installing the VEM Software on a Stateless ESXi Host.

VEM upgrades fall into three types:

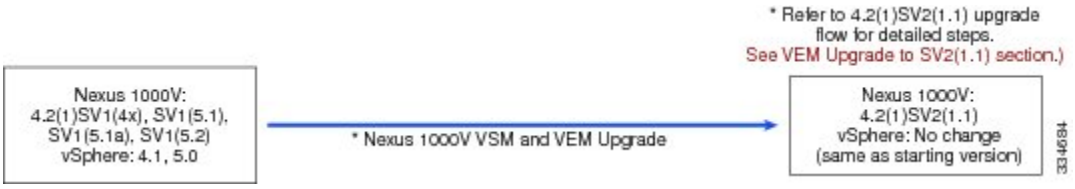
- An upgrade of an ESX or stateful ESXi host, without a migration from ESX (with a console OS) to ESXi. This upgrade type is described further in this section.
- An upgrade of a stateless ESXi host. This involves installing a new image on the host by updating the image profile and rebooting the host. The upgrade is described in Installing the VEM Software on a Stateless ESXi Host.
- An upgrade that involve a migration from ESX to ESXi (of the same or different vSphere version).

An upgrade of an ESX or stateful ESXi host without a migration from ESX (which has a console OS) to ESXi falls into two separate workflows.

1. Upgrade the VEM alone, while keeping the ESX/ESXi version intact. The first figure shows this flow.
2. Upgrade the ESX/ESXi without a change of the Cisco Nexus 1000V version. This process is addressed in the Workflow 2 figure.

The following figure shows Workflow 1 where Cisco Nexus 1000V Release 4.2(1)SV1(4.x) or 4.2(1)SV1(5.1), (5.1a), or (5.2) is upgraded to the current release, without a change of ESX versions.

Figure 5: Workflow 1 with a Cisco Nexus 1000V Version 4.2(1)SV1(4), SV1(4a), SV1(4b), SV1(5.1), or SV1(5.2) Installed

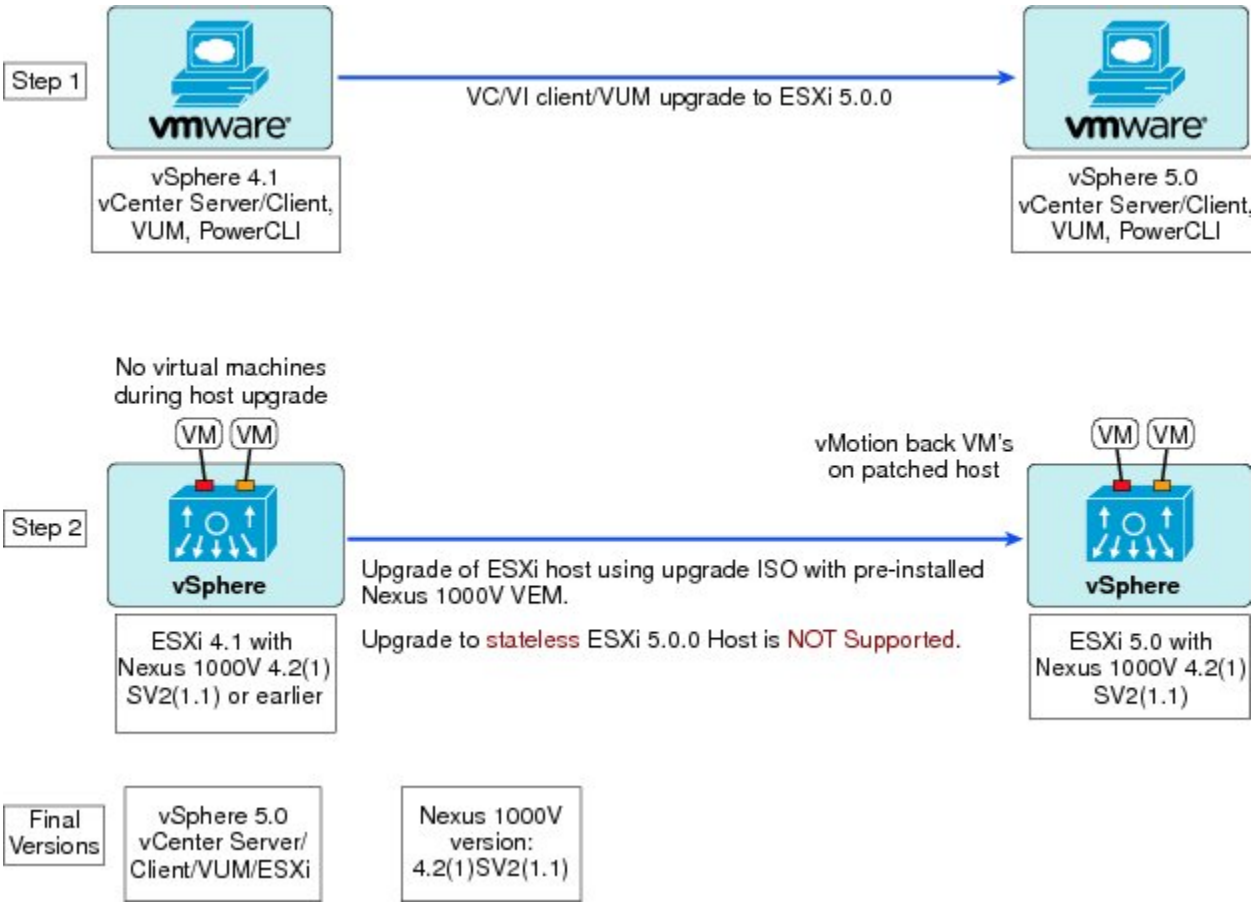


If you are using VUM, set up a host patch baseline with the VEM's offline bundle. Then follow Upgrading the VEMs Using VMware Update Manager from Release 4.2(1)SV1(4), (4a), (4b), (5.1), (5.1a), or (5.2) to Release 4.2(1)SV2(1.1), on page 29.

If you are upgrading from the command line, see Upgrading the VEMs Manually from Release 4.2(1)SV1(4), (4a), (4b), (5.1), (5.1a), or (5.2) to Release 4.2(1)SV2(1.1), on page 36.

The following figure shows Workflow 2 where Cisco Nexus 1000VRelease 4.2(1)SV2(1.1) is installed and VMware 4.1 is upgraded to 5.0.

Figure 6: Workflow 2 with Cisco Nexus 1000V 4.2(1)SV2(1.2) Installed and Upgrading ESX from 4.1 to 5.0



If you are using VMware Update Manager, the following considerations apply:

- If you are using VUM versions prior to 5.0, do one of the following:
  - If you are upgrading the ESX host to a new patch level, use a host patch baseline (independent of whether the VEM version is being changed as well).
  - If you are upgrading the ESX host to a new update within a release or major release, use a host upgrade baseline (again independent of whether the VEM version is being changed as well).
  - You cannot upgrade the ESX version and VEM version simultaneously. You need to schedule them as two separate upgrades.
- If you are using VUM version 5.0 or later, use the following method (independent of whether the VEM version is being changed as well):
  - If you are upgrading the ESX host to a new patch level within a release, use a host patch baseline. For example, vSphere 4.1 GA to 4.1 Patch 03.
  - If you are upgrading the ESX host to a new update within a release, use a host upgrade baseline. For example, vSphere 5.0 GA to 5.0 U1.
  - If you are upgrading the ESX host to a major release (for example, vSphere 4.1 U2 to 5.0 U1), generate an upgrade ISO and set up a host upgrade baseline. The upgrade ISO must have the desired final images for both ESX and VEM. The procedure to generate an upgrade ISO is in Creating an Upgrade ISO with a VMware ESX Image and a Cisco Nexus 1000V VEM Image, on page 24.
  - You can upgrade the ESX version and VEM version simultaneously if you are using VUM 5.0 Update 1 or later. VUM 5.0 GA does not support a combined upgrade.

Note If you plan to perform Workflow 2 and manually update to vSphere 5.0 or later, you must boot the host from an upgrade ISO with both ESX and VEM images.

VUM Upgrade Procedures

Creating an Upgrade ISO with a VMware ESX Image and a Cisco Nexus 1000V VEM Image

Before You Begin

- Install the VMware PowerCLI on a Windows platform. For more information, see the *vSphere PowerCLI Installation Guide*.
- On the same Windows platform, where the VMware PowerCLI is installed, do one of the following:
  - Download the ESX depot, which is a .zip file, to a local file path.
  - Download the VEM offline bundle, which is a .zip file, to a local file path.

Note In the following procedure, the ESX depot is available as `C:\VMware-ESXi-5.0.0-469512-depot.zip` and the VEM bundle is available as `C:\VEM500-20110822140-BG.zip`.

Procedure

Step 1 Start the VMWare PowerCLI application.

Step 2 Connect to the vCenter Server.

```
[vSphere PowerCLI] > Connect-VIServer 192.0.2.1 -User Administrator -Password XXXXX
```

Step 3 Load the ESX depot.

```
[vSphere PowerCLI] > Add-ESXSoftwareDepot c:\vmware-ESXi-5.1.0-depot.zip
```

Step 4 Display the image profiles.

```
[vSphere PowerCLI] > Get-EsxImageProfile
Name                           Vendor          Last Modified   Acceptance Level
----                           ------          -------------   ----------------
ESXi-5.1.0-799733-no-tools     VMware, Inc.    8/19/2011 1:... PartnerSupported
ESXi-5.1.0-799733-standard     VMware, Inc.    8/19/2011 1:... PartnerSupported
```

Step 5 Clone the ESX standard image profile.

Note The image profiles are usually in READ-ONLY format. You must clone the image profile before adding the VEM image to it.

```
[vSphere PowerCLI] > New-ESxImageProfile -CloneProfile ESXi-5.0.0-469512-standard -Name
n1kv-Image
Name                           Vendor          Last Modified   Acceptance Level
----                           ------          -------------   ----------------
n1kv-Image                     VMware, Inc.    8/19/2011 1:... PartnerSupported
```

Step 6 Load the Cisco Nexus 1000V VEM offline bundle.

```
[vSphere PowerCLI] > Add-EsxSoftwareDepot C:\ VEM510-201210150105-BG-release.zip

Depot Url
---------
zip:C:\Users\Administrator\Documents\ VEM510-201210150105-BG-release.zip?in...
```

Step 7 Confirm that the n1kv-vib package is loaded.

```
[vSphere PowerCLI] > Get-EsxSoftwarePackage -Name cisco*
Name                    Version                       Vendor     Release Date
----                    -------                       ------     ------------
cisco-vem-v150-esx      4.2.1.2.1.0-3.0.1           Cisco      1/21/2012...
```

Step 8 Bundle the n1kv-package into the cloned image profile.

```
[vSphere PowerCLI] > Add-EsxSoftwarePackage -ImageProfile n1kv-Image -SoftwarePackage
cisco-vem-v140-esx

Name                           Vendor          Last Modified   Acceptance Level
----                           ------          -------------   ----------------
n1kv-Image                     VMware, Inc.    1/24/2012 5:... PartnerSupported
```

Step 9 Verify that the Cisco VIB is present by listing all the VIBs in the cloned image profile.

```
[vSphere PowerCLI]> $img = Get-EsxImageProfile n1kv-Image
[vSphere PowerCLI]> $img.vibList
```

```
Name                     Version                        Vendor     Release Date
----                     -------                        ------     ------------
net-ixgbe                2.0.84.8.2-10vmw.500.0.0.46... VMware     8/19/2011...
ata-pata-hpt3x2n         0.3.4-3vmw.500.0.0.469512      VMware     8/19/2011...
ehci-ehci-hcd            1.0-3vmw.500.0.0.469512        VMware     8/19/2011...
ata-pata-atiixp          0.4.6-3vmw.500.0.0.469512      VMware     8/19/2011...
scsi-megaraid2           2.00.4-9vmw.500.0.0.469512     VMware     8/19/2011...
uhci-usb-uhci            1.0-3vmw.500.0.0.469512        VMware     8/19/2011...
net-r8168                8.013.00-3vmw.500.0.0.469512   VMware     8/19/2011...
ohci-usb-ohci            1.0-3vmw.500.0.0.469512        VMware     8/19/2011...
scsi-qla4xxx             5.01.03.2-3vmw.500.0.0.469512  VMware     8/19/2011...
ata-pata-sil680          0.4.8-3vmw.500.0.0.469512      VMware     8/19/2011...
scsi-megaraid-sas        4.32-1vmw.500.0.0.469512       VMware     8/19/2011...
scsi-aic79xx             3.1-5vmw.500.0.0.469512        VMware     8/19/2011...
ata-pata-amd             0.3.10-3vmw.500.0.0.469512     VMware     8/19/2011...
net-bnx2                 2.0.15g.v50.11-5vmw.500.0.0... VMware     8/19/2011...
misc-drivers             5.0.0-0.0.469512               VMware     8/19/2011...
sata-ahci                3.0-6vmw.500.0.0.469512        VMware     8/19/2011...
scsi-fnic                1.5.0.3-1vmw.500.0.0.469512    VMware     8/19/2011...
ata-pata-pdc2027x        1.0-3vmw.500.0.0.469512        VMware     8/19/2011...
scsi-hpsa                5.0.0-17vmw.500.0.0.469512     VMware     8/19/2011...
sata-sata-sil            2.3-3vmw.500.0.0.469512        VMware     8/19/2011...
net-igb                  2.1.11.1-3vmw.500.0.0.469512   VMware     8/19/2011...
net-e1000e               1.1.2-3vmw.500.0.0.469512      VMware     8/19/2011...
net-forcedeth            0.61-2vmw.500.0.0.469512       VMware     8/19/2011...
sata-ata-piix            2.12-4vmw.500.0.0.469512       VMware     8/19/2011...
scsi-qla2xxx             901.k1.1-14vmw.500.0.0.469512  VMware     8/19/2011...
scsi-adp94xx             1.0.8.12-6vmw.500.0.0.469512   VMware     8/19/2011...
net-sky2                 1.20-2vmw.500.0.0.469512       VMware     8/19/2011...
cisco-vem-v150-esx       4.2.1.2.1.0-3.0.1              Cisco      1/21/2012...
ipmi-ipmi-msghandler     39.1-4vmw.500.0.0.469512       VMware     8/19/2011...
net-be2net               4.0.88.0-1vmw.500.0.0.469512   VMware     8/19/2011...
esx-base                 5.0.0-0.0.469512               VMware     8/19/2011...
ipmi-ipmi-si-drv         39.1-4vmw.500.0.0.469512       VMware     8/19/2011...
scsi-megaraid-mbox       2.20.5.1-6vmw.500.0.0.469512   VMware     8/19/2011...
net-nx-nic               4.0.557-3vmw.500.0.0.469512    VMware     8/19/2011...
sata-sata-promise        2.12-3vmw.500.0.0.469512       VMware     8/19/2011...
scsi-ips                 7.12.05-4vmw.500.0.0.469512    VMware     8/19/2011...
scsi-lpfc820             8.2.2.1-18vmw.500.0.0.469512   VMware     8/19/2011...
ata-pata-cmd64x          0.2.5-3vmw.500.0.0.469512      VMware     8/19/2011...
sata-sata-svw            2.3-3vmw.500.0.0.469512        VMware     8/19/2011...
ata-pata-via             0.3.3-2vmw.500.0.0.469512      VMware     8/19/2011...
esx-tboot                5.0.0-0.0.469512               VMware     8/19/2011...
misc-cnic-register       1.1-1vmw.500.0.0.469512        VMware     8/19/2011...
net-s2io                 2.1.4.13427-3vmw.500.0.0.46... VMware     8/19/2011...
net-e1000                8.0.3.1-2vmw.500.0.0.469512    VMware     8/19/2011...
block-cciss              3.6.14-10vmw.500.0.0.469512    VMware     8/19/2011...
net-enic                 1.4.2.15a-1vmw.500.0.0.469512  VMware     8/19/2011...
net-bnx2x                1.61.15.v50.1-1vmw.500.0.0.... VMware     8/19/2011...
scsi-mpt2sas             06.00.00.00-5vmw.500.0.0.46... VMware     8/19/2011...
sata-sata-nv             3.5-3vmw.500.0.0.469512        VMware     8/19/2011...
ata-pata-serverworks     0.4.3-3vmw.500.0.0.469512      VMware     8/19/2011...
net-cnic                 1.10.2j.v50.7-2vmw.500.0.0.... VMware     8/19/2011...
scsi-mptsas              4.23.01.00-5vmw.500.0.0.469512 VMware     8/19/2011...
```

```
scsi-aacraid             1.1.5.1-9vmw.500.0.0.469512    VMware     8/19/2011...
tools-light              5.0.0-0.0.469512               VMware     8/19/2011...
ima-qla4xxx              2.01.07-1vmw.500.0.0.469512    VMware     8/19/2011...
ipmi-ipmi-devintf        39.1-4vmw.500.0.0.469512       VMware     8/19/2011...
net-tg3                  3.110h.v50.4-4vmw.500.0.0.4... VMware     8/19/2011...
scsi-bnx2i               1.9.1d.v50.1-3vmw.500.0.0.4... VMware     8/19/2011...
net-r8169                6.011.00-2vmw.500.0.0.469512   VMware     8/19/2011...
scsi-mptspi              4.23.01.00-5vmw.500.0.0.469512 VMware     8/19/2011...
```

Step 10 Export the image profile to an ISO file.

```
[vSphere PowerCLI]> Export-EsxImageProfile -ImageProfile n1kv-Image -FilePath
C:\n1kv15-esx50.iso –ExportToIso
```

Upgrading the vCenter Server to Release 5.1

Note This upgrade procedure also applies to vCenter Server 5.0 and vCenter Server 5.0 Update 1 and later.

Before You Begin

- Download the upgrade ISO file that contains the ESXi 5.1 image and the Cisco Nexus 1000V Release 4.2(1)SV1(5.2) image.
- See the *Cisco Nexus 1000V and VMware Compatibility Information* document to determine the correct VIB Version, VEM Bundle, Host Build, vCenter Server, and Update Manager versions.

Procedure

Step 1 Navigate to the VMware vSphere 5.1 installation file.

Note If you have the ISO image, you should mount it on the host.

Step 2 Double-click **autorun.**

Step 3 In the **VMware vCenter Installer** window, click **vCenter Server**.

Step 4 Click **Install**.

Step 5 Choose a language and click **OK.**

Step 6 Click **Next.**

Step 7 In the Patent Agreement window, click **Next.**

Step 8 In the **License Agreement** window, click the **I agree to the terms in the license agreement** radio button.

Step 9 Click **Next.**

Step 10 In the **Database Options** screen, click **Next.**

Step 11 Click the **Upgrade existing vCenter Server database** radio button and check the **I have taken a backup of the existing vCenter Server database and SSL certificates in the folder: C:\ProgramData\VMware\VMware VirtualCenter\SSL\.** check box.

Step 12 From the **Windows Start** Menu, click **Run.**

Step 13 Enter the name of the folder that contains the vCenter Server database and click **OK.**

Step 14 Drag a copy of the parent folder (SSL) to the desktop as a backup.

Step 15 Return to the installer program.

Step 16 Click **Next.**

Step 17 In the vCenter Agent Upgrade window, click the **Automatic** radio button.

Step 18 Click **Next.**

Step 19 In the **vCenter Server Service** screen, check the **Use SYSTEM Account** check box.

Step 20 Click **Next.**

Step 21 Review the port settings and click **Next.**

Step 22 In the **vCenter Server JVM Memory** screen based on the number of hosts, click the appropriate memory radio button.

Step 23 Click **Next.**

Step 24 Click **Install.**

Step 25 Click **Finish.**
This step completes the upgrade of the vCenter Server.

Step 26 Upgrade the VMware vSphere Client to ESXi 5.1.

Step 27 Open the VMware vSphere Client.

Step 28 From the **Help** menu, choose **About VMware vSphere**.

Step 29 Confirm that the vSphere Client and the VMware vCenter Server are both version VMware 5.1.

Step 30 Click **OK**, and exit the VMware vSphere Client.

What to Do Next

Complete the steps in Upgrading the vCenter Update Manager to Release 5.1.

Upgrading the VEMs Using VMware Update Manager from Release 4.2(1)SV1(4), (4a), (4b), (5.1), (5.1a), or (5.2) to Release 4.2(1)SV2(1.1)

Caution If removable media is still connected (for example, if you have installed the VSM using ISO and forgot to remove the media), host movement to maintenance mode fails and the VUM upgrade fails.

Procedure

Step 1 Display the current configuration.

```
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: VEM410-201209150101-BG
    DVS: VEM410-201208144101-BG
switch#
```

Note The minimum release of Cisco Nexus 1000V for VMware ESXi 5.0.0 hosts is Release 4.2(1)SV1(4a).

Step 2 Coordinate with and notify the server administrator of the VEM upgrade process.

```
switch# vmware vem upgrade notify
Warning:
Please ensure the hosts are running compatible ESX versions for the upgrade. Refer to
corresponding
"Cisco Nexus 1000V and VMware Compatibility Information" guide.
```

Step 3 Verify that the upgrade notification was sent.

```
switch# show vmware vem upgrade status

Upgrade VIBs: System VEM Image
Upgrade Status: Upgrade Availability Notified in vCenter
Upgrade Notification Sent Time: Mon Aug 20 23:40:51 2012
Upgrade Status Time(vCenter):
Upgrade Start Time:
Upgrade End Time(vCenter):
Upgrade Error:
Upgrade Bundle ID:
    VSM:  VEM410-201209150101-BG
    DVS:  VEM410-201208144101-BG
switch#
```

Note Verify that the Upgrade Status contains the highlighted text. If the text is not present, check the Upgrade Error line and consult the *Cisco Nexus 1000V Troubleshooting Guide*.

Step 4 Verify that the server administrator has accepted the upgrade in the vCenter.
For more information about how the server administrator accepts the VEM upgrade, see Accepting the VEM Upgrade, on page 32.

Coordinate the notification acceptance with the server administrator. After the server administrator accepts the upgrade, proceed with the VEM upgrade.

```
switch# show vmware vem upgrade status

Upgrade VIBs: System VEM Image
Upgrade Status: Upgrade Accepted by vCenter Admin
Upgrade Notification Sent Time: Mon Aug 20 23:40:51 2012
Upgrade Status Time(vCenter): Tue Aug 21 19:13:07 2012
Upgrade Start Time:
Upgrade End Time(vCenter):
Upgrade Error:
Upgrade Bundle ID:
    VSM: VEM410-201209150101-BG
    DVS: VEM410-201208144101-BG
switch#
```

Note Verify that the Upgrade Status contains the highlighted text. If the text is not present, check the Upgrade Error line and consult the *Cisco Nexus 1000V Troubleshooting Guide*.

Step 5 Initiate the VUM upgrade process.

Note Before entering the following command, communicate with the server administrator to confirm that the VUM process is operational.

The vCenter Server locks the DVS and triggers VUM to upgrade the VEMs.

```
switch# vmware vem upgrade proceed
switch# show vmware vem upgrade status

Upgrade VIBs: System VEM Image
Upgrade Status: Upgrade In Progress in vCenter
Upgrade Notification Sent Time: Mon Aug 20 23:40:51 2012
Upgrade Status Time(vCenter): Tue Aug 21 19:13:07 2012
Upgrade Start Time: Mon Aug 20 23:44:50 2012
Upgrade End Time(vCenter):
Upgrade Error:
Upgrade Bundle ID:
    VSM: VEM410-201209150101-BG
    DVS: VEM410-201209150101-BG
switch#
```

Note The DVS bundle ID is updated and is highlighted.

If the ESX/ESXi host is using ESX/ESXi 4.1.0 or a later release and your DRS settings are enabled to allow it, VUM automatically VMotions the VMs from the host to another host in the cluster and places the ESX/ESXi in maintenance mode to upgrade the VEM. This process is continued for other hosts in the DRS cluster until all the hosts are upgraded in the cluster. For details about DRS settings required and vMotion of VMs, visit the VMware documentation related to Creating a DRS Cluster.

Step 6 Check for the upgrade complete status.

```
switch# show vmware vem upgrade status

Upgrade VIBs: System VEM Image
Upgrade Status: Upgrade Complete in vCenter
Upgrade Notification Sent Time: Mon Aug 20 23:40:51 2012
Upgrade Status Time(vCenter): Tue Aug 21 19:13:07 2012
Upgrade Start Time: Mon Aug 20 23:44:50 2012
Upgrade End Time(vCenter): Tue Aug 21 19:14:38 2012
Upgrade Error:
Upgrade Bundle ID:
```

```
    VSM: VEM410-201209150101-BG
    DVS: VEM410-201209150101-BG
switch#
```

Step 7 Clear the VEM upgrade status after the upgrade process is complete.

```
switch# vmware vem upgrade complete
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: VEM410-201209150101-BG
    DVS: VEM410-201209150101-BG
switch#
```

Step 8 Verify that the upgrade process is complete.

```
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
4    248    Virtual Ethernet Module           NA                 ok

Mod  Sw                Hw
---  ----------------  ------------------------------------------------
1    4.2(1)SV2(1.1)    0.0
2    4.2(1)SV2(1.1)    0.0
3    4.2(1)SV2(1.1)    VMware ESXi 5.0.0 Releasebuild-469512 (3.0)
4    4.2(1)SV2(1.1)    VMware ESXi 5.0.0 Releasebuild-623860 (3.0)

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
4    02-00-0c-00-04-00 to 02-00-0c-00-04-80  NA

Mod  Server-IP        Server-UUID                           Server-Name
---  ---------------  ------------------------------------  --------------------
1    10.104.249.171   NA                                    NA
2    10.104.249.171   NA                                    NA
3    10.104.249.172   7d41e666-b58a-11e0-bd1d-30e4dbc299c0  10.104.249.172
4    10.104.249.173   17d79824-b593-11e0-bd1d-30e4dbc29a0e  10.104.249.173

* this terminal session
switch#
```

Note The lines with the bold characters in the preceding example display that all VEMs are upgraded to the current release.

The upgrade is complete.

Accepting the VEM Upgrade

Before You Begin

- The network and server administrators must coordinate the upgrade procedure with each other.
- You have received a notification in the vCenter Server that a VEM software upgrade is available.

Procedure

Step 1 In the vCenter Server, choose **Inventory > Networking**.

Step 2 Click the **vSphere Client DVS Summary** tab to check for the availability of a software upgrade.

Figure 7: vSphere Client DVS Summary Tab

Step 3 Click **Apply upgrade**.
The network administrator is notified that you are ready to apply the upgrade to the VEMs.

Manual Upgrade Procedures

Upgrading the VEM Software Using the vCLI

You can upgrade the VEM software by using the vCLI.

Before You Begin

- If you are using vCLI, do the following:
  - You have downloaded and installed the VMware vCLI. For information about installing the vCLI, see the VMware vCLI documentation.
  - You are logged in to the remote host where the vCLI is installed.

Note The vSphere command-line interface (vCLI) command set allows you to enter common system administration commands against ESX/ESXi systems from any machine with network access to those systems. You can also enter most vCLI commands against a vCenter Server system and target any ESX/ESXi system that the vCenter Server system manages. vCLI commands are especially useful for ESXi hosts because ESXi does not include a service console.

- If you are using the **esxupdate** command, you are logged in to the ESX host.
- Check *Cisco Nexus 1000V and VMware Compatibility Information* for compatible versions.
- You have already copied the VEM software installation file to the `/tmp` directory. Do not copy the files to the root (/) folder.
- You know the name of the VEM software file to be installed.

Procedure

Step 1 Go to the directory where the new VEM software was copied.

```
[root@serialport -]# cd tmp
[root@serialport tmp]#
```

Step 2 Determine the upgrade method that you want to use and enter the appropriate command:

- If you are using the vCLI, enter the **vihostupdate** command and install the ESX/ ESXi and VEM software simultaneously.
- If you are on an ESXi host running ESXi 4.1, enter one of the following commands:

vihostupdate --install --bundle [*path to Cisco updated VEM offline bundle*] **--server** [*vsphere host IP address*]

Note Put the host in maintenance mode before you enter the following command:

```
[root@serialport tmp]# vihostupdate –install –bundle VEM410-201209150101.zip

Enter username: root
Enter password:
Please wait installation in progress ...
The update completed successfully, but the system needs to be rebooted for the changes to
be effective.
[root@serialport tmp]#
```

- If you are using the **esxupdate** command from the ESX host /tmp directory, install the VEM software as shown in the following example:

  Note When using the **esxupdate** command, you must log in to each host and enter the following command.

  esxupdate -b *[VMware offline update bundle]* **update**
  This command loads the software manually onto the host, loads the kernel modules, and starts the VEM Agent on the running system.

For ESX/ESXi 4.1.0 hosts, enter the following commands:

```
/tmp # esxupdate --bundle=VEM410 201209150101.zip
Unpacking cross_cisco-vem-v150-esx_4.2.1.2.1.0-3.0.1
##################################################################################################################
 [100%]

Installing packages :cross_cisco-vem-v150-esx_4.2.1.2.1.0-3.0.1
##################################################################################################################
 [100%]

Running [/usr/sbin/vmkmod-install.sh]...
ok.
/tmp #

/tmp # esxupdate -b cross_cisco-vem-v150-esx_4.2.1.2.1.0-3.0.1 update
Unpacking cross_cisco-vem-v150-esx_4.2.1.2.1.0-3.0.1
##################################################################################################################
 [100%]

Installing packages :installing cross_cisco-vem-v150-esx_4.2.1.2.1.0-3.0.1

##################################################################################################################
 [100%]

Running [/usr/sbin/vmkmod-install.sh]...
ok.
/tmp #
```

For ESXi 5.0.0 or a later release host, enter the appropriate commands as they apply to you:

```
~ # esxcli software vib install -d /absolute-path/VEM_bundle
~ # esxcli software vib install -v /absolute-path/vib_file
```

Note You must specify the absolute path to the *VEM_bundle* and *vib_file* files. The absolute path is the path that starts at the root of the file system such as /tmp/vib_file

```
~ # esxcli software vib install -d /tmp/VEM500-20120803150112-BG-release.zip
Installation Result
   Message: Operation finished successfully.
   Reboot Required: false
   VIBs Installed: Cisco_bootbank_cisco-vem-v150-esx_4.2.1.2.1.0-3.0.1.vib
   VIBs Removed:
   VIBs Skipped:
~ #

~ # esxcli software vib install -v /tmp/cross_cisco-vem-v144-4.2.1.2.1.1.0-3.0.2.vib
Installation Result
   Message: Operation finished successfully.
   Reboot Required: false
   VIBs Installed: Cisco_bootbank_cisco-vem-v144-esx_4.2.1.2.1.1.0-3.0.2
   VIBs Removed:
   VIBs Skipped:
~ #
```

Step 3 Display values with which to compare to *Cisco Nexus 1000V and VMware Compatibility Information*.

```
[root@serialport tmp]# vmware -v
VMware ESXi 5.0.0 build-469512
root@serialport tmp]# # esxupdate query
------Bulletin ID------- -----Installed----- --------------Summary---------------
VEM410-201209150101-BG 2012-08-21T08:18:22 Cisco Nexus 1000V 4.2(1)SV2(1.1)

[root@host212 ~]# . ~ # vem status -v
Package vssnet-esx5.5.0-00000-release
Version 4.2.1.2.1.0-3.0.1
Build 1
Date Fri Aug 3 00:02:21 PDT 2012

Number of PassThru NICs are 0
VEM modules are loaded

Switch Name      Num Ports   Used Ports  Configured Ports  MTU     Uplinks
vSwitch0         128         3           128               1500    vmnic2
DVS Name         Num Ports   Used Ports  Configured Ports  MTU     Uplinks
switch           256         40          256               1500
vmnic7,vmnic6,vmnic5,vmnic4,vmnic3

Number of PassThru NICs are 0
VEM Agent (vemdpa) is running

~ #


[root@host212 ~]# vemcmd show version
VEM Version: 4.2.1.2.1.0-3.0.1
VSM Version: 4.2(1)SV2(1.1)
System Version: VMware ESXi 4.1.0 Releasebuild-502767
~ #
```

Step 4 Display that the VEMs were upgraded by entering the following commands from the VSM.

```
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
4    248    Virtual Ethernet Module           NA                  ok

Mod  Sw                  Hw
---  ------------------  ------------------------------------------------
1    4.2(1)SV2(1.1)      0.0
2    4.2(1)SV2(1.1)      0.0
3    4.2(1)SV2(1.1)      VMware ESXi 5.0.0 Releasebuild-469512 (3.0)
4    4.2(1)SV2(1.1)      VMware ESXi 5.0.0 Releasebuild-623860 (3.0)

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
```

```
4    02-00-0c-00-04-00 to 02-00-0c-00-04-80  NA

Mod  Server-IP        Server-UUID                           Server-Name
---  ---------------  ------------------------------------  --------------------
1    10.104.249.171   NA                                    NA
2    10.104.249.171   NA                                    NA
3    10.104.249.172   7d41e666-b58a-11e0-bd1d-30e4dbc299c0  10.104.249.172
4    10.104.249.173   17d79824-b593-11e0-bd1d-30e4dbc29a0e  10.104.249.173

* this terminal session
switch#
```

Note The highlighted text in the previous command output confirms that the upgrade was successful.

If the upgrade was successful, the installation procedure is complete.

Upgrading the VEMs Manually from Release 4.2(1)SV1(4), (4a), (4b), (5.1), (5.1a), or (5.2) to Release 4.2(1)SV2(1.1)

Note The important fields are highlighted in the steps. Bundle ID names may change depending on the build date.

Before You Begin

Note If VUM is installed, it should be disabled.

To manually install or upgrade the Cisco Nexus 1000V VEM on an ESX/ESXi host, follow the steps in Upgrading the VEM Software Using the vCLI, on page 32.

To upgrade the VEMs manually, perform the following steps as network administrator:

Note This procedure is performed by the network administrator. Before proceeding with the upgrade, make sure that the VMs are powered off if you are not running the required patch level.

Caution If removable media is still connected, (for example, if you have installed the VSM using ISO and forgot to remove the media), host movement to maintenance mode fails and the VEM upgrade fails.

Procedure

Step 1 Coordinate with and notify the server administrator of the VEM upgrade process.

```
switch# vmware vem upgrade notify
Warning:
```

```
Please ensure the hosts are running compatible ESX versions for the upgrade. Refer to
corresponding
"Cisco Nexus 1000V and VMware Compatibility Information" guide.
```

Step 2 Verify that the upgrade notification was sent.

```
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: VEM410-201209150101-BG
    DVS: VEM410-201208144101-BG
switch#
```

Step 3 Verify that the server administrator has accepted the upgrade in vCenter Server.
For details about the server administrator accepting the VEM upgrade, see Accepting the VEM Upgrade, on page 32.

After the server administrator accepts the upgrade, proceed with the VEM upgrade.

```
switch# show vmware vem upgrade status

Upgrade VIBs: System VEM Image
Upgrade Status: Upgrade Availability Notified in vCenter
Upgrade Notification Sent Time: Mon Aug 20 23:40:51 2012
Upgrade Status Time(vCenter):
Upgrade Start Time:
Upgrade End Time(vCenter):
Upgrade Error:
Upgrade Bundle ID:
    VSM: VEM410-201209150101-BG
    DVS: VEM410-201208144101-BG
switch#
```

Step 4 Perform one of the following tasks:

- If the ESX host is not hosting the VSM, proceed to Step 5.
- If the ESX host is hosting the VSM, coordinate with the server administrator to migrate the VSM to a host that is not being upgraded. Proceed to Step 5.

Step 5 Initiate the Cisco Nexus 1000V Bundle ID upgrade process.

Note If VUM is enabled in the vCenter environment, disable it before entering the **vmware vem upgrade proceed** command to prevent the new VIBs from being pushed to all the hosts.

Enter the **vmware vem upgrade proceed** command so that the Cisco Nexus 1000V Bundle ID on the vCenter Server gets updated. If VUM is enabled and you do not update the Bundle ID, an incorrect VIB version is pushed to the VEM when you next add the ESX to the VSM.

```
switch# vmware vem upgrade proceed
```

Note If VUM is not installed, the “The object or item referred to could not be found” error appears in the vCenter Server’s task bar. You can ignore this error message.

```
switch# show vmware vem upgrade status
```

```
Upgrade VIBs: System VEM Image
Upgrade Status: Upgrade In Progress in vCenter
Upgrade Notification Sent Time: Mon Aug 20 23:40:51 2012
Upgrade Status Time(vCenter): Tue Aug 21 19:13:07 2012
Upgrade Start Time: Mon Aug 20 23:44:50 2012
Upgrade End Time(vCenter):
Upgrade Error:
Upgrade Bundle ID:
    VSM: VEM410-201209150101-BG
    DVS: VEM410-201209150101-BG BG
switch#
```

Step 6 Check for the Upgrade Complete status.

```
switch# show vmware vem upgrade status

Upgrade VIBs: System VEM Image
Upgrade Status: Upgrade Complete in vCenter
Upgrade Notification Sent Time: Mon Aug 20 23:40:51 2012
Upgrade Status Time(vCenter): Tue Aug 21 19:13:07 2012
Upgrade Start Time: Mon Aug 20 23:44:50 2012
Upgrade End Time(vCenter): Tue Aug 21 19:14:38 2012
Upgrade Error:
Upgrade Bundle ID:
    VSM: VEM410-201209150101-BG
    DVS: VEM410-201209150101-BG BG
switch#
```

Step 7 Coordinate with and wait until the server administrator upgrades all ESX host VEMs with the new VEM software release and informs you that the upgrade process is complete.
The server administrator performs the manual upgrade by using the **vihostupdate** command or the **esxcli** command. For more information, see Upgrading the VEM Software Using the vCLI, on page 32.

Step 8 Clear the VEM upgrade status after the upgrade process is complete.

```
switch# vmware vem upgrade complete
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: VEM410-201209150101-BG
    DVS: VEM410-201209150101-BG BG
switch#
```

Step 9 Verify that the upgrade process is complete.

```
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
4    248    Virtual Ethernet Module           NA                  ok
```

```
Mod  Sw                  Hw
---  ------------------  ------------------------------------------------
1    4.2(1)SV2(1.1)      0.0
2    4.2(1)SV2(1.1)      0.0
3    4.2(1)SV2(1.1)      VMware ESXi 5.0.0 Releasebuild-469512 (3.0)
4    4.2(1)SV2(1.1)      VMware ESXi 5.0.0 Releasebuild-623860 (3.0)

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
4    02-00-0c-00-04-00 to 02-00-0c-00-04-80  NA

Mod  Server-IP        Server-UUID                          Server-Name
---  ---------------  -----------------------------------  --------------------
1    10.104.249.171   NA                                   NA
2    10.104.249.171   NA                                   NA
3    10.104.249.172   7d41e666-b58a-11e0-bd1d-30e4dbc299c0  10.104.249.172
4    10.104.249.173   17d79824-b593-11e0-bd1d-30e4dbc29a0e  10.104.249.173

* this terminal session
switch#
```

Note The line with the bold characters in the preceding example display that all VEMs are upgraded to the current release.

The upgrade is complete.

Installing the VEM Software on a Stateless ESXi Host

The following list outlines the VEM installation process on a stateless ESXi host.

Procedure

Step 1 See the procedure for Adding the Cisco Nexus 1000V to an ESXi Image Profile.

Step 2 Installing the VEM software using one of the two following procedures:

- Installing the VEM Software on a Stateless ESXi Host Using esxcli
- Installing the VEM Software on a Stateless ESXi Host Using VUM

Step 3 See the procedure for Configuring Layer 2 Connectivity.

Installing the VEM Software on a Stateless ESXi Host Using esxcli

Before You Begin

- When entering the **esxcli software vib install** command on an ESXi 5.0.0 host, note that the following message appears:

  Message: WARNING: Only live system was updated, the change is not persistent.

Procedure

Step 1 Display the VMware version and build number.

```
~ # vmware -v
VMware ESXi 5.0.0 build-441354
~ #
~ # vmware -l
VMware ESXi 5.0.0 GA
```

Step 2 Log in to the ESXi stateless host.

Step 3 Copy the offline bundle to the host.

```
~ # esxcli software vib install -d /vmfs/volumes/newnfs/MN-VEM/VEM500-20110728153-BG-release.zip

Installation Result
   Message: WARNING: Only live system was updated, the change is not persistent.
   Reboot Required: false
   VIBs Installed: Cisco_bootbank_cisco-vem-v150-esx_4.2.1.2.1.0-3.0.1
   VIBs Removed:
   VIBs Skipped:
```

Note If the host is an ESXi 5.0.0 stateful host, the "Message: Operation finished successfully" line appears.

Step 4 Verify that the VIB has installed.

```
~ # esxcli software vib list | grep cisco
cisco-vem-v150-esx    4.2.1.2.1.0-3.0.1    Cisco   PartnerSupported  2012-10-09
```

Step 5 Check that the VEM agent is running.

```
~ # vem status -v
Package vssnet-esxmn-ga-release
Version 4.2.1.2.1.0-3.0.1
Build 5
Date Thu Jul 28 01:37:10 PDT 2011
Number of PassThru NICs are 0
VEM modules are loaded
Switch Name      Num Ports   Used Ports  Configured Ports  MTU     Uplinks
vSwitch0         128         4           128               1500    vmnic4
Number of PassThru NICs are 0
VEM Agent (vemdpa) is running
```

Step 6 Display the VEM version, VSM version, and ESXi version.

```
~ # vemcmd show version
VEM Version: 4.2.1.2.1.0-3.0.1
VSM Version:
System Version: VMware ESXi 5.0.0 Releasebuild-441354
```

Step 7 Display the ESXi version and details about pass-through NICs.

```
~ # vem version -v
Number of PassThru NICs are 0
Running esx version -441354 x86_64
VEM Version: 4.2.1.2.1.0-3.0.1
VSM Version:
System Version: VMware ESXi 5.0.0 Releasebuild-441354
```

Step 8 Add the host to the DVS by using the vCenter Server.

Step 9 On the VSM, verify that the VEM software has been installed.

```
switch# 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    4.2(1)SV1(4a)     0.0
2    4.2(1)SV1(4a)     0.0
3    4.2(1)SV1(4a)     VMware ESXi 5.0.0 Releasebuild-441354 (3.0)

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    10.104.62.227    NA                                    NA
2    10.104.62.227    NA                                    NA
3    10.104.62.216    3fa746d4-de2f-11de-bd5d-c47d4f7ca460  sans2-216.cisco.com
```

Installing the VEM Software on a Stateless ESXi Host Using VUM

Before You Begin

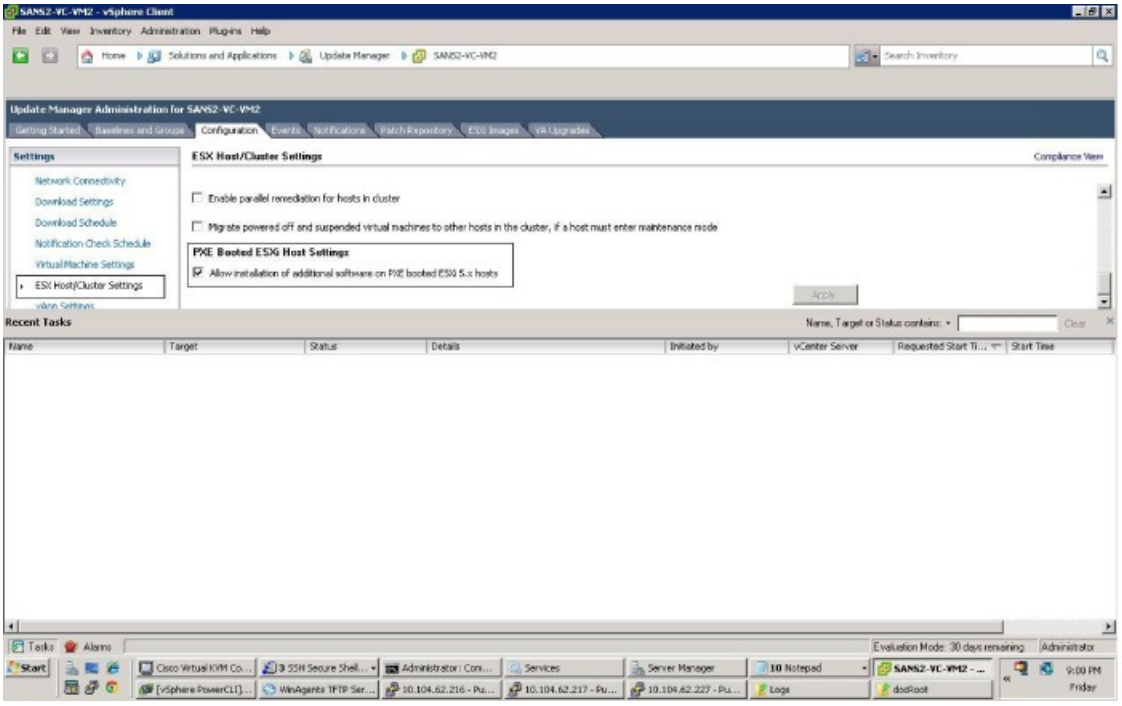
- Make sure that the VUM patch repository has the VEM software downloaded.

Procedure

Step 1 In the vCenter Server, choose **Home > Update Manager > Configuration > ESX host/Cluster** settings.

Step 2 Check the **PXE Booted ESXi Host Settings** check box.

Figure 8: ESX Host/Cluster Settings Window



Step 3 Add the host to the DVS by using the vCenter Server.

Simplified Upgrade Process

Combined Upgrade

You can upgrade the VEM and ESX version simultaneously. It requires vSphere version 5.0 Update1 and later versions. It is supported in Cisco Nexus 1000V Release 4.2(1)SV1(5.2) and later. This upgrade can be implemented manually or by using VUM.

Selective Upgrade

You can upgrade a selective set of VEMs and a few hosts or clusters at a time in a single maintenance window. This enables incremental upgrades during short maintenance windows. It is supported with combined upgrades of VEM and ESX, and also with manual upgrades of VEMs only. It is supported for VUM-based combined

upgrades with select hosts or clusters using the GUI. It is not supported with VUM-based upgrades of VEMs alone. To upgrade manually using this procedure follow these general steps:

- Identify the cluster or set of hosts in a cluster
- Place the selected hosts in maintenance mode (to vacate the VMs)
- Upgrade the VEM image on the hosts using the manual command or scripts
- Take the hosts out of maintenance mode, allowing Distributed Resource Scheduler (DRS) to rebalance VMs

Background Upgrade

You can upgrade VEMs without a maintenance window for VEMs. You use the manual procedure to upgrade VEMs during production. Place the host in maintenance mode, upgrade the VEM, and remove the host from the maintenance mode. You do not have to shut off HA Admission Control and such (as you would during VUM upgrades). You must ensure the spare capacity in the cluster and perform a health check before the upgrade. To upgrade using this procedure follow these general steps:

- Upgrade the VSM first as usual. This may be done in a maintenance window
- Place one host at a time in maintenance mode (to vacate the VMs)
- Upgrade the VEM image on that host using manual commands or scripts
- Take the host out of maintenance mode, allowing the DRS to rebalance the VMs.
- Repeat the same procedure for every host in the DVS.

Note Make sure there is enough spare capacity for HA and that all required ports have system profiles (such as mgmt vmk). Check the host health before upgrading.

Extended Upgrade

You can modify configurations between the upgrade maintenance windows. VSM configuration changes are allowed where you can add or remove modules, port configurations, VLANs, and other similar changes. If a set of hosts are upgraded to the latest VEM version using the Selective Upgrade or the Background Upgrade, the remaining set of hosts will remain in older VEM versions. During that time, various Cisco Nexus 1000V configuration changes are allowed between maintenanance windows.

Note Do not make configuration changes during a maintenance window when the VEMs are being upgraded.

The list of allowed configuration changes are as follows:

- Add or remove modules
- Add or remove ports (ETH and VETH)
- Shut or no-shut a port
- Migrate ports to or from a vswitch
- Change port modes (trunk or access) on ports

- Add or remove port profiles
- Modify port profiles to add or remove specific features such as VLANS, ACLs, QoS, or PortSec.
- Change port channel modes in uplink port profiles
- Add or delete VLANs and VLAN ranges
- Add or delete static MACs in VEMs

Note Queuing configuration changes are not supported on QoS.

Upgrading from Releases 4.0(4)SV1(3, 3a, 3b, 3c, 3d) to Release 4.2(1)SV2(1.1)

Upgrading from Releases 4.0(4)SV1(3, 3a, 3b, 3c, 3d) to the current release is a two-step process.

Procedure

Step 1 See the Upgrading from Releases 4.0(4)SV1(3, 3a, 3b, 3c, 3d) to Release 4.2(1)SV1(4b) section in the *Cisco Nexus 1000V Software Upgrade Guide, Release 4.2(1)SV1(4b)*.

Step 2 See the Upgrade Paths.

Migrating from Layer 2 to Layer 3

Layer 3 Advantages

The following lists the advantages of using a Layer 3 configuration over a Layer 2 configuration:

- The VSM can control the VEMs that are in a different subnets.
- The VEMs can be in different subnets.
- Because the VEMs can be in different subnets, there is no constraint on the physical location of the hosts.
- Minimal VLAN configurations are required for establishing the VSM-VEM connection when compared to Layer 2 control mode. The IP address of the VEM (Layer 3 capable vmknic's IP address) and the VSM's control0/mgmt0 interface are the only required information.
- In the VSM, either the mgmt0 or the control0 interface can be used as the Layer 3 control interface. If mgmt0 is used, there is no need for another IP address as the VSM's management IP address is used for VSM-VEM Layer 3 connection.

- If the management VMKernel (vmk0) is used as the Layer 3 control interface in the VEM, there is no need for another IP address because the host's management IP address is used for VSM-VEM Layer 3 connectivity.

Note These advantages are applicable only for ESX-Visor hosts. On ESX-Cos hosts, a new VMKernel must be created.

Layer 2 to 3 Conversion Tool

About VSM-VEM Layer 2 to 3 Conversion Tool

Use the VSM-VEM Layer 2 to 3 Conversion Tool as an optional, simplified method to migrate from Layer 2 to Layer 3 mode. The tool enables you to do the following:

- Check whether the prerequisites are met for the migration from L2 to L3 mode.
- Migrate the VSM from Layer 2 to Layer 3 Mode, with user interaction.

  In the process of migration, the tool creates a port profile. You can use port profiles to configure interfaces, which you can assign to other interfaces to give them the same configuration. The VSM-VEM Layer 2 to 3 Conversion Tool also gives you the option of retrieving the IP addresses from a local file (static).

Prerequisites for Using VSM-VEM Layer 2 to 3 Conversion Tool

The L2-L3_CT.zip file contains the applications required to run VSM-VEM Layer 2 to 3 Conversion Tool

Before you begin:

- Log in as administrator to use this conversion tool script.
- Download the L2-L3_CT.zip file from the CCO Download Center.
- Install Tool Conversion Language (TCL) version 8.4 or later on the workstation.
- Install VMware PowerShell API version 5.0 or later on both the vCenter and the workstation.
- Install OpenSSH on the workstation.
- In the workstation environment variables, add `installation_directory_for_OpenSSH\bin` directory to the end of the Windows path variable.
- Ensure that VLANs are allowed on the uplinks.

Note You must install vCenter, VSM, and OpenSSH with admin privileges.

Using VSM-VEM Layer 2 to 3 Conversion Tool

Procedure

Step 1 On your workstation, unzip the L2-L3_CT.zip file to any folder.
When you unzip the file, a Pre-Migrate-Check-Logs folder is created that holds all the running logs. Debugging log files will be created in this folder.

Step 2 Inside the L2-L3_CT folder, run migration.bat as an administrator.
This starts the VSM-VEM Layer 2 to 3 Conversion Tool.

Step 3 Enter the VSM IP address.

Step 4 Enter the VSM username.

Step 5 Enter the vCenter IP.

Step 6 Enter the vCenter username.

Step 7 Enter the VSM password.

Step 8 Enter the vCenter password.
The migration tool begins creating the .csv file for the user, and then checks for a port profile with layer 3 capability.

Step 9 If there is no layer 3-capable port profile, the tool will prompt for the creation of one. If you don't want to create a layer-3 capable port profile, skip to the next step.

a) Enter yes to confirm when asked to create 1 layer 3-capable port profile.
b) Enter a layer 3 port profile name.
c) Enter access VLAN ID

This creates a port profile with the required configuration. You can select this port profile when prompted by the tool. The migration tool checks for connectivity between VSM, vCenter, and VEM modules. Wait for the message to display that all connectivity is fine.

Step 10 Enter yes to continue when asked if you want to continue.
The migration tool proceeds to create an extract .csv file.

Step 11 Open the extract.csv file (in `C:\Windows\Temp`).

Step 12 Enter the vmknic IP details at the end of the text, delimited by semicolons, and save the file as convert.csv.

Step 13 Press any key to continue.

Step 14 Enter yes to confirm when asked if you are sure you completed the required steps.

Step 15 Enter the VSM password.

Step 16 Enter the vCenter password.
The migration tool connects to the vCenter and VSM of the user.

Step 17 Enter yes to confirm when asked if you want to continue.
The migration process continues.

Step 18 Enter the port profile name from the list of port profiles that appears at the prompt.

Once the port profile is selected, the max port value is automatically changed to 128.

Step 19 Enter yes to confirm when asked if you have updated convert.csv file as per the instructions.

Step 20 Enter yes to confirm, when asked if you want to continue.
The tool checks the connectivity between VSM, vCenter, and VEM modules. A message is displayed that the addition to vmknics are successful and all connectivity is fine. The **VmkNicAddingToHost** window will remain open until the configuration is complete.

Step 21 Enter yes to confirm that you would like to proceed with mode change from L2 to L3.

Step 22 Enter yes to confirm when asked if you wish to continue.
Wait for the SUCCESSFULLY COMPLETED MIGRATION message to display. The migration from layer 2 to layer 3 is now complete. The operating mode should now be listed as L3.

Using Extract Mode

You can use Extract Mode to extract the attached VEM states and save them to the Extract.csv file, which is located in `C:\Windows\Temp`.

Procedure

	Command or Action	Purpose
Step 1	Choose extract mode when prompted by VSM-VEM Layer 2 to 3 Conversion Tool. You can now view the data in the Extract.csv file in the Windows temp folder of your workstation.	This mode will not migrate the VSM.

Using Convert Mode

You can use Convert Mode to migrate the VSM from Layer 2 to Layer 3.

Procedure

	Command or Action	Purpose
Step 1	Rename the Extract.csv file to Convert.csv	The migration tool will retrieve the data from the Convert.csv file.
Step 2	Populate your Convert.csv file (in `C:\Windows\Temp`) with the vmknic IP address and netmask.	
Step 3	Run migration.bat.	This will migrate the VSM mode from Layer 2 to Layer 3 .

Example

The following example shows how to use the VSM-VEM Layer 2 to 3 Conversion Tool.

```
Enter VSM IP:
enter VSM Username:
Enter VC IP:
enter VC Username:
Enter VSM password:
Enter VC password:
create the Csv File for User I/P: C:\windows\temp\extract.csv
#### VSM DETAILS STARTS ##########
.........
..............
#### VC DETAILS END ##########
..............
..................
Operating Mode : L2
Operatoinal Mode is L2 Currently ......
################################################################################
List of port profiles on VSM:
-----------------------------
################################################################################
=========
 CHECK 1: Checking for a port profile with capability l3control set and Enabled.
..................
=========
There is not even One L3 Capable Port Profile

Do you want to Create One L3 Capable Port Profile
Please Give Option (Yes/No):Yes
Please Enter L3 PortProfile Name: L3-Control
Please Give Access Vlan Id :5
Creating L3 Port Profile : L3-Control with Access Vlan : 5
.....................................
.....................................................
L3 capable port profiles: L3-Control
Modules Registered:[10.105.228.116]
=========
 CHECK 3:  Checking for connectivity between VSM and VC, VSM and VEM Modules
=========
.....................
.....................................

## All connectivity is fine
################################################################################
Please wait for a few minutes.
Do you want to Continue,Please Type ....(yes/no):yes
Migration Tool Proceeding ....
Creating csv file: C:\windows\temp\extract.csv
Modules : 10.105.228.116
##########################################################
Modules Registered:[3 10.105.228.116]
##########################################################

##########################################################
################################################################################
Extraction of VEM connection status has been dumped in: C:\windows\temp\extract.
csv
Please rename this file before using Convert Mode
Update the VMKNic IP and NetMask for all disconnected entries
################################################################################
!##############################################################################
########!
!Open c:\windows\temp\Extract.csv and save as Convert.csv (in the same directory
)
!Enter the VMKNic IP and netmask in the Convert.csv file as shown below
!VEM_Host_IP;PPConnectionStatus;Vem_Vmk_IP;NetMask!
!PPConnectionStatus Should not be changed!
!10.10.10.12;DisConnected;10.10.10.100;255.255.255.0!
!After Updating the IP and Netmask, save the file in the same directory
!##############################################################################
```

```
########!
Press any key to continue . . .
Are you sure you completed the above steps? (yes/no):yes

################################################################################

##Tool expects this File have an IP/Netmask given for disconnected VEM in the co
rrect format : C:\windows\temp\Convert.csv

##10.10.10.12;DisConnected;10.10.10.100;255.255.255.0

################################################################################
VSM password required 10.105.228.115:

VC password required 10.105.228.113:

create the Csv File for User I/P: C:\windows\temp\extract.csv
.....................
.............................
## All connectivity is fine

################################################################################
Please wait for a few minutes.
Do you want to Continue,Please Type ....(yes/no):yes
Migration Tool Proceeding ....
..........................
.....................................................
#########################################################
Name the port profile you want to proceed with : [l3-pp]
Please type any port profile mentioned above       ||:l3-pp
You Selected : l3-pp
.................
..............................
#####################################################################
## Have you created a Convert.csv file with a proper VMKNic IP and NetMask?
## In the C:\windows\temp\Convert.csv file for disconnected VEMs.
#####################################################################
Have you Updated C:\windows\temp\Convert.csv as per the above instructions?(Yes)
:yes
Do you want to Continue,Please Type ....(yes/no):yes
Migration Tool Proceeding ....
.........................
.................................................

Addition to VmKNics are successful
## All connectivity is Fine
.........................
...................................
################################################################################

Would You Like to Proceed with Mode Change from L2 to L3....(yes/no):yes
Do you want to Continue,Please Type ....(yes/no):yes
Migration Tool Proceeding ....
.................
.....................
switch#
Operating Mode : L3
Operatoinal Mode is L3 Currently
Svs Connection Mode : L3
Vem IP : 10.10.10.108 Connected Back
...............
...................
All VEMs are back: pass
 ==============SUCCESSFULLY COMPLETED MIGRATION==========================
```

Interface Comparisons Between mgmt0 and control0

The following describes the differences between using a mgmt0 interface or a control0 interface:

- On the VSM, there are two ways of connectivity via the mgmt0 or control0 interface.
- Setting mgmt0 as Layer 3 interface uses the mgmt0 interface on the VSM.
- The control0 interface is a special interface created for Layer 3 connectivity.
- The Layer 3 interface on the VEM is selected by designating the interface with the Layer 3 control capability.
- The egress control traffic route is decided by the VMware routing stack.
- On a VEM, the management vmknic (vmk0) can be used for Layer 3 control connectivity if it is managed by the Cisco Nexus 1000V and is designated with the Layer 3 control capability.

Configuring the Layer 3 Interface

Configure either the control0 (see Step 1) or mgmt0 interface (see Step 2).

Procedure

Step 1 Configuring the control0 interface.

Note When using control0 as the control interface on the VSM, the control0 interface must be assigned with an IP address.

a) Configure the IP address.

```
switch# configure terminal
switch(config)# interface control 0
switch(config-if)# ip address 5.5.5.2 255.255.255.0
```

b) Display the running configuration of the control0 interface.

```
switch# show running-config interface control 0
!Command: show running-config interface control0
!Time: Mon Dec 12 02:41:47 2011
version 4.2(1)SV1(5.1)
interface control0
  ip address 5.5.5.2/24
```

Step 2 Configure the mgmt0 interface.

Note When using mgmt0 as the control interface, no configuration on the VSM is required as the mgmt0 interface is assigned with the host's management IP address.

a) Display the running configuration of the mgmt0 interface.

```
switch# show running-config interface mgmt 0
!Command: show running-config interface mgmt0
!Time: Mon Dec 12 02:43:25 2011
version 4.2(1)SV1(5.1)
interface mgmt0
  ip address 10.104.249.37/27
```

Creating a Port Profile with Layer 3 Control Capability

Before You Begin

- You are creating a port profile with Layer 3 control capability.
- Allow the VLAN that you use for VSM to VEM connectivity in this port profile.
- Configure the VLAN as a system VLAN.

Note VEM modules will not register to the VSM before a vmkernel interface (vmk) is migrated to a Layer 3 control capable port profile. You must migrate a vmk to the Layer 3 port profile after migrating host vmnics to Ethernet port profiles. Migrate your management vmkernel interface into the Layer 3 capable port profile. Do not use multiple vmkernel interfaces on the same subnet.

Procedure

Step 1 Create a Layer 3 port profile.

```
VSM_1# configure terminal
VSM_1(config)# port-profile type vethernet l3_control
VSM_1(config-port-prof)# switchport mode access
VSM_1(config-port-prof)# switchport access vlan 3160
VSM_1(config-port-prof)# capability l3control
VSM_1(config-port-prof)# vmware port-group
VSM_1(config-port-prof)# state enabled
VSM_1(config-port-prof)# no shutdown
```

Step 2 Display the port profile.

```
VSM_1# show port-profile name l3_control
port-profile l3_control
 type: Vethernet
 description:
 status: enabled
 max-ports: 32
 min-ports: 1
 inherit:
 config attributes:
  switchport mode access
  switchport access vlan 3160 (Allow the VLAN in access mode.)
  no shutdown
 evaluated config attributes:
  switchport mode access
  switchport access vlan 3160
  no shutdown
 assigned interfaces:
  Vethernet1
 port-group: l3_control
 system vlans: 3160 (Configure the VLAN as a system VLAN.)
 capability l3control: yes (Configure capability l3 control.)
 capability iscsi-multipath: no
```

```
capability vxlan: no
capability l3-vn-service: no
port-profile role: none port-binding: static
```

Creating a VMKernel on the Host

Procedure

Step 1 Log in to the vCenter Server.

Step 2 Choose **Home > Inventory > Hosts and Clusters**.

Step 3 Choose the host.

Step 4 Click the **Configuration** tab.

Step 5 In the Hardware pane, choose **Networking**.

Step 6 Click the **vSphere Distributed Switch** button.

Step 7 Go to **Manage Virtual Adapters**.

Step 8 Add and create a new VMKernel.

Note The management vmkernel can also be used as a Layer 3 control interface. For ESX-Visor hosts only. Migrate your management vmkernel interface into the Layer 3 capable port profile. Do not use multiple vmkernel interfaes on the same subnet.

Step 9 Assign the VMkernel to the port profile created in Creating a Port Profile with Layer 3 Control Capability, on page 51.

Step 10 Assign an IP address.

Configuring the SVS Domain in the VSM

Before You Begin

The control0 or mgmt0 interface can be assigned as the Layer 3 control interface.

Procedure

Step 1 Disconnect the VSM to vCenter Server connection.

```
switch# configure terminal
switch(config)# svs connection toVC
switch(config-svs-conn)# no connect
switch(config-svs-conn)# exit
```

Step 2 (Optional) Remove the control and the packet VLAN configuration.

```
switch(config)# svs-domain
switch(config-svs-domain)# no control vlan
switch(config-svs-domain)# no packet vlan
```

Step 3 Change the svs mode from Layer 2 to Layer 3 with the mgmt0 interface as the Layer 3 control interface.

```
switch(config-svs-domain)# svs mode l3 interface mgmt0
switch(config-svs-domain)# exit
```

Note If the control0 interface is being used as the Layer 3 control interface, enter the **svs mode l3 interface control0** command:

Step 4 Restore the VSM to vCenter Server connection.

```
switch(config)# svs connection toVC
switch(config-svs-conn)# connect
switch(config-svs-conn)# end
```

Note After entering the **svs connection toVC** command, the module is detached and reattached in Layer 3 mode. If this delay is more than six seconds, a module flap occurs. This does not affect the data traffic.

Step 5 Display the SVS domain configuration.

```
switch# show svs domain
SVS domain config:
  Domain id:    3185
  Control vlan: NA
  Packet vlan:  NA
  L2/L3 Control mode: L3
  L3 control interface: mgmt0
  Status: Config push to VC successful.

Note: Control VLAN and Packet VLAN are not used in L3 mode.
```

Feature History for Upgrading the Cisco Nexus 1000V

The following table lists the release history for upgrading the Cisco Nexus 1000V.

Feature Name	Releases	Feature Information
Combined Upgrade	4.2(1)SV1(5.2)	The ability to perform a simultaneous upgrade of the VEM and ESXi host.
Upgrading the Cisco Nexus 1000V	4.0(4)SV1(2)	Introduced in this release.