Cisco HxBench Getting Started Guide

First Published: 2018-01-19

Last Modified: 2022-03-21

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
http://www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883

Communications, Services, Bias-free Language, and Additional Information

- To receive timely, relevant information from Cisco, sign up at Cisco Profile Manager.
- To get the business impact you're looking for with the technologies that matter, visit Cisco Services.
- To submit a service request, visit Cisco Support.
- To discover and browse secure, validated enterprise-class apps, products, solutions and services, visit Cisco Marketplace.
- To obtain general networking, training, and certification titles, visit Cisco Press.
- To find warranty information for a specific product or product family, access Cisco Warranty Finder.

Documentation Feedback

To provide feedback about Cisco technical documentation, use the feedback form available in the right pane of every online document.

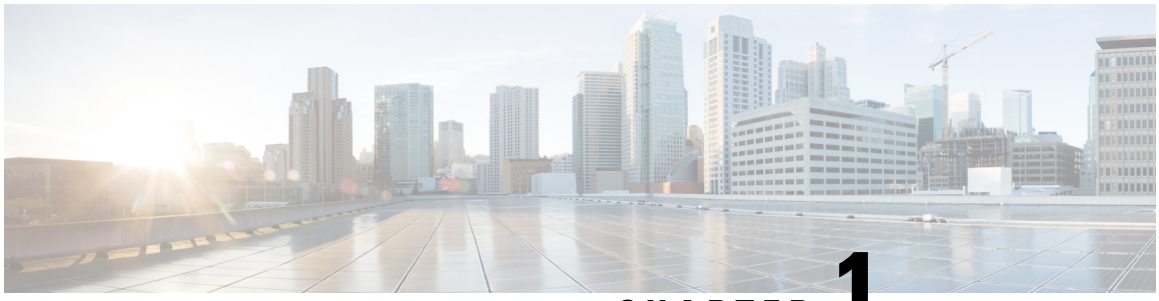
Cisco Bug Search Tool

Cisco Bug Search Tool (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.

Bias-Free Language

The documentation set for this product strives to use bias-free language. For purposes of this documentation set, bias-free is defined as language that does not imply discrimination based on age, disability, gender, racial identity, ethnic identity, sexual orientation, socioeconomic status, and intersectionality. Exceptions may be present in the documentation due to language that is hardcoded in the user interfaces of the product software, language used based on standards documentation, or language that is used by a referenced third-party product.

Communications, Services, Bias-free Language, and Additional Information



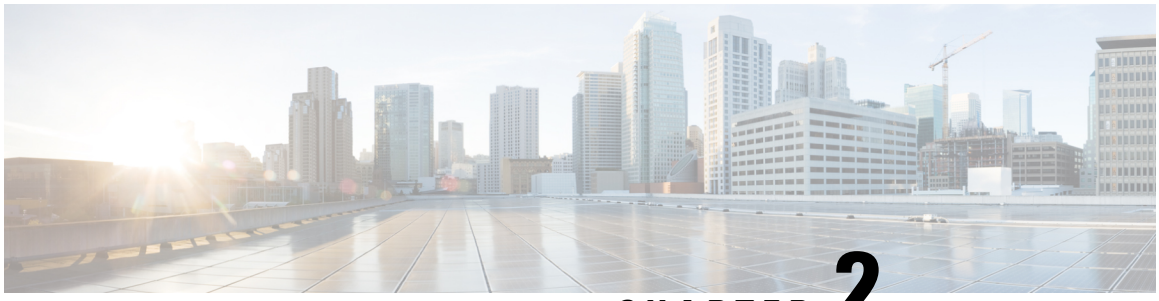
CHAPTER 1

Cisco HxBench

Introduction

Cisco HxBench is a storage performance testing tool that can be used to measure the storage infrastructure performance using defined test scenarios and workloads. HxBench uses the industry standard Vdbench storage performance benchmarking tool. HxBench is provided as a virtual appliance to deploy and run tests. HxBench simplifies performance benchmarking for virtualized environments.

This document describes the process of configuring a host, deploying and configuring an HxBench virtual application, setting up the HxBench virtual application on Hyper-V, configuring a virtual machine, and using the HxBench application.



CHAPTER 2

Prerequisites

Prerequisites for ESXi

ESXi Installation Prerequisites

Before installing HxBench, review the following installation and configuration requirements:

Open Virtual Appliance (OVA) Size

HxBench Controller OVA	
vCPU	8
RAM	8 GB
OS Disk	16 GB
Access Credentials	Username: *appadmin* Password: Default is *password*
HxBench Test OVA	
vCPU	1
RAM	2 GB
OS Disk	8 GB
Data Disk	As provisioned by user for testing.
Number of test VMs	As defined by user for testing.
Access Credentials	Username: *appadmin* Password: Default is *password*

Credentials to Access vCenter

Username	<*root or admin*> username
Password	<*root or admin*> password

Supported Browsers

Chrome	Chrome version 50 or higher.
Firefox	Not supported.
Internet Explorer	Not supported.
Safari	Not supported.

Prerequisites for Hyper-V

Hyper-V Installation Prerequisites

Before installing HxBench, review the following installation and configuration requirements.

Virtual Hard Disk (VHDX) Size

The following table lists the prerequisites for setting up the HxBench Virtual Application on Hyper-V:

HxBench Controller VHDX	
vCPU	8
RAM	8 GB
OS Disk	16 GB
Access Credentials	Username: *appadmin* Password: Default is *password*
HxBench Test VHDX	
vCPU	1
RAM	2 GB
OS Disk	8 GB
Data Disk	As provisioned by user for testing.
Number of test VMs	As defined by user for testing.

Access Credentials	Username: *appadmin* Password: Default is *password*

Supported Browsers

Chrome	Chrome version 50 or higher.
Firefox	Not supported.
Internet Explorer	Not supported.
Safari	Not supported.

Related Topics

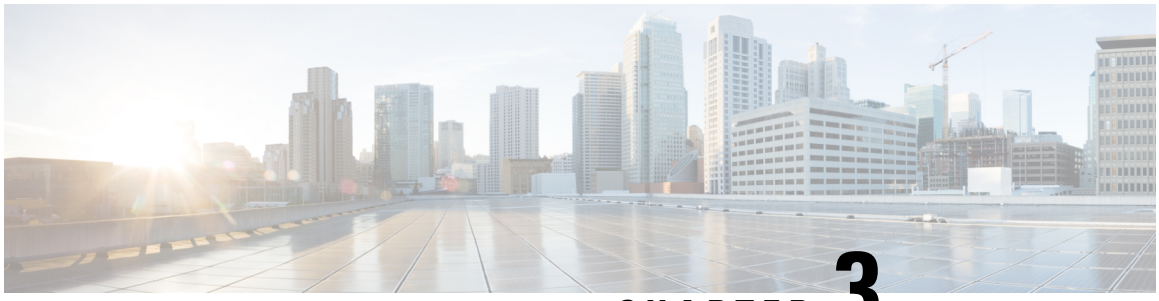
Hyper-V Network Prerequisites, on page 5

Hyper-V Network Prerequisites

Hyper-V Network Prerequisites

Complete the following Hyper-V network prerequisites:

1. From the HyperV Manager, under **Actions of the HyperV server**, click **Virtual Switch Manager**.
2. Under the tab **New virtual network switch** choose the **External** network switch, then click **Create Virtual Switch**.
3. Specify the name of the switch as **HxBench Private**.
4. Click **Apply** then **OK**.



CHAPTER 3

Overview

The HxBench application is delivered in the form of an Open Virtual Appliance (OVA) package. Setting up an application involves deploying a virtual machine, configuring the virtual machine, and configuring the HxBench application.

Set Up an HxBench Virtual Application

ESXi Network Recommendation

This section describes how to set up the network to deploy the test virtual machines successfully and to run storage performance testing. You can set up the network manually to run the tests. This section provides the step-by-step tasks for manual network creation.

Datacenter or Cluster with Multiple Hosts

For a datacenter or cluster with multiple hosts, segment the network that connects to subordinate VMs as shown in the figure below. The HxBench Controller assigns static IP addresses to the test VMs and provides IP addresses to the subordinate VMs.

Figure 1: Network Consideration—Datacenter or Cluster with Multiple Hosts for Raw Disk

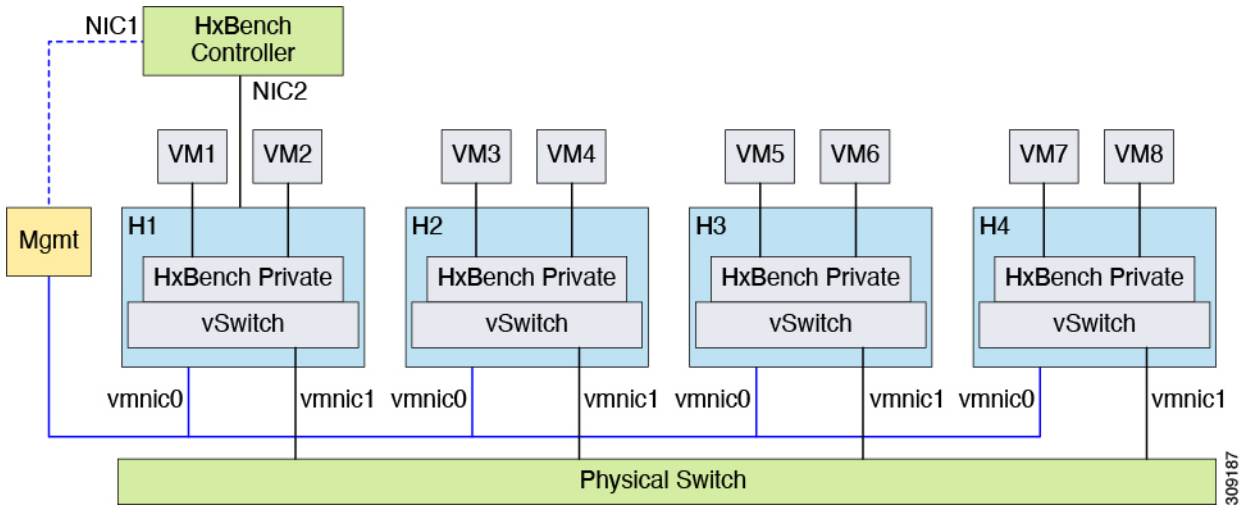
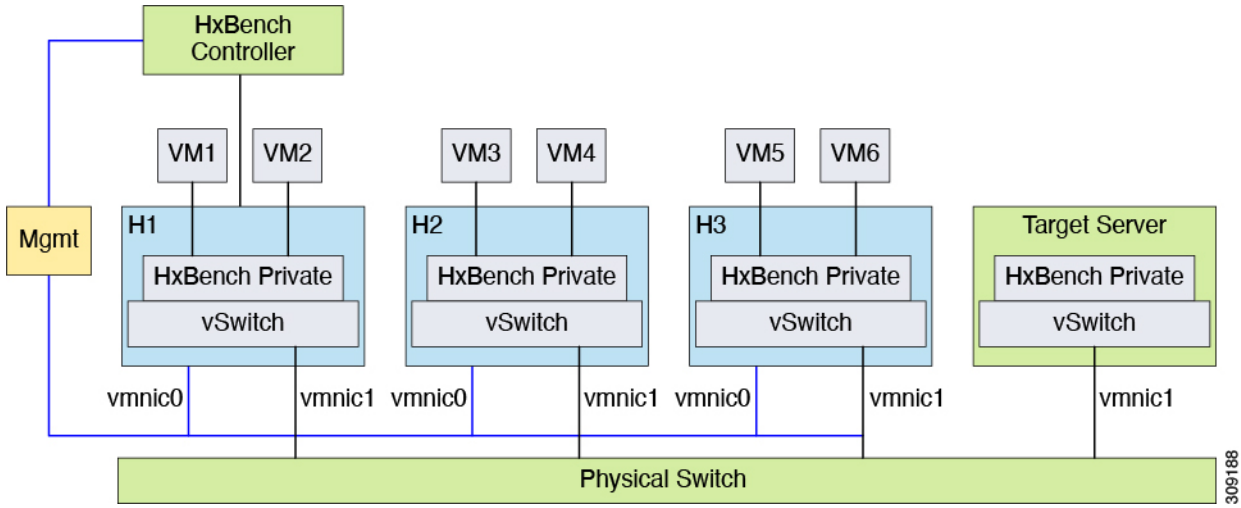


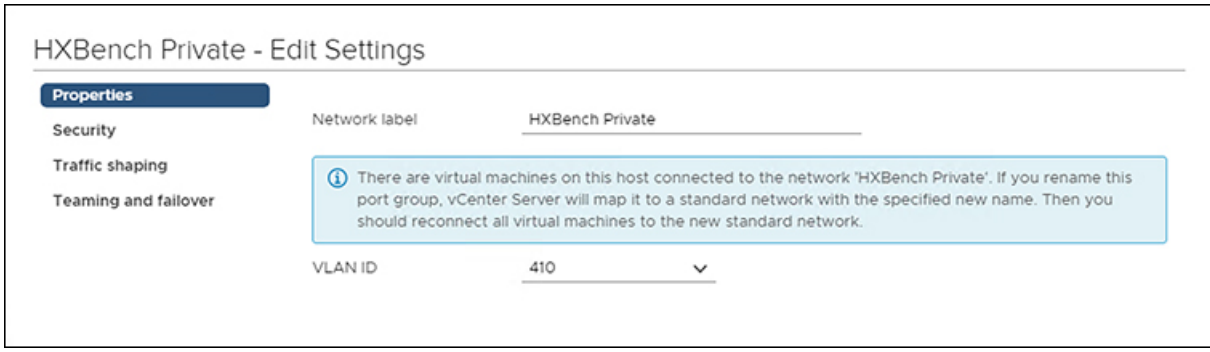
Figure 2: Network Consideration—Datacenter or Cluster with Multiple Hosts for iSCSI Block Storage



Follow these steps to create the required Standard / Distributed Switch and Port Group for HxBench:

1. Create a Standard / Distributed Switch with an uplink connected to a physical switch. Alternatively, you can select an existing Standard / Distributed Switch with uplink connected to the switch.
2. Using vSphere Web Client, create a **Port Group** labeled *HxBench Private* on the newly created Standard / Distributed Switch or on the selected Standard / Distributed Switch with a valid VLAN ID.
3. Repeat steps 1 and 2 on all the hosts in the cluster.
4. During OVA deployment, map NIC-2 of the HxBench Controller to the newly created **HxBench Private Port Group**.
5. Using vSphere Web Client, update the VLAN ID of the *HxBench Private* Port Group. Click **Edit** > **Properties**. On the **HxBench Private Properties** page, under the **General** tab, configure **VLAN ID** from the drop-down list.

6. Make sure that the VLAN ID is updated in the physical switch configuration and that the switch is configured to process traffic based on specific VLAN IDs.

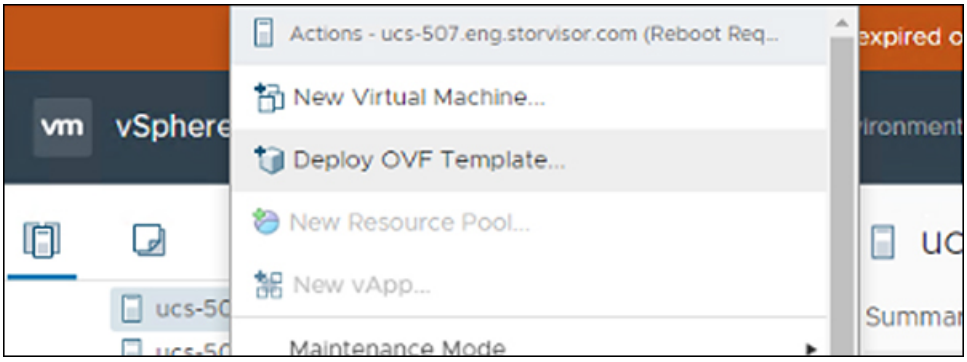


Note For procedural steps on manual network creation for a Datacenter or cluster with a single host, refer to Deploy Cluster on a Single Host at the end of this guide.

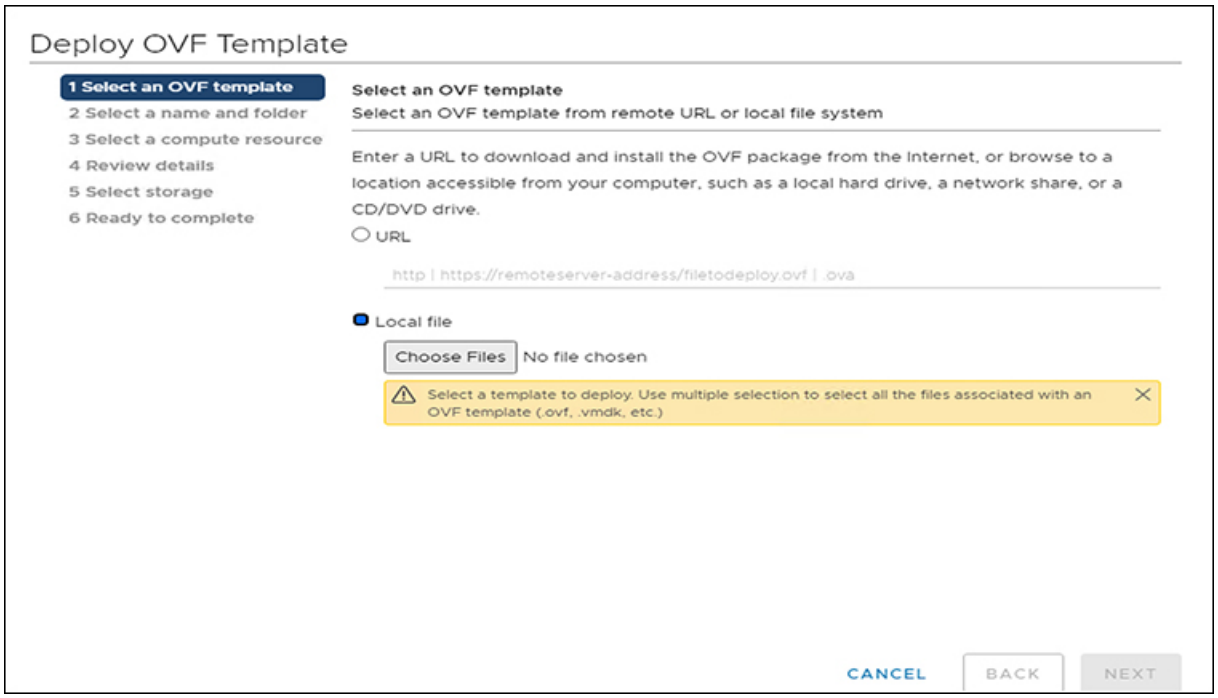
Deploy the vCenter Controller

Deploy the vCenter Controller as follows:

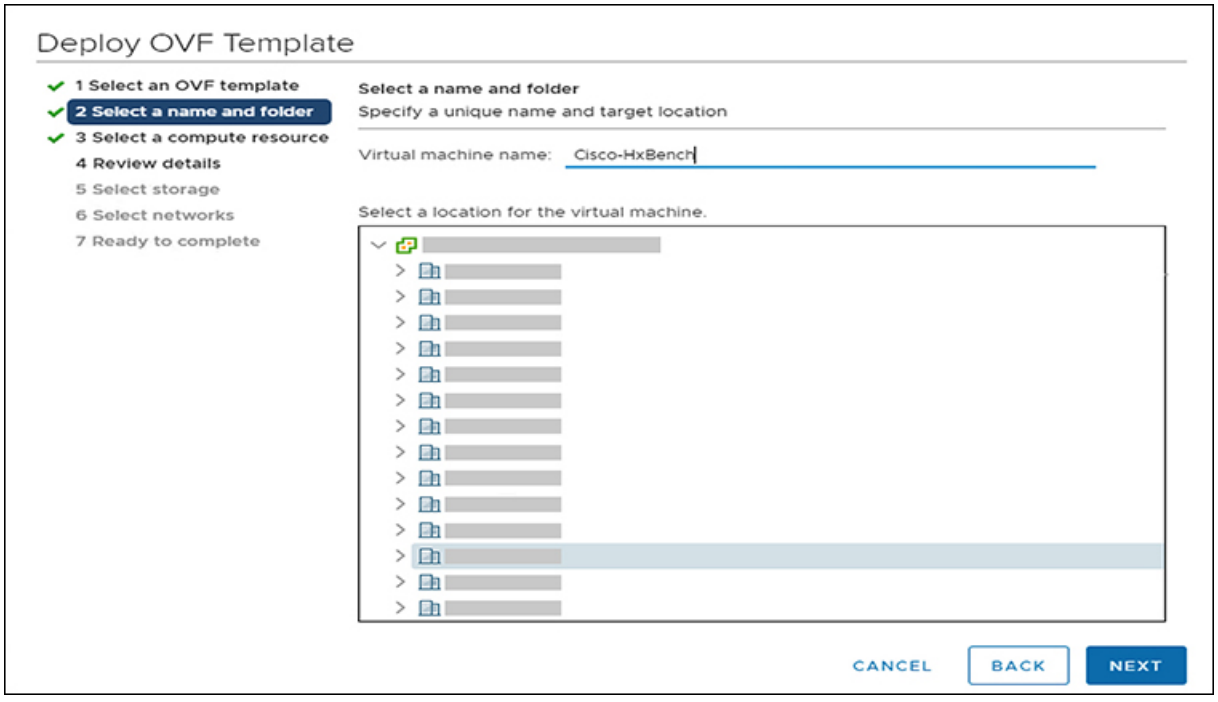
Step 1 From the vSphere Web Client Navigator, select **File** > **Deploy OVF Template**.



Step 2 Select the **OVA template** file you want to deploy from the disk.

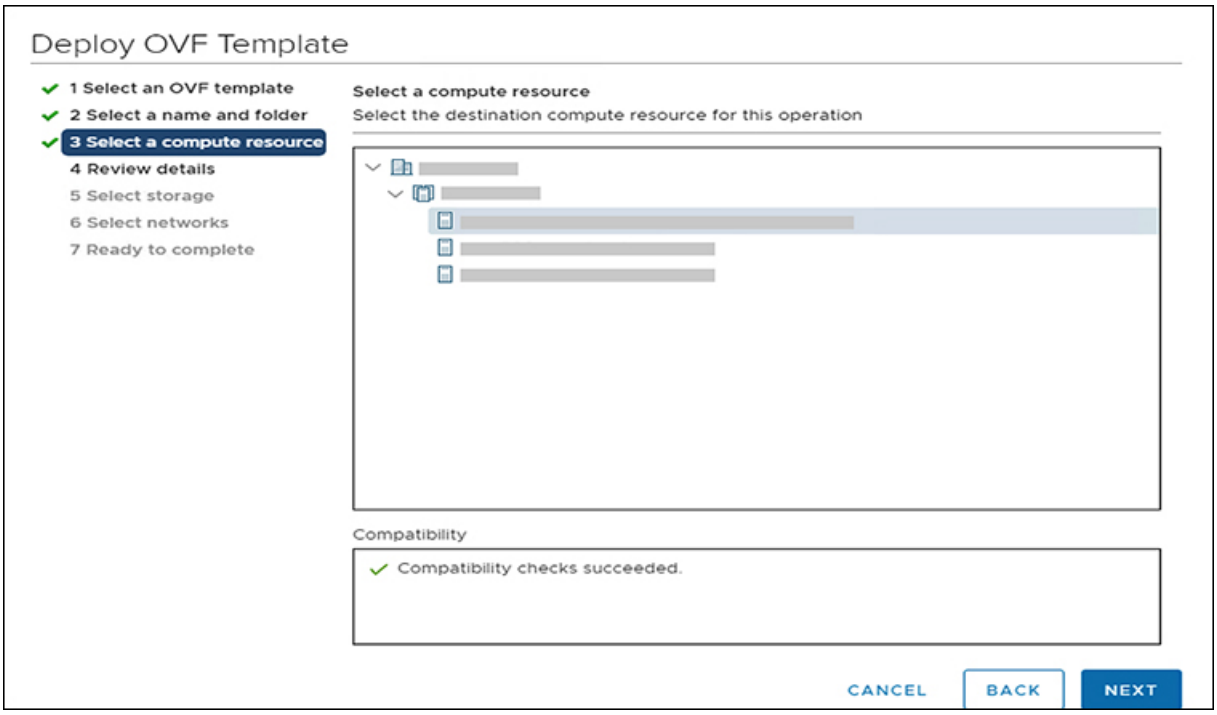


Step 3 Specify a **Name** for the VM. Click **Next**.

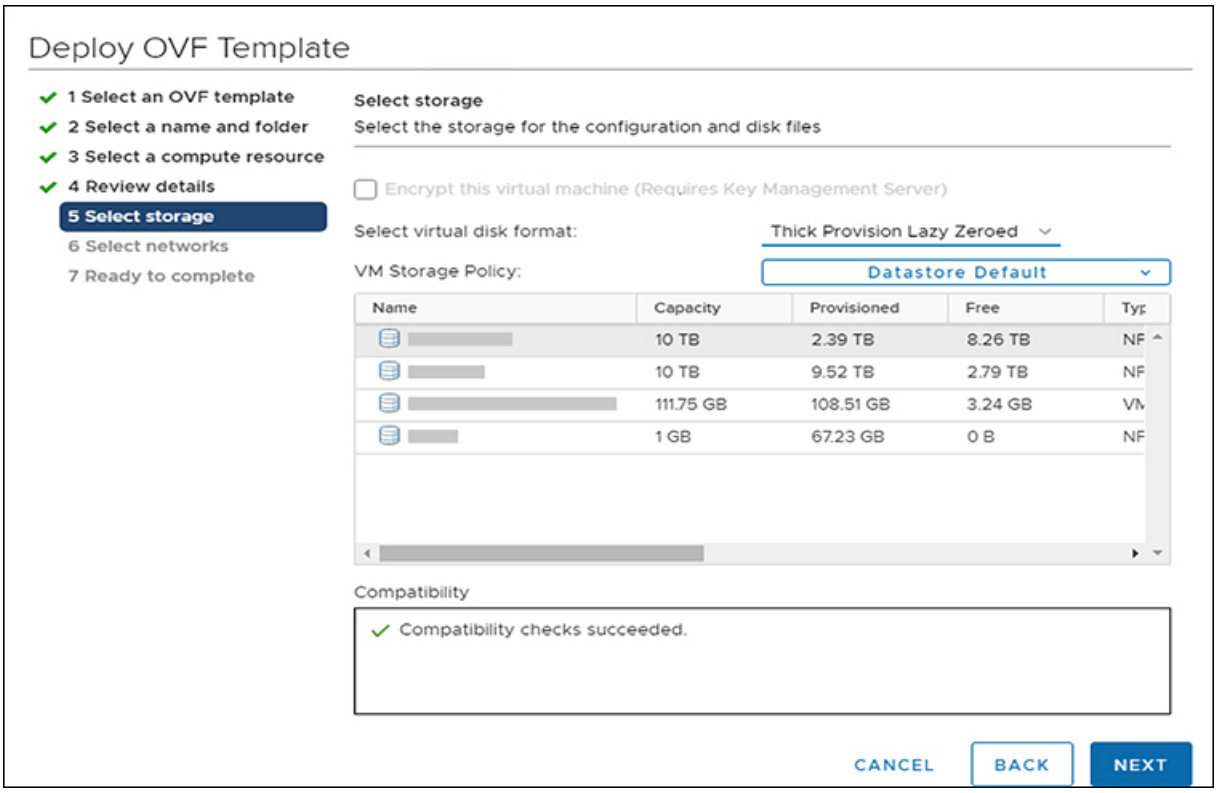


The name has an 80 character limit and must be unique within the inventory folder.

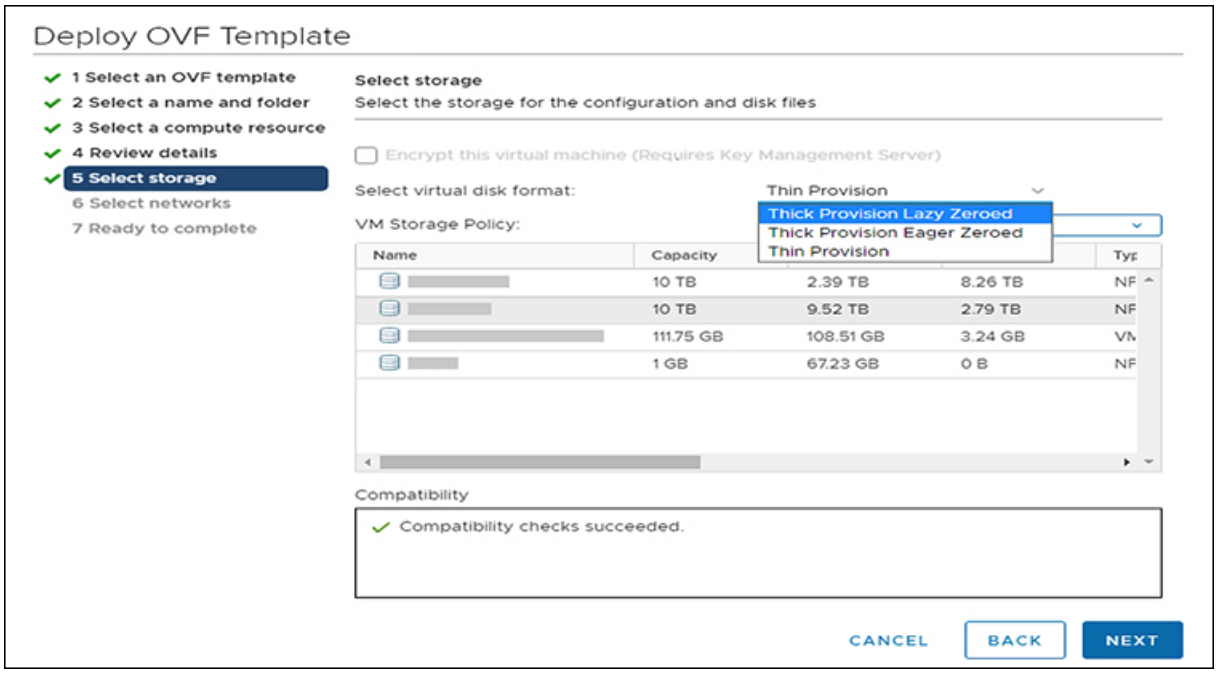
Step 4 Select the **computer resource** where you want to deploy the VM. Click **Next.**



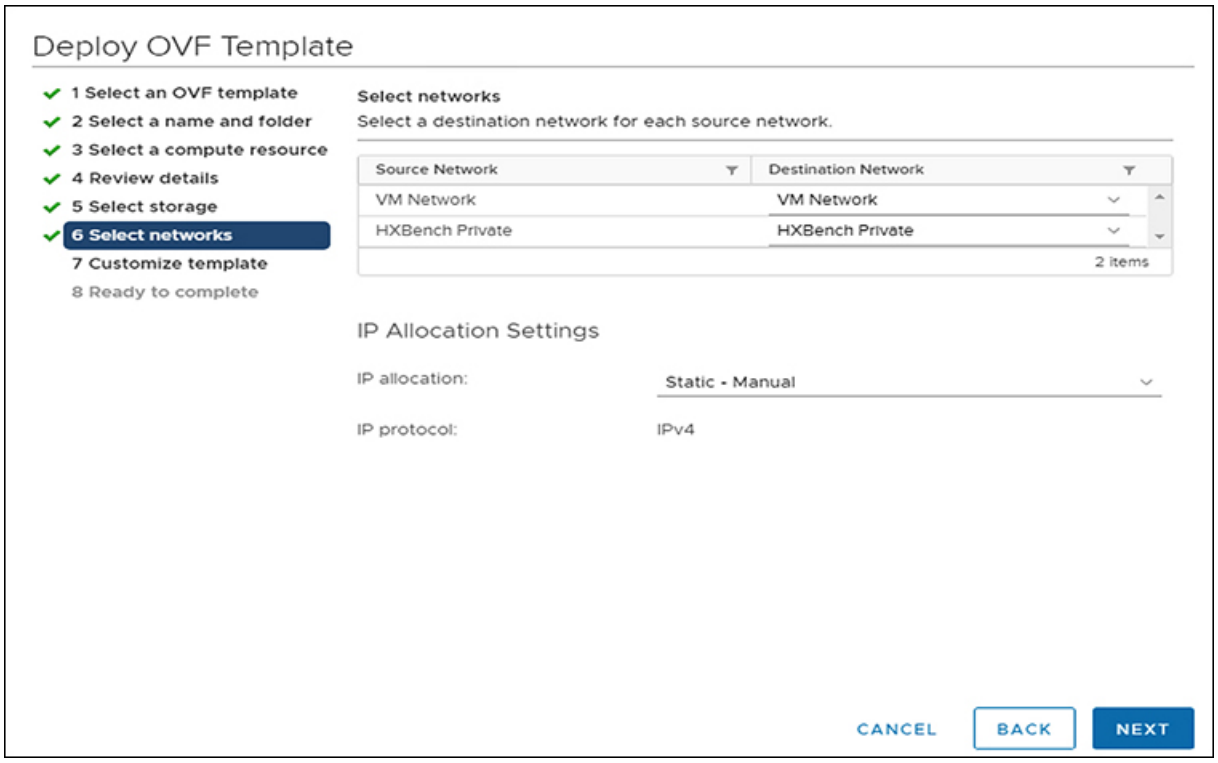
Step 5 Under **Select Storage**, select the datastore where you want to deploy the VM. Click **Next**.



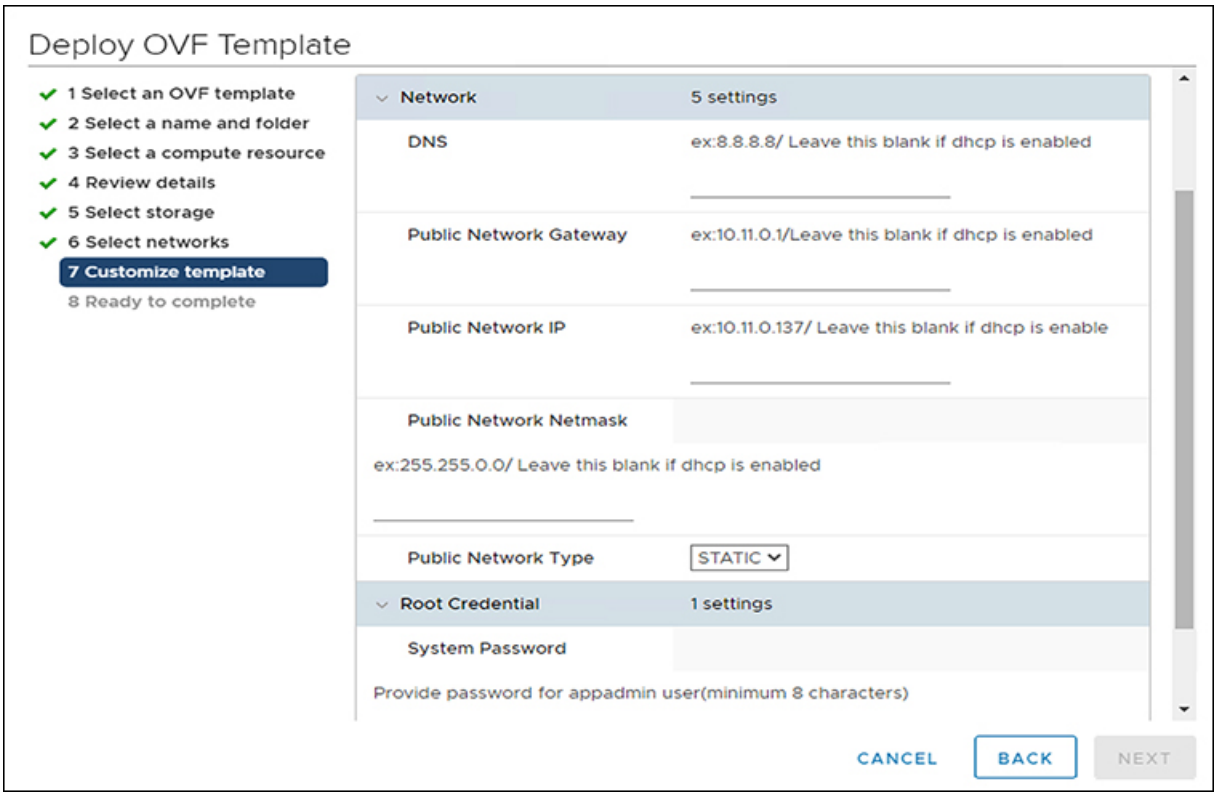
Step 6 Select the **Disk Format**. Click **Next**.



Step 7 Under **Select networks**, select **HxBench Private**.



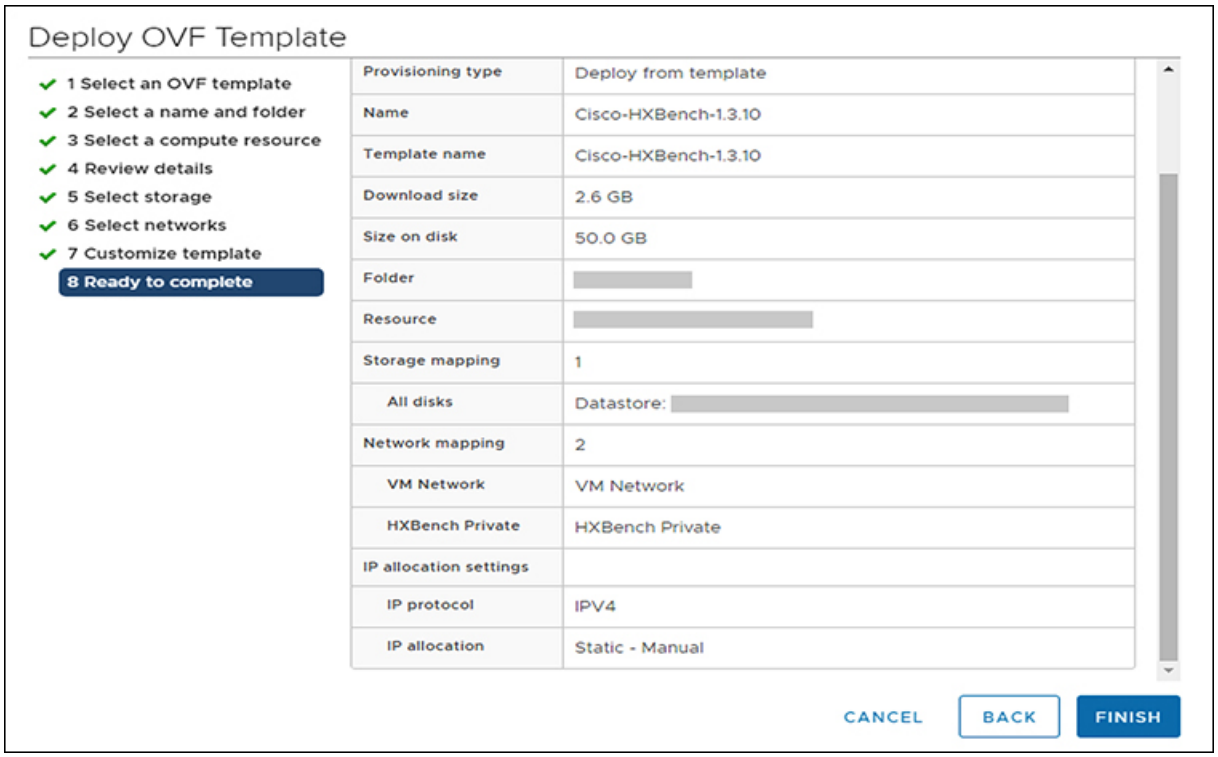
Step 8 Under **Customize template**, configure the Network settings. You can configure either DHCP or a Static IP address for the VM.



Field	Description
DNS field	Leave this space empty if DHCP is used. *For example, 8.8.8.8*
Public Network Gateway field	Leave this space empty if DHCP is used. *For example, 10.11.0.1*
Public Network IP field	Leave this space empty if DHCP is used. *For example, 10.11.0.120*
Public Network Netmask field	Leave this space empty if DHCP is used. *For example, 255.255.0.0*
Public Network Type field	From the drop-down list, select **DHCP** or **Static**.

Review the selected options to start deploying the OVA. Click **Next**.

Step 9 Select **Ready to complete** and click **Finish**.



What to do next

Wait for the deployment task to complete.

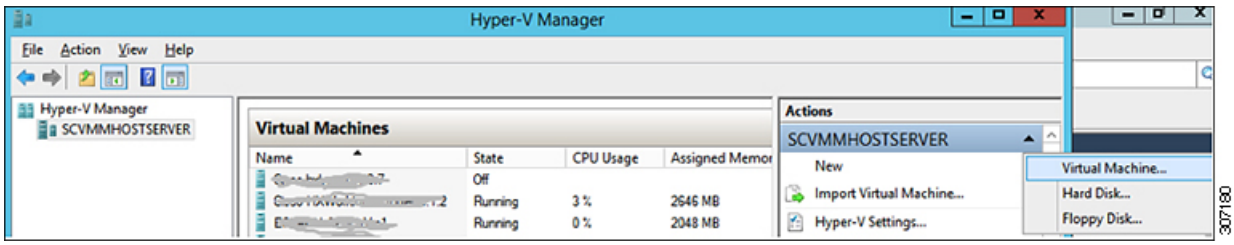
After completion, a success message appears.

Deploy the Hyper-V Controller

To deploy the Hyper-V controller:

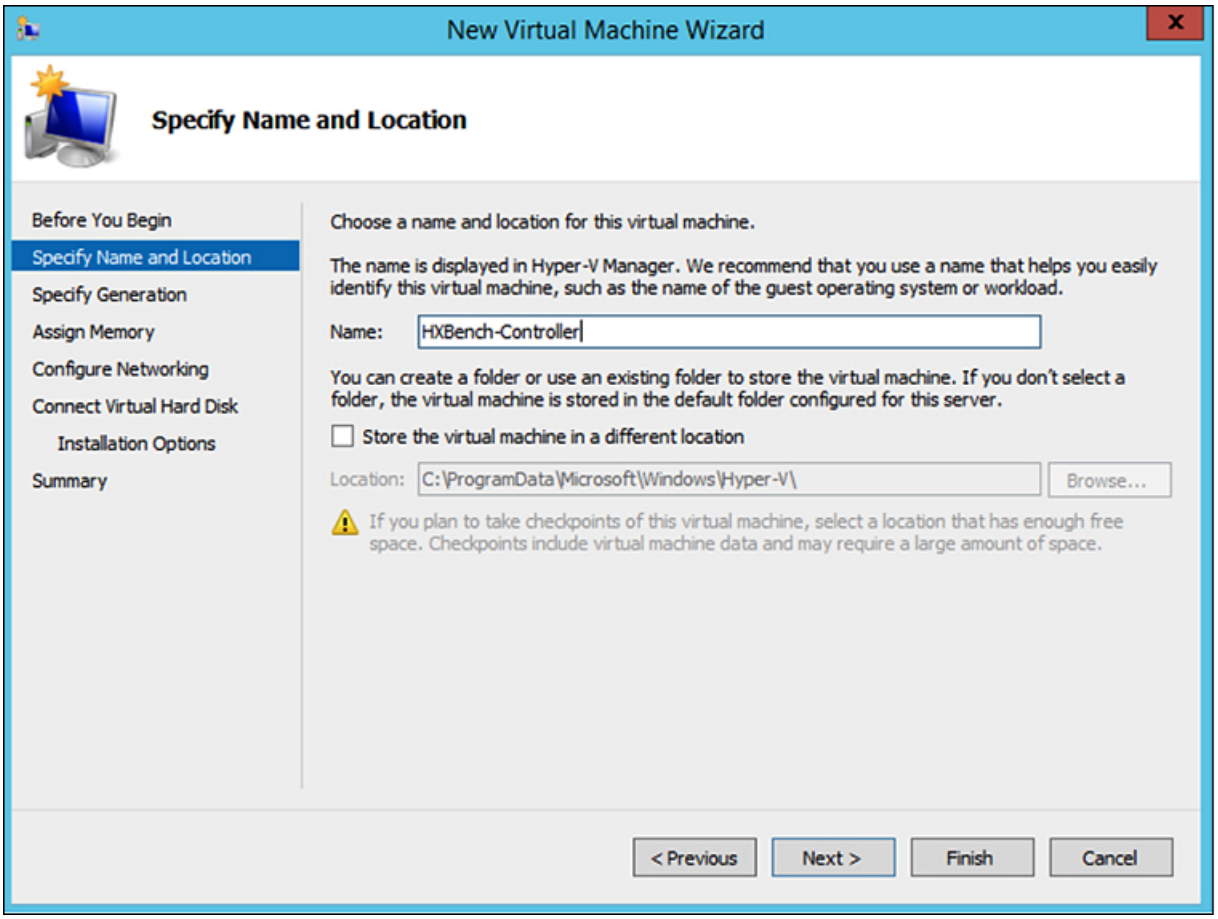
Step 1 Extract the zip file **Cisco-HxBench-2.0.zip** and copy the vhdx file **Cisco-HxBench-2.0-HyperV.vhdx** to the **HyperV server**.

Step 2 From the HyperV Manager, select the HyperV server where HxBench Controller is to be deployed and select **New > Virtual Machine**.

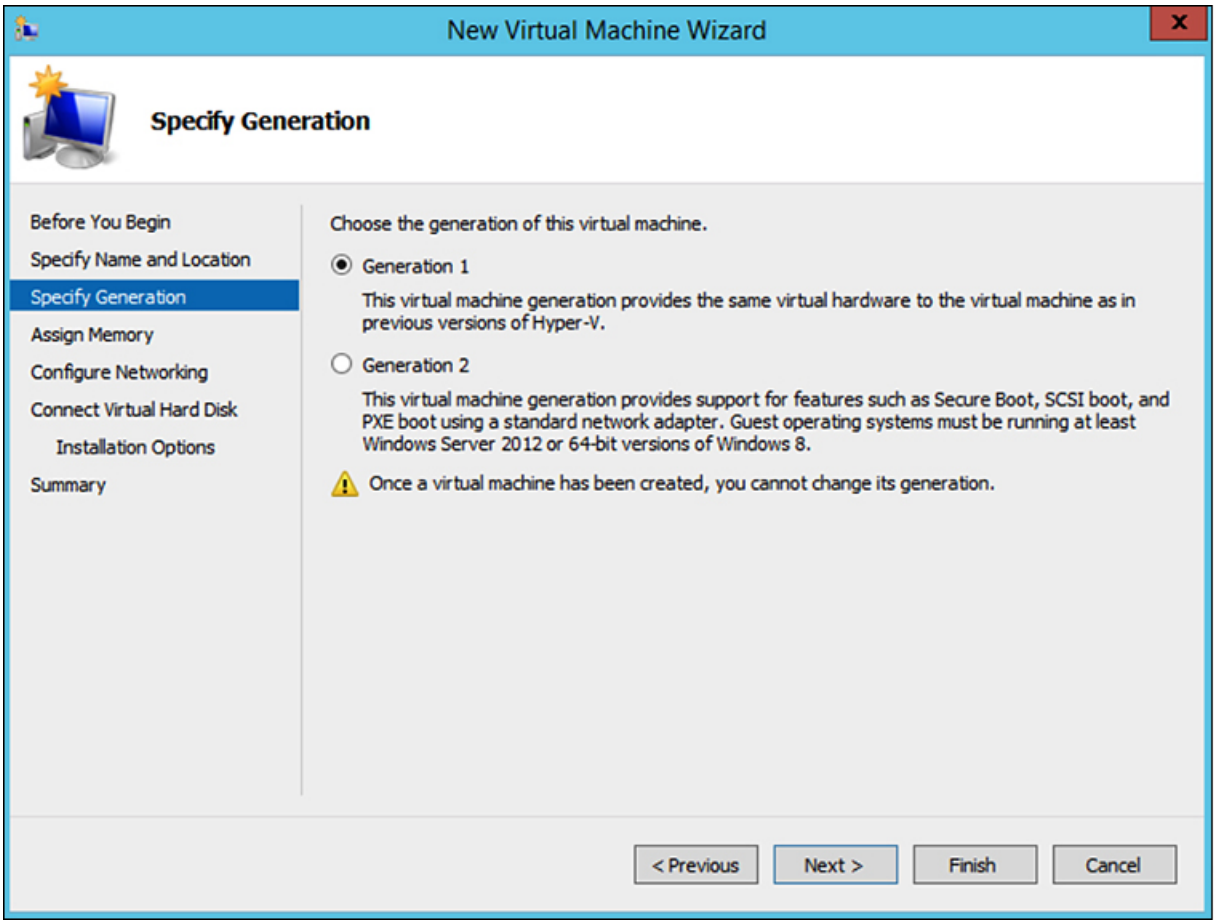


The New Virtual Machine Wizard appears. Follow the prompts to configure the new Virtual Machine.

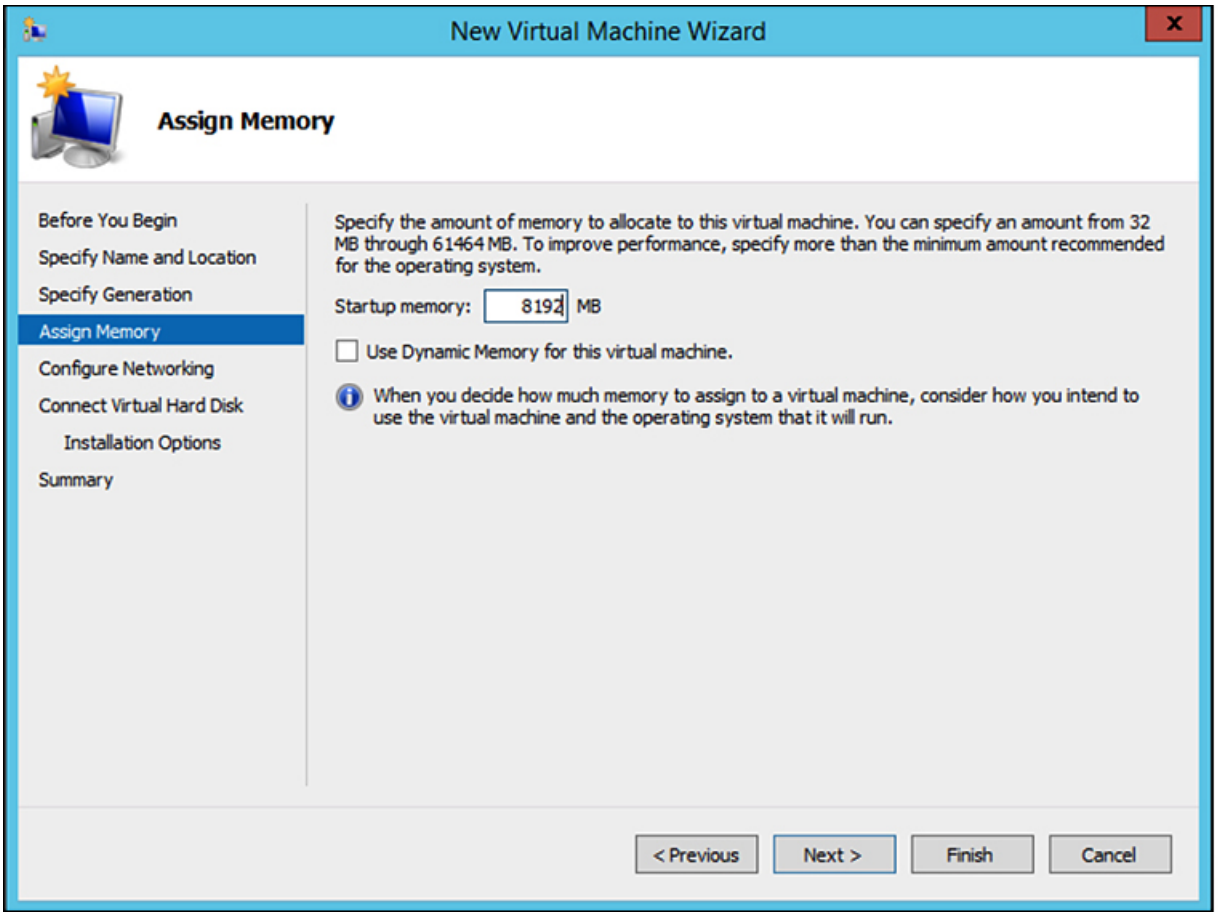
a) Specify the **Name** of the VM, then click **Next**.



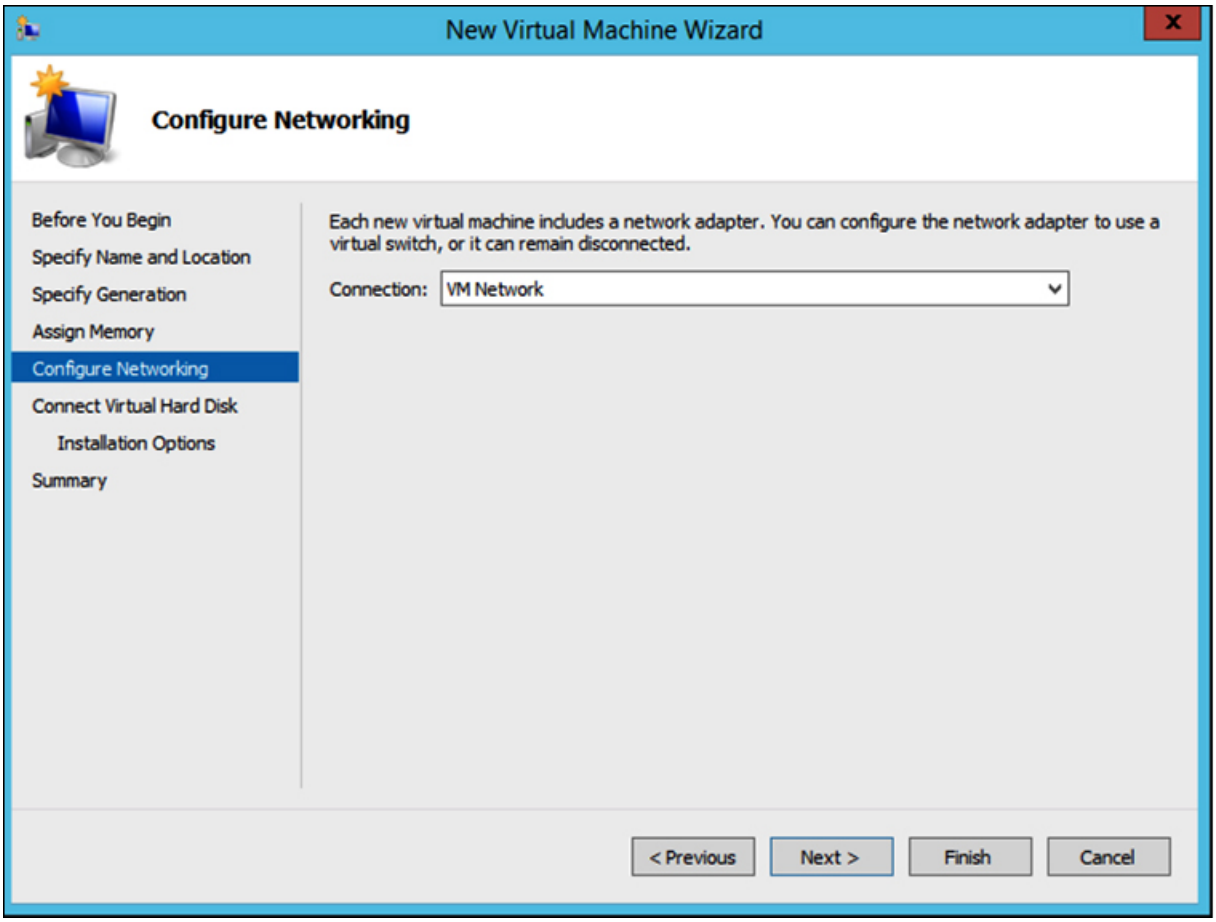
b) Select **Generation 1** for the VM generation.



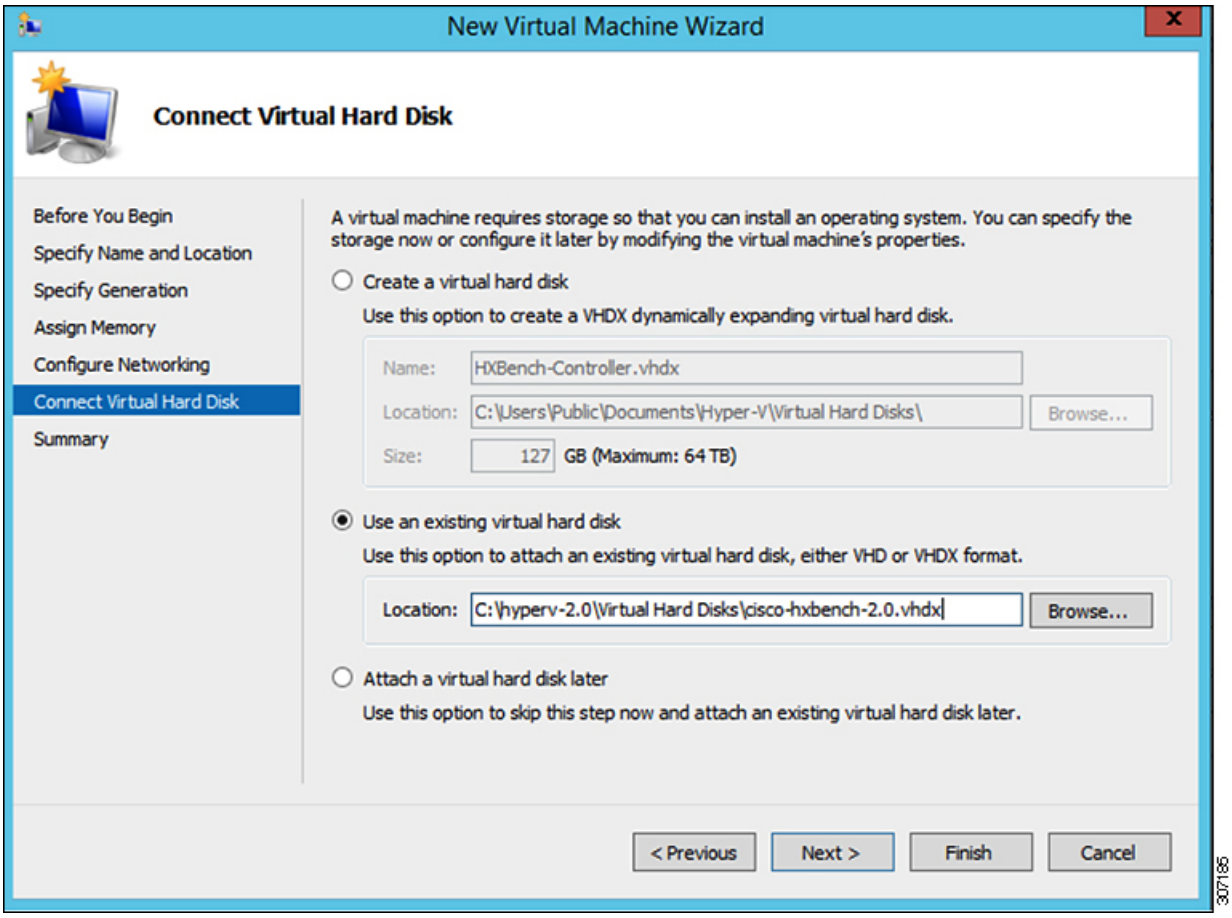
c) Specify **8192 MB** as the memory size, then click **Next**.



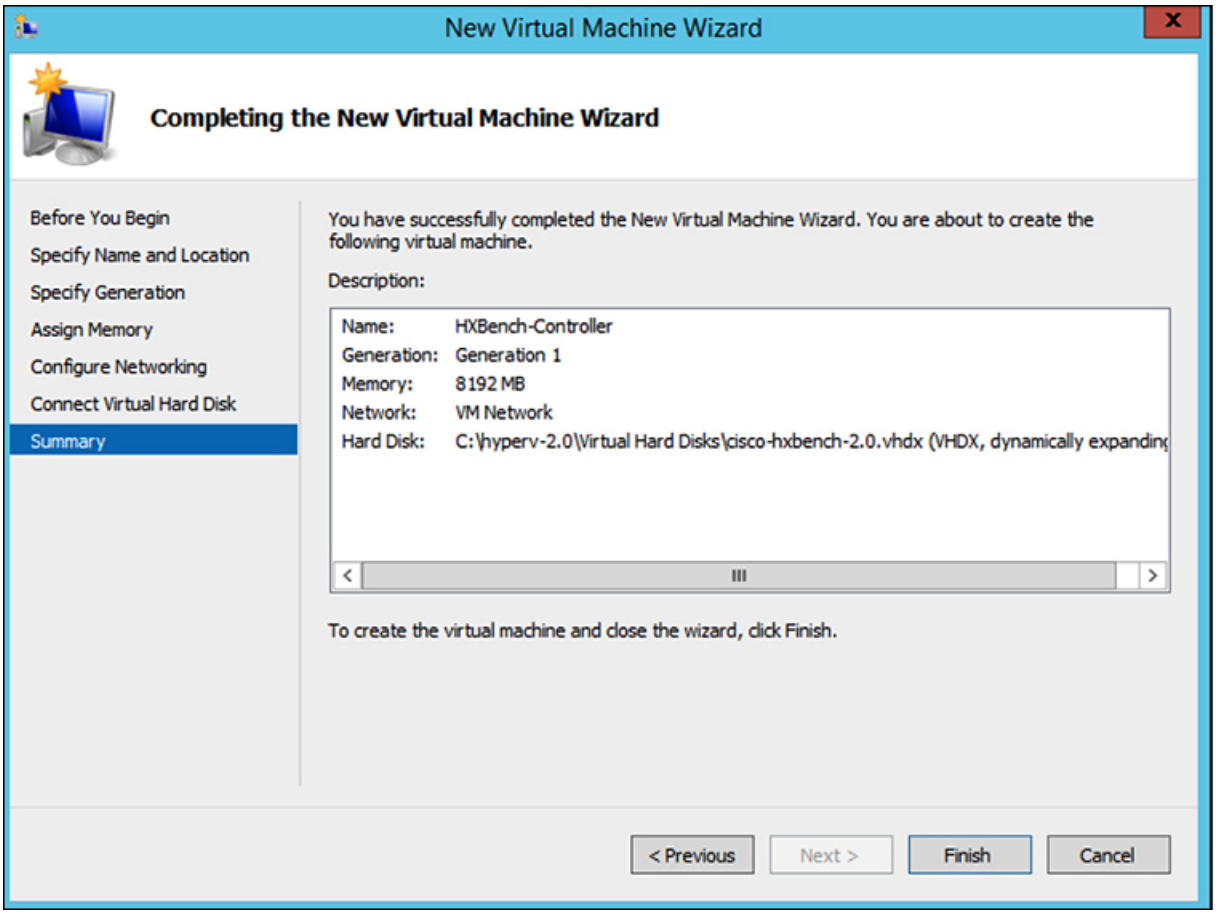
d) Select Network connection **Public Network for HxBench VM**, then click **Next.**



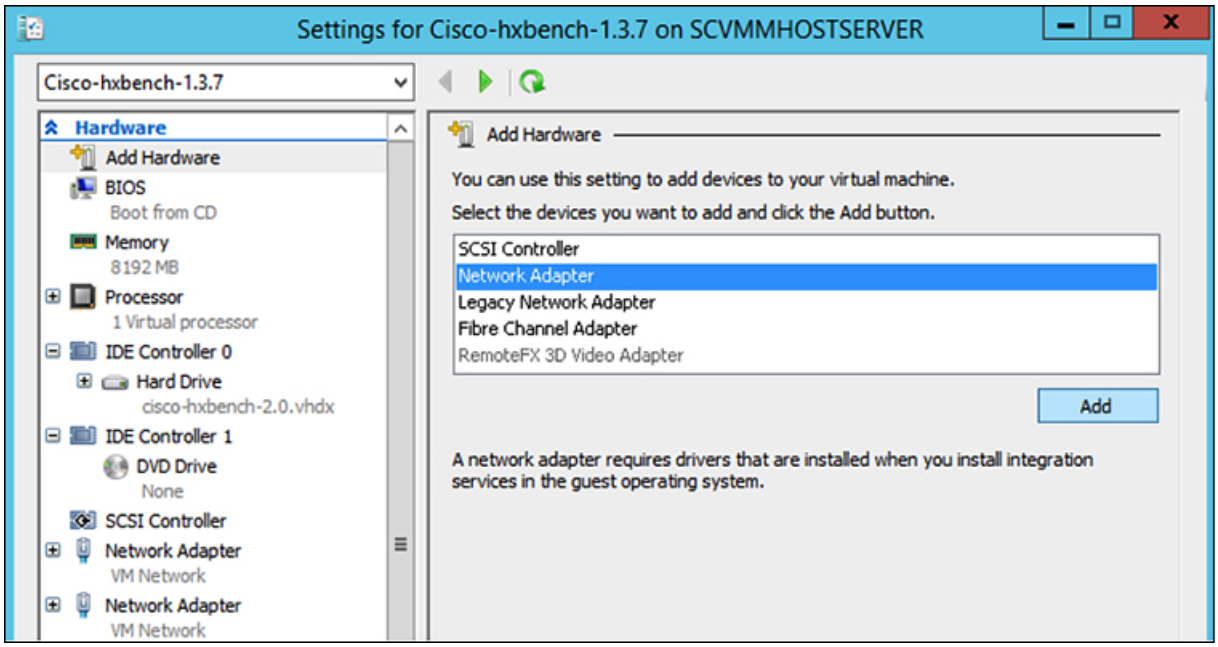
e) Select **Use an existing virtual hard disk**, browse and select the copied **Cisco-HxBench-2.0-HyperV.vhdx**, then click **Next**.



f) Review the selected options to start deploying the vhdx, then click **Finish**.

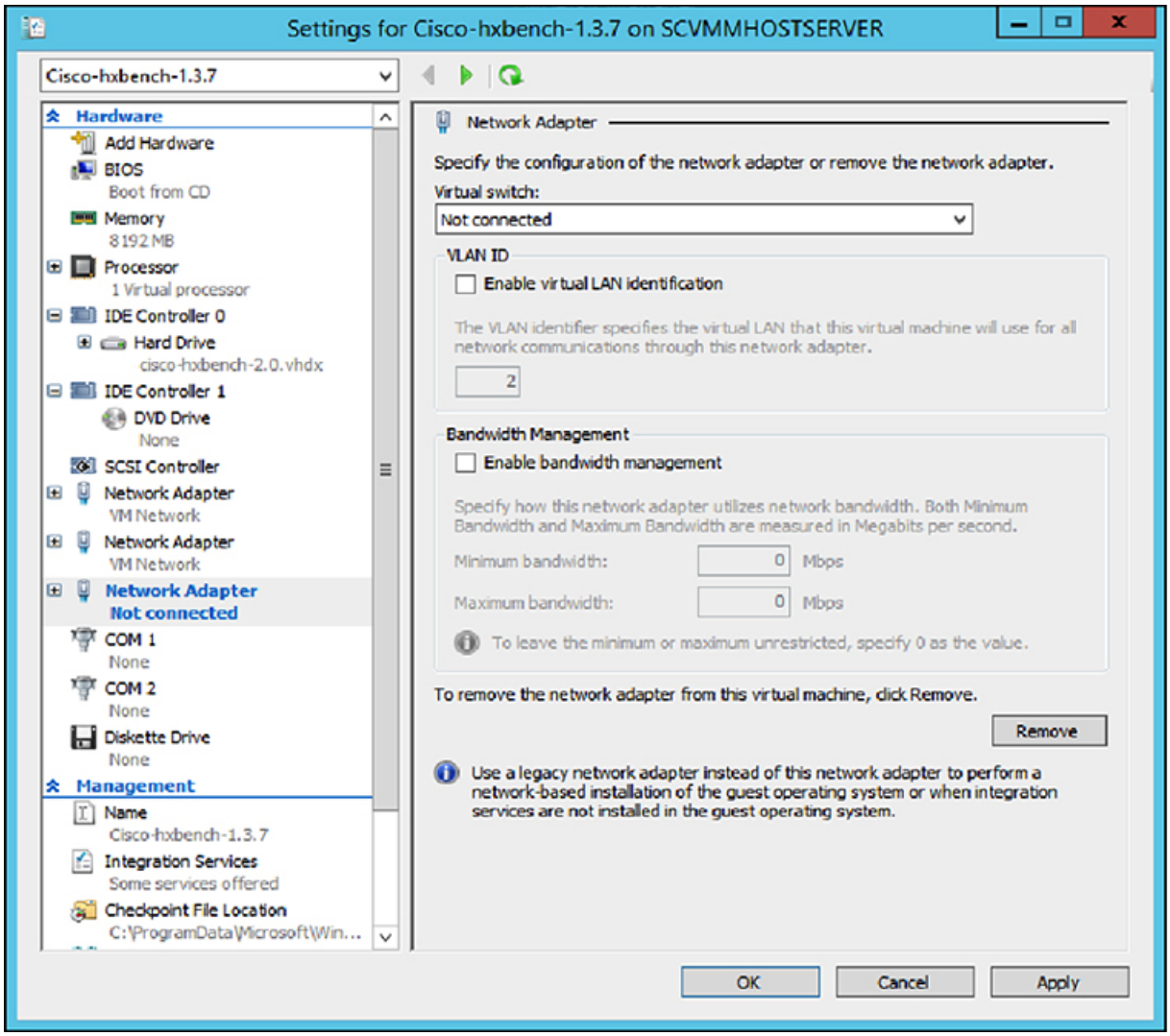


Step 3 After the completion of the VM deployment, click **VM Settings**. Under the **Add Hardware** tab, select **Network Adapter**, then click **Add**.



Step 4 Choose **Public Network for HXBench VM** under the Virtual Switch. Click **Apply**, then click **OK**.

Step 5 Assign a **VLAN ID** to both networks, if enabled.



Step 6 Power on the VM by clicking **Start**.

Step 7 Click **Start** to power on the VM and then click **Connect** to connect via the console.

Step 8 Change the password from the console. While changing the password, use the default username and password as `appadmin/password`.

Step 9 Configure the static or DHCP IP from terminal for the first login. Follow the instructions prompted in the terminal.

Step 10 After IP configuration, enter the new password as prompted in terminal. The machine will not reboot if DHCP and reboots with static IP selection.

Step 11 After all IP configuration changes, if any changes are required or any wrong entry IP is entered, edit the interfaces file using VIM editor: /etc/network/interfaces to update the details

Step 12 If the previous step is done manually, then reboot/reset the machine using Hyper-V manager.

Configure the Virtual Machine

Step 1 Power on the virtual machine.

Step 2 Log in to the virtual machine from the HxBench Web Interface.

Username	*<appadmin>*
Password	Use the Changed password during Hyper-V Controller deployment

Step 3 If you selected DHCP during deployment, the HxBench Application starts running when the VM boots up with the assigned DHCP address. Make a note of the IP address assigned to the VM.

If you selected static IP address, use the same to access the HxBench Controller and the HxBench Web Interface.

Access the HxBench Web Interface

To access the HxBench Web Interface, enter *http://<IPaddressof theVM>:8000/hxbench/index.html* in your browser.

Log in to the HxBench Web Interface using the following credentials:

Username	*appadmin*
Password	Use the Changed password during Hyper-V Controller deployment

Configure the Host in Hyper-V

Before running the test, configure the host as follows:

Note Perform the following steps on all hosts.

Step 1 From the Powershell CLI, enter:

```
>Set-ExecutionPolicy Unrestricted
>enable-wsmancredssp –role "Server" –Force
```

Step 2 Using windows powershell in administrator mode, copy and run the following file: **“/home/appadmin/host_configuration.ps1”** from the deployed HXBench Controller to **all Windows HyperV Host** and in Powershell execute the following: **./host_configuration.ps1**.

Step 3 Use the same to access the HXBench Controller and the HXBench Web Interface.

HX Bench picks up the hostname and tries to deploy VMs on the same. If it fails to resolve the hostname, then VM deployment fails.

If this occurs, perform the following steps:

a) Add DNS IP and FQDN of the host to `/etc/hosts` file in the controller using the below commands:

```
sudo vi /etc/hosts
 <IP-address> <FQDN>
```

Configure the Host in vCenter

HxBench picks up the hostname and tries to deploy VMs on the same. If it fails to resolve the hostname, then VM deployment fails.

Add DNS IP and FQDN of the host to `/etc/hosts` file in the controller using the below commands:

```
sudo vi /etc/hosts
 <IP-address> <FQDN>
```

Configure the HxBench Application

During initial login to the HxBench application after the installation, perform the following steps.

Step 1 Upload Vdbench software to the HxBench controller.

a) Download Vdbench software version 5.04.07 from the Oracle website. Download the *vdbench50407.zip* file from the link: http://www.oracle.com/technetwork/server-storage/vdbench-downloads-1901681.html.

b) Click **Start**. Upload the *vdbench50407.zip* file to the HxBench controller using the **Upload** button.

Note Uploading Vdbench software to the HxBench controller is a one time activity.

Step 2 Upon successful completion of Vdbench software upload, click **Next**. Provide your server details (vCenter or Hyper-V, shown as follows) where the tests should run. Complete the following fields and click **Save**.

Note Use an account that has administrator privileges to create or delete a virtual machine.

Table 1: vCenter Server Details

Field	Description
Host Name	vCenter hostname
User Name	<*admin*> username

Field	Description
Password	<*admin*> password

Table 2: Hyper-V Server Details

Field	Description
Node Name	Name of Hyper-V cluster
Host Name	Hyper-V hostname (use **Add** option for adding more hosts)
User Name	<*admin*> username
Password	<*admin*> password
Controller Type	Select **HX** or **Non-HX** as the Controller Type: When selecting the HX controller type, add the follwing fields: • Controller IP • Controller Username • Controller Password

Note The user of the host should have all access to that host, and be able to create a session from powershell.

What to do next

After successful addition of vCenter, you will be redirected to the **Run Test** workflow.

Validate the Network on vCenter Controller

After adding the vCenter server, validate the network setup by performing the following checks:

- Query the network port group details of NIC2 in the HxBench controller.
- Check the type of switch to which the port group is associated.
- If the port group is connected to Virtual Distributed Switch (VDS), check whether all the hosts in the cluster are connected to the VDS and NIC2 port group.

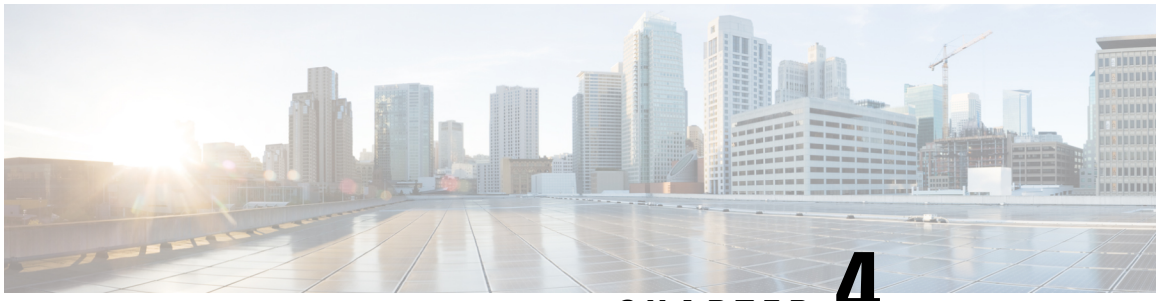
Note If the hosts are not connected to the VDS, you will see a warning that the network setup is partial. In such case, test VMs will be deployed to hosts only after the network setup is complete. You can manually update the configuration to connect all the hosts to a specific port group and VDS.

- If the port group is connected to the Virtual Standard Switch (VSS), the validation check will query the network and VLAN details of all the host switches.
  - If all the hosts are configured with the same port group and VLAN ID, the validation is successful and HxBench controller redirects to the Run Test workflow.
  - If some of the hosts are not configured with same port group and VLAN ID, the validation status is marked as **PARTIAL**. You can either continue to use the partial setup or alternatively, or you can create a new network setup on all hosts. Click **Cancel** to use the partial setup.

    If you choose to create a new network setup on all hosts, provide the following details and click **Create Network**.

Field	Description
VLAN ID	If the network switch is configured to allow traffic from specific VLAN IDs, make sure to update this VLAN ID to the configuration.
Host Name	For example, *10.11.1.xxx*
Switches	Choose vSwitch from the drop-down list.

- The HxBench controller assigns static IP addresses to all the test virtual machines. The static IP address is assigned from a private IP address range of *169.254.0.xxx*.



CHAPTER 4

Configure and Run Tests

Run a Raw Test

To test the storage performance in HxBench, select the **Bench Tests** tab and click the **Create Test** button. The **Create** page appears. This is the first of three pages that guide you through creating a bench test.

Step 1 On the **Test Profile** page, complete the following fields:

Field Name	Description
Test Name field	Type a unique name into the field. The test name is used to associate test parameters and test results into user-defined reports.
Test Type list	Select **Raw Disk** from the list.

a) Select the desired **Profile Type** for the named test from the following options:

Profile Type	Description
Select Existing	Use an existing profile from the list of available Test Profiles.

Profile Type	Description
Create New	Create a new test. Complete the Vdbench test parameter values to define a new custom test: **Test Parameters** • **Read Mix (%)**: Valid range is 1-100%. The default is 60%. • **IO Type** list: Valid values are **Random** and **Sequential**. The default is **Random**. • **IO Block Size (KB)**: Valid range is 0-99. The default is 8. • **Threads per VM**: Value must be greater than 1. The default is 32. **Data Set** • **Deduplication (%)**: Valid range is 0-99%. The default is 50%. • **Compression (%)**: Valid range is 0-99%. The default is 50%. • **Dataset per VM (GB)**: Value must be greater than 1. The default is 100. • **Working Set (% of Dataset)**: Valid range is 0-100%. The default is 100%. **Loadpoint and Run Time** • Select the Loadpoint: **Fixed Load (only 100% loadpoint)** or **Stepwise Load (Initial calibration, 10%, 50%, 75% 90%, 100% load point)** • **Run Time (min)**: Length of time of the test: Value must be greater than 1.
Upload File	Click the **Browse** button to navigate to upload Vdbench test parameters from a file.

b) Click **Next** to continue to the **VM Group**.

Step 2 On the **VM Group** page, provide the infrastructure details of the virtual machines you want to test.

a) Select the infrastructure to run the tests.

Infrastructure Type	Description
Use Existing VM Group	To use the existing infrastructure to run the tests, select the VM from the **Select VM Group** list.

Infrastructure Type	Description

Create New VMs	To create a new infrastructure, select **Create New VMs** and complete the following fields:
	• **VM Name Prefix**: Name of the VM.
	• **vCenter**: Pre-populated values. You cannot edit or change the values.
	• **Datastore** list: List of datastores in the vCenter that are queried at runtime.
	• **Number of VMs**: Valid value range is 1 to 4 VMs. The default is 4.
	• **Stretched Cluster:** Enable Stretched Cluster; If you are benchmarking a Stretched Cluster complete the additional fields:
	  • **HX Connect IP:** HX Connect IP address
	  • **HX Connect Username:** HX Connect Username
	  • **HX Connect Password:** HX Connect Password.
	  • **Fetch Data Store:** After entering HX Connect details click on this button to fetch Datastore details.

b) Click **Next**.

c) Upon successful selection of Define Test and Define Infra, click **Start Test** to start the test.
As the test progresses, it will automatically transition through the following work flow progress pages.

Work flow Page	Description
Create Infra	View the Test VMs created with the given specifications. Use the **Log Details** tab to view the progress.
Validate Infra	VM infrastructure is validated for its availability and reachability.
Create Data Set	Data disk priming is carried out to run the test. The VM infrastructure is ready upon the completion of data disk priming. Now, the Vdbench tool is triggered to run the storage performance test using the provided test inputs on the VM infrastructure.
Run Tests	Performance metrics are captured and updated as the test progresses.
Completed	When the test is successfully **Completed**, the status turns green. The fields under **Aggregate Test Results** are updated.

Testing iSCSI Storage for HyperFlex

Testing iSCSI Storage: HyperFlex Cluster

To test HyperFlex storage performance in HxBench, perform the following steps:

Step 1 On the **Bench Tests** tab, click **Create Test**. The **Test Profile** page appears. This is the first of three pages that guide you through creating a bench test.

Step 2 On the **Test Profile** page, complete the following fields:

Field Name	Description
Test Name field	Type a unique name into the field. The test name is used to associate test parameters and test results into user-defined reports.
Test Type list	Select **iSCSI Block Storage Workload – HX** from the list.

a) Select the desired **Profile Type** for the named test from the following options:

Profile Type	Description
Select Existing	Use an existing profile from the list of available Test Profiles.
Create New	Create a new test. Complete the Vdbench test parameter values to define a new custom test: **Test Parameters** • **Read Mix (%)**: Valid range is 1-100%. The default is 60%. • **IO Type** list: Valid values are **Random** and **Sequential**. The default is **Random**. • **IO Block Size (KB)**: Valid range is 0-99. The default is 8. • **Threads per VM**: Value must be greater than 1. The default is 32. **Data Set** • **Deduplication (%)**: Valid range is 0-99%. The default is 50%. • **Compression (%)**: Valid range is 0-99%. The default is 50%. • **Dataset per VM (GB)**: Value must be greater than 1. The default is 100. • **Working Set (% of Dataset)**: Valid range is 0-100%. The default is 100%. **Loadpoint and Run Time** • Select the Loadpoint: **Fixed Load (only 100% loadpoint)** or **Stepwise Load (Initial calibration, 10%, 50%, 75% 90%, 100% load point)** • **Run Time (min)**: Length of time of the test: Value must be greater than 1.

Profile Type	Description
Upload File	Click the **Browse** button to navigate to upload Vdbench test parameters from a file.

b) Click **Next** to continue to the **VM Group**.

Step 3 On the **VM Group** page, provide the infrastructure details of the virtual machines you want to test.

a) Select the infrastructure to run the tests.

Infrastructure Type	Description
Use Existing VM Group	To use the existing infrastructure to run the tests, select the VM from the **Select VM Group** list.
Create New VMs	To create a new infrastructure, select **Create New VMs** and complete the following fields: • **VM Name:** Name of the VM. • **Node:** Name of the node. • **Data Store** list: List of data stores in the vCenter that are queried at runtime. • **Total VMs across All Nodes**: Total count of VMs across all nodes. Value needs to be greater than 1. • **MTU Size:** (Optional) MTU size for the test VMs and controller. • **HX Connect IP:** HX Connect IP address. • **HX Connect Username:** HX Connect Username. • **HX Connect Password:** HX Connect Password.
Target Server Details	**Enable CHAP:** Select either Yes or No. If yes is selected, the CHAP Username and Password fields is visible and mutual authentication between target and user is configured. Complete the required fields. • **IP Address:** CHAP IP address • **CHAP Username:** CHAP username • **CHAP Password:** CHAP password
Network Configuration Details	• **Static/DHCP:** Select Static or DHCP for IPs to assign to the test VMs. • **IP Range Start:** Starting IP address for test VMs. Successive unused IPs after this IP are used for test VMs. This option is only available if you select **Static**. • **Netmask:** NetmaskIP of the network used for test VMs. This option is only available if you select **Static**. • **Gateway:** GatewayIP of the network used for test VMs. This option is only available if you select **Static**.

Infrastructure Type	Description
Data Priming	Priming involves performing an initial write to the entire VM. This is required for all new VMs to ensure performance results are valid. Existing VMs should be re-primed when using a storage efficiency ration other than the one used for initial creation. Use the radio buttons to include or skip priming and specify when to run the priming test in the field provided.

b) Click **Next**.

c) Upon successful selection of Define Test and Define Infra, click **Start Test** to start the test.
As the test progresses, it will automatically transition through the following work flow progress pages.

Work flow Page	Description
Create Infra	View the Test VMs created with the given specifications. Use the **Log Details** tab to view the progress.
Validate Infra	VM infrastructure is validated for its availability and reachability.
Create Data Set	Data disk priming is carried out to run the test. The VM infrastructure is ready upon the completion of data disk priming. Now, the Vdbench tool is triggered to run the storage performance test using the provided test inputs on the VM infrastructure.
Run Tests	Performance metrics are captured and updated as the test progresses.
Completed	When the test is successfully **Completed**, the status turns green. The fields under **Aggregate Test Results** are updated.

When the test is successfully Completed, the status turns green and the fields under **Loadpoint Averages and VM Average Comparison** are updated.

- You can view the Test VMs created with the given specifications. You can view the progress in the **Status column.**

  View the progress in the **Status column**. View the Test VMs created with the given specifications.
- Data disk priming is carried out to run the test.
- The VM infrastructure is ready upon the completion of data disk priming. The vdbench tool is now triggered to run the storage performance test using the provided test inputs on the VM infrastructure.
- Performance metrics are updated as the test progresses on the**Run Tests** page.
- When the test is in progress the **Create VM Group** button is disabled. The button is enabled after test completes, fails or terminates.

Testing iSCSI Storage: Non-HyperFlex Clusters

To test storage performance (non-HyperFlex platform) in HxBench, proceed as follows:

Step 1 On the **Bench Tests** tab, click **Create Test**. The **Create** page appears. This is the first of three pages that guide you through creating a bench test.

Step 2 On the **Test Profile** page, complete the following fields:

Field Name	Description
Test Name field	Type a unique name into the field. The test name is used to associate test parameters and test results into user-defined reports.
Test Type list	Select **iSCSI Block Storage Workload – Non-HX** from the list.

a) Select the desired **Profile Type** for the named test from the following options:

Profile Type	Description
Select Existing	Use an existing profile from the list of available Test Profiles.
Create New	Create a new test. Complete the Vdbench test parameter values to define a new custom test: **Test Parameters** • **Read Mix (%)**: Valid range is 1-100%. The default is 60%. • **IO Type** list: Valid values are **Random** and **Sequential**. The default is **Random**. • **IO Block Size (KB)**: Valid range is 0-99. The default is 8. • **Threads per VM**: Value must be greater than 1. The default is 32. **Data Set** • **Deduplication (%)**: Valid range is 0-99%. The default is 50%. • **Compression (%)**: Valid range is 0-99%. The default is 50%. • **Dataset per VM (GB)**: Value must be greater than 1. The default is 100. • **Working Set (% of Dataset)**: Valid range is 0-100%. The default is 100%. **Loadpoint and Run Time** • Select the Loadpoint: **Fixed Load (only 100% loadpoint)** or **Stepwise Load (Initial calibration, 10%, 50%, 75% 90%, 100% load point)** • **Run Time (min)**: Length of time of the test: Value must be greater than 1.
Upload File	Click the **Browse** button to navigate to upload Vdbench test parameters from a file.

b) Click **Next** to continue to the **VM Group**.

Step 3 On the **VM Group** page, configure details of the infrastructure where you want to deploy the test virtual machines to run the test. You must use an existing infrastructure.

a) Select **Use Existing VM Group** to run the tests.

b) Click **Next**.

c) Click **Start Test** to start the test.

When the test is successfully Completed, the status turns green and the fields under **Loadpoint Averages and VM Average Comparison** are updated.

- You can view the Test VMs created with the given specifications. You can view the progress in the **Status column.**

  View the progress in the **Status column.** View the Test VMs created with the given specifications.

- Data disk priming is carried out to run the test.
- The VM infrastructure is ready upon the completion of data disk priming. The vdbench tool is now triggered to run the storage performance test using the provided test inputs on the VM infrastructure.
- Performance metrics are updated as the test progresses on the**Run Tests** page.
- When the test is in progress the **Create VM Group** button is disabled. The button is enabled after test completes, fails or terminates.

Terminate a Test

You can terminate a running test using the **Terminate** option in the Run test wizard. The test will be marked as **Terminated by user**.

Test Details

The various operations you can perform on completed tests, test profiles, and VM infrastructure are listed in this section.

Bench Tests

You can view the list of tests run on the controller under the **BENCH TESTS** tab. You can select any test from this list and visualize the test summary, performance metrics and compare across multiple tests. If there is a test running, the Test History view lists it as *In-Progress Test* and updates the view details periodically. You can delete a test and associated data from HxBench.

Comparisons

You can select and compare test results on the **COMPARISONS** tab. You can select any test from this list, the Run Definition and Loadpoint and compare across multiple tests.

- Use the toggle to auto select similar tests.
- Use the check boxes to select specific metrics.
- Click the + to add additional tests.

Test Profiles

You can view the list of available profiles in the controller under the **TEST PROFILES** tab. You can select a profile and view the details. You can download a profile from here. You can also upload a profile and use

it for testing. However, when a profile file is uploaded, the content must be in the correct format as defined by Vdbench. If there is any wrong format or unrecognized keys, the test will fail. You can delete a profile from HxBench.

VM Groups

You can view the available VM infrastructure and its status from the **VM GROUPS** page. If an infrastructure is not required for any further testing, you can delete it.

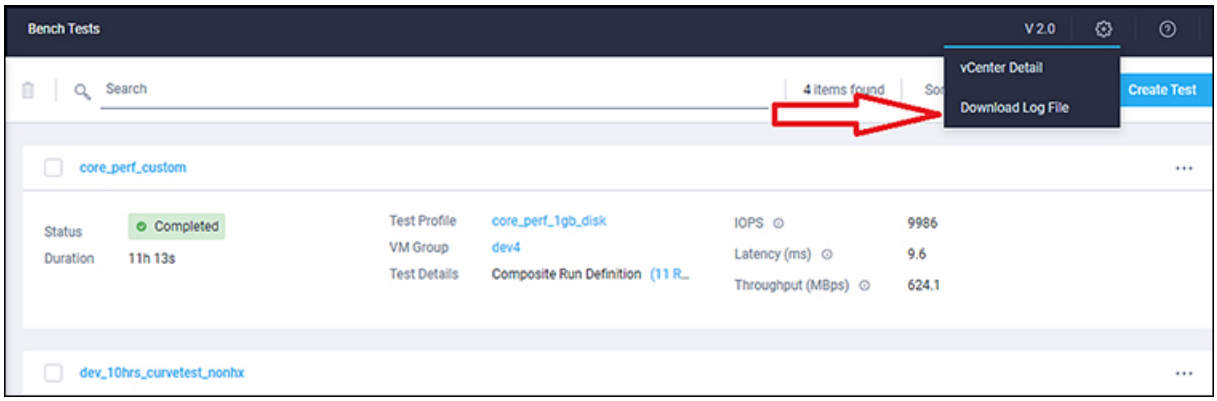
You can create a VM infrastructure to run a test using the Run Test wizard.

Application Logs

Application logs are stored in the following location:

/home/appadmin/hxbench/hxbench/hxbench.log

The following screenshot shows how to download the application logs.



Test Results

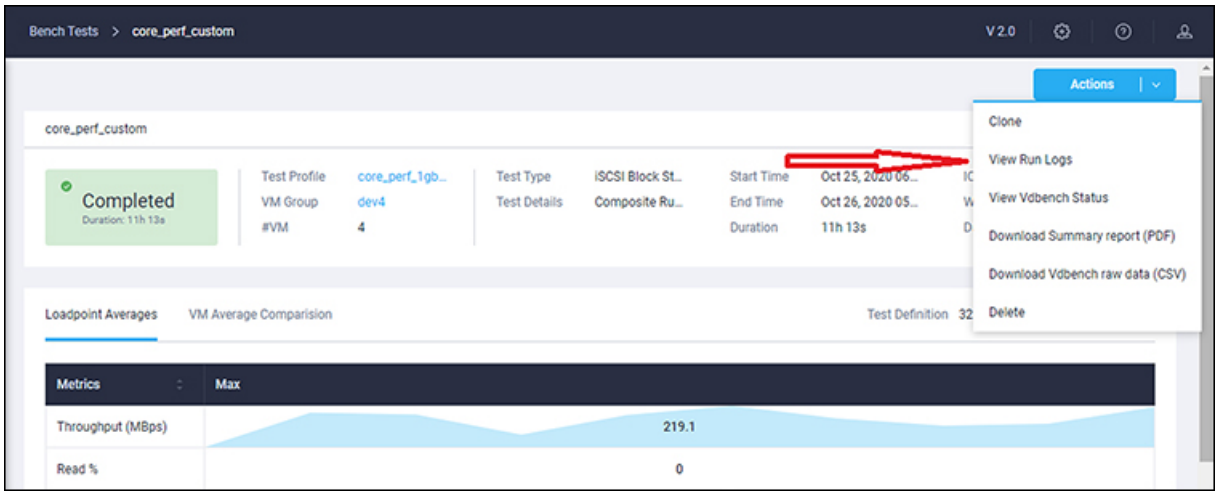
Test Results Logs

- Click on **Test Details** > **View Logs** > **View Run Logs**.

  You can view the complete test logs.

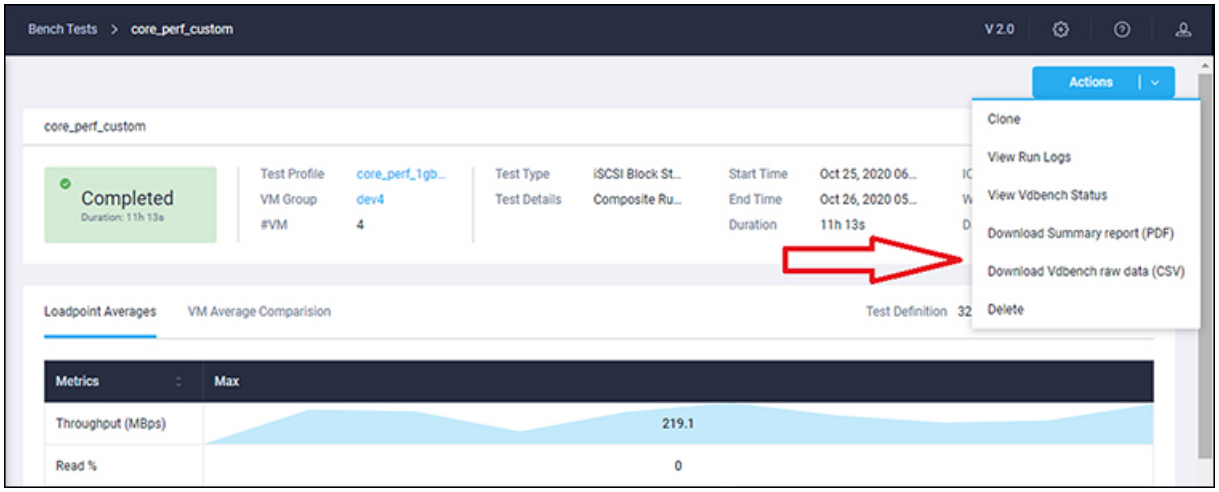
- Click on **Test Details** > **View Logs** > **View Vdbench Status**.

  You can view the parsable information about the current status of Vdbench.



Download Test Results Report

- To download the detailed results in PDF, click on **Download** icon under **Test Details** and select **PDF**.
- To download the detailed results in CSV, click on **Download** icon under **Test Details** and select **CSV**.



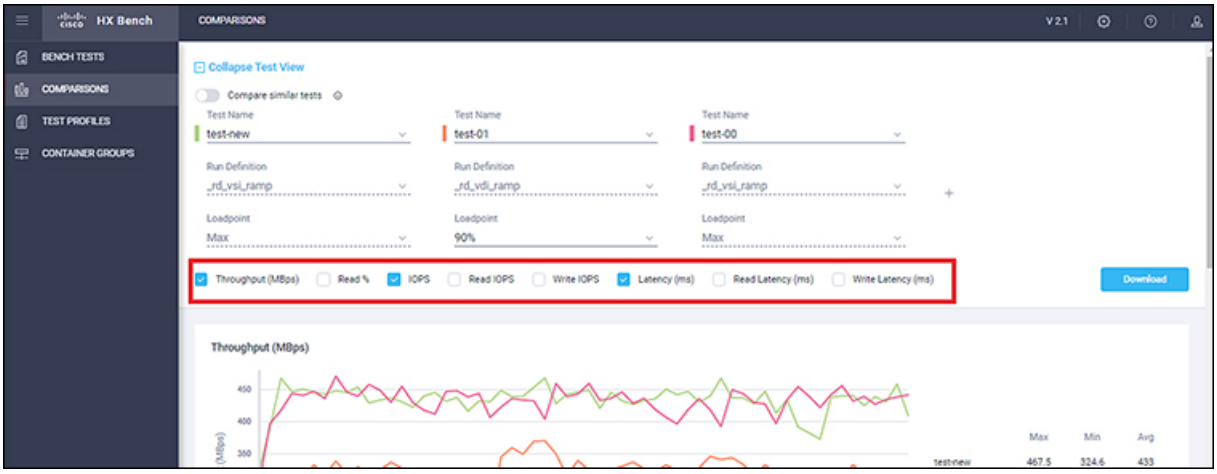
Comparing Test Results

You can perform various comparisons on completed tests by selecting the required test from the list. You can select a minimum of two and a maximum of five tests at a time. To compare completed test proceed as follows:

Step 1 Click on the **Comparisons** tab.

Step 2 Select the tests to be compared from the completed **Test Name** list. You can select a minimum of two and a maximum of five tests.

Step 3 Use the check boxes to select the test parameters that you want to compare.

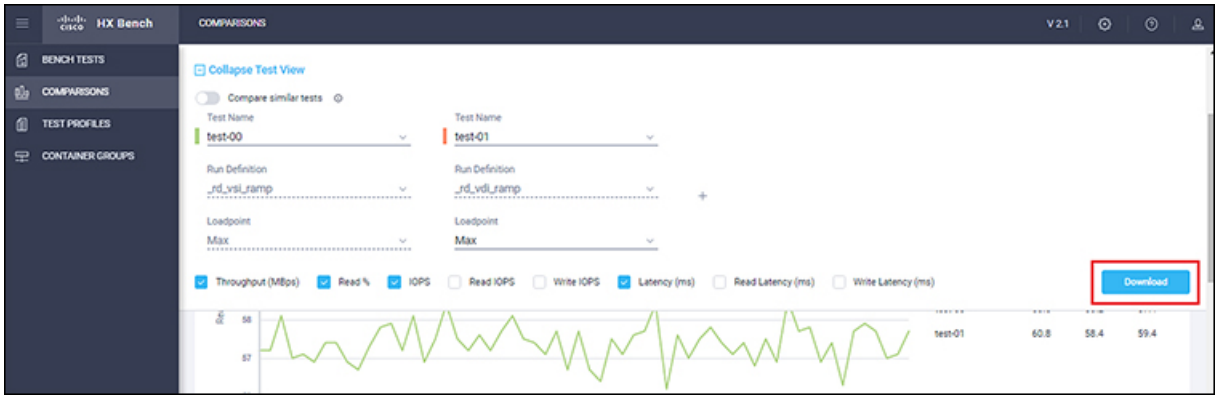


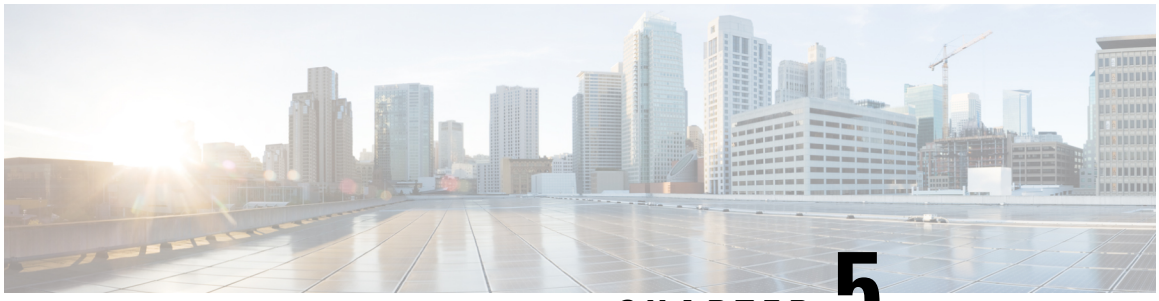
Step 4 Turn on the **Compare similar tests** switch to compare tests with the same test profile. The first test selected is considered the base test, all of the other tests to be compared will have the same run definition and loadpoint as the first test.

The comparison results appear with an illustrative graph.

What to do next

To download the detailed test comparisons result in PDF, click on the **Download** button under the **Comparisons** tab.





CHAPTER 5

Creating Test VMs

Creating Test VMs for Raw Disk

Step 1 Click on the **VM Groups** tab.

Step 2 Under the **Create VM Groups** tab, click on **Create VM Group** and complete the following fields:

Table 3: Create VM Group for Raw Disk fields

Field	Description
VM Group for Test Type	Select **Raw Disk** from the drop-down.
VM Name Prefix	Name of the VM.
vCenter	vCenter field is pre-populated. You cannot edit the value.
Number of VMs	Number of VMs to deploy. The default value is set to 4.
Network	List of network switches available in vCenter.
Stretched Cluster	If you are benchmarking a Stretched Cluster complete the additional fields: • **HX Connect IP:** HX Connect IP address • **HX Connect Username:** HX Connect Username • **HX Connect Password:** HX Connect Password. • **Fetch Data Store:** After entering HX Connect details click on this button to fetch Datastore details.

Step 3 Click **Save**.

Creating Test VMs for iSCSI

Creating Test VMs for iSCSI: HyperFlex Clusters

Step 1 Select the **VM Groups** tab.

Step 2 On the **Create VM Groups** tab, click **Create VM Group** and complete the following fields:

Table 4: Create VM Group for iSCSI Block Storage Fields

Field	Description
VM Group Details	
VM Group for Test Type	Select **iSCSI Block Storage Workload** from the list.
VM Group Name	Type the unique VM Group Name in the field.
vCenter	vCenter field is pre-populated. You cannot edit the value.
Data Center	Select the Data Center from the list.
Cluster	Select the Cluster from the list.
Data Store	List of data stores in the vCenter that are queried at runtime.
Network	List of network switches available in vCenter.
Total VMs across All Nodes	Total count of VMs across all nodes. Value needs to be greater than 1. The default value is set to 4.
Disk Size / VM (GB)	
MTU Size	(Optional) MTU size for the test VMs and controller. This field is optional.
Target Server Details	
Cluster Type	Specify HX or non HX.
HX Connect IP	HX Connect IP
HX Connect Username	HX Connect Username
HX Connect Password	HX Connect Password
Target Server IP	IP address of the target server. This IP is used to discover targets in the target server.
CHAP	Select either **Yes** or **No**. If yes is selected, mutual authentication between target and user is configured.

Field	Description
VM Group Details	
CHAP Username	CHAP username. This field is visible only if the CHAP radio button is selected with **Yes**.
CHAP Password	CHAP Password. This field is visible only if the CHAP radio button is selected with **Yes**.
Network Configuration Details	
Static/DHCP	Select **Static**or **DHCP** for IPs to assign to the test VMs.
IP Range Start	Starting IP address for test VMs. Successive unused IPs after this IP are used for test VMs. This option is not available if you select DHCP.
Gateway	GatewayIP of the network used for test VMs. This option is not available if you select DHCP.
Netmask	NetmaskIP of the network used for test VMs. This option is not available if you select DHCP.
Target Server Details	
Enable CHAP	Select either Yes or No. If yes is selected, the CHAP Username and Password fields is visible and mutual authentication between target and user is configured. Complete the required fields. • **IP Address:** CHAP IP address • **CHAP Username:** CHAP username • **CHAP Password:** CHAP password
Network Configuration Details	
Static/DHCP	Select Static or DHCP for IPs to assign to the test VMs.
IP Range Start	Starting IP address for test VMs. Successive unused IPs after this IP are used for test VMs. This option is only available if you select **Static**.
Netmask	NetmaskIP of the network used for test VMs. This option is only available if you select **Static**.
Gateway	(Optional) Gateway IP of the network used for test VMs. This option is only available if you select **Static**.

Step 3 Click **Save**.

Creating Test VMs for iSCSI: Non-HyperFlex Clusters

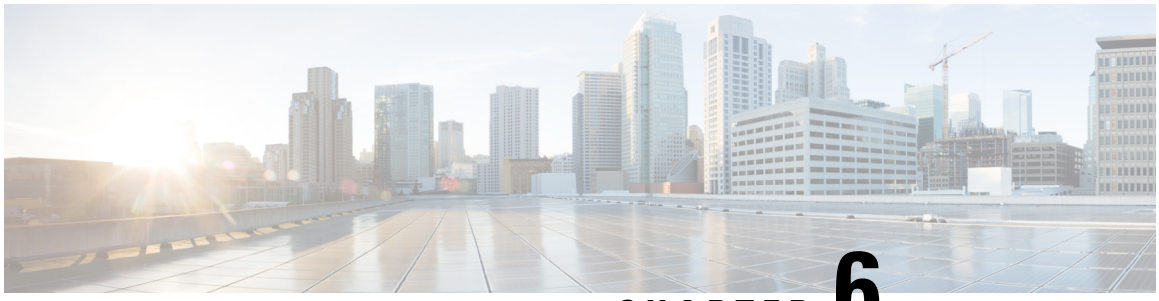
Step 1 Click on the **VM Groups** tab.

Step 2 Under the **Create VM Groups** tab, click on **Create VM Group** and complete the following fields:

Table 5: Create VM Group for iSCSI Block Storage Fields

Field	Description
VM Group for Test Type	Select **iSCSI Block Storage Workload** from the drop-down list.
VM Name Prefix	Name of the VM.
vCenter	vCenter field is pre-populated. You cannot edit the value.
Datastore	List of datastores in the vCenter that are queried at runtime.
Number of VMs	Number of VMs to deploy. The default value is set to 4.
Cluster Type	Set the Cluster Type to **HX/Non-HX for iSCSI Block Storage Workload**. Default value is **HX**.
Target Server IP	IP address of the target server. This IP is used to discover targets in the target server.
CHAP	Select either **Yes** or **No**. If yes is selected, mutual authentication between target and user is configured.
CHAP Username	CHAP username. This field is visible only if the CHAP radio button is selected with **Yes**.
CHAP Password	CHAP Password. This field is visible only if the CHAP radio button is selected with **Yes**.
Network Configuration Details	
Static/DHCP	Select **Static**or **DHCP** for IPs to assign to the test VMs.
IP Range Start	Starting IP address for test VMs. Successive unused IPs after this IP are used for test VMs. This option is not available if you select DHCP.
Gateway	GatewayIP of the network used for test VMs. This option is not available if you select DHCP.
Netmask	NetmaskIP of the network used for test VMs. This option is not available if you select DHCP.
Network	List of network switches available in vCenter.
MTU Size	MTU size for the test VMs and controller. This field is optional.

Step 3 Click **Save**.



CHAPTER 6

Appendix

Appendix

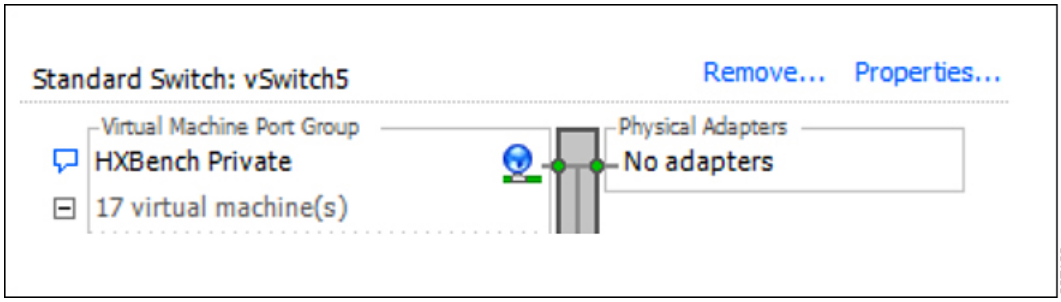
Deploy Cluster on a Single Host

This appendix provides step-by-step tasks for manual network creation for a Datacenter or cluster with one host.

Datacenter or Cluster with One Host

Follow these steps to create the required vSwitch and Port Group for HxBench.

1. Create a vSwitch with or without any uplinks using vSphere Web Client. Alternatively, you can select an existing vSwitch to create the HxBench Private **Port Group**.
2. Create a **Port Group** labeled *HxBench Private* (as shown in the following diagram).



3. During OVA deployment, map NIC-2 of the HxBench Controller to the newly created **HxBench Private Port Group**. Or. the DVS port switch can be used with the proper uplink configured on all the hosts.

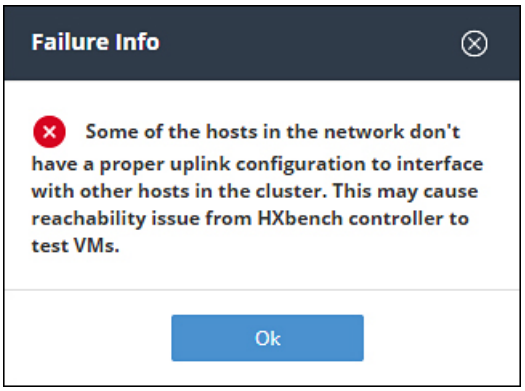
Troubleshooting Section

Network Issues

VM Deployment Failure

Uplink Error

The following error message is displayed:



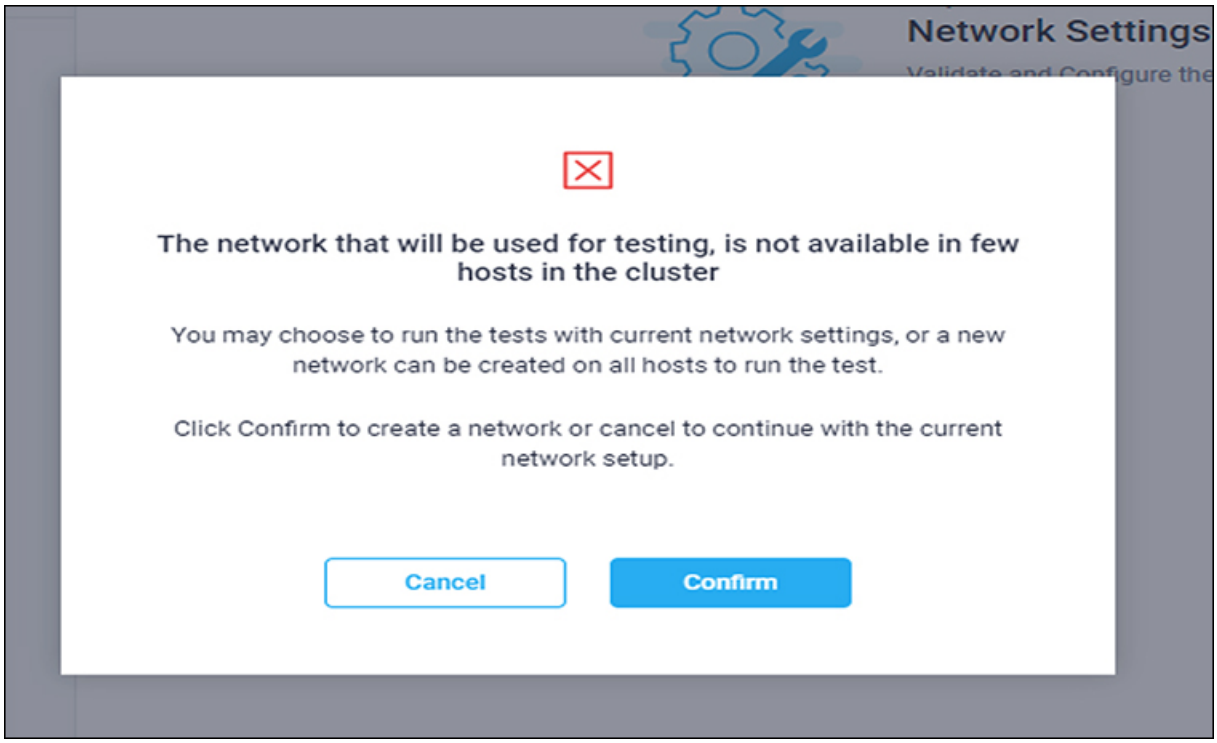
Steps to resolve this error:

- Please check if all the Host in the Cluster are connected to HXBench Private network and necessary VLAN ID is assigned.

  (For VLAN ID details, please contact the Networking team.)

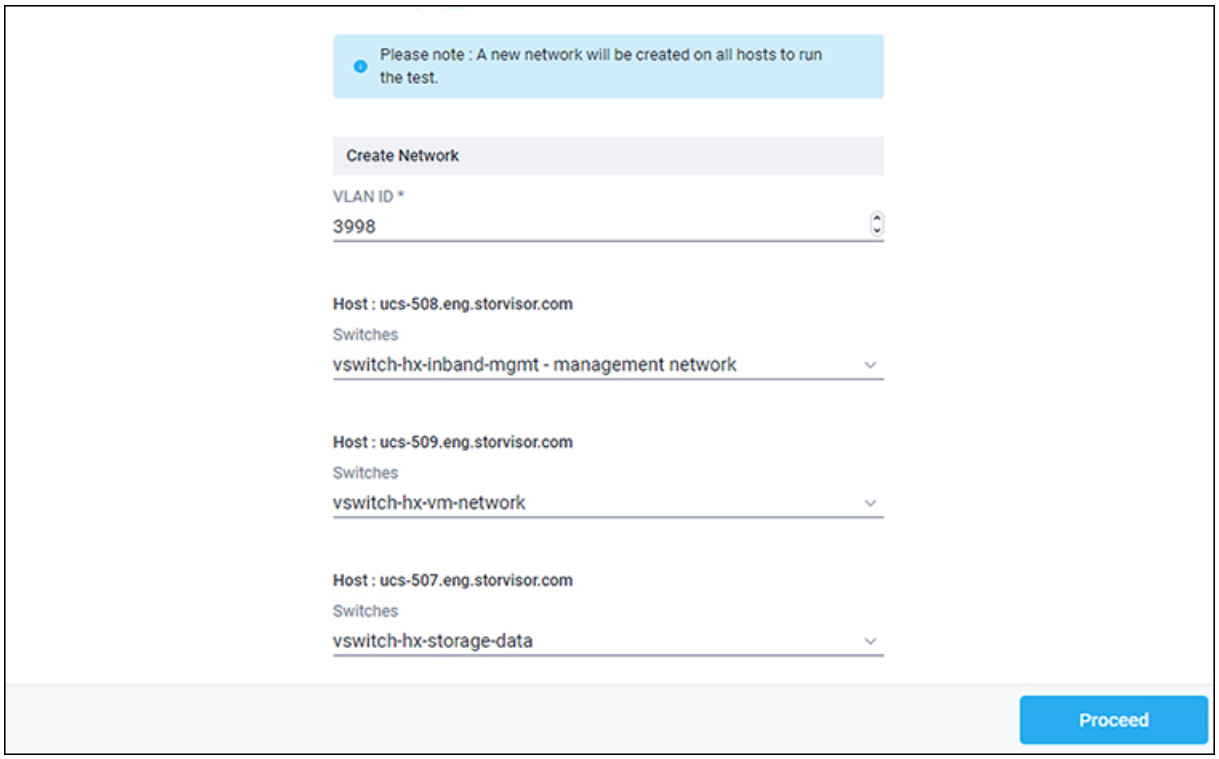
Missing Host Error

This issue occurs when some of the hosts in the cluster are not connected to HXBench Private network.



Steps to resolve this issue:

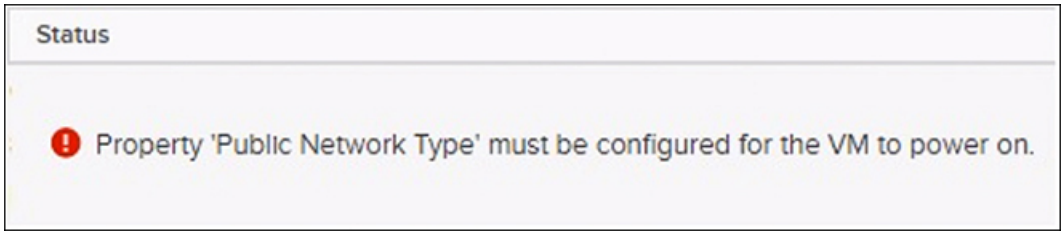
- To continue to run the tests on all the hosts in the cluster, click on **Confirm** button which creates the network on all the hosts.



Note For VLAN ID details, contact the Networking team.

Network Type Configuration Error

The following error message is displayed:



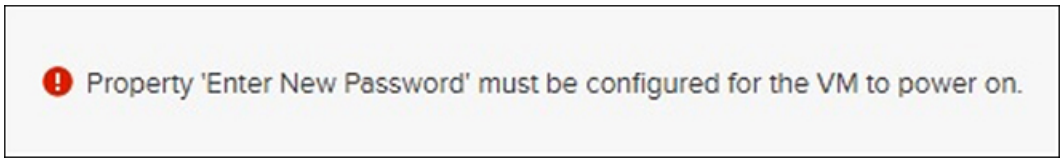
The issue may occur if either the Public Network Type property or DHCP/static option is not selected in the **Network Type** selection during the deployment.

Steps to resolve this error:

Redeploy the HxBench controller. During deployment, select Public Network Type property from the drop-down menu.

Password Configuration Error

The following error message is displayed:



The issue may occur if the password is not changed in the System password section during the deployment.

Steps to resolve this error:

Redeploy the HxBench controller. During deployment, under **System password**, enter the password that you would like to use to access the HxBench controller

VM Deployment Failure

The following error message is displayed:

```
Unable to copy files to x.x.x.x
```

Steps to resolve this issue:

- Click on the **Retry** button to reboot the VM.
- Copy the files again.

  If the files are copied successfully, then you can continue to use the same VM group to run the future tests.