Preparing Virtual Machines for Cisco APIC-EM

Preparing a VMware System for Cisco APIC-EM Deployment

To ensure that the Cisco APIC-EM works well within a virtual environment, configure the virtual machine with recommended resource pool values. A resource pool is a logical abstraction for the virtual machines that can be used to manage resources. Resource pools can be grouped into hierarchies and then used to partition CPU and memory resources.

You can configure and prepare the virtual machine using either the VMware vSphere Client or Web Client. We recommend that you use the VMware vSphere Web Client, since the **Latency Sensitivity** setting for resource pools must be configured as **High**. The **Latency Sensitivity** setting can only be configured using the VMware vSphere Web Client.

Note When deploying the Cisco APIC-EM in a virtual environment, you must first configure the VMware system before installing Cisco APIC-EM. To install Cisco APIC-EM, you need to download the ISO image containing the controller from Cisco.com and then map the ISO image to the VMware system and boot from it.

Virtual Machine Configuration Recommendations

The following table lists the recommended configuration settings for a successful Cisco APIC-EM VMware vSphere installation, including resource pools. When installing Cisco APIC-EM on a supported virtual machine, we recommend that the following configuration settings are used.

Note When preparing the virtual machine for the Cisco APIC-EM, the configuration settings terminology may differ depending upon the VMware application and GUI that your are using.

Table 1: Virtual Machine Configuration Recommendations (Including Resource Pools)

Datastores	We recommend that you do not share a datastore with any defined virtual machines that are not part of the designated Cisco APIC-EM cluster. If the datastore is shared, then disk I/O access contention may occur and cause a significant reduction of disk bandwidth throughput and a significant increase of I/O latency to the cluster. **Note** When configuring the virtual machine, you can select any of the VMware virtual machine provisioning polices for the virtual disk file (Thick Provision Lazy Zeroed, Thick Provision Eager Zeroed, or Thin Provision).
Resource Pool: CPU Resources	• Shares—Normal • Reservation—14400 MHz is minimum configuration setting for this value • Reservation Type—Check box for Expandable • Limit—Unlimited
Resource Pool: Memory Resources	• Shares—Normal • Reservation—Refer to the *Cisco Application Policy Infrastructure Controller Enterprise Module Release Notes* for detailed information about RAM requirements. • Reservation Type—Check box for Expandable • Limit—Unlimited
VMware ESXi Version	5.1/5.5/6.0/6.5
Guest OS: Family and Version	• Guest OS Family—Linux • Guest OS Version—Ubuntu Linux (64-bit)

Virtual Hardware: CPU	• CPU— 6 cores (minimum) • Reservation—14400 MHz is minimum configuration setting for this value • Limit—Unlimited • Shares—Normal **Note** 6 CPUs is the minimum number required for your virtual machine configuration. For better performance, we recommend using 12 CPUs. Additionally, the number of sockets used when setting up CPUs to a virtual machine in VMware does not impact the controller's performance.
Virtual Hardware: Memory	• Memory—Refer to the *Cisco Application Policy Infrastructure Controller Enterprise Module Release Notes* for detailed information about RAM requirements. • Reserve all memory—Check box to Enable.
Virtual Hardware: New Hard disk	500 GB (minimum)
Virtual Hardware: New SCSI controller	VMware Paravirtual
Virtual Hardware: New network	• New network value—Enter the network IP address that the controller will connect to for this value. • Status—Check box to enable Connect at Power On • Adapter type—VMXNET3
Virtual Hardware: New CD/DVD Drive	Select Datastore ISO file from the drop down and the configure the location of the ISO file in the File window
VM Options: Advanced	Choose High for Latency Sensitivity **Note** You can configure and prepare the virtual machine using either the VMware vSphere Client or Web Client. We recommend that you use the VMware vSphere Web Client, since the Latency Sensitivity setting for resource pools must be configured as High. The Latency Sensitivity setting can only be configured using the VMware vSphere Web Client.

Configuring Resource Pools Using vSphere Web Client

To ensure that the Cisco APIC-EM works well within a virtual environment, you should configure resource pools with the recommended values. A resource pool is a logical abstraction for the virtual machines that can be used to manage resources. Resource pools can be grouped into hierarchies and then used to partition CPU and memory resources.

Note You should first create a new resource pool with the recommended configuration values as described in this procedure, and then subsequently create a virtual machine (where the Cisco APIC-EM will be installed) on that resource pool.

Before you begin

You have reviewed your VMware documentation concerning resource pools and their configuration.

You are familiar with the VMware vSphere Web Client and have a basic knowledge of how to create, manage and troubleshoot virtual machines using it.

You have your host and virtual datastores already set up and accessible in vSphere Web Client for this procedure.
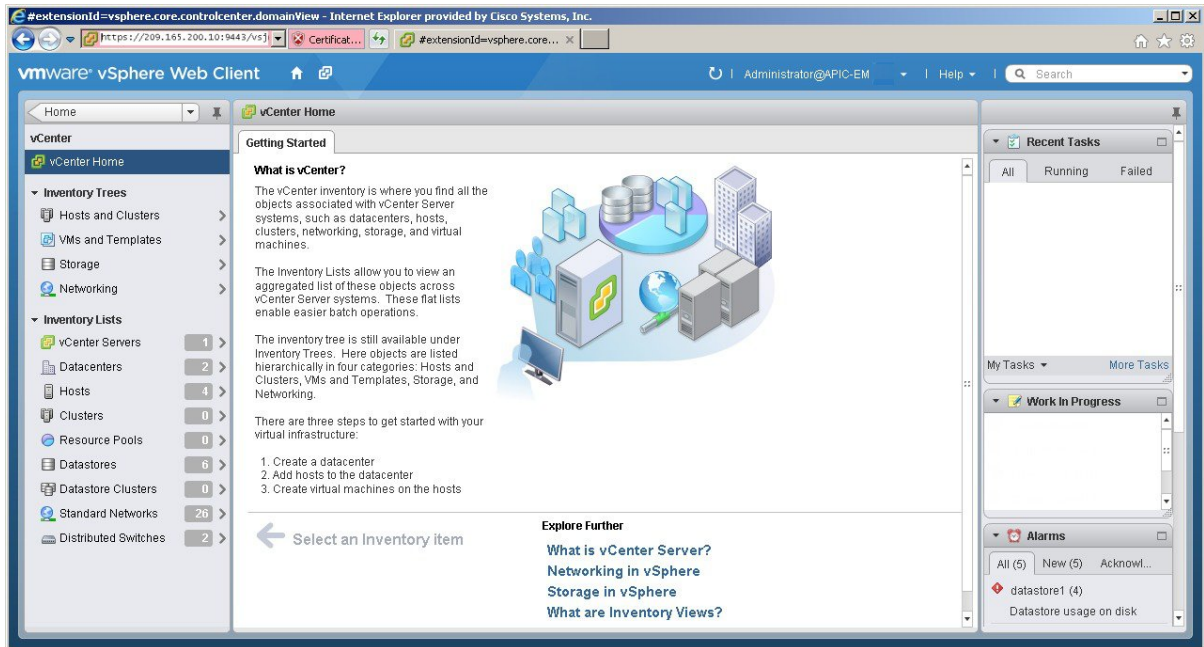
Step 1 Open the VMware vSphere Web Client to perform the procedure.
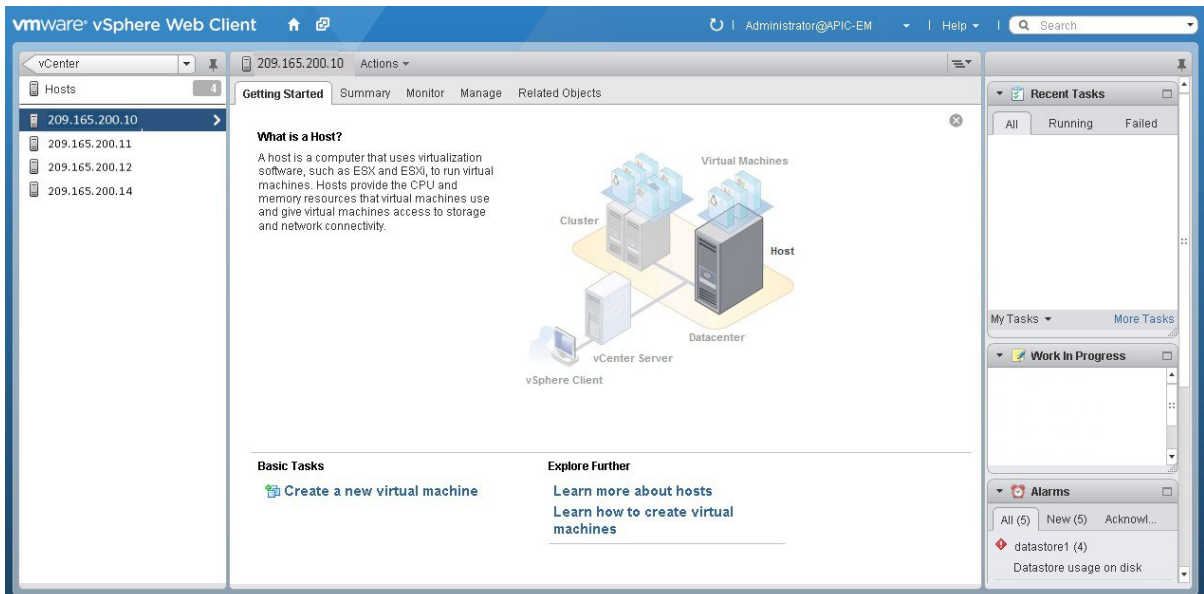
Figure 1: VMware vSphere Web Client
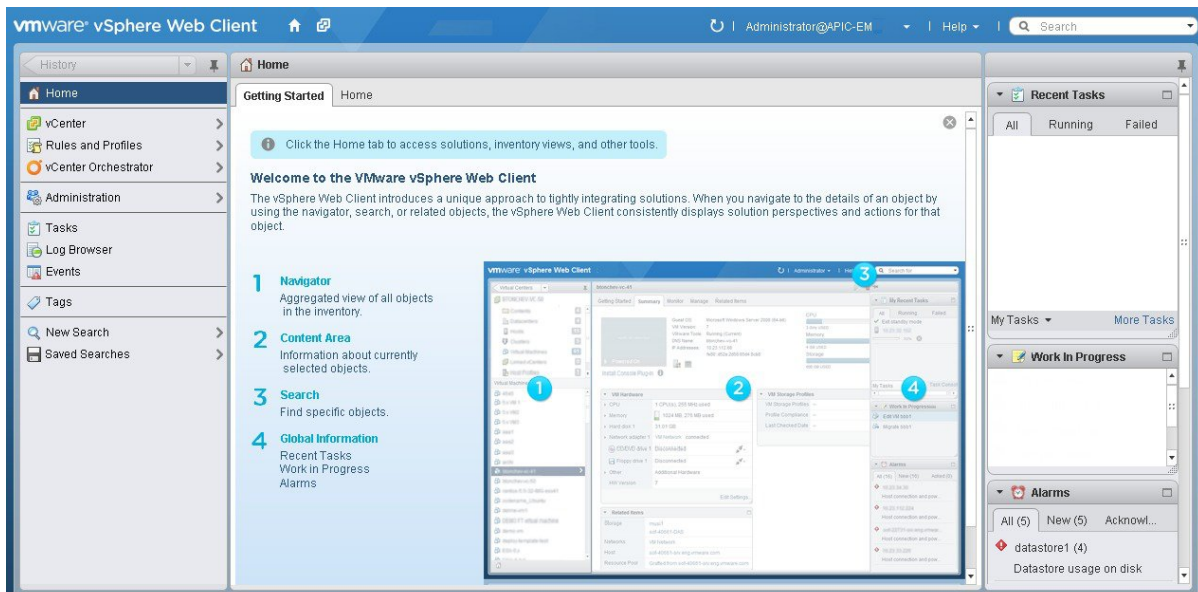
Step 2 Click **vCenter** in the **Navigator**.

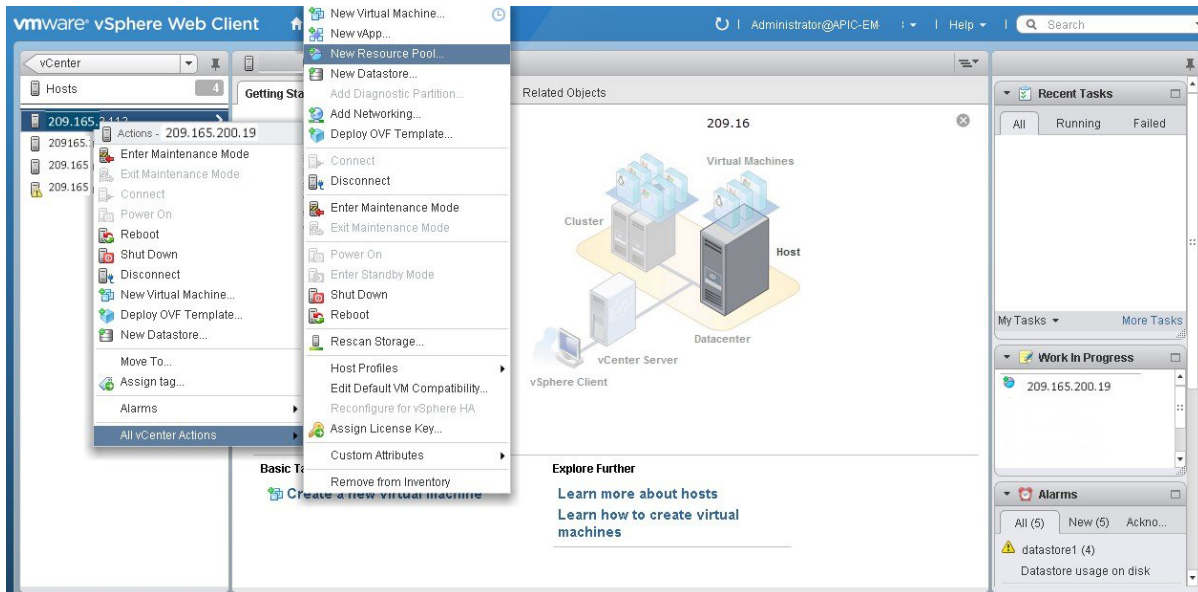*Figure 2: vCenter Home*

Step 3   Click on **Hosts**.

Figure 3: Hosts

Choose a host where you will create the resource pool.
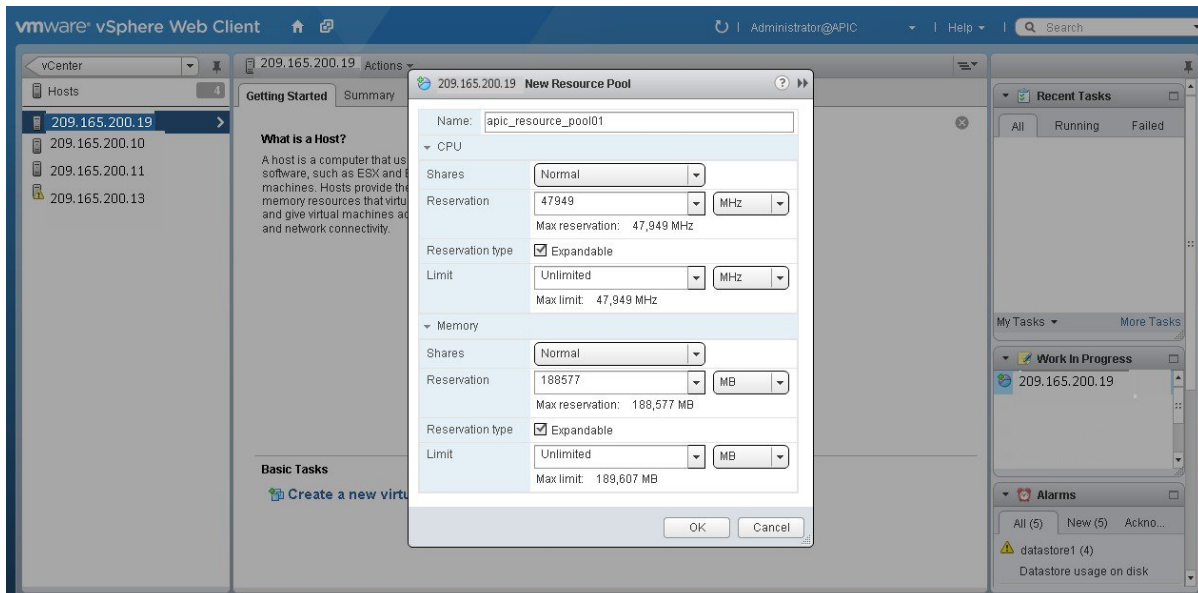
Step 4   Right-click on the selected host and click **All vCenter Actions** | **New Resource Pool**.

Figure 4: New Resource Pool

Step 5   Enter a name and specify values for the resource pool in the **New Resource Pool** dialog box.

Figure 5: New Resource Pool

We recommend entering the following resource pool values in this dialog box:

- **CPU Resources**

    - **Shares**—Choose **Normal** from the drop-down menu

    - **Reservation**—14400 MHz is minimum configuration setting for this value

    - **Reservation Type**—Check box for Expandable

- **Limit**—Set to Maximum Limit

- **Memory Resources**

    - **Shares**—Choose **Normal** from the drop-down menu

    - **Reservation**—32 GB or 64 GB is the minimum configuration setting for this value, depending upon your hardware.

    - **Reservation Type**—Check box for Expandable

    - **Limit**—Set to Maximum Limit

Step 6   Click **OK** to save the configured resource pool values.

What to do next

Proceed to create a new virtual machine on this resource pool. For assistance with this procedure, see the following procedure, Configuring a VMware Server Using vSphere Web Client.

Configuring a Virtual Machine Using vSphere Web Client

To ensure that the Cisco APIC-EM properly functions in a virtual environment, create the virtual machine(s) following the procedure described below with the recommended settings.

Note   You must create this virtual machine on the resource pool that you earlier configured, as described in the previous procedure.

Before you begin

You have reviewed the minimum system requirements for a successful Cisco APIC-EM VMware vSphere installation, as previously described in this guide.

You are familiar with the VMware vSphere Web Client and have a basic knowledge of how to create, manage and troubleshoot virtual machines using the Web Client.

You have your host and virtual datastores already set up and accessible in vSphere Web Client for this procedure.

You have already created a resource pool on the host, following the steps described in the previous procedure, Configuring Resource Pools Using vSphere Web Client.
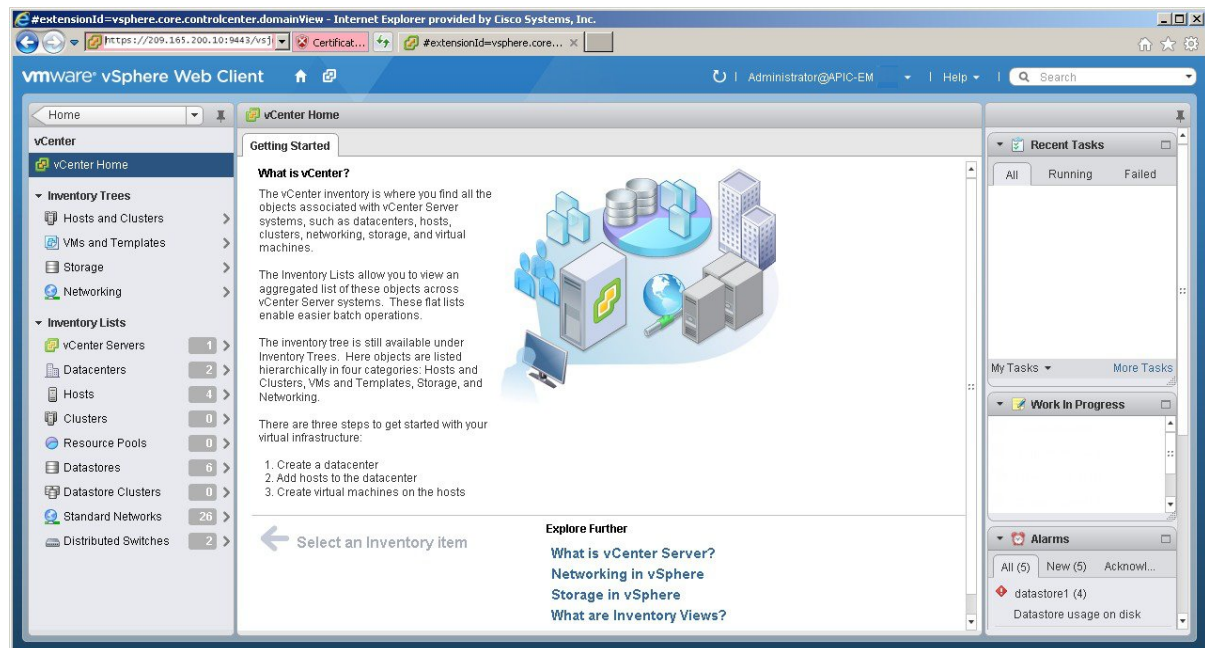
Step 1   Open the VMware vSphere Web Client to perform the procedure.

Figure 6: VMware vSphere Web Client
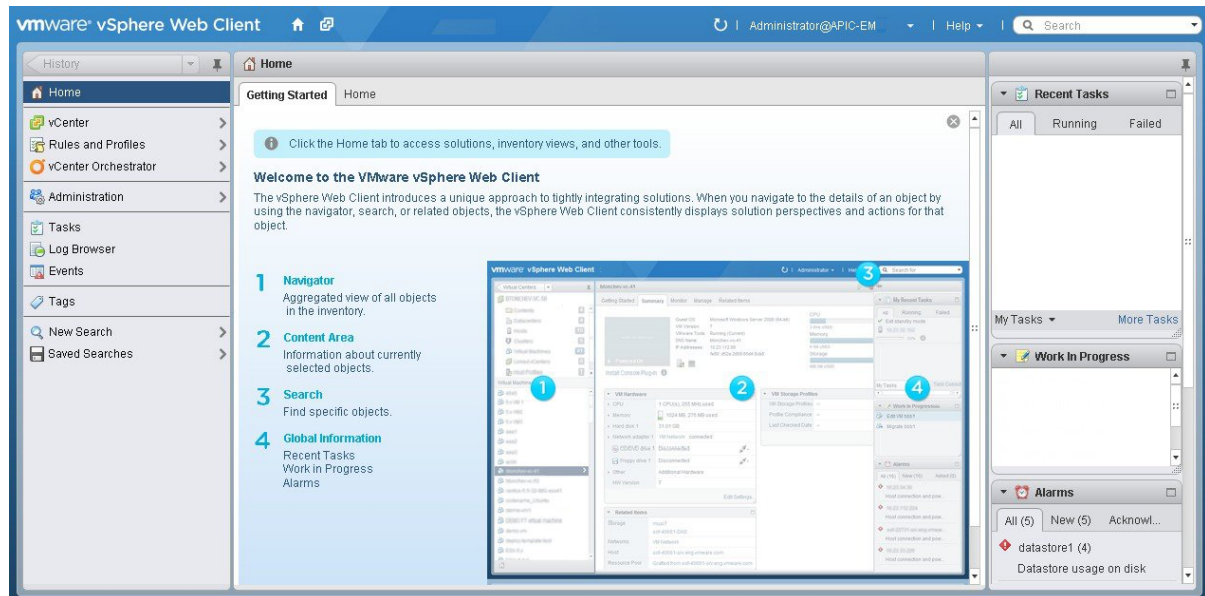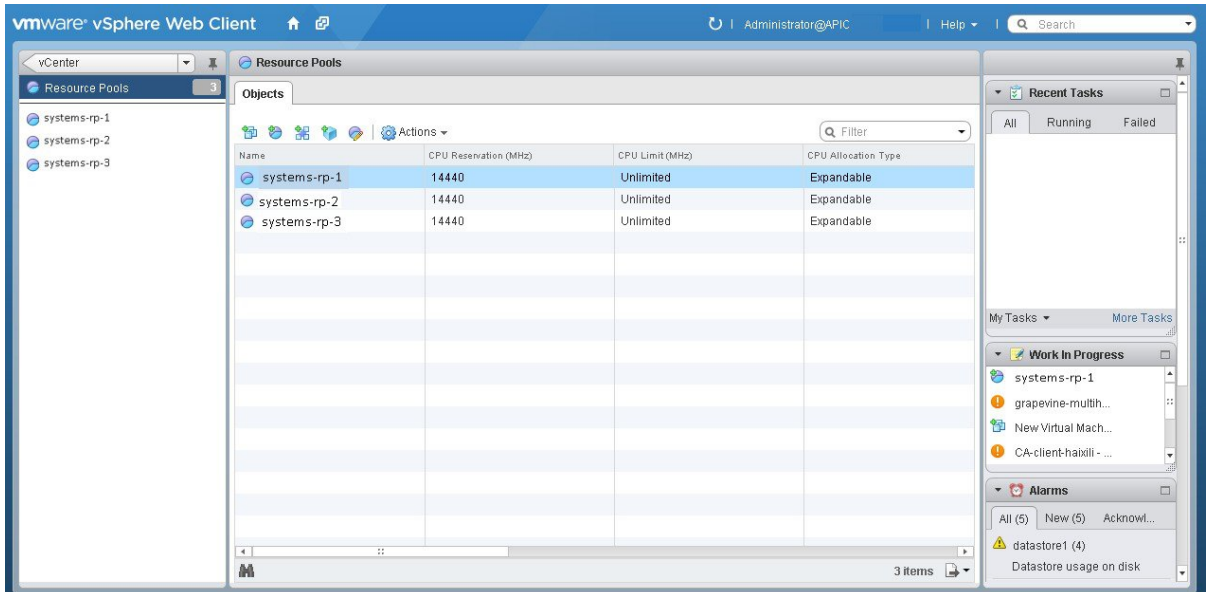

Step 2   Click **vCenter** in the **Navigator**.

Figure 7: vCenter

Step 3   Click **Resource Pools** in the **Inventory Lists** in **vCenter**.
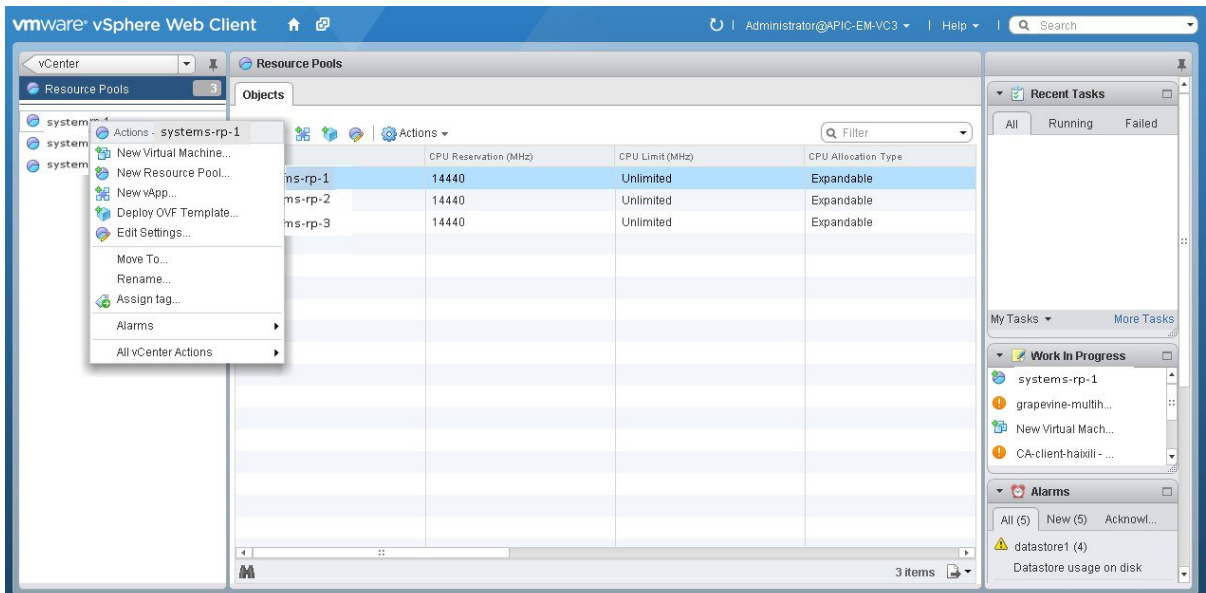
Step 4   Choose the resource pool where you will install the virtual machine from the list.

Figure 8: Resource Pools

Step 5   Right click on the resource pool and select **New Virtual Machine** from the menu.
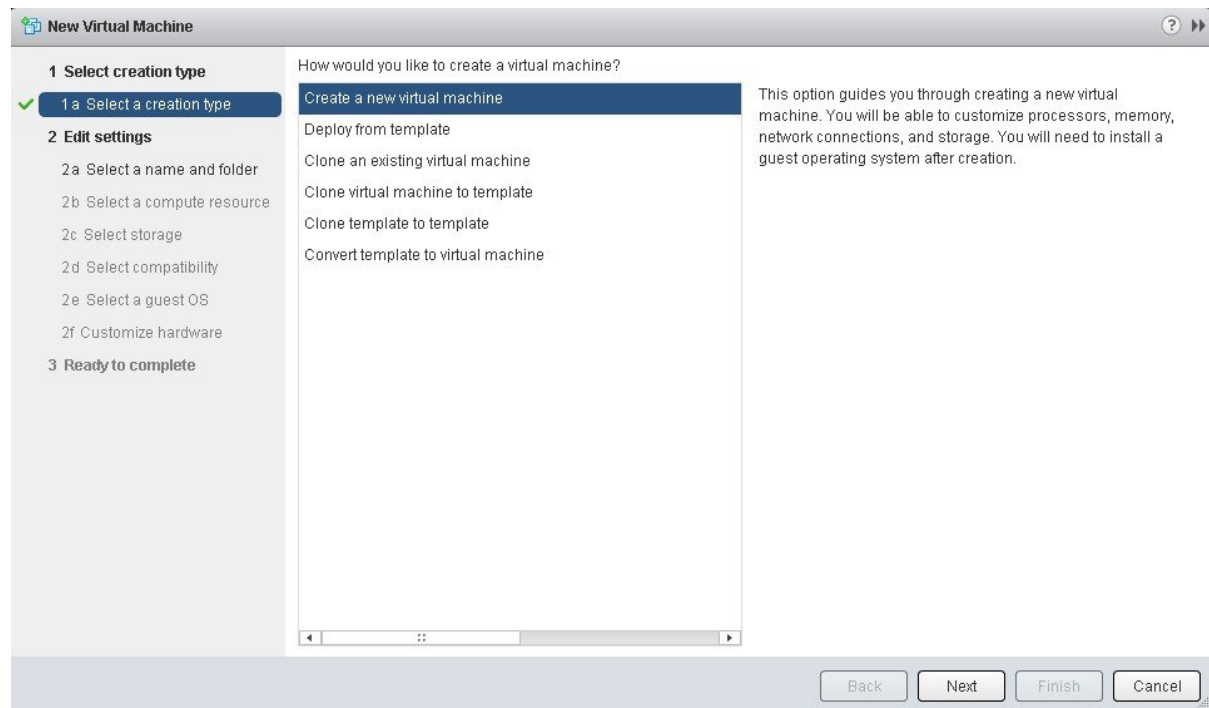
Figure 9: New Virtual Machine

Note   We strongly recommend that only a single virtual machine be created under the resource pool.

Step 6   Click **Create a new virtual machine** in the **New Virtual Machine** dialog box under **1a Select creation type**.
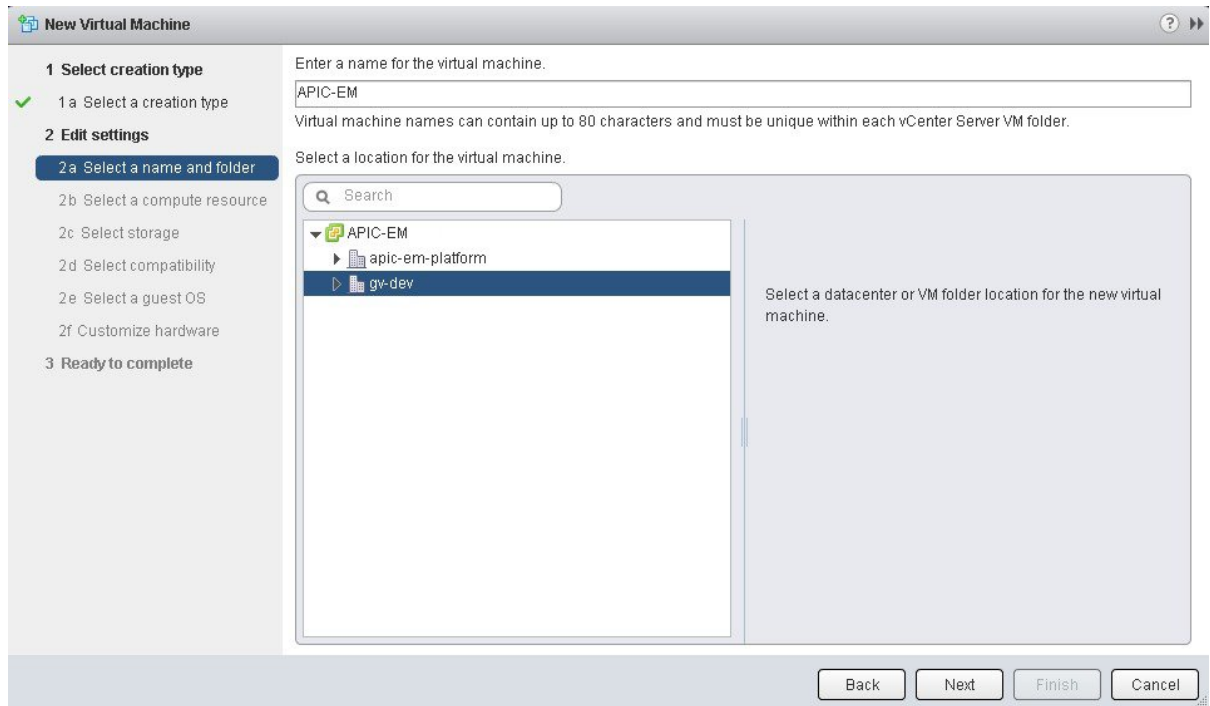
Figure 10: Select Creation Type

Click **Next** to proceed to the next step.

Step 7   In the **New Virtual Machine** dialog box under **2 Edit Settings**, click **2a Select a name and folder**.

Enter a name for the virtual machine and a location for the virtual machine.
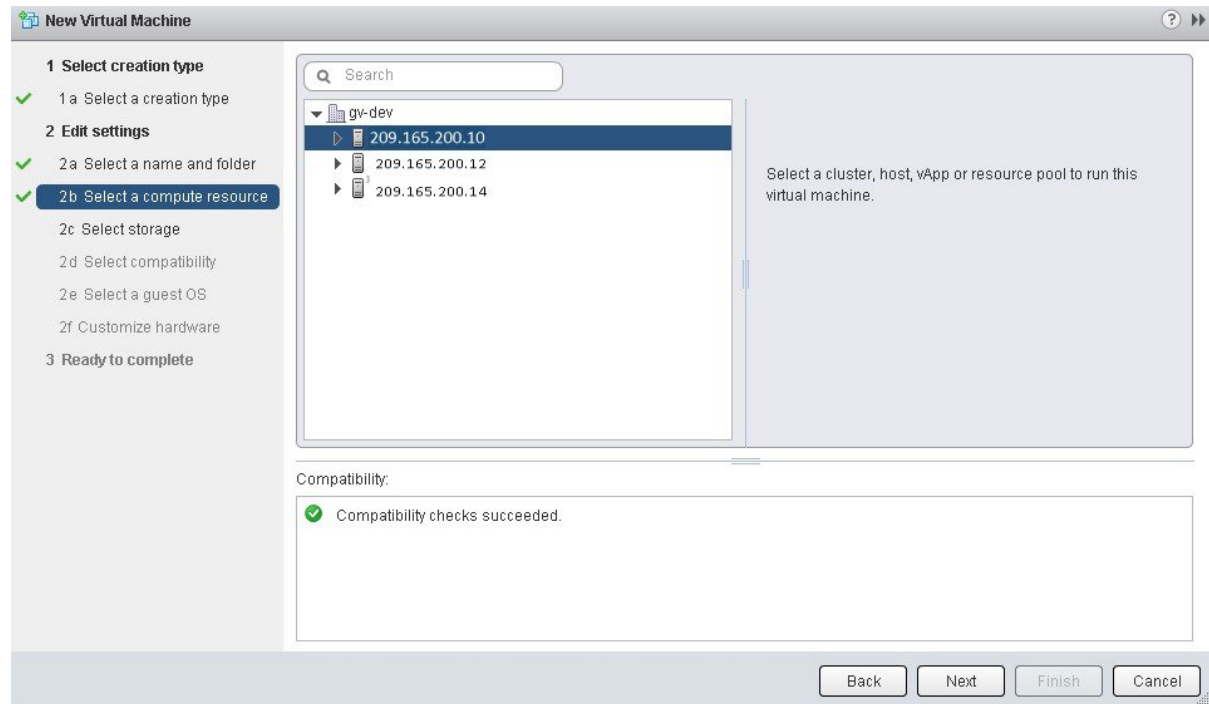
Figure 11: Select Name and Folder

Click **Next** to proceed to the next step.

Step 8   Click **2b Select a computer resource**.

Select the resource pool that was created in the previous procedure.
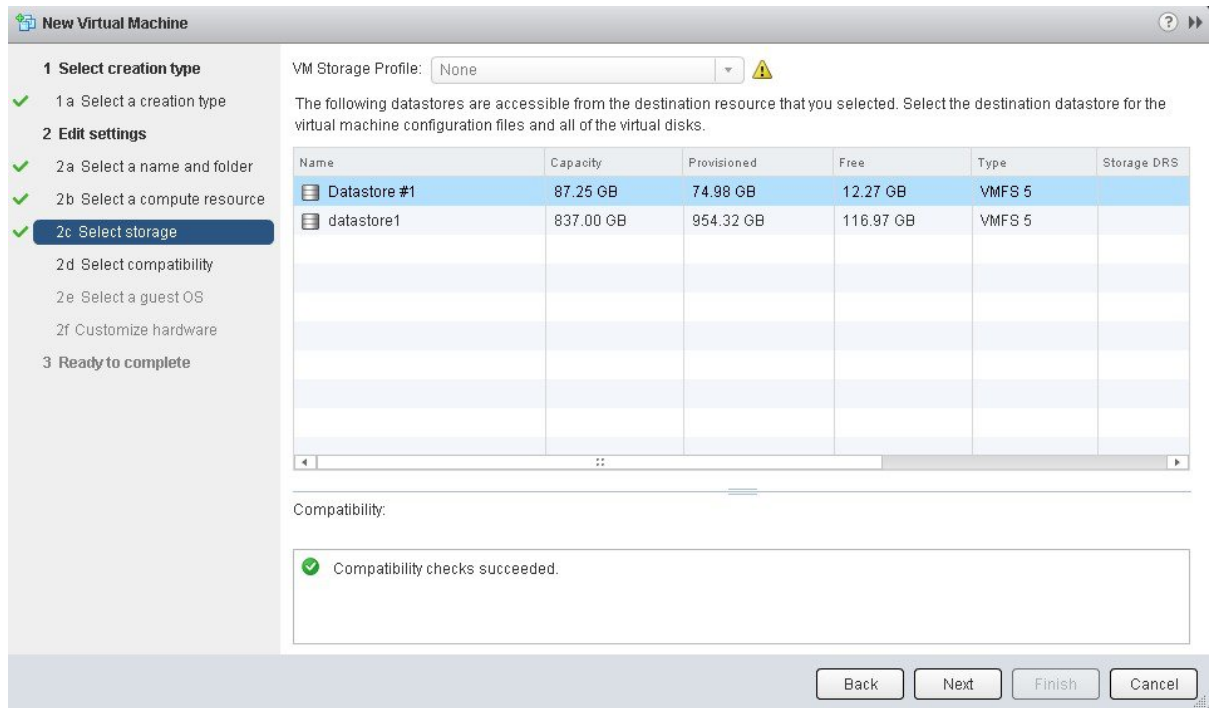
Figure 12: Select Computer Resource

Click **Next** to proceed to the next step.

Step 9   Click **2c Select storage**.

Select a datastore for your virtual machine.
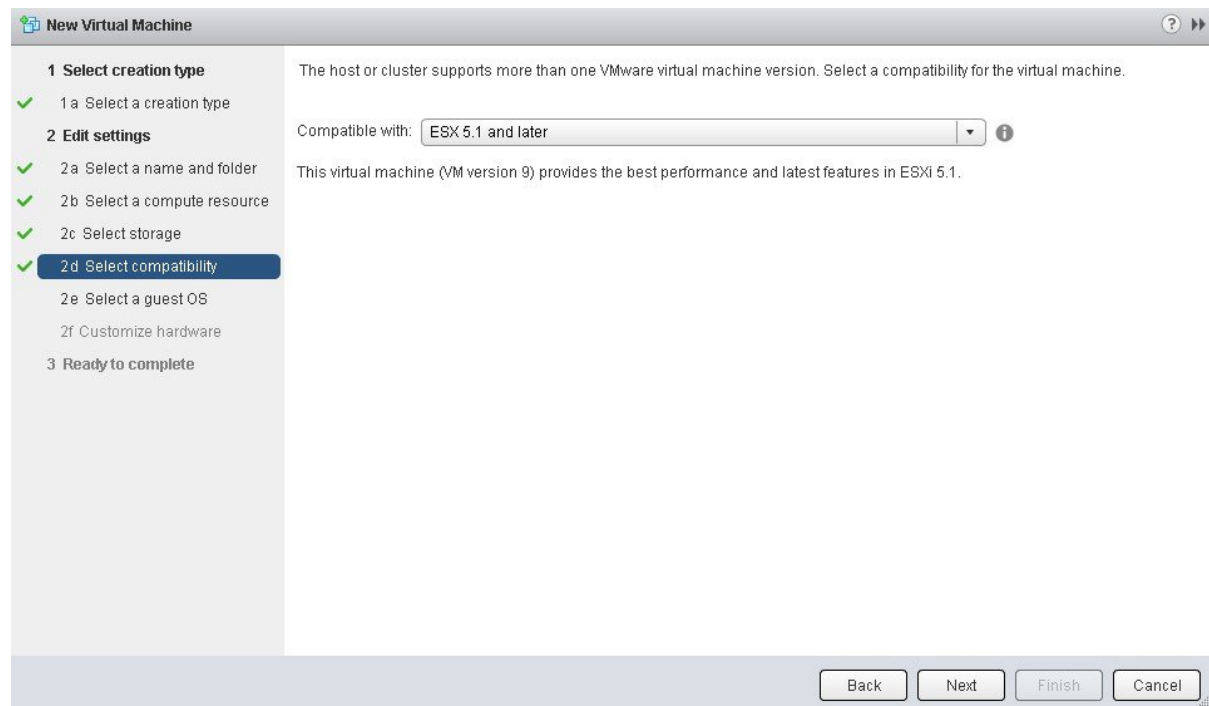
Figure 13: Select Storage

Click **Next** to proceed to the next step.

Step 10   Click **2d Select compatibility**.

Select **ESX 5.1 and later** from the drop down menu.
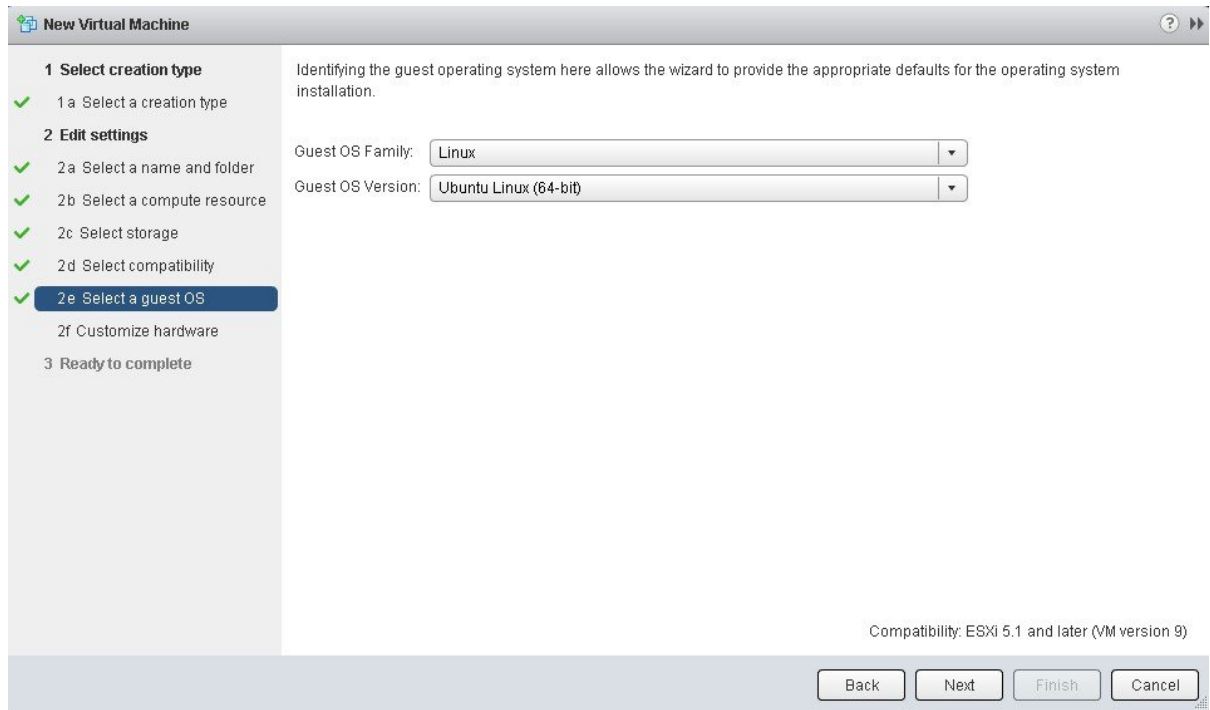
Figure 14: Select Compatibility

Click **Next** to proceed to the next step.

Step 11 Click **2e Select a guest OS**.

Select the following values from the drop down menus:

- **Guest OS Family**: Linux
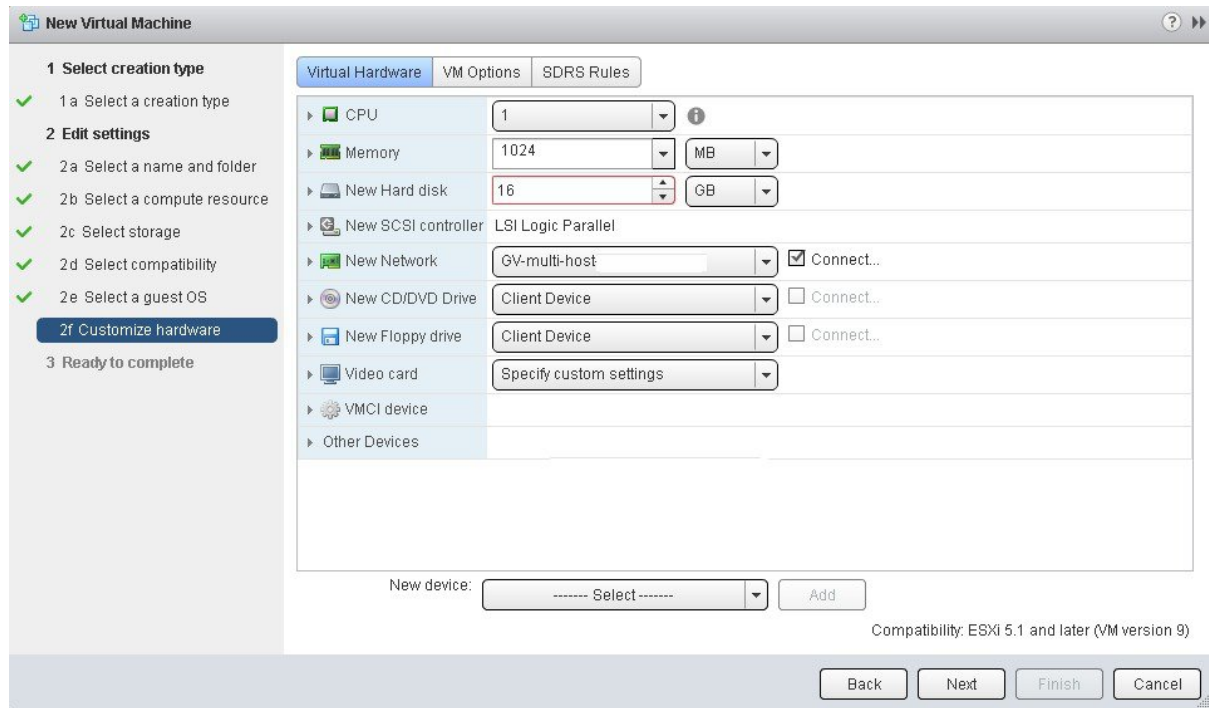- **Guest OS Version**: Ubuntu Linux (64-bit)

Figure 15: Select Guest OS

Click **Next** to proceed to the next step.

Step 12   Click **2f Customize hardware**.

Figure 16: Customize Hardware

Step 13 In the **Virtual Hardware** tab, ensure that the following **CPU** values are selected.

CPU	Enter a value of 6 cores.
	Note 6 cores is the minimum number to enter for your virtual machine configuration. For better performance, we recommend entering and using 12 cores.
Reservation	Enter a minimum value of at least 14400 MHz.
Limit	Select **Unlimited** from the drop down menu
Shares	Select **Normal** from the drop down menu.

Note The above dedicated CPU resources for the host are required for the Cisco APIC-EM.

Step 14 In the **Virtual Hardware** tab, ensure that the following **Memory** values are selected.

Memory	Enter a minimum value of 32 GB or 64 GB, depending on your hardware.
Reserve all guest memory (all locked)	Check this box.

Note The above dedicated memory resources for the host are required for the Cisco APIC-EM.

Step 15 In the **Virtual Hardware** tab, ensure that the following **New Hard disk** value is entered.

| New Hard disk | Increase to at least 500 GB minimum. |

Step 16   In the **Virtual Hardware** tab, ensure that the following **New SCSI controller** value is entered.

| New SCSI controller | Select **VMware Paravirtual** from the drop down menu. |

Step 17   In the **Virtual Hardware** tab, ensure that the following **New Network** values are entered.

New network value	Enter the network that the controller will connect to for this value.
Status	Check the box for **Connect at Power On**.
Adapter type	Select **VMXNET3** from the drop down menu.

Step 18   In the **Virtual Hardware** tab, ensure that the following **New CD/DVD Drive** value is entered.

| New CD/DVD Drive | Select **Datastore ISO file** from the drop down and configure the location of the ISO file in the **File** window. |
| Status | Check the box for **Connect at Power On**. |

Step 19   Click the **VM Options** tab to open it and ensure that the following values are entered.

| Advanced | Choose **High for Latency sensitivity** from the drop down menu. |

Click **Ok** to save your configuration and to proceed to the next step.

Step 20   Click **3 Ready to complete**.

Click **Finish** to finish the virtual machine configuration.

Step 21   In the virtual machine, map the Cisco APIC-EM ISO image onto the local drive (CD/DVD).

Step 22   Boot up the virtual machine and choose the **CD-ROM** option from the **Boot Menu**.

Step 23   Choose **Install Grapevine Appliance** from the **Ubuntu** window that appears in the virtual machine.

What to do next

Proceed to configure the controller by following the configuration wizard prompts.

For information about the configuration process, see following sections:

- Configuring Cisco APIC-EM as a Single Host Using the Wizard
- Configuring Cisco APIC-EM as a Multi-Host Cluster Using the Wizard