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Cisco Nexus 1000V VEM Software Installation and Upgrade Guide, Release 4.0(4)SV1(2)

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Use this document and your VMware documentation to install software on the Cisco Nexus 1000V Virtual Ethernet Module (VEM) on a VMware ESX or ESXi 4.0 server. The following methods can be used to install VEM software:

- VMware Update Manager (VUM)
- Remote Login
- VMware virtual CLI (vCLI)

Note The Cisco Nexus 1000V is compatible with any server hardware listed in the VMware Hardware Compatibility List (HCL), which is running VMWare vSphere 4.0 Enterprise Plus.

Note The Cisco Nexus 1000V is compatible with any upstream physical access layer switch that is Ethernet standard compliant, including the Catalyst 6500 series switch, Cisco Nexus switches, and switches from other network vendors.

This document includes the following topics:

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Audience

This document is for use by experienced server administrators who configure and maintain server software. Table 1 describes the roles of server administrator and network administrator.

Table 1 Administrator Roles

Network Administrator	Server Administrator
• Creates, configures, and manages vswitches. • Creates, configures, and manages port profiles, including the following: – Security – Port channels – QoS policies	• Assigns the following to port groups: – Virtual network interface cards (VNICs) – vmkernel interfaces – Service console interfaces • Assigns physical NICs (PNICs) to vswitches on each host.

This document includes instructions for installing new VEM software as a fresh install or after upgrading the VSM software to a new version.

To install the Virtual Supervisor Module (VSM), see the *Cisco Nexus 1000V Software Installation Guide, Release 4.0(4)SV1(2)*.

For detailed information about upgrading the software on the VSM and VEM, see the *Cisco Nexus 1000V Software Upgrade Guide, Release 4.0(4)SV1(2)*.

Information About the Virtual Ethernet Module

This section provides information about the Virtual Ethernet Module and includes the following topics:

- Introduction to Cisco Nexus 1000V and the Virtual Ethernet Module, page 2
- Obtaining VEM Software, page 4
- VEM Installation Methods, page 4
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Introduction to Cisco Nexus 1000V and the Virtual Ethernet Module

Cisco and VMware jointly designed APIs that produced the Cisco Nexus 1000V. The Cisco Nexus 1000V is a distributed virtual switch solution that is fully integrated within the VMware virtual infrastructure, including VMware vCenter for the virtualization administrator. This solution off loads the configuration of the virtual switch and port groups to the network administrator to enforce a consistent data center network policy.

The Cisco Nexus 1000V has the following components that can virtually emulate a 66-slot modular Ethernet switch with redundant supervisor functions:

- Virtual Ethernet module (VEM)-data plane—Each hypervisor is embedded with one VEM, a lightweight software component that effectively replaces the virtual switch by performing the following functions:
  - Advanced networking and security

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  - Switching between directly attached virtual machines
  - Uplinking to the rest of the network
- Virtual supervisor module (VSM)-control plane—The VSM is a standalone, external, physical or virtual appliance that performs the following functions for the Cisco Nexus 1000V system (that is, the combination of the VSM itself and all VEMs it controls):
  - Configuration.
  - Management. A single VSM can manage up to 64 VEMs.
  - Monitoring.
  - Diagnostics.
  - Integration with VMware vCenter.

  Active-standby VSMs increase high availability.

In the Cisco Nexus 1000V, traffic is switched between virtual machines locally at each VEM instance. Each VEM also interconnects the local virtual machine with the rest of the network through the upstream access-layer network switch (blade, top-of-rack, end-of-row, and so forth). The VSM runs the control plane protocols and configures the state of each VEM accordingly, but it never forwards packets.

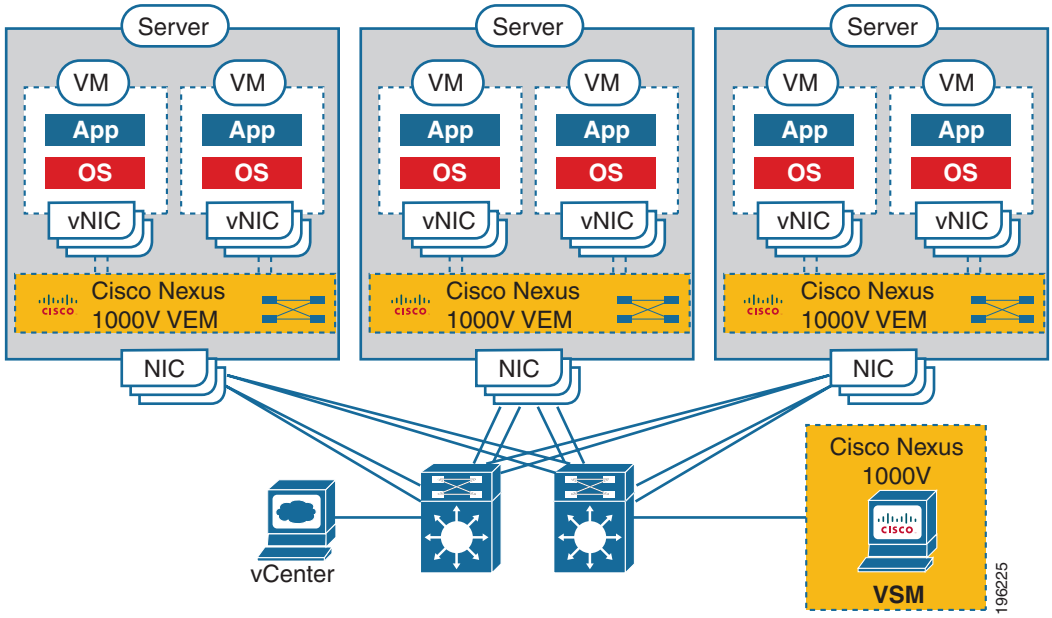
In Cisco Nexus 1000V, modules are numbered as follows:

- Module 1 is reserved for the Virtual Supervisor Module (VSM).
- Module 2 is reserved for the standby VSM in a dual supervisor system.
- The first server or host is automatically assigned to Module 3.
  NIC ports are 3/1 and 3/2.

The ports to which the virtual NIC interfaces connect are virtual ports on the Cisco Nexus 1000V where they are assigned a global number.

Figure 1 shows an example of the Cisco Nexus 1000V distributed architecture.

Figure 1 Cisco Nexus 1000V Distributed Switching Architecture



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Obtaining VEM Software

VEM software can be obtained from the sources shown in Table 2.

Table 2 Obtaining VEM Software

Source	Description
VUM	If you are using VUM, then VUM obtains the VEM software from the VSM through the web server hosted on the VSM. After obtaining it, VUM installs the VEM software either during the VSM **Add Host** operation on the Cisco Nexus 1000V DVS, or after the VEM software is updated on the VSM.[1]
VSM	After the VSM has been installed as a VM, copy the file containing the VEM software from the VSM homepage using the following url: http://*VSM_IP_Address*/
VMware	Download the VEM software from the VMware website. Click **Download Vmware vSphere 4 Enterprise Plus > Download** Download the VMware patches if you are utilizing VMware releases with patches.
Cisco	Download the VEM software from the Cisco website.

1. vCenter Update Manager 4.0 does not list Cisco Nexus 1000V patches or updates, but you can add a Cisco Nexus 1000V patch source using the VMware knowledge base procedure at the following url:

   http://kb.vmware.com/selfservice/microsites/search.do?language=en_US&cmd=displayKC&externalId=1013134

   vCenter Update Manager 4.0 Update 1 does not have this limitation.

VEM Installation Methods

VEM software can be installed using your VMware documentation. Table 3 lists the methods for installing software on a VEM.

Table 3 Cisco Nexus 1000V VEM Software Installation Methods

	Server/Host	
Install Method	**ESX**	**ESXi**
VMware Virtual CLI (vCLI)	X	X
Remote Login Manual Installation	X	X[1]
VMware Update Manager (VUM)[2, 3]	X	X

1. SSH must be enabled on the host.
2. For installations, no action is required by the server administrator; VUM automatically installs the VEM software.
3. VUM will not install the VEM software on a host where the vCenter resides. The vCenter must be migrated to another host before installing VEM software.

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Information About VEM Software for VMware Patch Releases

Cisco Nexus 1000V VEM software is updated to support VMware patch releases and is available on both the VMware and Cisco software download web sites.

The Cisco Nexus 1000V software posted on these web sites can be used for both installation and upgrade of the VEM for both the VMware Classic and VMware Embedded platforms with the following exception:

- On the VMware Embedded platform, the Cisco Nexus 1000V bundle posted on the Cisco website can only be used for installation due to restrictions in the VMware Embedded platform manual install and upgrade utility.

For information about installing software on an ESX or ESXi, see your VMware documentation.

For information about VEM software packages and compatibility, see the document, *Cisco Nexus 1000V Compatibility Information, Release 4.0(4)SV1(2)*.

Prerequisites

Note When performing any VUM operation on hosts which are a part of a cluster, ensure that VMWare High Availability (HA), VMware Fault Tolerance (FT), and VMware Distributed Power Management (DPM) features are disabled for the entire cluster. Otherwise, VUM will fail to upgrade the hosts in the cluster.

Note Any ESX patches or updates after ESX400/ESXi400-201006201-UG will be backward compatible with the Cisco Nexus 1000V U2 VEM vib (cross_cisco-vem_v110-4.0.4.1.2.0.90-1.20.19.vib).

Before installing the Cisco Nexus 1000V VEM software, you must know or do the following:

- You have a copy of your VMware documentation available for installing software on a host.
- The following are the disk and memory usage for the VEM software on an ESX/ESXi host:
  - 6.5 MB of disk space.
  - Maximum of 150 MB of RAM when all Cisco Nexus 1000V features are activated.
- You have already obtained a copy of the VEM software file from one of the sources listed in Table 2.
- If you are installing the VEM software for the first time, you can install it before the Virtual Supervisor Module (VSM) is installed; however, verification and configuration of the VEM can only be done after installing the VSM.
- Download the appropriate VEM software based on the current ESX host patch level. To identify the VEM version based on the relevant patch level, see the compatability matrix in *Cisco Nexus 1000V Compatibility Information, Release 4.0(4)SV1(2)*.
- If you install the VEM software on an ESXi host before adding the host to a vSphere Server, you need to reboot the host. The alternative is to add the host to vSphere Server first and then install the VEM software.
- If using VUM for a first-time installation, no action is required by the server administrator. VUM automatically installs the VEM software.

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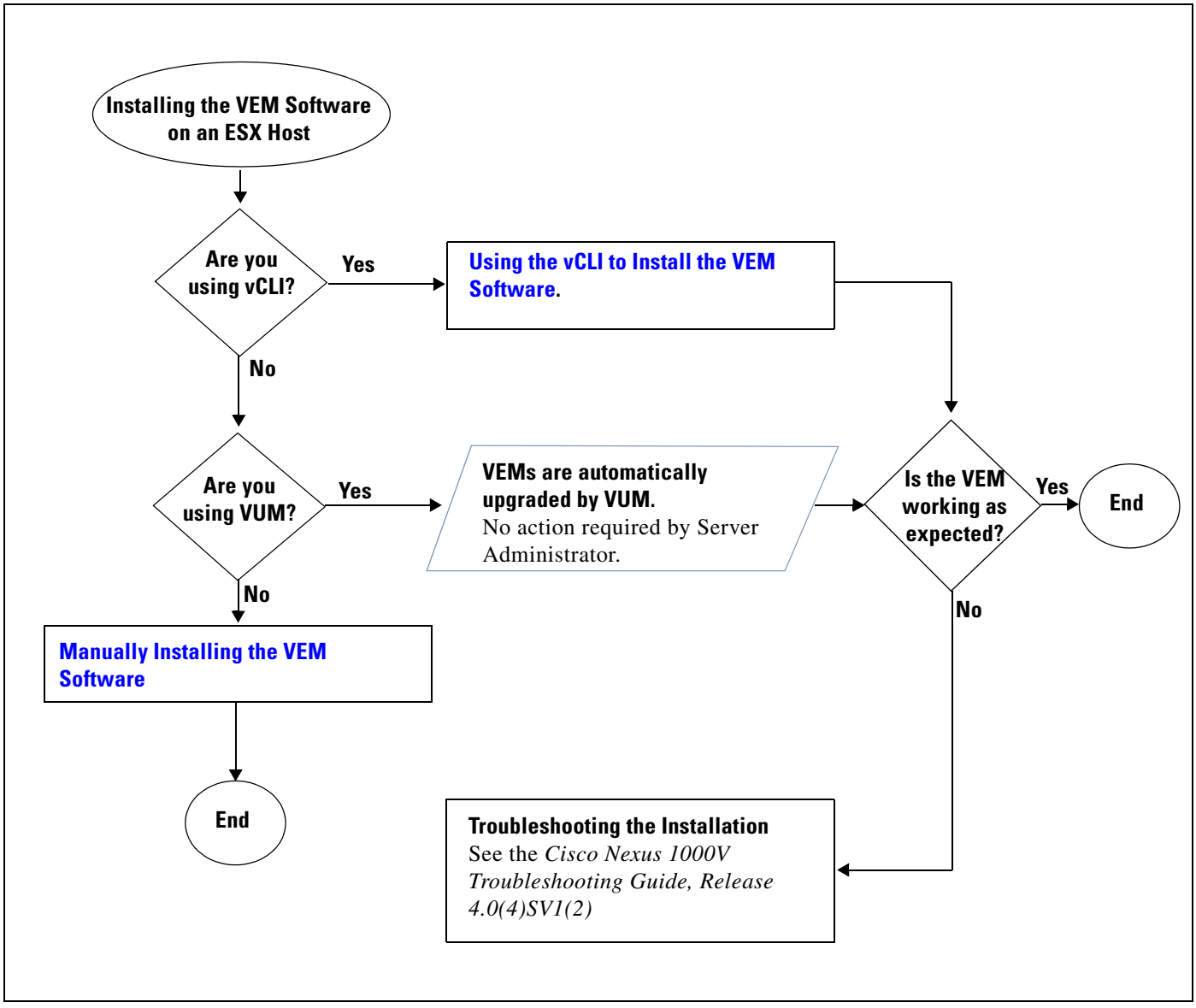
- If you use a proxy server to connect VUM to the Internet, you may need to disable the proxy before starting a VUM upgrade. In VMware versions before VUM Update 1, the proxy prevents VUM from communicating locally with the VSM. For this reason, automatic VEM upgrades may fail if the proxy is not disabled first.

Flow Chart: Installing the VEM Software on an ESX Host

The following flow chart is designed to be used as reference with "Using the vCLI to Install the VEM Software" section on page 7 and "Manually Installing the VEM Software" section on page 8 to guide you through the software installation process.

Figure 2 Installing the VEM Software on an ESX Host



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Using the vCLI to Install the VEM Software

You can install the Cisco Nexus 1000V VEM software with vCLI on an ESXi host.

BEFORE YOU BEGIN

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

Note If you are using VUM, then the Cisco Nexus 1000V software will be installed automatically. No action is required by the server administrator.

- You have downloaded and installed the VMware vCLI. For information about installing vCLI, see the VMware vCLI documentation.
- You have already copied the VEM software installation file to the /tmp directory.
- You know the name of the VEM software file to be installed.
- You are logged in to the remote host where vCLI is installed.
- The host is in maintenance mode.

PROCEDURE

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

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

Step 2 Using the **vihostupdate** utility and the correct name of the new VEM software file, install the VEM software.

```
[root@serialport tmp]# vihostupdate -i -b ./cisco-vem-v100-4.0.4.1.1.nn-0.4.nn.zip
--server fcs-visor1
Enter username: root
Enter password:
Host updated successfully.
[root@serialport tmp]#
```

Step 3 Verify that the installation was successful.

```
[root@serialport tmp]# vihostupdate -q --server fcs-visor1
Enter username: root
Enter password:
-----Bulletin ID----- -----Installed----- ----------Summary----------
VEM400-20904000-BG    2009-J4-TO6:02:56    A Cisco switch module for VMware ESX Server
4.0.0 systems
[root@serialport tmp]#
```

Step 4 Do one of the following:

- If the installation was successful, the installation procedure is complete.
- If not, see the *Cisco Nexus 1000V Troubleshooting Guide, Release 4.0(4)SV1(2)*.

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You have completed this procedure.

Manually Installing the VEM Software

You can manually install the Cisco Nexus 1000V VEM software on an ESX host.

BEFORE YOU BEGIN

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

Note If you are using VUM, then the Cisco Nexus 1000V software will be installed automatically. No action is required by the server administrator.

- You are logged in to the ESX host
- You have already copied the VEM software installation file to the ESX host /tmp directory.
- You know the name of the VEM software file to be installed.
- The host is in maintenance mode.

PROCEDURE

Step 1 From the ESX 4.0 host /tmp directory, using the **esxupdate** command and the correct name of the VEM software file, install the VEM software as shown in the following example.

```
[root@cos1-]# esxupdate -b ./cross_cisco-vem-v100-4.0.4.1.1.nn-0.4.nn-release.vib update
cross_cisco-vem-v100-4.0.4.1.1.nn-0.4.nn..   ################################### [100%]
Unpacking cross_cisco-vem-v100-esx_4..        ################################### [100%]
Installing cisco-vem-v100-esx                 ################################### [100%]
Running [/usr/sbin/vmkmod-install.sh]...
ok.
[root@cos1-]#
```

This command loads the software manually onto the host, loads the kernel modules, and starts the VEM Agent on the running system.

Step 2 Verify that the installation was successful by checking for the statement, **VEM Agent is running**, in the output of the **vem status** command.

```
[root@cos1-]# vem status
VEM modules are loaded
Switch Name   Num Ports   Used Ports  Configured Ports  MTU   Uplinks
vSwitch0      32          3           32                1500  vmnic0

VEM Agent is running
[root@cos1-]#
```

Step 3 Do one of the following:

- If the installation was successful, the installation procedure is complete.
- If not, see the *Cisco Nexus 1000V Troubleshooting Guide, Release 4.0(4)SV1(2)*.

You have completed this procedure.

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Step 4 For details about adding a host to the DVS, see the *Cisco Nexus 1000V Getting Started Guide, Release 4.0(4)SV1(2)*.

Uninstalling the VEM Software

You can uninstall the Cisco Nexus 1000V software from a VEM.

BEFORE YOU BEGIN

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

- Make sure the host is not currently a part of any DV switch by removing all of the following active ports from the DV switch.
  - VMware kernel NICs
  - Virtual switch interfaces
  - Virtual NICs
- You are logged in to the ESX host remotely using SSH.

PROCEDURE

Step 1 Uninstall the VEM software using the **vem-remove -d** command.

This command removes the software from the host, removes the kernel modules, and stops the VEM Agent on the running system.

Example:
```
[root@fcs-cos2 ~]# vem-remove -d
Watchdog-vemdpa: Terminating watchdog with PID 6651
Removing CIsco VEM VIB from COS system
Removing VIB cross_cisco-vem-v100-esx_4.0.4.1.1.27-0.4.2
Removing cisco-vem-v100-esx ################################ [100%]
Running [/usr/sbin/vmkmod-install.sh]...
Ok.
root@fcs-cos2 ~]#
```

Example:
```
~ # vem-remove -d
watchdog-vemdpa: Terminating watchdog with PID 8815
Removing Cisco VEM VIB from visor system
Removing VIB cross_cisco-vem-v100-esx_4.0.4.1.1.27-0.4.2
Removing packages :cisco-vem-v100-esx ############################ [100%]
Running [/usr/sbin/vmkmod-install.sh]...
ok.
Cleaning up running visor system
~ #
```

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Step 2 Verify that the software was successfully removed by checking for the output of the **esxupdate --vib-view query** command:

Example:
```
[root@fcs-cos2 -]# esxupdate --vib-view query

------------------VIB ID------------------ Package State -----------Timestamp-----------
cross_cisco-vem-v100-esx_4.0.4.1.1.27-0.4.2 retired      2009-07-02T15:26:45.994264-05:00
root@fcs-cos2 -]#
```

Example:
```
~ # esxupdate --vib-view query

------------------VIB ID------------------ Package State -----------Timestamp-----------
cross_cisco-vem-v100-esx_4.0.4.1.1.27-0.4.2 retired      2009-07-02T05:20:47.860404+00:00

~ #
```

Step 3 Do one of the following:

- If the removal was successful, your uninstallation is complete.
- If not, see the *Cisco Nexus 1000V Troubleshooting Guide, Release 4.0(4)SV1(2)*.

You have completed this procedure.

Related Documentation

Cisco Nexus 1000V includes the following documents available on Cisco.com:

General Information

Cisco Nexus 1000V Release Notes, Release 4.0(4)SV1(2)

Cisco Nexus 1000V Compatibility Information, Release 4.0(4)SV1(2)

Install and Upgrade

Cisco Nexus 1000V Software Installation Guide, Release 4.0(4)SV1(2)

Cisco Nexus 1000V VEM Software Installation and Upgrade Guide, Release 4.0(4)SV1(2)

Cisco Nexus 1000V Software Upgrade Guide, Release 4.0(4)SV1(2)

Configuration Guides

Cisco Nexus 1000V License Configuration Guide, Release 4.0(4)SV1(2)

Cisco Nexus 1000V Getting Started Guide, Release 4.0(4)SV1(2)

Cisco Nexus 1000V Interface Configuration Guide, Release 4.0(4)SV1(2)

Cisco Nexus 1000V Layer 2 Switching Configuration Guide, Release 4.0(4)SV1(2)

Cisco Nexus 1000V Port Profile Configuration Guide, Release 4.0(4)SV1(2)

Cisco Nexus 1000V Quality of Service Configuration Guide, Release 4.0(4)SV1(2)

Cisco Nexus 1000V Security Configuration Guide, Release 4.0(4)SV1(2)

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Cisco Nexus 1000V System Management Configuration Guide, Release 4.0(4)SV1(2)

Cisco Nexus 1000V High Availability and Redundancy Configuration Guide, Release 4.0(4)SV1(2)

Cisco Nexus 1000V XML API User Guide, Release 4.0(4)SV1(2)

Programming Guide

Cisco Nexus 1000V XML API User Guide, Release 4.0(4)SV1(2)

Reference Guides

Cisco Nexus 1000V Command Reference, Release 4.0(4)SV1(2)

Cisco Nexus 1000V MIB Quick Reference

Troubleshooting and Alerts

Cisco Nexus 1000V Troubleshooting Guide, Release 4.0(4)SV1(2)

Cisco Nexus 1000V Password Recovery Guide

Cisco NX-OS System Messages Reference

Obtaining Documentation and Submitting a Service Request

For information about obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation.

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