



Installing the Cisco Nexus 1000V for Microsoft Hyper-V

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Prerequisites

Make sure that you have the following components installed and configured on the target setup:

- Windows Active Directory service
- Microsoft System Center Virtual Machine Manager (SCVMM) 2012 SP1 UR2 build version 3.1.6020.0
- Windows Server 2012 Hosts

System Requirements

This section describes the hardware and software requirements.

Hardware Requirements

The hardware must meet the requirements set by Microsoft to run the Hyper-V role. Cisco Nexus 1000V for Microsoft Hyper-V Virtual Supervisor Module (VSM) requires VMs with the following configuration:

- 4 GB minimum of hard disk space
- 4 GB minimum of RAM
- Four network adapters (network interface cards—NICs) on the host where Microsoft Hyper-V is installed. You can have various combinations depending on the hardware you have. For example, you can have one NIC with four ports or four NICs with one port each.

Software Requirements

To install and bring up a Cisco Nexus 1000V for Microsoft Hyper-V, you need the following server setup:

- Microsoft System Center Virtual Machine Manager (SCVMM) 2012 SP1 UR2 build version 3.1.6020.0
- Windows 2012 hosts
- Active Directory server

To configure the VSM, you need the following information:

- VSM IP address
- VSM domain ID (1-1023)—This is used for High Availability (HA)
- Layer 3 connectivity between a VSM and the hosts running a VEM is required.
 - L2 control is not supported.
- TCP Port 80 open on the network for communication from System Center Virtual Machine Manager to VSM

VSM NIC Ordering

The VSM creates interfaces in an ascending MAC order of the virtual NIC offered by Microsoft Hyper-V. Currently, Microsoft Hyper V provides no guarantees that this order is the same as displayed at the VSM VM Settings panel, but this is usually the case. VSM always uses its first interface as control0 and its second interface as mgmt0. The network profiles for these two interfaces may need to use different VLAN. Therefore, the users should verify that the interfaces are selected by the VSM in the same order as displayed in the Settings panel, to select profiles appropriately.

If the order is not the same, the users can use the following commands to specify their preferred MAC to control0 / mgmt0 interface mappings:

- **system internal control-mac XXXX.XXXX.XXXX**
- **system internal mgmt-mac XXXX.XXXX.XXXX**

These commands require **copy running-config startup-config** command to be run afterwards to make the change persistent and effective after the next VSM reload.

```
# show system internal interface mac-address
```

Sample output:

```
Interface Preferred MAC
```

```
-----
```

```
mgmt0 cccc.bbbb.aaaa
```

```
control0 aaaa.bbbb.cccc
```

**Note**

Actual MAC values for currently selected control0/mgmt0 interfaces can be displayed with existing command “show interface mac-address”. After a VSM reload, both mappings should be the same, unless the system malfunctions.

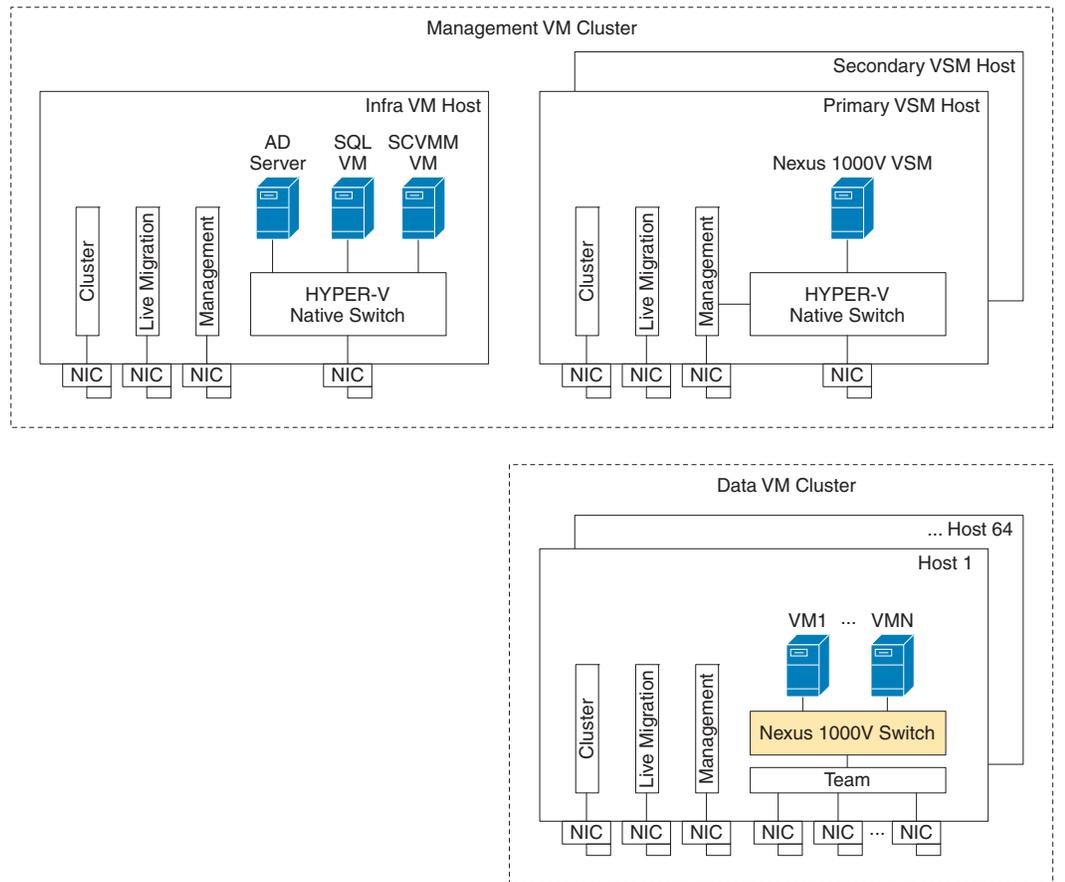
If any of the preferred MAC for control0/mgmt0 selected by users is not available at VSM boot up, the driver ignores it and it picks another interface instead (following MAC ascending order). In that case, the system logs an error with a syslog as follows:

```
%KERN-3-SYSTEM_MSG: Preferred MAC (aaaa.bbbb.cccc) for control0 not found - kernel
```

Basic Topology

Figure 1-1 displays the basic Hyper-V topology on a Cisco Nexus 1000V for Microsoft Hyper-V VEM.

Figure 1-1 Basic Topology for the Cisco Nexus 1000V for Microsoft Hyper-V



Note: The Management NIC is actually on the Microsoft Switch.

Management VM cluster for Infra VMs

Data VM Cluster for Workload VMs

Minimum topology 3 servers with 4 NICs each.

Installer APP is recommended for this topology.

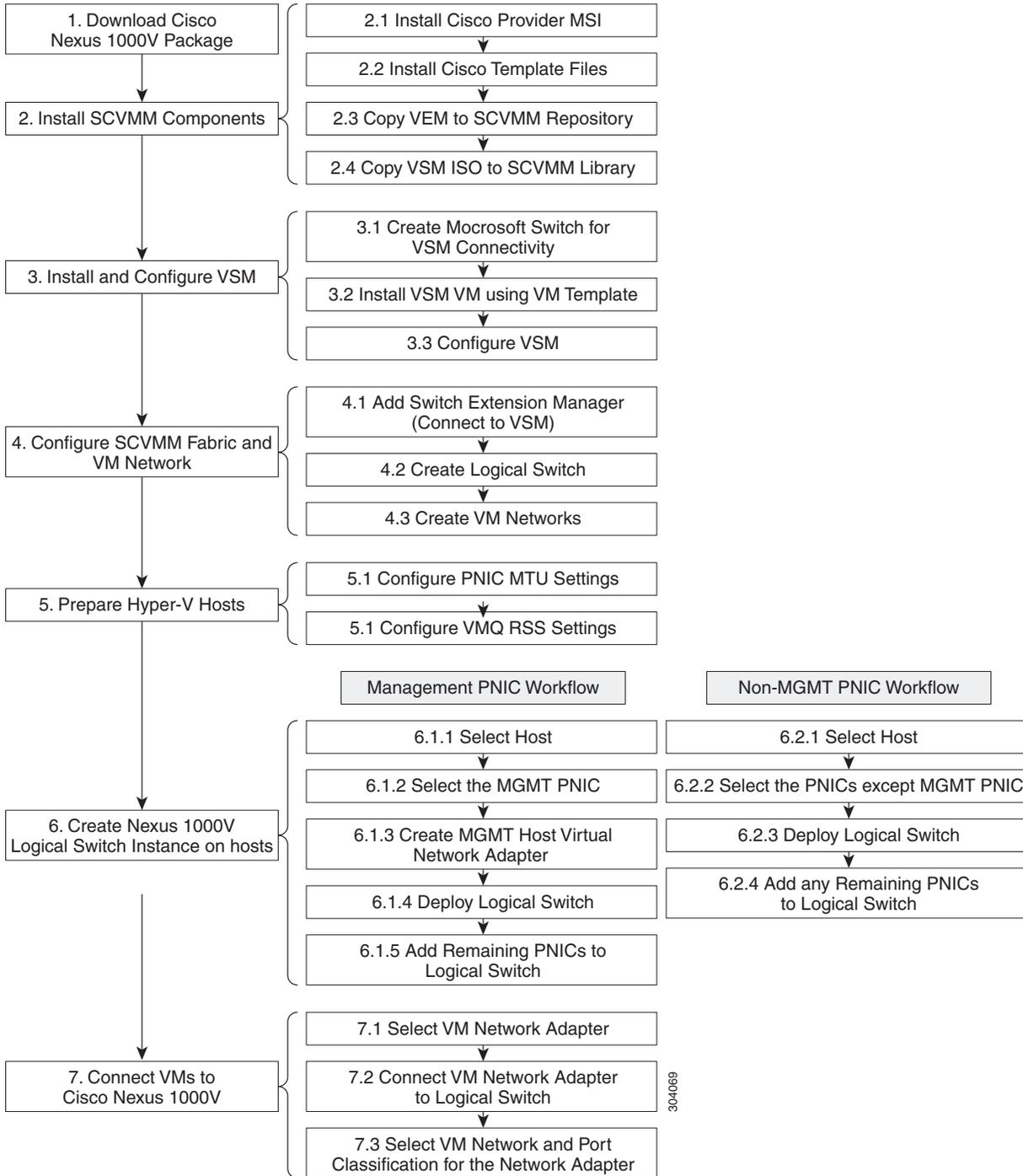
Figure 1-1 displays the Cisco Nexus 1000V for Microsoft Hyper-V deployment on two servers with the following network configuration:

- Management NIC—This network adapter is connected to an external network for the host OS connectivity.
- Microsoft Virtual Switch—The Microsoft virtual switch with one physical network adapter for the VSM connectivity.
- Two Physical Network adapters—These adapters are connected to the Cisco Nexus 1000V Logical Switch instance of the Hyper-V host.

Installation Workflow

Figure 1-2 displays the Cisco Nexus 1000V for Microsoft Hyper-V installation process on Microsoft System Center Virtual Machine Manager (SCVMM) 2012 SP1 UR2 build version 3.1.6020.0.

Figure 1-2 Cisco Nexus 1000V for Microsoft Hyper-V Installation Workflow



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**Note**

Steps 2 to 4 in the installation workflow are performed by Installer App that is described in the earlier chapter. Steps 5 to 7 are common to Installer App and Manual installation methods.

Installation Steps

Refer to the installation workflow for step-by-step installation instructions.

1. [Downloading Cisco Nexus 1000V Package, page 1-6](#)
2. [SCVMM and VSM Configuration, page 1-6](#)
3. [Preparing Microsoft Hyper-V Hosts, page 1-19](#)
4. [Adding Hosts to Logical Switch, page 1-20](#)
5. [Connecting VMs to Logical Switch, page 1-21](#)

Downloading Cisco Nexus 1000V Package

The Cisco Nexus 1000V for Microsoft Hyper-V package (a zip file) is available at the download URL location provided with the software. Complete the following steps to download the Cisco Nexus 1000V for Microsoft Hyper-V package.

1. Download the Cisco Nexus 1000V for Microsoft Hyper-V package for Microsoft System Center Virtual Machine Manager (SCVMM) 2012 SP1. The package contains the following files:
 - a. Virtual Supervisor Module (VSM) ISO (n1000vh-dk9.5.2.1.SM1.5.1.iso)
 - b. Virtual Ethernet Module (VEM) MSI package (Nexus1000V-VEM-5.2.1.SM1.5.1.msi)
 - c. Cisco VSEM Provider MSI package (Nexus1000V-VSEMPProvider-5.2.1.SM1.5.1.msi)
 - d. Cisco SCVMM VM Template (Cisco Nexus1000V VSM Template)
 - e. Cisco Installer App (Cisco.Nexus1000VInstaller.UI.exe)

SCVMM and VSM Configuration

This section describes the procedure for installing the Cisco Nexus 1000V for Microsoft Hyper-V VSM software using the Installer App or using the manual installation. The recommended method of software installation is using the Installer App.

You can install the Cisco Nexus 1000V for Microsoft Hyper-V VSM software using the Installer App or using the manual installation procedure as described in the following sections:

- [Installing the Software using Installer App, page 1-6](#)
- OR
- [Installing Cisco Nexus 1000V for Microsoft Hyper-V Manually, page 1-11](#)

Installing the Software using Installer App

Using the Installer App is the recommended method of software installation. Refer to the following sections for more information:

- [Prerequisites for Using Installer App, page 1-7](#)
- [Configuring SCVMM and VSM using Installer App, page 1-8](#)

Prerequisites for Using Installer App

The Cisco Nexus 1000V Installer App is the graphical user interface (GUI) for installing the VSMs in high availability (HA) mode on Hyper-V hosts. Complete the pre-requisites listed in this section to install the Cisco Nexus 1000V for Microsoft Hyper-V VSM software using the Installer App.

The VSM is deployed with the following credentials:

- username: admin
- password: admin

**Note**

Make sure that you have .NET 4.0 or later installed on the host.

**Note**

Make sure that you have updated to SCVMM UR2 via Windows update. After upgrading, the new version number for SCVMM should be SCVMM UR2 build version 3.1.6020.0.

**Note**

Make sure that the Management Physical Adapter for your Hyper-V host is free. The Installer App expects that the Management Physical Adapter used in the Host OS connectivity should not be associated with any virtual Switch and it should not be a member of a NIC TEAMING.

The machine where the installer is running should meet the following requirements:

- It should be on the same domain as the SCVMM server.
- It should have Microsoft SCVMM Console installed (check C:/Program Files/Microsoft/System Center/Virtual Machine Manager to see if it is installed).
- The currently logged in user should have the administrative privileges on the SCVMM server and the Library server.
- The currently logged in user should be able to run PowerShell cmdlets.

Make sure you have the following information:

- SCVMM IP Address/ Host name and Port number
- SCVMM Username and Password
- ISO image location for VSM
- MSI file location for VEM and MSI file for Cisco Provider DLL
- VSM Management IP Address
- Subnet Mask
- Gateway
- Domain ID
- Management VLAN ID of the VSM
- Management VLAN ID of the Hyper-V Hosts

**Note**

If you are using the SCVMM credentials that do not have the administrative rights on the SCVMM server machine, make sure that the UAC (User Account Control) on the SCVMM machine is turned off.

Complete the following procedure to install the Cisco Nexus 1000V for Microsoft Hyper-V:

1. Download the Cisco Nexus 1000V package for Windows Server 2012 zip file from Cisco.com.
2. Unzip and launch the Cisco Nexus 1000V Installer application file.
3. The **Cisco Nexus 1000V Installer for Microsoft Hyper-V** window displays. The Cisco Nexus 1000V Installer App for Microsoft System Center 2012 with Hyper-V is available in the Install Cisco Nexus 1000V Logical Switch (VSM Installation):

Refer to [Configuring SCVMM and VSM using Installer App, page 1-8](#) for installing Cisco Nexus 1000V Logical Switch (VSM Installation).

Configuring SCVMM and VSM using Installer App

Complete the following steps to install the software to configure SCVMM and VSM using the Cisco Nexus 1000V Logical Switch (VSM Installation) in the Installer App:

1. Click Cisco Nexus 1000V Logical Switch (VSM Installation) and click **Next**.

The following prerequisites for the installation are displayed on the **Prerequisites** window:

- Hyper-V hosts should be added to SCVMM.
- Hyper-V hosts should be part of Active Directory.
- The machine where the installer is running should meet the following requirements:
 - It should be on the same domain as the SCVMM server.
 - It should have SCVMM Console installed (Check C:/Program Files/Microsoft/System Center/Virtual Machine Manager to see if it is installed.)
 - The currently logged in user should have administrative privileges on the SCVMM server and Library server.
 - The currently logged in user should be able to run PowerShell cmdlets.

Once these prerequisites have been fulfilled, click **Next**. The **Login to SCVMM** window is displayed.

2. In the **Login to SCVMM** window, enter the following SCVMM server credentials:
 - Host Name or IP Address
 - Port (https only). The field is pre-populated with default value 8100, which can be modified if required.
 - User Name
 - Password.
3. Click **Next**.
4. The **Enter VSM Details** window displays.

Click **Import Configuration** to import a saved configuration.

If you are deploying an additional VSM, the **Deploy in HA mode** option is provided. Check the **Deploy in HA mode** option to deploy the VSM in HA mode.



Note When the **Deploy in HA mode** option is selected, the Host 2 fields become active. When deploying in HA mode, both hosts should have the same configuration.

5. For Host 1, select a host from the drop-down menu in the **IP Address/Name** field. If a host or a network adapter that you want to connect to is not available, see the tooltip on the Installer App window. The installer creates a Hyper-V extensible switch on the host and deploys the VSM to this switch. The selected adapter is used as an uplink for the newly created Microsoft virtual switch.
6. If you are deploying the VSM in HA mode, choose a host and a network adapter for the second VSM in the **IP Address/Name** field and in the **Network Adapter** field respectively. You can select the same server as Host 1 and Host 2 or select a different server for both the hosts. You can also deploy the two VSMs on the same server. In this example, a stand-alone VSM is configured.
7. Enter a name for the VSM in the **VSM Name** field.
8. In the **ISO Image Location** field, browse to the location of the VSM setup ISO file and click **Open**.
9. Browse the location of VEM MSI file and click **Open**.



Note Make sure that the correct MSI file with the name **Nexus1000V-VSEMPProvider-5.2.1.SM1.5.1.0.msi** is selected.

10. Enter the configuration data in the following fields:
 - VSM IP Address in the **VSM IP Address** field.
 - Subnet Mask VSM in the **Subnet Mask** field.
 - Gateway IP Address in the **Gateway IP Address** field.
 - Domain ID in the **Domain ID** field. (Make sure that this number is unique and has not been used before in the VLAN.)
 - VSM Management VLAN in the **VSM Management VLAN** field. It is the VLAN that the VSM VM is a part of.
11. The following question is displayed: **Is the Management VLAN of the host(s) the same as the VSM VLAN?** The options are **Yes**, **No**.

The option that is most commonly used is **Yes**. If you select the option **Yes**, the field **The management VLAN of the host(s) is:** field is disabled. If you select the option **No**, the field **The management VLAN of the host(s) is:** is enabled. Enter the Management VLAN of the host.



Note If you do not know the management VLAN of the host, contact your network administrator.

12. Once these fields are populated, the **Save Configuration** option becomes active.



Note The save configuration option allows you to create an XML configuration file for a later use. You can import and pre-populate the common values in the template for a later use.

13. Click **Next**.
14. Optional Step: Click **Save Selection** to save the entries. Click **Import Selection** to import the saved data on your system.
15. Click **Next**.

16. In the **Review Inputs** window, each entry is validated and if there is an issue with any of the entries, you receive a Validation Error message. The error message describes the details of the error. Click **Next**.



Note If a pop-up message is displayed that the Cisco Provider DLL is not installed on the SCVMM server, click **Yes** and browse to the location of the Cisco Provider Installation file (named Nexus1000V-VSEMPProvider-5.2.1.SM1.5.1.0.msi) in the installation package. Wait for a while before the Provider is installed and the review window is displayed.

17. The installation begins and the **Track Progress** window displays each step of the installation process in real time. The green dot next to the step indicates the completion of that particular step. A typical installation of the VSM takes about 6-8 minutes in standalone mode. If you are deploying the VSM in HA mode, installation takes about 10-15 minutes.

When the installation process completes, the Confirmation window is displayed.

18. Click **Next**.
19. The **View Installation Summary** window provides a brief summary along with a confirmation of the successful installation.



Warning

Do not click Next until all the steps are completed. If you click Next, installation is half-complete.

20. Click **Finish**.
21. To change the password on the VSM and on the SCVMM, complete the following steps.

Enter the following command to change the password on the VSM:

```
switch(config)# username admin password Sfish@123
switch(config)# copy r s
[#####] 100%
Copy complete, now saving to disk (please wait)...
```

Modify the password on the SCVMM as follows:

Click **Settings --> Security --> Run As Accounts --> Select** and open the properties of the VSM Run as Account and modify the password and **Refresh** the Cisco Nexus 1000V Extension Manager.

Sample Configuration

Installer App creates the following Logical Switches on the SCVMM:

1. MSFT Logical Switch for VSM Connectivity, for example, Microsoft_Switch_HP-357
2. Nexus 1000V Logical Switch, for example, n1kv_HP-357 where HPV-357 appended is the VSM name provided by the user during the installation.

Installer App creates a sample configuration for the network uplink as follows:

```
switch# sh nsm network uplink
uplink network: n1kv_uplink_network_1993_HP-357
  Publish-name: n1kv_uplink_network_1993_HP-357
  import port-profile: n1kv_uplink_network_policy_HP-357
  network segment pool:
    n1kv_network_segment_pool_HP-357
  System Uplink-Network: TRUE
  Switchport mode override: auto
  Native network segment: n1kv_vmaccess_1993_HP-357
  port-profile config:
```

```
switchport mode trunk
switchport trunk allowed vlan 415,1993
switchport trunk native vlan 1993
```

In this example, the HPV-357 appended is the VSM name provided by the user during the installation. Refer to Cisco Nexus 1000V for Microsoft Hyper-V Network Segmentation Manager Guide for more configuration options.

Installing Cisco Nexus 1000V for Microsoft Hyper-V Manually

Refer to the following sections for installing Cisco Nexus 1000V for Microsoft Hyper-V:

- [Installing SCVMM Components, page 1-11](#)
- [Installing and Configuring VSM Workflow, page 1-12](#)
- [Configuring SCVMM Fabric Workflow, page 1-16](#)

Installing SCVMM Components

Install the SCVMM components as described in the following steps:

1. Install Cisco Provider MSI.
 - a. Install the *Nexus1000V-VSEMPProvider-5.2.1.SMI.5.1.0.msi* from the Cisco Nexus1000V zip location on SCVMM Server in order to establish communication between SCVMM and Cisco Nexus1000V VSM.



Note It restarts the SCVMM service.

- b. Verify that the Cisco Provider is installed properly by completing the following steps:
 - Open SCVMM console.
 - Navigate to Settings Pane.
 - Click on Configuration Providers.
 - c. Verify the Cisco Systems Nexus 1000V extension is displayed.
2. Install Cisco VSM template files.

After downloading the Cisco Nexus 1000V for Microsoft Hyper-V package, complete the following steps to install the VSM template:

 - On SCVMM server, open the PowerShell console from the SCVMM console.
 - Run the script *Register-Nexus1000VSMTemplate.ps1* from the installation package.
 - This script imports the Cisco VSM Template in SCVMM Library.
 3. Copy VEM to SCVMM repository.

The VEM is an MSI file that needs to be placed in the following location on SCVMM server: *ALLUSERSPROFILE%\Switch Extension Drivers*, for example, *C:\ProgramData\Switch Extension Drivers*. SCVMM uses the MSI file during Add host operation.



Warning

Do not install the VEM on the SCVMM server. Only copy the file to the location specified.

4. Copy VSM ISO file, for example, N1000vh-dk9.5.2.1.SM1.5.0.339 to SCVMM library in the following location on SCVMM server: \\VMName\MSSCVMMLibrary. After copying the ISO file, make sure to refresh the SCVMM library so that SCVMM detects the copied ISO.

Installing and Configuring VSM Workflow

Complete the following steps to install and configure VSM workflow:

1. Create Microsoft switch for VSM connectivity.
2. Install VSM VM using VM Template. Refer to [Installing VSM using VM Template, page 1-12](#) for more information.
3. Configure VSM. Refer to [Configuring VSM, page 1-13](#) for more information.

Installing VSM using VM Template

Once Microsoft switch is created, install VSM VM using a VM template after completing the following steps:

1. From the left navigation pane in the SCVMM user interface, click **VMs and Services** icon and choose **Create Virtual Machine** from the top menu bar. The **Create Virtual Machine Wizard** window opens up.
2. In the **Select Source** panel, choose **Use an existing virtual machine, VM template, or virtual hard disk** option and click **Browse**. Choose the **Nexus1000V_VSM_Template** file listed under the **Type: VM Template** header. Click **OK** and click **Next**.
3. In the **Specify Virtual Machine Identity** panel, enter the name of the virtual machine and click **Next**.
4. In the **Configure Hardware** panel, configure the hardware settings for the virtual machine. If you are using a template, most of the settings have already been configured (For example, the hard drive is set to 4 GB and there are 3 network adapters). The only item that you have to manually configure is the ISO image. Click **Virtual DVD drive** below the **Bus Configuration** header in the center pane. Click **Existing ISO image file** and click **Browse**. Choose the ISO image from SCVMM library, click **OK**, and click **Next**.
5. In the **Select Destination** panel, keep the default settings of **Place the virtual machine on a host; Destination: All Hosts**. Click **Next**.
6. Once the host is displayed in the **Select Host** panel, select it and click **Next**.
7. In the **Configure Settings** panel, review the settings and click **Next**.
8. In the **Select Networks** panel, specify the virtual switches that are used for the virtual machine. For each network adapter, select the type of the virtual switch, for example, **Standard Switch** or **Logical Switch**. Click **Next**.
9. In the **Add Properties** panel, keep the default settings of the **Automatic Actions**. Click **Next**.
10. In the **Confirm the Settings** panel in the final Summary window, review and confirm the settings. Click **Create** to begin the virtual machine creation. A progress bar is displayed in the **Job Status** column in the VM window.
11. Once the virtual machine creation is complete, right-click the **Name** of the virtual machine in the SCVMM user interface and choose **Power On**. Right-click the **Name** of the virtual machine again, click **Connect or View**, and choose **Connect via Console**.

Refer to the following table for more information on the Cisco Nexus 1000V ISO boot options.

Table 1-1 Cisco Nexus 1000V ISO Boot Options

No.	Boot Option	If the disk is unformatted	If disk is formatted
1	Install Cisco Nexus 1000V and bring up the new image	<ul style="list-style-type: none"> • Boot the kickstart image from ISO • Format the disk and copy the images from ISO to bootflash: • Load the system image 	<ul style="list-style-type: none"> • Boot the kickstart image from ISO • Copy the images from ISO to bootflash: • Load the system image
2	Install Cisco Nexus 1000V and go to VSH shell	<ul style="list-style-type: none"> • Boot the kickstart image from ISO • Format the disk and copy the images from ISO to bootflash: • Start VSH shell 	<ul style="list-style-type: none"> • Boot the kickstart image from ISO • Copy the images from ISO to bootflash: • Start VSH shell
3	Install Cisco Nexus 1000V only if the disk is unformatted, and bring up the new image	Same as option #1	<ul style="list-style-type: none"> • Boot the kickstart image from ISO • Try to load the system image from the disk with the same name as that in ISO • If the image is not found, start VSH shell
4	Install Cisco Nexus 1000V only if the disk is unformatted and go to VSH shell	Same as option #1	<ul style="list-style-type: none"> • Boot the kickstart image from ISO • Start VSH shell

Configuring VSM

After installing VSM using a VM template, connect to a VM console and configure the VSM. We recommend that the VSM should be deployed using the template provided by Cisco. Once the deployment is complete, power on the VSM. The following basic inputs are required for the VSM configuration:

1. Switch Name
2. Domain ID
3. Management Address
4. Subnet Mask
5. Gateway Address



Note

Make sure to eject the virtual ISO image from the CDROM.

Deploying VSM

Deploy the VSM as outlined in the following steps:

1. The **Virtual Machine Viewer** window opens up. While it processes, it stops at the command prompt with the following message: *Do you want to format it? (y/n)*. Enter **Y** for yes at the prompt.
2. At the next command prompt, the following message is displayed: *Perform r/w tests (takes very long time) on target disks? (y/n)*. Enter **Y** for yes at the prompt.

3. After the software is copied and the CD-ROM drive is mounted, you are prompted to enter the **System Administrator Account Setup**. At the **Enter the password for “admin”:** prompt, enter the password. At the **Confirm the password for “admin”:** prompt, re-enter the password.
4. Enter the high availability (HA) role at the next prompt **Enter HA role [standalone/primary/secondary]**, for example, primary.



Note We recommend that you create a VSM high availability pair. Configure the first VM as the primary VSM and install the second VM as the secondary VSM.

If you set the HA role as secondary, the following question is displayed at the prompt: **Setting HA role to secondary will cause a system reboot. Are you sure (yes/no)?**: Enter **Yes** if you want to set the HA role to **Secondary**.

5. Enter the domain ID at the prompt: **Enter the domain ID[1-1023]**, for example, 199. A domain ID is required for the VSMs to communicate with each other.
6. After step 5 for secondary VSM, the message is displayed: **saving boot configuration** and the system reloads.
7. At the next prompt, the **Basic System Configuration Dialog** is displayed. Enter **Yes** at the prompt.
8. At the next command prompt, the following message is displayed: **Create another login account? [yes/no] (n)**. Select **No** to skip creating another login account.



Note The defaults are used if you do not change the values.

9. Enter the switch name, for example, **Nexus1000V-Eng**.
10. Press **Y** for yes when prompted to continue with the out-of-band management configuration.
11. Enter the *Mgmt0* IPv4 address for the VSM, for example, 10.10.10.4. You can enter any IP address.
12. Enter the *Mgmt0* IPv4 netmask, for example, 255.255.255.0.
13. At the next command prompt, the following message is displayed: **Configure the default gateway?** Enter **Y** for yes.
14. Enter the IPv4 address of the default gateway, for example, 10.10.10.5.
15. At the next command prompt, the following message is displayed: **Vem feature level will be set to 5.2(1)SM1(5.1). Do you want to reconfigure? (yes/no) [n]**: Press **Enter** at the prompt to enter the default value.
16. The following message is displayed: **Would you like to edit the configuration? (yes/no) [n]**: Press **Enter** at the prompt to enter the default value.
17. Complete steps 1 to 5 to configure the secondary VSM with an HA role.
18. Verify the HA role using the command **show system redundancy status** on primary and secondary VSMs.

Logging into VSM

After completing these steps, you are prompted to log into the VSM. Access the VSM via SSH using the IP address configured in the VSM installation section. The following minimal objects need to be created on the VSM:

1. Logical Network
2. Network Segment Pool

3. IP Pool Template
4. Network Segment
5. Virtual Ethernet Port Profile
6. Ethernet Port Profile
7. Network Uplink

Complete the following steps to configure the VSM:

1. Enter the configuration mode using the command **config t**.
1. Create a Logical Network using the command **nsm logical network <name>** at the prompt to configure the SCVMM networking fabric, for example, **nsm logical network Intranet**. Type **exit**. You can enter any name for the Logical Network.
2. Create a Network Segment Pool using the command **nsm network segment pool <name>**, for example, **nsm network segment pool IntranetSJ**.
3. Associate the Network Segment Pool to the Logical Network using the command: **member-of logical-network <name>**, for example, **member-of logical-network Intranet**. Type **exit**.
4. Create an IP pool template using the command **nsm ip pool template <name>**, for example, **nsm ip pool template pool10**.
5. Configure the IP address range and network IP address range using the commands, for example, **ip address <30.0.0.2> <30.0.0.100>** and **network <30.0.0.2> <255.255.255.0>**.
6. Create a Network Segment using the command using the command, **nsm network segment <name>**, for example, **nsm network segment VMNetworkA**.
7. Enter the command **switchport access vlan 100**.
8. Associate the Network Segment Pool to the Network Segment using the command **member-of network segment pool <name>**, for example, **member-of network segment pool IntranetSJ**.
9. Import the IP pool template to the Network Segment using the command **ip pool import template <name>**, for example, **ip pool import template pool10**.
10. Create a VLAN inside the Network Segment using the command **switchport access vlan <number>**, for example, **switchport access vlan 100**.
11. Publish the Network Segment using the command **publish network segment <name>**, for example, **publish network segment VMNetworkA**. Type **exit**.
12. Create a virtual Ethernet port profile using the command **port-profile type vethernet <name>**, for example, **port-profile type vethernet UplinkNoPortChannel**.
13. Enter the **no shutdown** command to keep the system in a power-on state. Enter **state enabled** at the prompt.
14. Publish the port profile using the command **publish port-profile** and type **exit**. The port profile is imported for publishing the Network uplink.
15. Create a type Ethernet policy before the creation of Network Uplink:


```
switch(config)# port
port-channel          port-group-monitor  port-monitor          port-profile
switch(config)# port-profile type ethernet eth-pp-policy
switch(config-port-prof)# no shutdown
switch(config-port-prof)# state enabled
switch(config-port-prof)# exit
```
16. Create a Network Uplink using the command **nsm network uplink NexusUplink**.

17. Associate the Network Segment Pool using the command **allow network segment pool** *IntranetSJ*, for example, **allow network segment pool** *IntranetSJ*.
18. Import the port profile that was created earlier using the command **import port-profile** *<name>*, for example, **import port-profile eth-pp-policy**.
19. Publish the Network Uplink using the command **publish network uplink** *<name>*, for example, **publish network uplink** *NexusUplink*.
20. Copy the running configuration to the start-up configuration using the **copy running-config startup-config** command. The following message is displayed in the window: *Copy complete, now saving to disk (please wait)*
21. Enter the **show running-config** command to verify the configuration.

**Note**

The setup script configures the VSM to function in L3 control mode. L2 control mode is not supported with Cisco Nexus 1000V for Microsoft Hyper-V. When configuring L3 control with Microsoft Hyper-V, you do not need to create a port profile with capability L3control. The VSM communicates with the Microsoft Server 2012 management interface directly. There is no need to create a special vEthernet port profile to be assigned to the Windows 2012 host.

Configuring SCVMM Fabric Workflow

Complete the following steps to configure SCVMM fabric workflow:

1. Add Switch Extension Manager (Connect SCVMM to VSM). Refer to [Connecting SCVMM to VSM, page 1-16](#) for more information.
2. Create Logical Switch. Refer to [Creating Logical Switch in SCVMM, page 1-17](#) for more information.
3. Create VM Networks. Refer to [Configuring VM Network, page 1-18](#) for more information.

Connecting SCVMM to VSM

Once the VSM is up, configure the SCVMM networking fabric for the Nexus 1000V.

**Note**

Check and turn off the proxy server settings for your LAN in the Internet Options settings window of Internet Explorer before proceeding to the next steps.

Complete the following instructions to retrieve the objects from the VSM to SCVMM.

1. When the VSM is up, log in to the VSM using SSH and the IP address configured in the previous section.
2. From the SCVMM administrator console, navigate to the **Fabric** pane.
3. On Fabric Pane under **Networking**, select **Switch Extension Manager**.
4. Right click to add a **New Extension Manager**. The **Add Virtual Switch Extension Manager Wizard** window is displayed.
5. In the General panel of the **Add Virtual Switch Extension Manager Wizard** window, enter the connection settings for the extension manager as outlined in the following steps:
 - a. Select a manufacturer, for example, *Cisco Systems*.
 - b. Select the model type, for example, *Nexus 1000V*.

- c. Select the configuration provider for the extension manager, for example, *Cisco Systems Nexus 1000V*.
 - d. Enter the IP address of the VSM in the connection string, for example, *http://10.10.10.4*.
 - e. Create a run as account for the VSM. In the **Run As account** field, click **Browse...** The **Select a Run As Account** window opens up.
 - f. In the **Select a Run As Account** window, select an account from the available options or click **Create Run As account** tab to create an account for the VSM. A **Create Run As account** window opens up.
 - g. In the **Create Run As account** window, enter the following VSM credentials:
 - Enter the name of the account in the **Name** field as *VSM_admin*.
 - Enter the description of the account in the **Description** field.
 - Enter the user name in the **User Name** field and the password in the **Password** field.
 - Confirm the password in the **Confirm password** field.
 - Uncheck the **Validate Domain Credentials** box as the Active Directory cannot be validated with the credentials.
 - Click **OK**.
 - The new account, for example, *VSM_admin* is displayed in the **Select a Run As Account** window. This is a one-time procedure for the VSM.
 - h. Select the new account and click **OK** in the **Select a Run As Account** window.
6. Click **Next**.
 7. In the Host Groups panel, select a few or all the host groups that can use the virtual switch extension manager and click **Next**.
 8. In the Summary panel, confirm the settings and click **Finish**.

Once the Virtual Switch Extension Manager has been successfully added, it is listed in the main window in the SCVMM user interface at the path: **Fabric -> Switch Extension Managers**.

Creating Logical Switch in SCVMM

Once the Virtual Switch Extension Manager has been added, create a logical switch on VMM. Define the extensions and port profiles for the logical switch, create classifications that contain the native port profile and a port profile for each extension as outlined in the following steps.

Complete the following steps to create the logical switch:

1. In the SCVMM user interface, click **Logical Switches** under **Networking** in the left navigation panel. The **Create Logical Switch Wizard** window is displayed.
2. The Getting Started panel opens up. Review the instructions and click **Next**.
3. In the General panel, add a name for the logical switch in the **Name** field, for example, *N1000V_Test*.
4. Click **Next**.
5. In the Extensions panel, the virtual switch extensions are listed. Choose the extensions that you want to use with the logical switch. The following extensions are displayed in the Virtual switch extensions panel:
 - Microsoft NDIS Capture, Extension type: Monitoring
 - Microsoft Windows Filter, Extension type: Filter

- Configured VSM, Extension type: Forwarding

Select the Cisco extension. Only one forwarding extension can be selected.

6. Click **OK** and click **Next**.
7. In the Uplink panel, specify the uplink port profiles that are part of this logical switch. The uplink port profiles are available for use on the hosts where an instance of the logical switch is created.
 - Choose **Team** in the **Uplink mode** field to select multiple uplinks.



Note Even if you use a single uplink or multiple uplinks, the mode should always be **Team**.

- In the Uplink port profiles field, click **Add..** The Add Uplink Port Profile window opens up. Select a port profile that is available for use by the host physical adapter that connects to this logical switch.
 - Click **Next**.
8. In the Virtual Port panel, click **Add..** The **Add Virtual Port** window opens up.
 - Choose the VSM by checking the *Nexus 1000v-Test* check box.
 - Select the port profile from the drop-down menu. Select a port profile classification for the port profile, for example, *AllAccess1*.
 - Click **Browse..** in the **Port Classification** field. Assign the selected port profile to a port classification in the **Select a Port Profile Classification** window.
 - Click **Create Port Classification...** The **Create Port Classification Wizard** window opens up. Enter the name for the port profile classification in the **Name** field, for example, *AllAccess1*. Enter the description for the port profile classification in the **Description** field.
 - Click **OK**. Now the selected port classification is displayed in the **Select a Port Profile Classification** window.
 - Choose the Port Profile Classification you just created and click **OK**.
 9. Click **OK** to finish adding the Virtual Port.
 10. Click **OK** and click **Next** to close the **Create Logical Switch Wizard** window.
 11. In the Summary panel, confirm the settings and click **Finish**. Now the logical switch is created.

The defined configuration is available on every host that uses the logical switch and the hosts, virtual switches, and virtual machines remain in compliance with their associated logical switch



Note

If you want to add more port profiles to the VSM, you have configure the properties again. All the hosts should be configured for multiple uplinks. To update the properties and add more uplink port profiles, right-click the logical switch in the SCVMM user interface and click **Properties**.

Configuring VM Network

Once the logical switch and the hosts are configured, complete the following steps to configure the VMs and associate the network segments to the VMs.

1. Click **VMs and Services** in the left navigation panel of the SCVMM user interface.
2. Click **VM Networks**. Right-click and select the **Create VM Network** option. The **Create VM Network Wizard** window opens up.

3. In the **Name** panel, specify the name for the VM network in the **Name** field. Enter the description for the VM network in the **Description** field. For example, add a name for the **VM network** as **VM_network**. If the name is same as the network-segment name, it is easy for the customers to do the mapping.
4. Select the logical network for the VM network in the **Logical Network** field.
5. Click **Next**.
6. In the Isolation panel, select **Automatic** to configure the isolation for the VM network automatically or select **Specify an externally supplied VM network** to configure the isolation externally. Confirm the **External VM Network** that was previously created, for example, **VM_Network**.
7. Click **Next**.
8. In the Summary panel, confirm the settings and click **Finish**.

The new VM network is displayed in the **VM Networks and IP Pools** panel in the SCVMM user interface.

Preparing Microsoft Hyper-V Hosts

Prepare Microsoft Hyper-V hosts before adding hosts to the logical switch. This is an optional step. Refer to the following sections for MTU configuration and change the RSS registry.

MTU configuration with Cisco Nexus 1000V:

In Microsoft Hyper-V, the VSM does not manage the MTU setting of VM NIC or physical adapters. All physical adapters added to the Cisco Nexus 1000V switch should have the same MTU configured and the PNIC MTU should not be changed after it is added to the switch.

Complete the following steps to configure MTU:

1. Open View Network Connections.
2. Right click on the adapter and select properties.
3. Click Configure under the adapter properties window.
4. Click Advanced tab.
5. Click on Jumbo Packet under Property.
6. Set the desired value of Jumbo Packet property.

Repeat these steps for all the adapters that are added to Cisco Nexus 1000V logical switch.

Certain adapters allow the MTU change only via their own adapter manager. For example, Cisco VIC cards MTU can be changed via UCSM or ILO.

VMQ Processor Configuration with Cisco Nexus 1000V

VMQ allows the network traffic received on an adapter to be spread over multiple CPU cores thereby providing better performance. For VMQ to operate correctly with Cisco Nexus 1000V, two factors are significant:

- RSS base CPU number [determines the lowest CPU core that can be used by RSS]
- Maximum number of RSS CPU [determines how many CPU cores can be used by RSS]

The above two factors should be set in such a way that same CPU core is not used by multiple NICs.

**Note**

Changing RSS registry is a disruptive operation and causes Ethernet Adapter to flap.

Cisco Nexus 1000V supports the following port-channel operational modes, LACP and vPC.

LACP utilizes same Subgroup id for all members of the port-channel. Therefore, Rss Base CPU and MaxRss Processors should be set with same value for all member ports.

MAC pinning / Manual pinning port-channel use multiple subgroup id within the members of the port-channel. Therefore, Rss Base CPU and Max Rss Processors should be set in such a way that same CPU core is not used by multiple NIC.

Steps to change RSS registry:

Complete the following steps to change RSS registry:

1. Open View Network Connections.
2. Right click on adapter and select properties.
3. Click Configure under adapter properties window.
4. Click Advanced tab.
5. Click on Maximum Number of RSS Processor under Property and Set the value.
6. Click on Starting RSS CPU under Property and set the value.

Repeat the steps for all the adapters that you want VMQ to be enabled.

Rss setting cannot be modified via Network connections for certain adapters. For those adapters, user needs to set the registry keys directly using the registry editor. Check Microsoft documentation for changing the registry.

Adding Hosts to Logical Switch

Once the logical switch is created, you can update the properties of the logical switch after completing the following steps.

1. In the left navigation pane, select the server, for example, **Hyper-V server** under **Fabric > Servers > All Hosts**, right-click, and choose **Properties**. The **Properties** window opens up.
2. Click **Virtual Switches** in the left navigation pane of the **Properties** window.
3. In the **Virtual Switches** panel, click in the **New Virtual Switches** field from the top menu bar and select **New Logical Switch**. Select the correct Logical Switch and physical adapters to assign to the Logical Switch. The module is added to Cisco Nexus1000V VSM in a short while.

**Note**

MGMT PNIC can be added to Logical Switch only during Switch creation time. Adding it later results in a loss of host connectivity.

4. The *Nexus1000V_Test Logical Switch* is displayed in this example. Under the **Physical Adapter** header, choose a network adapter from the drop-down list in the **Adapter** field. Confirm the uplink port profile for the adapter in the **Uplink Port Profile** field.
5. Click **Add** to add a second network adapter. Choose a different network adapter, confirm the uplink port profile and click **OK**.

**Note**

Do not use the same port profile for both adapters. If you have configured the port channels, then you can use the same port-profile on both the adapters. Refer the NSM Configuration Guide for more details.

Now, the Cisco Nexus 1000V package that was copied on the SCVMM is installed on the host.

**Note**

We recommend that one logical switch is created per one VSM.

Connecting VMs to Logical Switch

Complete the following steps to connect VMs to the Cisco Nexus 1000V Logical Switch:

1. Select VM network adapter.
2. Connect the VM network adapter to Logical Switch. Refer to [Connecting VM Network Adapter to Logical Switch, page 1-21](#) for more information.

Connecting VM Network Adapter to Logical Switch

Once the new VM network is configured, you can deploy a VM to a VM Network as follows:

1. Select the server on which the VM is installed in the SCVMM user interface. In the left navigation pane under **VMs and Services > All Hosts**, click the **Hyper-V server**. In the main window, right-click the virtual machine that you have created, for example, *server2012_TestVM*, and choose **Properties**.
2. In the properties file, click **Hardware Configuration** in the left navigation pane.
3. In the Hardware Configuration panel, select **NetWork Adapter**. In the Network Adapter 1 panel on the right, choose **Connected to a VM Network**.
4. Select browse to find the VM network created in earlier section.
5. Click **OK**.
6. Connect the adapter to a combination of VM Network and Port Classification. In the Hardware Configuration panel, under Virtual Switch, select the logical switch in the **Logical Switch** field, for example, *Nexus1K_LS*. For the classification, choose the previously created port profile in the **Classification** field, for example, VethPP.
7. Click **OK**.

The Cisco Nexus 1000V for Microsoft Hyper-V installation is now complete.

