# Configuring the Cisco Nexus 1000V Switch for Microsoft Hyper-V

This chapter contains the following sections:

# About Microsoft System Center Virtual Machine Manager

Microsoft System Center Virtual Machine Manager (SCVMM) 2012 SP1 is a comprehensive IT infrastructure, virtualization, and cloud management platform. With this platform, you can manage your applications and services across multiple hypervisors and across public, hosted, and private cloud infrastructures to deliver flexible and cost-effective IT services. Microsoft SCVMM allows you, as the administrator, to configure and manage the servers, the network, and the storage resources.

Microsoft SCVMM 2012 SP1 introduces the following constructs to model and configure the networks on the Hyper-V servers:

- Logical network
- Network site
- VM network

- VM subnet

- IP pool

- Uplink profile

- Port classification

- Logical switch

# About the Cisco Nexus 1000V Switch for the Microsoft Hyper-V Configuration

Microsoft SCVMM SP1 models the physical networks as a fabric. The Cisco Nexus 1000V has introduced a capability to configure and edit the following new objects based on Microsoft SCVMM SP1 network object model:

- Logical networks

- Network segment pools (results in the creation of network sites on virtual machine manager [VMM])

- Network segments (results in the creation of a virtual machine [VM] network and VM subnet)

- IP pools

- Network uplink

### Logical Networks and Network Segment Pools

A logical network (for example, Internet or intranet) is a connectivity abstraction that models separate networks managed by an enterprise. A logical network is composed of one or more network segment pools, and each network segment pool is a group of VLANs, IP subnets, or VLAN/IP subnet pairs. The logical network hides the VLANs and IP subnets that make the network from all the users (the VM network administrators, the tenant administrators, and the server administrators) other than the fabric administrator managing the physical fabric.

### Network Segments

A network segment is associated with a unique broadcast domain. A network segment facilitates the availability of the network resources to a virtual machine. Microsoft SCVMM uses the VM networks and the VM subnets to provide the isolated virtual machine networks. When the Cisco Nexus 1000V switch is used to manage the virtual network, the VMM administrator creates the VM networks that use external isolation.

As a network administrator, you can create network segment on the Cisco Nexus 1000V switch to provide external isolation. You can provide the isolated networks using the VLANs and the private VLANs.

**Note** In the Cisco Nexus 1000V for Microsoft Hyper-V, a VLAN is not created to define a bridge domain. Instead, a network segment is created on a Virtual Supervisor Module (VSM). The VSM provides the switch control and management plane for the Cisco Nexus 1000V switch. Creating a network segment triggers VLANs to be created automatically.

### IP Pools

You can assign a range of IP addresses to the hosts and to the virtual machines that are running inside the Microsoft SCVMM-managed environment using an IP pool template. The IP pool template is the address template that is applied to the network segments. When you create an IP pool template for a VM network, you can define a range of IP addresses that are used by the VMs managed by Microsoft SCVMM.

### Network Uplink

The uplink network is a combination of an Ethernet port profile and one or more network segment pools. When applied to the physical adapter on a server, the uplink network defines the policy and the VLANs that are allowed on the physical adapter. Each uplink network configured on the VSM is available as an uplink port profile to the Microsoft SCVMM administrator.

# Configuring the Cisco Nexus 1000V Switch for Microsoft Hyper-V

**Step 1**     Create a logical network. For more information about how to create a logical network, see Creating a Logical Network, on page 5.

**Step 2**     Create a network segment pool and associate the network segment pool to the logical network. For more information about how to create a network segment pool, see Creating a Network Segment Pool,  on page 6.

**Step 3**     Create an IP pool template. For more information about how to create an IP pool template, see Creating an IP Pool Template,  on page 8.

**Step 4**     Create a network segment. For more information about how to create a network segment, see Creating a Network Segment,  on page 9.

**Step 5**     Create a port profile. For more information about how to create a port profile, see Creating a Port Profile.

**Step 6**     Create an uplink network. For more information about how to create an uplink network, see Creating an Uplink Network, on page 12.

# Managing Logical Networks

**Step 1**     On the menu bar, choose **Physical** > **Network**.

**Step 2**     In the **Network** pane, choose the pod.

**Step 3**     In the **Managed Network Elements** tab, choose the Cisco Nexus 1000V switch to be configured.

**Step 4**     Click **View Details**.

**Step 5**     Click the **Logical Network** tab.
The logical networks created in the Cisco Nexus 1000V switch are displayed. The **Logical Network** tab provides the following actions:

| Action | Description |
| --- | --- |
| **Refresh** | Refreshes the current page. |
| **Favorite** | Adds this page to the **Favorites** tab which displays the page that you go to most often. |
| **Create Logical Network** | Creates a logical network in the Cisco Nexus 1000V switch. |

When you choose a logical network, the following action appears:

| Action | Description |
| --- | --- |
| **Delete Logical Network** | Deletes a logical network. |

# Creating a Logical Network

**Step 1**  Navigate to the **Logical Network** tab.
For the procedure to navigate to the **Logical Network** tab, see

**Step 2**  Click **Create Logical Network**.

**Step 3**  In the **Create Logical Network** dialog box, complete the following fields:

| Name | Description |
|---|---|
| **Logical Network Name** field | The name of the logical network. |
| **Logical Network Description** field | The description of the logical network. |
| **No Mode Isolation** check box | Check this check box to configure Hyper-V Network Virtualization (HNV) logical network. HNV provides virtual networks (called VM networks) to virtual machines, similar to how server virtualization (a hypervisor) provides virtual machines to the operating system.<br>**Note**    This feature is supported in Nexus 1000v HyperV 5.2(1) SM3(1.1) and later releases. |
| **Copy Running configuration to Startup configuration** check box | Check this check box to copy the running configuration to the startup configuration. |

**Step 4**  Click **Submit**.

# Managing Network Segment Pools

**Step 1**  On the menu bar, choose **Physical** > **Network**.

**Step 2**  In the **Network** pane, choose the pod.

**Step 3**  In the **Managed Network Elements** tab, choose the Cisco Nexus 1000V switch to be configured.

**Step 4**  Click **View Details**.

**Step 5**  Click the **Network Segment Pool** tab.

The network segment pools available in the Cisco Nexus 1000V switch are displayed. The globally unique identifier (GUID) of the network segment is displayed. The **Network Segment Pool** tab provides the following actions:

| Action | Description |
| --- | --- |
| **Refresh** | Refreshes the current page. |
| **Favorite** | Adds this page to the **Favorites** tab which displays the page that you go to most often. |
| **Create Network Segment Pool** | Creates a network segment pool for the Cisco Nexus 1000V switch. |

When you choose a network segment pool, the following actions appear:

| Action | Description |
| --- | --- |
| **Delete Network Segment Pool** | Deletes a network segment pool. |
| **Update Network Segment Pool** | Updates a network segment pool. |

# Creating a Network Segment Pool

**Step 1**  Navigate to the **Network Segment Pool** tab.
For more information about how to navigate to the **Network Segment Pool** tab, see Managing Network Segment Pools, on page 5.

**Step 2**  Click **Create Network Segment Pool**.

**Step 3**  In the **Create Network Segment Pool** dialog box, complete the following fields:

| Name | Description |
| --- | --- |
| **Network Segment Pool** field | The name of the network segment pool. |
| **Logical Network Name** field | Click **Select** and choose a logical network to which you want to associate the network segment pool. |
| **Segment Type** drop-down list | Choose **VLAN**, **VXLAN**, or **HNV** as the segment type to accordingly configure the network segment pool. |
| **Multicast IP** field | This field appears when you choose **VXLAN** as the segment type. The multicast IP address that needs to be assigned to the network segment pool. |

| Name | Description |
|---|---|
| **Intra Port Communication** check box | Check this check box to enable the intra port communication. |
| **Copy Running configuration to Startup configuration** check box | Check this check box to copy the running configuration to the startup configuration. |

**Step 4**       Click **Submit**.

# Managing IP Pool Templates

**Step 1**       On the menu bar, choose **Physical** > **Network**.

**Step 2**       In the **Network** pane, choose the pod.

**Step 3**       In the **Managed Network Elements** tab, choose the Cisco Nexus 1000V switch to be configured.

**Step 4**       Click **View Details**.

**Step 5**       Click the **IP Pool Template** tab.
The IP pool templates available in the Cisco Nexus 1000V switch are displayed. The **IP Pool Template** tab provides the following actions:

| Action | Description |
|---|---|
| **Refresh** | Refreshes the current page. |
| **Favorite** | Adds this page to the **Favorites** tab which displays the page that you go to most often. |
| **Create IP Pool Template** | Creates an IP pool template that defines the IP-pool range to be used when virtual machines are deployed on a VLAN-based virtual machine network. |

When you choose an IP pool template, the following actions appear:

| Action | Description |
|---|---|
| **Delete IP Pool Template** | Deletes an IP pool template. |
| **Update IP Pool Template** | Updates the IP pool template. |

# Creating an IP Pool Template

**Step 1**     Navigate to the **IP Pool Template** tab.
For more information about how to navigate to the **IP Pool Template** tab, see

**Step 2**     Click **Create IP Pool Template**.

**Step 3**     In the **Create IP Pool Template** dialog box, complete the following fields:

| Name | Description |
|---|---|
| **IP Pool Template Name** field | The name of the IP pool template. |
| **Description** field | The description of the IP pool template. |
| **IP Address From Range** field | The first IP address of the IP pool. |
| **IP Address To Range** field | The last IP address of the IP pool. |
| **Network Address** field | The network address range of the IP pool template. |
| **Network Subnet Mask** field | The subnet mask address of the IP pool template. |
| **Default Router** field | The gateway IP address of the IP pool template. |
| **DNS Server** field | The DNS server IP address of the IP pool template. |
| **DNS Suffix** field | The DNS suffix of the IP pool template. |
| **Netbios Name Server** field | The IP address of the NetBIOS name server for the IP pool template. |
| **Netbios** drop-down list | Choose **disabled** or **enabled**. |
| **Copy Running configuration to Startup configuration** check box | Check this check box to copy the running configuration to the startup configuration. |

**Step 4**     Click **Submit**.

# Managing Network Segments

**Step 1**  On the menu bar, choose **Physical** > **Network**.

**Step 2**  In the **Network** pane, choose the pod.

**Step 3**  In the **Managed Network Elements** tab, choose the Cisco Nexus 1000V switch to be configured.

**Step 4**  Click **View Details**.

**Step 5**  Click the **Network Segment** tab.
The network segments available in the Cisco Nexus 1000V switch are displayed. The **Network Segment** tab provides the following actions:

| Action | Description |
|---|---|
| **Refresh** | Refreshes the current page. |
| **Favorite** | Adds this page to the **Favorites** tab which displays the page that you go to most often. |
| **Create Network Segment** | Creates a network segment on the Cisco Nexus 1000V switch. |

When you choose a network segment, the following actions appear:

| Action | Description |
|---|---|
| **Delete Network Segment** | Deletes a network segment. |
| **Update Network Segment** | Updates a network segment. |
| **Publish Network Segment** | Publishes the network segment to SCVMM. |

# Creating a Network Segment

**Step 1**  Navigate to the **Network Segment** tab.
For procedure to navigate to the **Network Segment** tab, see Managing Network Segments, on page 9.

**Step 2**  Click **Create Network Segment**.

**Step 3**  In the **Create Network Segment** dialog box, complete the following fields:

| Name | Description |
|------|-------------|
| **Network Segment Name** field | The name of the network segment. |
| **Network Segment Description** field | The description of the network segment. |
| **Network Segment Type** drop-down list | Choose **Ethernet** or **vethernet** as the network segment type. |
| **IP Subnet** field | The subnet IP address of the network segment.<br>**Note**     This feature is supported in Nexus 1000v HyperV 5.2(1) SM3(1.1) and later releases. |
| **IP Pool Template Name** field | Click **Select** and choose an IP pool template for the network segment. |
| **Network Segment Pool** field | Click **Select** and choose a network segment pool for the network segment. |
| **Tenant VRF** field | Click **Select** and choose a tenant Virtual Routing and Forwarding (VRF) for the network segment. For more information about the tenant VRF, see<br>. |
| **System Network Segment** check box | Check this check box to configure the segment as a system segment. |
| **Type** drop-down list | Choose **VLAN**, **PVLAN**, or **VXLAN** as the type for network segment. |
| **VLAN** field | This field appears when you choose the type as **VLAN** in the **Type** field. The valid VLAN ID of the network segment. |
| **Publish Network Segment** check box | Check this check box to publish the network segment to SCVMM. |
| **Publish Network Segment Name** field | This field appears when you check the **Publish Network Segment** check box. The default published name is the same name as the segment name. If you want to publish the segment with a different name, enter the name. |
| **Copy Running configuration to Startup configuration** check box | Check this check box to copy the running configuration to the startup configuration. |
| The following fields appear when you choose the type as **PVLAN** in the **Type** field. ||
| **Private VLAN Type** field | By default, **Primary** is displayed. Choose **Primary** or **Secondary** as the type of private VLAN. |
| **Primary VLAN** field | The valid primary VLAN ID of the network segment. |
| The following fields appear when you choose the private VLAN type as **Secondary** in the **Private VLAN Type** field. ||
| **Secondary VLAN Type** field | Choose **Host** or **Promiscuous** as the mode of secondary VLAN. |
| **Host Type** drop-down list | This field appears when you choose **Host** as the type of secondary VLAN. Choose **Community** or **Isolated** as the type of host. |

| Name | Description |
|---|---|
| **Primary VLAN** field | The valid primary VLAN ID of the network segment. |
| **Secondary VLAN** field | The valid secondary VLAN ID of the network segment. |
| The following field appears when you choose the type as **VXLAN** in the **Type** field. | |
| **Bridge Domain ID** field | The bridge domain ID of the network segment. The valid bridge domain ID range is from 4097 to 16777215. |

**Step 4**     Click **Submit**.

# Managing Network Uplinks

**Step 1**     On the menu bar, choose **Physical** > **Network**.

**Step 2**     In the **Network** pane, choose the pod.

**Step 3**     In the **Managed Network Elements** tab, choose the Cisco Nexus 1000V switch to be configured.

**Step 4**     Click **View Details**.

**Step 5**     Click the **Network Uplink** tab.
The uplink networks available in the Cisco Nexus 1000V switch are displayed. The **Network Uplink** tab provides the following actions:

| Action | Description |
|---|---|
| **Refresh** | Refreshes the current page. |
| **Favorite** | Adds this page to the **Favorites** tab which displays the page that you go to most often. |
| **Create Uplink Network** | Creates an uplink network. |

When you choose an uplink network, the following actions appear:

| Action | Description |
|---|---|
| **Inherit Port Profile** | Imports the Ethernet port profile that gives the policy for the uplink. |
| | In the **Inherit Port Profile Configuration** dialog box, complete the following fields: |
| | • **Network Uplink**—Displays the network uplink. |
| | • **Port Profile**—Click **Select** to choose a port profile from which you want to inherit the configuration. |
| | • **Copy Running configuration to Startup configuration**—Check this check box to copy the running configuration to the startup configuration. |
| **Delete Inherit Port Profile** | Removes the inherited policies from a port profile. |
| **Publish Network Uplink** | Publishes the network uplink to Microsoft SCVMM. |
| **Delete Uplink Network** | Deletes an uplink network. |
| **Update Uplink Network** | Updates the uplink network. |

# Creating an Uplink Network

**Step 1**  Navigate to the **Network Uplink** tab.
For more information about how to navigate to the **Network Uplink** tab, see .

**Step 2**  Click **Create Uplink Network**.

**Step 3**  In the **Create Uplink Network** dialog box, complete the following fields:

| Name | Description |
|---|---|
| **Network Uplink** field | The name of the network segment. |
| **Network Segment Pool** field | Click **Select** and choose a network segment pool. |
| **Port Profile** field | Click **Select** and choose a port profile. |
| **Network Segment** field | Click **Select** and choose a network segment. |
| **System Network Uplink** check box | Check this check box to configure the uplink as a system network uplink. |

| Name | Description |
|---|---|
| **Publish Network Uplink** check box | Check this check box to publish the network uplink to SCVMM. |
| **Copy Running configuration to Startup configuration** check box | Check this check box to copy the running configuration to the startup configuration. |

**Step 4**    Click **Submit**.

# Managing VXLAN Range

**Step 1**    On the menu bar, choose **Physical** > **Network**.

**Step 2**    In the **Network** pane, choose the pod.

**Step 3**    In the **Managed Network Elements** tab, choose the Cisco Nexus 1000V switch to be configured.

**Step 4**    Click **View Details**.

**Step 5**    Click the **VXLAN Range** tab.
The VXLAN ranges available in the Cisco Nexus 1000V switch are displayed. The **VXLAN Range** tab provides the following actions:

| Action | Description |
|---|---|
| **Refresh** | Refreshes the current page. |
| **Favorite** | Adds this page to the **Favorites** tab which displays the page that you go to most often. |

| Action | Description |
|---|---|
| **Configure VXLAN Range** | Configures the VXLAN range for the Cisco Nexus 1000V switch.<br><br>In the **VXLAN Configuration** dialog box, complete the following fields:<br><br>• **Select Device** field—Displays the selected device.<br><br>• **Configure VXLAN** check box—Check this check box to configure the VXLAN range.<br>  **Note**  Uncheck this check box and execute the **Configure VXLAN Range** action to unconfigure the VXLAN in the device.<br><br>• **VXLAN ID** field—The VXLAN ID number within the valid range.<br><br>• **Copy Running configuration to Startup configuration** check box—Check this check box to copy the running configuration to the startup configuration. |

# Managing Tenant VRF

Virtual Routing and Forwarding (VRF) implemented at core and aggregation layers provides per tenant isolation at Layer 3, with separate dedicated per-tenant routing and forwarding tables insuring that no inter-tenant (server to server) traffic within the data center will be allowed, unless explicitly configured.

**Step 1**  On the menu bar, choose **Physical** > **Network**.

**Step 2**  In the **Network** pane, choose the pod.

**Step 3**  In the **Managed Network Elements** tab, choose the Cisco Nexus 1000V switch to be configured.

**Step 4**  Click **View Details**.

**Step 5**  Click the **Tenant VRF** tab.
The tenant VRFs available in the Cisco Nexus 1000V switch are displayed. The **Tenant VRF** tab provides the following actions:

| Action | Description |
|---|---|
| **Refresh** | Refreshes the current page. |
| **Favorite** | Adds this page to the **Favorites** tab which displays the page that you go to most often. |

| Action | Description |
|---|---|
| **Create Tenant VRF** | Creates a tenant VRF for the Cisco Nexus 1000V switch.<br><br>In the **Create Tenant VRF** dialog box, complete the following fields:<br><br>• **Tenant VRF Name** field—The name of the tenant VRF.<br><br>• **Description** field—The description of the tenant VRF.<br><br>• **Logical Network Name** field—Click **Select** and choose a logical network.<br><br>• **Copy Running configuration to Startup configuration** check box—Check this check box to copy the running configuration to the startup configuration. |

When you choose a tenant VRF, the following action appears:

| Action | Description |
|---|---|
| **Delete Tenant VRF** | Deletes the tenant VRF. |