Installing the Cisco CSR 1000v in Microsoft Hyper-V Environments

Microsoft Hyper-V Support Information

(Cisco IOS XE Release 3.12S or later and Cisco IOS XE Release Denali 16.3.1 or later)—the Cisco CSR 1000v supports installation on Microsoft Hyper-V using Windows Server 2012 R2.

Note (Cisco IOS XE Denali 16.2)—Installing Cisco CSR 1000v in a Microsoft Hyper-V environment is not supported.

The Cisco CSR 1000v installation on Microsoft Hyper-V requires the manual creation of a VM and installation using the .iso file. Deploying the OVA template into a Microsoft Hyper-V environment is not supported.

The following Microsoft Hyper-V features are supported:

- Live Migration
- Snapshot
- Move
- Export
- Hyper-V Replica

For more information about Microsoft Hyper-V, see the Microsoft Windows Server 2012 R2 documentation.

Microsoft Hyper-V Limitations

This section describes the limitations when specifying VLANs on a VM interface, using the Hyper-V Manager.

(Cisco IOS XE Denali 16.3.1 or later) You can only add one VLAN for a VM interface using the Virtual Switch Manager of Hyper-V Manager.

(Cisco IOS XE 3.17 or earlier) The Cisco CSR 1000v vNIC/interface numbering may change after the Cisco CSR 1000v (running on Hyper-V) is replicated or migrated to another server. To prevent the interface numbering from changing, as a workaround, execute the `clear platform software vnic-if nvtable` command before the failover/restart occurs.

(Cisco IOS XE 3.17 or earlier) You can only add one VLAN for a VM interface using the Virtual Switch Manager of Hyper-V Manager. However, using Cisco IOS XE 3.17 or earlier, you also have the option of using a powershell CLI command **Set-VMNetworkAdapterVlan** to specify multiple VLANs. See the following example:

Set-VMNetworkAdapterVlan -**VMName** dr-vm-6-1 -**Trunk** -**AllowedVlanIdList** 1-300 -**NativeVlanId** 0

✎

Note The **Set-VMNetworkAdapterVlan** command must be re-entered every time that the Cisco CSR 1000v is reloaded. We recommend that limit the number of VLANs to 300 or below—using the **AllowedVlanIdList** parameter.

For more information on the **Set-VMNetworkAdapterVlan** powershell command, see https://technet.microsoft.com/itpro/powershell/windows/hyper-v/set-vmnetworkadaptervlan.

See also Configure virtual local area networks for Hyper-V.

Installation Requirements for Microsoft Hyper-V

The Microsoft Hyper-V requirements for Cisco CSR 1000V using Cisco IOS XE 16.12 through 17.3 releases are as follows:

- The following Microsoft Hyper-V versions are supported:
  - Windows Server 2016 is recommended - tested and meets the performance benchmarks.

- vCPUs. The following vCPU configurations are supported:
  - 1 vCPU: requires minimum 4 GB RAM allocation
  - 2 vCPUs: requires minimum 4 GB RAM allocation
  - 4 vCPUs: requires minimum 4 GB RAM allocation

- Virtual CPU cores—1 vCPU is required
- Virtual hard disk size—8 GB minimum
- Supported vNICs—NetVSC (pmap)

- Maximum number of vNICs supported per VM instance—8

- Virtual CD/DVD drive installed—required

Note   The Microsoft Hyper-V requirements for older versions of Cisco IOS XE (before IOS XE Denali 16.3) are shown in Installation Requirements for Microsoft Hyper-V—Cisco IOS XE 3.x, on page 7.

Manually Creating the Cisco CSR 1000v VM using the .iso File (Microsoft Hyper-V)

Prerequisites

Prerequisites for Manually Creating the CSR 1000v VM using the .iso File

While the following procedure provides a general guideline for how to manually create the VM for the Cisco CSR 1000v, the exact steps that you need to perform may vary depending on the characteristics of your Microsoft Hyper-V environment and setup. For more information, see Microsoft Windows Server 2012 R2 documentation.

Note   The Cisco CSR 1000v does not support deploying the OVA file in Microsoft Hyper-V environments.

Before installing the Cisco CSR 1000v on a Microsoft Hyper-V VM, the following must be installed on the host:

- Hyper-V Manager

- Failover Cluster Manager

- Virtual Switch

Although not required, it is recommended that you create the Virtual Switch prior to creating the VM for the Cisco CSR 1000v.

Configuring the Server Manager Settings

The following steps are performed on Server Manager on the host before creating the Cisco CSR 1000v VM.

SUMMARY STEPS

1. On the Server Manager, select **Dashboard** to configure the local server.
2. Select **Manager** from the top right, and then select **Add Roles and Features** from the drop-down menu.
3. Click **Next**.
4. Select **Server Roles**. In the Roles list, select the following options by clicking on the checkbox:
5. Select Features. In the Features list, select the following option by clicking on the checkbox:

6. Click **Next**.

DETAILED STEPS

Step 1   On the Server Manager, select **Dashboard** to configure the local server.

Step 2   Select **Manager** from the top right, and then select **Add Roles and Features** from the drop-down menu.

The **Add Roles and Features Wizard opens.**

Step 3   Click **Next**.

Step 4   Select **Server Roles**. In the Roles list, select the following options by clicking on the checkbox:

- **File and Storage Services**

- **Hyper-V**

Step 5   Select Features. In the Features list, select the following option by clicking on the checkbox:

- Failover Clustering

Failover clustering is required. It is not automatically installed, so you must make sure this option is checked. This feature requires that Failover Cluster Manager is installed.

Step 6   Click **Next**.

Creating the VM

To create the VM, perform the following steps:

SUMMARY STEPS

1. In Hyper-V Manager, click on the host.
2. Select **New > Virtual Machine**.
3. Click **Specify Name and Location.**
4. On the **Assign Memory** screen, enter the **Startup Memory** value.
5. On the **Configure Networking** screen, select a network connection to the virtual switch that was previously created.
6. On the **Connect Virtual Hard Disk Screen**, select the following option:
7. Review the VM settings, and if correct, click **Finish**.

DETAILED STEPS

Step 1   In Hyper-V Manager, click on the host.

Step 2   Select **New > Virtual Machine**.

Step 3   Click **Specify Name and Location.**

- Enter the name of the VM.

• (Optional) Click the checkbox to store the VM in a different location.

Click **Next**.

Step 4   On the **Assign Memory** screen, enter the **Startup Memory** value.

The Cisco CSR 1000v requires 4096 MB for the startup memory.

Click **Next**.

Step 5   On the **Configure Networking** screen, select a network connection to the virtual switch that was previously created.

The network adapter selected in this step will become the first interface for the Cisco CSR 1000v once the VM is launched and the router boots. The other vNICs for the VM are created in the next procedure.

Note   Changing the MAC address of the first interface and rebooting a licensed Cisco CSR 1000v will de-activate the license.

Click **Next**.

Step 6   On the **Connect Virtual Hard Disk Screen**, select the following option:

• Attach a virtual hard disk later.

Note   The New Virtual Machine Wizard only supports creating a virtual hard disk using the .vhdx format. The Cisco CSR 1000v requires that the hard disk uses the .vhd format. You will create the virtual hard disk after the VM has been created.

Click **Next**. The **Summary** screen displays.

Step 7   Review the VM settings, and if correct, click **Finish**.

The new VM is created.

Configuring the VM Settings

To configure the VM settings before launching the VM, perform the following steps:

SUMMARY STEPS

1. In Hyper-V Manager, select the host, and then right-click on the VM that was created in the previous steps.
2. Select **Settings**.
3. Specify the number of virtual processors, also known as virtual CPU's (vCPU's) for the VM.
4. Under IDE Controller 0, select the Hard Drive.
5. Under IDE Controller1, select the **DVD Drive**.
6. Select **Network Adapte**r to verify that the network connection to the virtual switch is configured.
7. Select **Com 1** to configure the serial port.
8. Select **Hardware** > **Add Hardware** to add the network interfaces (vNICs) to the VM.
9. Click **BIOS** to verify the boot sequence for the VM.

DETAILED STEPS

Step 1   In Hyper-V Manager, select the host, and then right-click on the VM that was created in the previous steps.

Step 2   Select **Settings**.

Step 3   Specify the number of virtual processors, also known as virtual CPU's (vCPU's) for the VM.

See table "Installation Requirements for Microsoft Hyper-V" below, for the supported configurations.

Step 4   Under IDE Controller 0, select the Hard Drive.

Click the **Virtual Hard Disk** checkbox and click **New** to create a new virtual hard disk.

The New Virtual Hard Disk Wizard opens. Click **Next**.

a) On the Choose Disk Format screen, click the VHD checkbox to create the virtual hard disk using the .vhd format. Click **Next**.

> **Note**   The Cisco CSR 1000v does not support the VHDX format.

b) On the **Choose Disk Type** screen, click on the **Fixed Size** option. Click **Next**.

The Cisco CSR 1000v does not support the other disk type options.

c) Specify the Name and Location for the virtual hard disk. Click **Next**.

d) On the **Configure Disk** screen, click the option to create a new blank virtual hard disk. For the size, specify 8 GB.

e) Click **Next** to view the Summary of the virtual hard disk settings.

f) Click **Finish** to create the new virtual hard disk.

When the new hard disk has been created, continue configuring the VM settings with the next step.

Step 5   Under IDE Controller1, select the **DVD Drive**.

The DVD Drive screen displays.

For the **Media** setting, click the **Image File** checkbox, and browse to the Cisco CSR 1000v .iso file that you downloaded from Cisco.com.

Click **OK**.

Step 6   Select **Network Adapter** to verify that the network connection to the virtual switch is configured.

Step 7   Select **Com 1** to configure the serial port.

This port provides access to the Cisco CSR 1000v console.

> **Note**   Telnet access to the Cisco CSR 1000v console is not supported for Microsoft Hyper-V. You must use a Putty session to access the console.

Step 8   Select **Hardware** > **Add Hardware** to add the network interfaces (vNICs) to the VM.

a) Select **Network Adapter** and click **Add**.

Microsoft Hyper-V adds the network adapter and highlights that hardware with the status Virtual Switch "Not Connected".

b) Select a virtual switch on the drop-down menu to place the network adapter onto it.

Repeat these steps for each vNIC added. The Cisco CSR 1000v supports only the HV NETVSC vNIC type. The maximum number of vNICs supported is 8.

Note	The hot-add of vNICs is not supported with Microsoft Hyper-V, so the network interfaces need to be added before launching the VM.

After the Cisco CSR 1000v boots, you can verify the vNICs and how they are mapped to the interfaces using the **show platform software vnic-if interface-mapping** command. See Mapping Cisco CSR 1000v Network Interfaces to VM Network Interfaces.

Step 9   Click **BIOS** to verify the boot sequence for the VM.

The VM should be set to boot from the CD.

Launching the VM to Boot the Cisco CSR 1000v

To launch the VM, perform the following steps:

SUMMARY STEPS

1. Select the virtual switch.
2. Select the VM and click **Start**.

DETAILED STEPS

Step 1   Select the virtual switch.

Step 2   Select the VM and click **Start**.

The Hyper-V Manager connects to the VM, and starts the launch process. Once the VM is launched, the Cisco CSR 1000v starts the boot process. For more information on the booting process, see Installing the Cisco CSR 1000v in Microsoft Hyper-V Environments, on page 1.

Installation Requirements for Microsoft Hyper-V—Cisco IOS XE 3.x

This section contains information about Microsoft Hyper-V requirements for older Cisco IOS XE releases (the releases supported by Cisco CSR 1000v before IOS XE Denali 16.3.1)

The table below lists the installation requirements for Microsoft HyperV.

Table 1: Installation Requirements for Microsoft Hyper-V (Cisco IOS XE versions 3.x)

Microsoft Hyper-V Requirements	Cisco IOS XE 3.12S and 3.13S	Cisco IOS XE 3.14S, 3.15S, 3.16S, 3.17
Microsoft Hyper-V version supported	Windows Server 2012 R2	Windows Server 2012 R2

Microsoft Hyper-V Requirements	Cisco IOS XE 3.12S and 3.13S	Cisco IOS XE 3.14S, 3.15S, 3.16S, 3.17
Supported vCPU configurations[1]	• 1 vCPU: requires minimum 2.5 GB RAM allocation • 2 vCPUs: requires minimum 2.5 GB RAM allocation • 4 vCPUs: requires minimum 4 GB RAM allocation	• 1 vCPU: requires minimum 4 GB RAM allocation • 2 vCPUs: requires minimum 4 GB RAM allocation • 4 vCPUs: requires minimum 4 GB RAM allocation
Virtual CPU cores required	1	1
Virtual hard disk size[2]	8 GB	8 GB
Supported vNICs	HV driver	HV driver
Maximum number of vNICs supported per VM instance	8	8
Virtual CD/DVD drive Installed	Required	Required

[1] The required vCPU configuration depends on the throughput license and technology package installed. See the data sheet for your release for more information.

[2] The VHD format is supported only. The VHDX format is not supported.