

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.

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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.
- 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.

Security	Network label	HXBench Private			
Traffic shaping Teaming and failover	There are virtual machines on this host connected to the network 'HXBench Private'. If you rename this port group, vCenter Server will map it to a standard network with the specified new name. Then you should reconnect all virtual machines to the new standard network.				
	VLAN ID	410 🗸			

Note For procedural steps on manual network creation for a Datacenter or cluster with a single host, refer to Appendix 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**.

I Select an OVF template	Select a name and fold	Select a name and folder			
2 Select a name and folder	t a name and folder Specify a unique name and target location				
4 Review details	Virtual machine name:	Cisco-HxBench			
5 Select storage					
5 Select networks	Select a location for the	virtual machine.			
7 Ready to complete	~ 🛃				
	> 🗈				
	> 🗈				
	> 🗈				
	> 🗈				
	> 🗈				
	> 🖪				
	> 🗈				
	> 🗈				
	> 🗈				

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**.

1 Select an OVF template 2 Select a name and folder	Select a compute resource Select the destination compute resource for this operation
3 Select a compute resource	(h)
4 Review details	
5 Select storage	
7 Ready to complete	
	Compatibility Compatibility checks succeeded.



 1 Select an OVF template 2 Select a name and folder 3 Select a compute resource 4 Peview details 	Select storage Select the storage for the	configuration and c	disk files		
5 Select storage 6 Select networks	Select virtual disk format:	chine (Requires Re)	Thick Provision La	zy Zeroed 🗸 🗸	
7 Ready to complete	VM Storage Policy:		Datast	ore Default	~
	Name	Capacity	Provisioned	Free	Typ
		10 TB	2.39 TB	8.26 TB	NF
		10 TB	9.52 TB	2.79 TB	NF
	8	111.75 GB	108.51 GB	3.24 GB	Vħ
		1 GB	67.23 GB	0 B	NF
	< Compatibility	_			•
	✓ Compatibility checks	succeeded.			
			CANCEL	ВАСК	NEX

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

1 Select an OVF template 2 Select a name and folder 3 Select a compute resource	Select storage Select the storage for the	configuration and	disk files				
4 Review details	Encrypt this virtual machine (Requires Key Management Server)						
5 Select storage	Select virtual disk format:		Thin Provision	~			
6 Select networks 7 Ready to complete	VM Storage Policy:		Thick Provision La Thick Provision Ea	zy Zeroed	~		
	Name	Capacity	Thin Provision	iger zeroed	Typ		
		10 TB	2.39 TB	8.26 TB	NF ^		
		10 TB	9.52 TB	2.79 TB	NF		
		111.75 GB	108.51 GB	3.24 GB	VN		
		1 GB	67.23 GB	0 B	NF		
	4						
	Compatibility						
	 Compatibility checks 	succeeded.					

Step 7 Under Select networks, select HxBench Private.

2 Select a name and folder	Select networks Select a destination network f	or each source	network.		
4 Review details	Source Network	Ŧ	Destination Network	۲	r
5 Select storage	VM Network		VM Network	~	
6 Select networks	HXBench Private		HXBench Private	~	
7 Customize template				2 ite	ns
8 Ready to complete					
	IP Allocation Settings				
	IP allocation:	Static - Ma	anual		~
	IP protocol:	IPv4			

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

Deploy OVF Template						
✓ 1 Select an OVF template	 Network 	5 settings				
 2 Select a name and folder 3 Select a compute resource 4 Review details 5 Select storage 	DNS	ex:8.8.8.8/ Leave this blank if dhcp is enabled				
 Select storage 6 Select networks 7 Customize template 8 Ready to complete 	Public Network Gateway	ex:10.11.0.1/Leave this blank if dhcp is enabled				
	Public Network IP ex:10.11.0.137/ Leave this blank if dhcp is en					
	Public Network Netmask					
	ex:255.255.0.0/ Leave this blank if dhcp is enabled					
	Public Network Type	STATIC V				
	v Root Credential	1 settings				
	System Password					
	Provide password for appadmin	user(minimum 8 characters)				
		CANCEL BACK NEXT				

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**.

Deploy OVF Template			
✓ 1 Select an OVF template	Provisioning type	Deploy from template	^
 2 Select a name and folder 	Name	Cisco-HXBench-1.3.10	
 3 Select a compute resource 4 Peview details 	Template name	Cisco-HXBench-1.3.10	
 ✓ 5 Select storage 	Download size	2.6 GB	
 ✓ 6 Select networks ✓ 7 Customize template 	Size on disk	50.0 GB	
8 Ready to complete	Folder		
	Resource		
	Storage mapping	1	
	All disks	Datastore:	
	Network mapping	2	
	VM Network	VM Network	
	HXBench Private	HXBench Private	
	IP allocation settings		
	IP protocol	IPV4	
	IP allocation	Static - Manual	
		CANCEL BACK FINIS	н

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.

ila -		Hyper-V Ma	anager			×	- 0 X
Eile Action View Help							
🗢 🌩 🙎 📰 📓 🗔							Q
Hyper-V Manager					Actions		
SCVMMHOSTSERVER	Virtual Machines				SCVMMHOSTSERVER	• ^	
	Name	State	CPU Usage	Assigned Memor	New		Virtual Machine
	Constitution of the	Off Running	3%	2646 MB	💫 Import Virtual Machine		Hard Disk
	El mainte a chat	Running	0%	2048 MB	😤 Hyper-V Settings		Floppy Disk

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.

8	New Virtual Machine Wizard
Specify Na	ame and Location
Before You Begin Specify Name and Location Specify Generation Assign Memory Configure Networking Connect Virtual Hard Disk	Choose a name and location for this virtual machine. The name is displayed in Hyper-V Manager. We recommend that you use a name that helps you easily identify this virtual machine, such as the name of the guest operating system or workload. Name: HXBench-Controller You can create a folder or use an existing folder to store the virtual machine. If you don't select a folder, the virtual machine is stored in the default folder configured for this server. Store the virtual machine in a different location
Summary	Location: C:\ProgramData\Microsoft\Windows\Hyper-V\
	< Previous Next > Finish Cancel

b) Select Generation 1 for the VM generation.

80	New Virtual Machine Wizard
Specify Gene	eration
Before You Begin Specify Name and Location Specify Generation Assign Memory Configure Networking Connect Virtual Hard Disk Installation Options Summary	 Choose the generation of this virtual machine. ● Generation 1 This virtual machine generation provides the same virtual hardware to the virtual machine as in previous versions of Hyper-V. O Generation 2 This virtual machine generation provides support for features such as Secure Boot, SCSI boot, and PXE boot using a standard network adapter. Guest operating systems must be running at least Windows Server 2012 or 64-bit versions of Windows 8. ① Once a virtual machine has been created, you cannot change its generation.
	< Previous Next > Finish Cancel

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

New Virtual Machine Wizard	
Assign Memo	ory
Before You Begin Specify Name and Location Specify Generation Assign Memory Configure Networking Connect Virtual Hard Disk Installation Options Summary	Specify the amount of memory to allocate to this virtual machine. You can specify an amount from 32 MB through 61464 MB. To improve performance, specify more than the minimum amount recommended for the operating system. Startup memory: 8192 MB Use Dynamic Memory for this virtual machine. When you decide how much memory to assign to a virtual machine, consider how you intend to use the virtual machine and the operating system that it will run.
	< Previous Next > Finish Cancel

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

80 -	New Virtual Machine Wizard
Configure Ne	etworking
Before You Begin Specify Name and Location Specify Generation Assign Memory Configure Networking Connect Virtual Hard Disk Installation Options Summary	Each new virtual machine includes a network adapter. You can configure the network adapter to use a virtual switch, or it can remain disconnected.
	< Previous Next > Finish Cancel

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

8	New Virtual Machine Wizard
Connect Vir	tual Hard Disk
Before You Begin Specify Name and Location Specify Generation Assign Memory	A virtual machine requires storage so that you can install an operating system. You can specify the storage now or configure it later by modifying the virtual machine's properties. O Create a virtual hard disk Use this option to create a VHDX dynamically expanding virtual hard disk.
Configure Networking Connect Virtual Hard Disk Summary	Name: HXBench-Controller.vhdx Location: C:\Users\Public\Documents\Hyper-V\\Virtual Hard Disks\ Size: 127 GB (Maximum: 64 TB) Isse an existing virtual hard disk Use an existing virtual hard disk Use this option to attach an existing virtual hard disk, either VHD or VHDX format.
c	Location: C:\hyperv-2.0\Virtual Hard Disks\cisco-hxbench-2.0.vhdx Browse O Attach a virtual hard disk later Use this option to skip this step now and attach an existing virtual hard disk later.
	< Previous Next > Finish Cancel

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

New Virtual Machine Wizard	
Completing	the New Virtual Machine Wizard
Before You Begin Specify Name and Location Specify Generation Assign Memory Configure Networking Connect Virtual Hard Disk Summary	You have successfully completed the New Virtual Machine Wizard. You are about to create the following virtual machine. Description: Name: HXBench-Controller Generation: Generation 1 Memory: 8192 MB Network: VM Network Hard Disk: C:\hyperv-2.0\Virtual Hard Disks\cisco-hxbench-2.0.vhdx (VHDX, dynamically expanding
	<

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

😰 Setting	s for Cisco-hxbench-1.3.7 on SCVMMHOSTSERVER
Cisco-hxbench-1.3.7	
Hardware Add Hardware Madd Hardware BIOS Boot from CD Memory 8192 MB Processor 1 Virtual processor I Virtual processor I DE Controller 0	Add Hardware You can use this setting to add devices to your virtual machine. Select the devices you want to add and click the Add button. SCSI Controller Network Adapter Legacy Network Adapter Fibre Channel Adapter RemoteFX 3D Video Adapter
 Hard Drive cisco-hxbench-2.0.vhdx IDE Controller 1 DVD Drive None SCSI Controller Network Adapter VM Network Network Adapter VM Network Network Adapter VM Network 	Add A network adapter requires drivers that are installed when you install integration services in the guest operating system.

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.

Cisco-hxbench-1.3.7	
Hardware Add Hardware Add Hardware BIOS Boot from CD Memory 8192 MB Processor 1 Virtual processor I Virtual processor IDE Controller 0 D Hard Drive cisco-hybench-2.0.vbdx	Network Adapter Specify the configuration of the network adapter or remove the network adapter. Virtual switch: Not connected VLAN ID Enable virtual LAN identification The VLAN identifier specifies the virtual LAN that this virtual machine will use for all network communications through this network adapter.
IDE Controller 1 DVD Drive None	2 Bandwidth Management
SCSI Controller Network Adapter VM Network Network VM Network	Enable bandwidth management Specify how this network adapter utilizes network bandwidth. Both Minimum Bandwidth and Maximum Bandwidth are measured in Megabits per second. Minimum bandwidth: O Mbps
Network Adapter Not connected	Maximum bandwidth: 0 Mbps
Tone COM 1	To leave the minimum or maximum unrestricted, specify 0 as the value.
None Diskette Drive	To remove the network adapter from this virtual machine, dick Remove. Remove
None Management Nome Cisco-hxbench-1.3.7 Integration Services Some services offered Checkpoint File Location C:\ProgramData\Microsoft\Win	Use a legacy network adapter instead of this network adapter to perform a network-based installation of the guest operating system or when integration services are not installed in the guest operating system.

Overview

- **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.

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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></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	<i><admin></admin></i> username

Field	Description
Password	<admin> password</admin>

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	<i><admin></admin></i> username
Password	<admin> password</admin>
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.