

How to Configure iSCSI Initiator in VMware ESXi 6.x

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This edition applies to QSAN XCubeSAN Series. Note that this document was produced based on beta code and some screens may change when it becomes generally available.

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Contents

Notices	i
Trademarks	i
Technical Support	i
Configure iSCSI Initiator	1
Executive Summary	1
Audience	1
Test Environment	1
Configuration Guide	2
Logging iSCSI Target Using Software iSCSI Initiator	2
Add a New Storage Using the iSCSI LUN	11
Add a New HDD to the Created Guest OS Using the Added Datastore	14
Logging iSCSI Target Directly from the Guest OS	17
Conclusion	20
Apply To	20
Reference	20

Configure iSCSI Initiator

Executive Summary

In this document, we will guide users to understand how to use the software iSCSI initiator in VMware® ESXi 6.x to connect to QSAN XCubeSAN dual controller system. We will also demonstrate the steps pertaining to how multipath I/O be configured with XCubeSAN for achieving the expected throughput.

Audience

This document is applicable for QSAN customers and partners who are familiar with QSAN products. Any settings which are configured with basic operations will not be detailed in this document. If there is any question, please refer to the user manuals of products, or contact QSAN support for further assistance.

Test Environment

Host

- OS: VMware ESXi server 6.0
- NICs:
 - VMnic2 (management)
 - VMnic0/VMnic1 (used for connecting to XS5216-D)

Storage

- QSAN XCubeSAN XS5216
 - Firmware Version: 1.0.0
 - iSCSI data port: 172.16.135.10/24 & 172.16.136.10/24
 - LUN Mapped: target0, LUN0, 3TB

Diagram

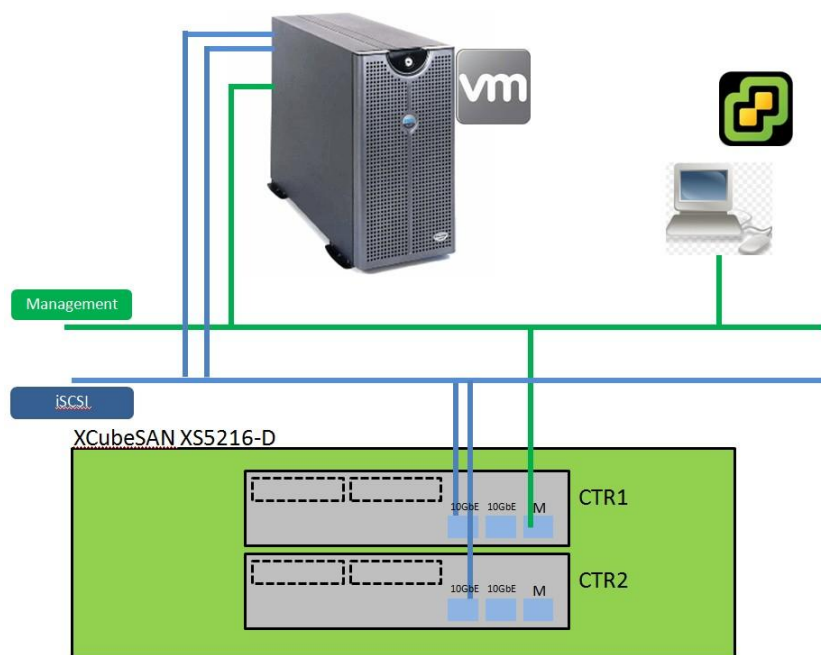


Figure 1 Test Diagram

Configuration Guide

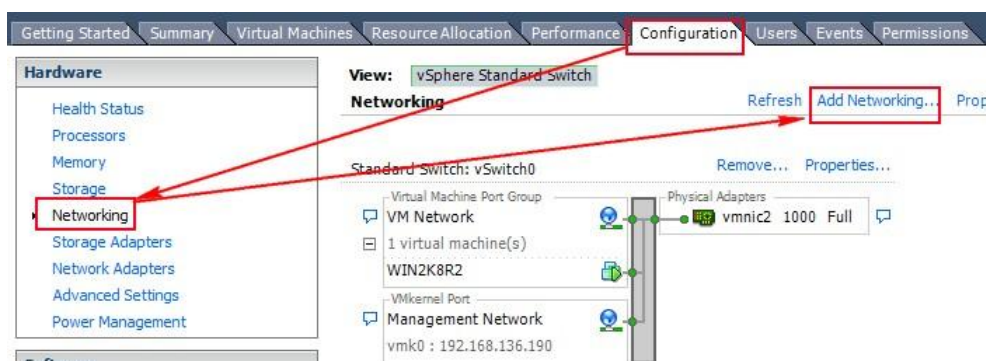
Logging iSCSI Target Using Software iSCSI Initiator

Users can either use VMware vSphere client or VMware Web client to configure the software iSCSI initiator. We are using VMware vSphere client to connect to the ESXi server directly as an example here.

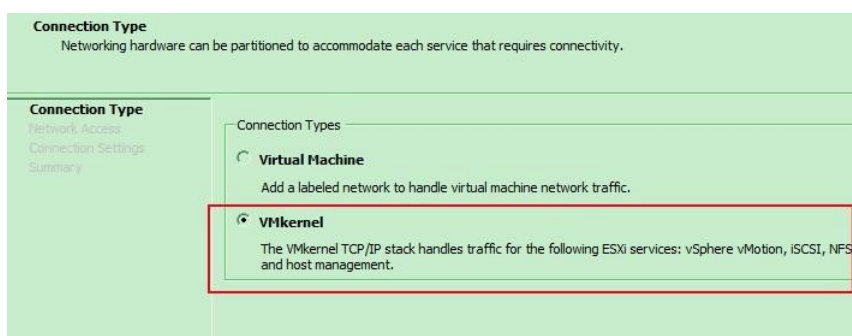
1. Login the ESXi server from VMware vSphere Client.



2. In **Configuration** tab, modify **Networking** setting to add a **VMkernel** network (It is the TCP/IP stack which handles traffic for ESXi server services, such as vMotion, iSCSI, and NFS).



3. Make sure the **VMkernel** connection is selected.



4. Create the first virtual switch and make sure to choose the right network interface which is connected to the same network with XCubeSAN XS5216 iSCSI data port.

VMkernel - Network Access
The VMkernel reaches networks through uplink adapters attached to vSphere standard switches.

[Connection Type](#)
Network Access
Connection Settings
Summary

Select which vSphere standard switch will handle the network traffic for this connection. You may also create a new vSphere standard switch using the unclaimed network adapters listed below.

	Speed	Networks
Create a vSphere standard switch Intel Corporation 82574L Gigabit Network Connection		
<input checked="" type="checkbox"/> vmnic0	1000 Full	None
<input type="checkbox"/> vmnic1	1000 Full	None
Use vSwitch0 Intel Corporation 82572EI Gigabit Ethernet Controller		
<input type="checkbox"/> vmnic2	1000 Full	192.168.0.1-192.168.255.254

Preview:

VMkernel Port: VMkernel
Physical Adapters: vmnic0

< Back **Next >** Cancel

- Specify **Network Label** and setup a proper **VMkernel** network IP which is used to connect to the iSCSI data port of XCubeSAN XS5216.

VMkernel - Connection Settings
Use network labels to identify VMkernel connections while managing your hosts and datacenters.

[Connection Type](#)
[Network Access](#)
Connection Settings
IP Settings
Summary

Port Group Properties

Network Label: VMkernel-iSCSI1

VLAN ID (Optional): None (0)

☐ Use this port group for vMotion

☐ Use this port group for Fault Tolerance logging

☐ Use this port group for management traffic

Preview:

VMkernel Port: VMkernel-iSCSI1
Physical Adapters: vmnic0

< Back **Next >** Cancel

VMkernel - IP Connection Settings
Specify VMkernel IP settings

[Connection Type](#)
[Network Access](#)
[Connection Settings](#)
IP Settings
[Summary](#)

☐ Obtain IP settings automatically
☒ Use the following IP settings:

IP Address: 172 . 16 . 136 . 1
 Subnet Mask: 255 . 255 . 255 . 0
 VMkernel Default Gateway: 172 . 16 . 136 . 254 Edit...

Preview:

VMkernel Port: VMkernel-ISCsI1
 172.16.136.1

Physical Adapters: vmnic0

< Back Next > Cancel

6. Check all configurations are correct, and then click **Finish** button.

Ready to Complete
Verify that all new and modified vSphere standard switches are configured appropriately.

[Connection Type](#)
[Network Access](#)
[Connection Settings](#)
Summary

Host networking will include the following new and modified standard switches:

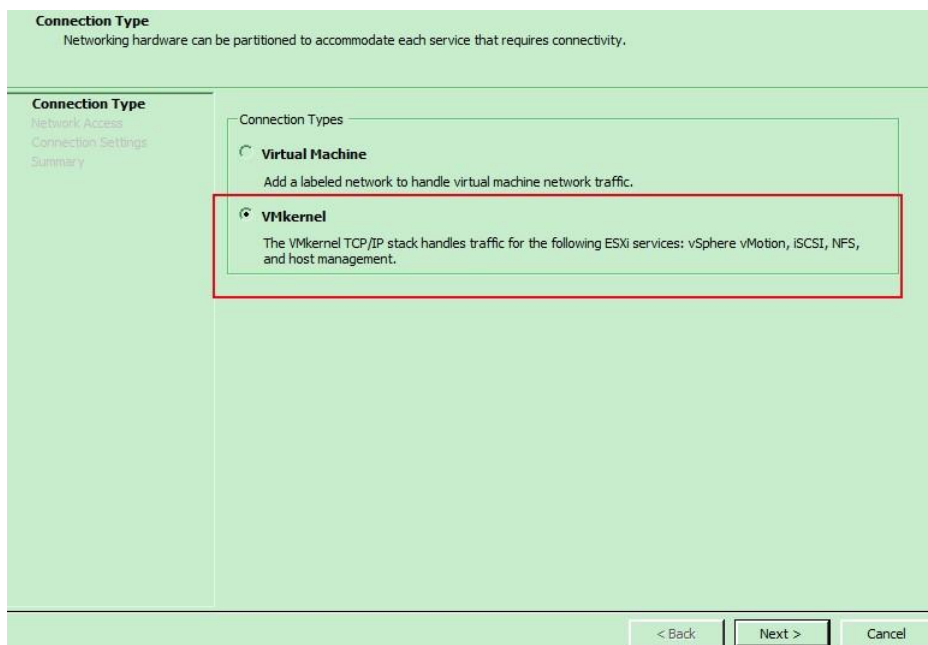
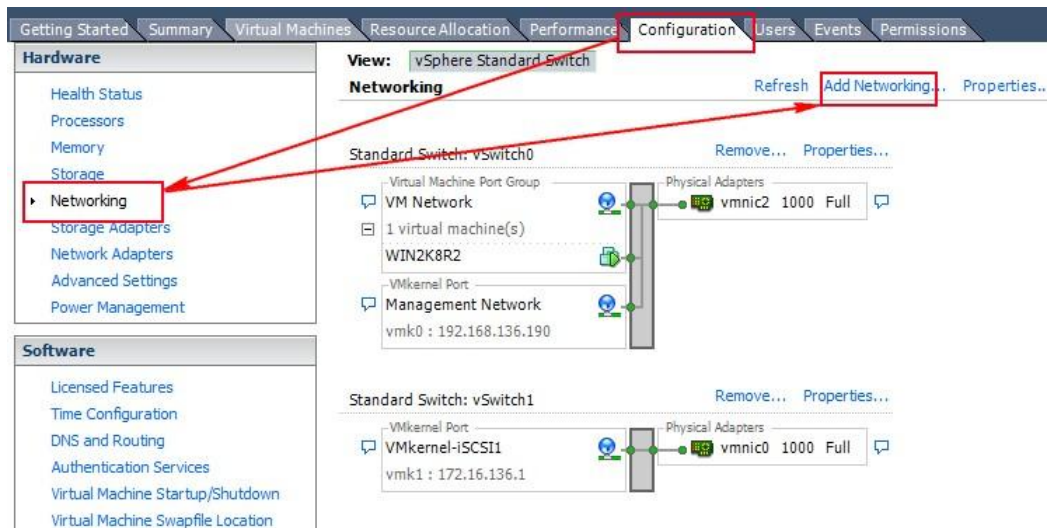
Preview:

VMkernel Port: VMkernel-ISCsI1
 172.16.136.1

Physical Adapters: vmnic0

< Back Finish Cancel

7. In order to create a multipath I/O session to the iSCSI target, it's necessary to add another **VMkernel** network, and we suggest to add another vSwitch for separating the network segment and preventing getting user confused



VMkernel - Connection Settings
 Use network labels to identify VMkernel connections while managing your hosts and datacenters.

[Connection Type](#)
[Network Access](#)
Connection Settings
[IP Settings](#)
[Summary](#)

Port Group Properties
Network Label: VMkernel-iSCSI2
VLAN ID (Optional): None (0)
☐ Use this port group for vMotion
☐ Use this port group for Fault Tolerance logging
☐ Use this port group for management traffic

Preview:

[< Back](#)
[Next >](#)
[Cancel](#)

VMkernel - IP Connection Settings
 Specify VMkernel IP settings

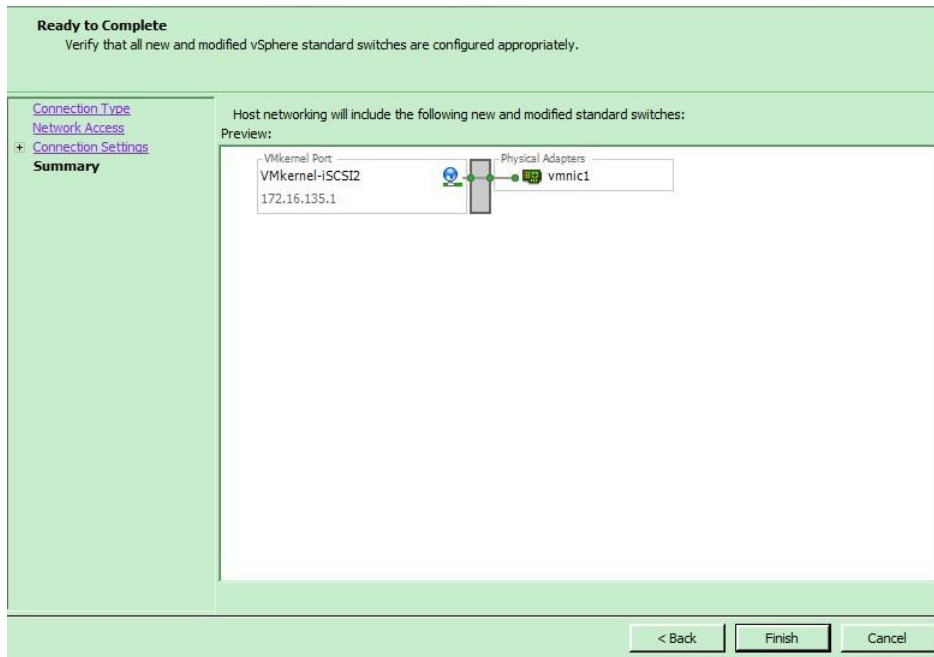
[Connection Type](#)
[Network Access](#)
[Connection Settings](#)
IP Settings
[Summary](#)

☐ Obtain IP settings automatically
☒ Use the following IP settings:

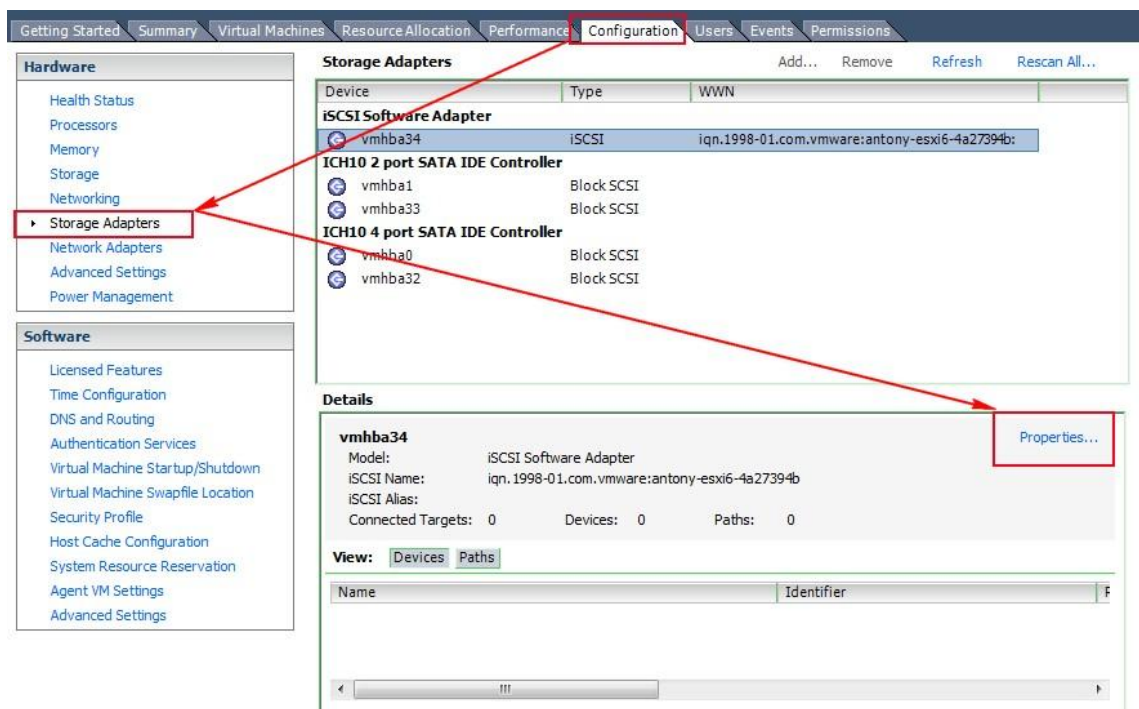
IP Address: 172 . 16 . 135 . 1
Subnet Mask: 255 . 255 . 255 . 0
VMkernel Default Gateway: 172 . 16 . 135 . 254 [Edit...](#)

Preview:

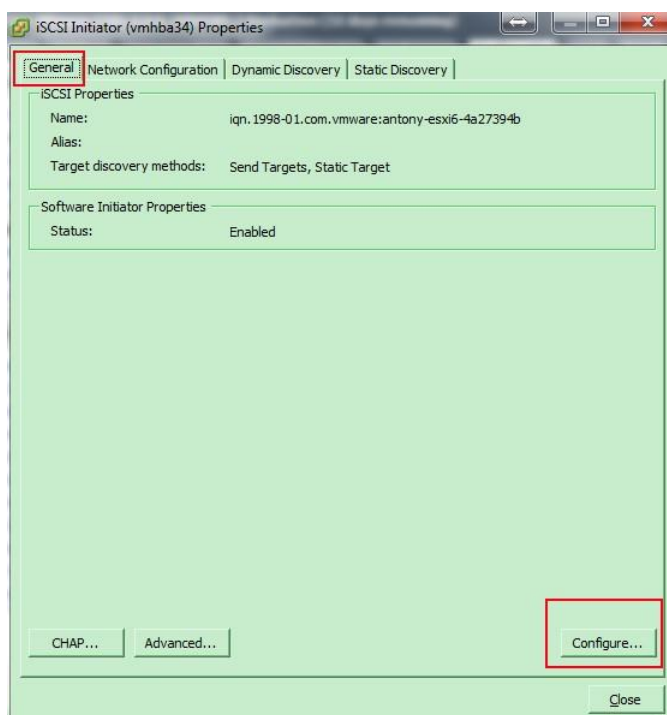
[< Back](#)
[Next >](#)
[Cancel](#)



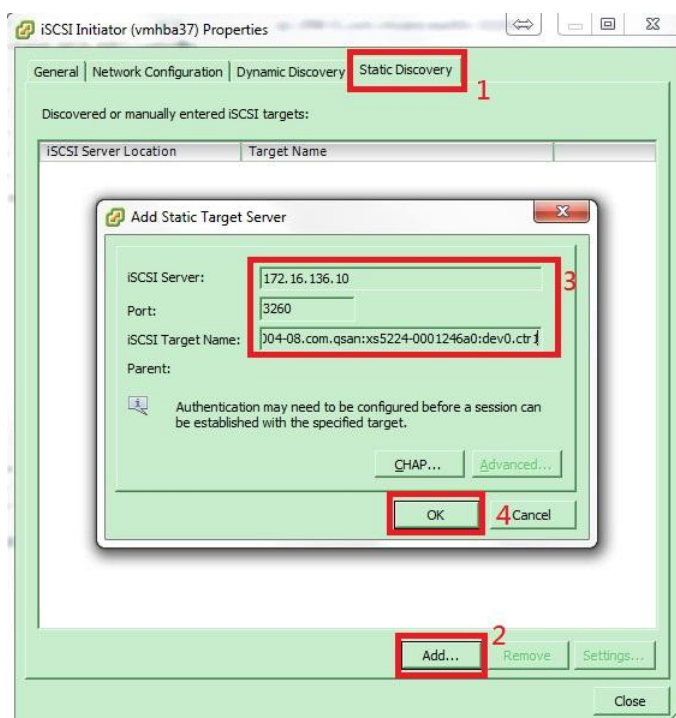
8. In **Configuration** tab, select **Storage Adapters** to list all available storage adapters. Choose **iSCSI Software HBA** and click **Properties** to modify the settings.

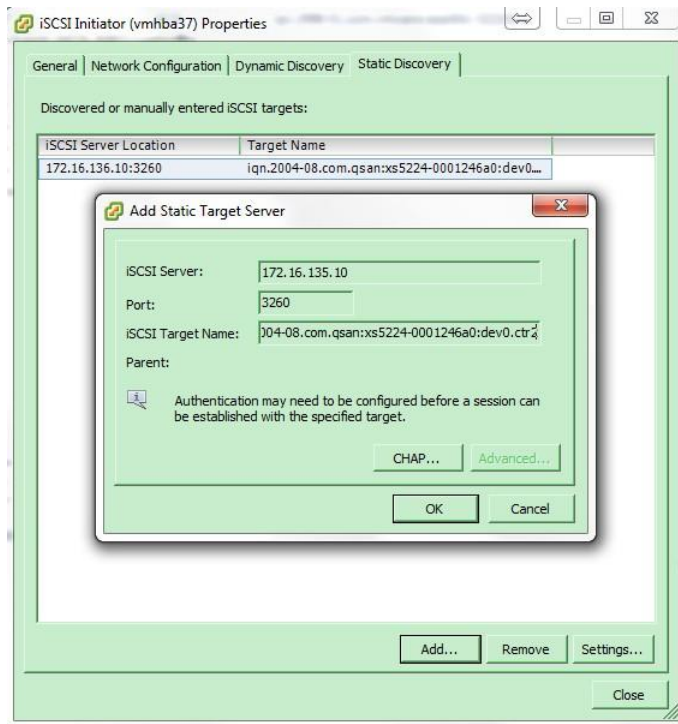


9. In **iSCSI initiator Properties**, select **General** tab and click **Configure** to enable iSCSI initiator.



10. Next, please add another VMkernel port (default is one only) into the iSCSI initiator, so that the multipath session can be created smoothly.
11. Go to **Static Discovery** tab, click **Add** button to set iSCSI target IP, here is iSCSI data port of XCubeSAN XS5216.



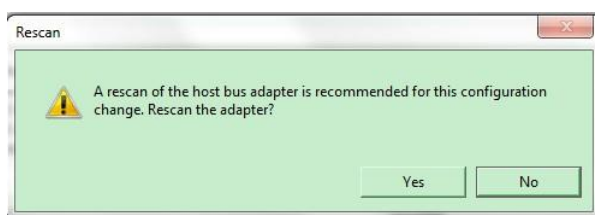


NOTE:

The iSCSI target iqn can be found on web UI. Remember that the iqn is different if you are connecting to the iSCSI data port of controller1 and controller2 from ESXi server.



12. A **Rescan** window will pop up after the configuration is finished, click **Yes** button to rescan all devices.



- After rescanning, the available LUNs will be listed in the **Details** column when selecting the **iSCSI software adapter**. Although only one LUN is created on XCUBESAN XS5216-D, there are two different physical paths to the same LUN, therefore the system displays two different records to the same LUN here.

Getting Started Summary Virtual Machines Resource Allocation Performance Configuration Users Events Permissions

Hardware

- Health Status
- Processors
- Memory
- Storage
- Networking
- Storage Adapters
- Network Adapters
- Advanced Settings
- Power Management

Software

- Licensed Features
- Time Configuration
- DNS and Routing
- Authentication Services
- Virtual Machine Startup/Shutdown
- Virtual Machine Swapfile Location
- Security Profile
- Host Cache Configuration
- System Resource Reservation
- Agent VM Settings
- Advanced Settings

Storage Adapters Add... Remove Refresh Res

Device	Type	WWN
iSCSI Software Adapter		
vmhba34	iSCSI	iqn.1998-01.com.vmware:antony-esxi6-4a27394b
ICH10 2 port SATA IDE Controller		
vmhba1	Block SCSI	
vmhba33	Block SCSI	
ICH10 4 port SATA IDE Controller		
vmhba0	Block SCSI	
vmhba32	Block SCSI	

Details

vmhba34

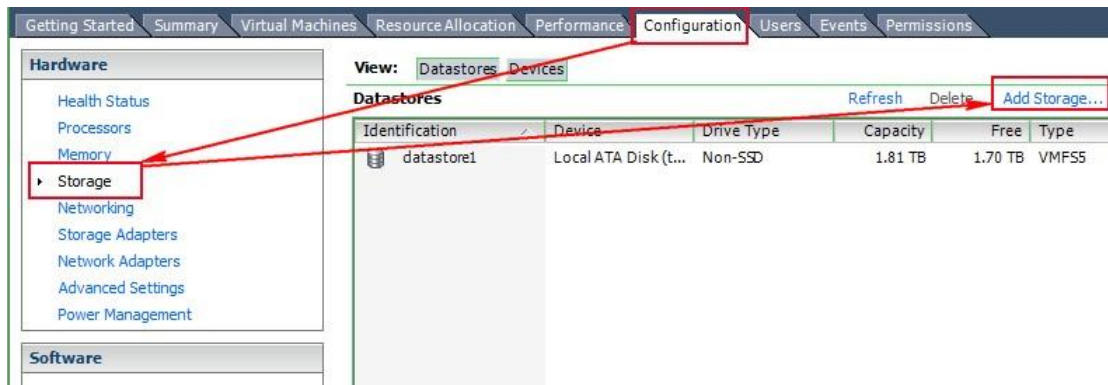
Model: iSCSI Software Adapter
 iSCSI Name: iqn.1998-01.com.vmware:antony-esxi6-4a27394b
 iSCSI Alias:
 Connected Targets: 2 Devices: 1 Paths: 2

View: Devices Paths

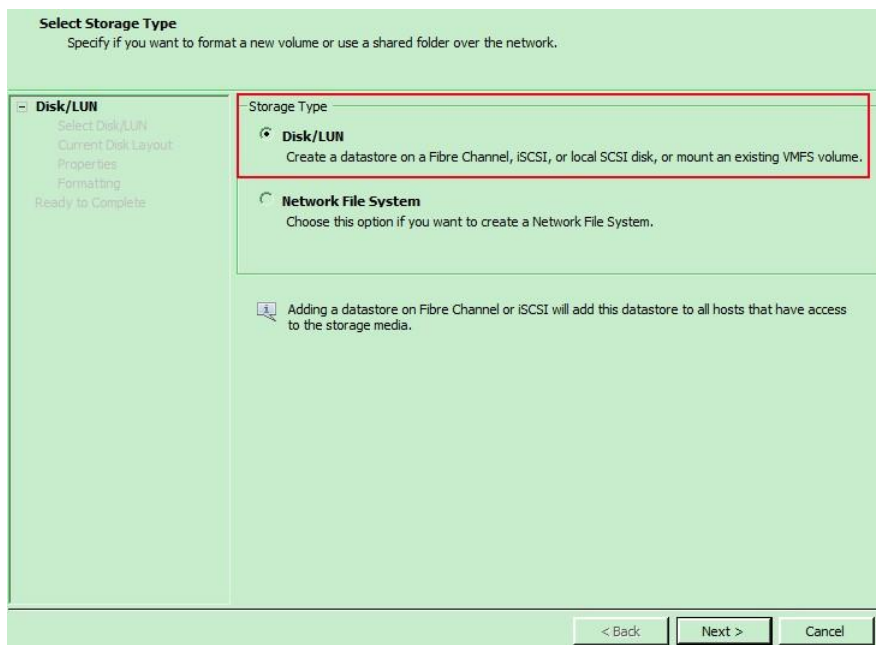
Runtime Name	Target	LUN	Status
vmhba34:C1:T2:L0	iqn.2004-08.com.qsar	0	Active
vmhba34:C0:T0:L0	iqn.2004-08.com.qsar	0	Active (I/O)

Add a New Storage Using the iSCSI LUN

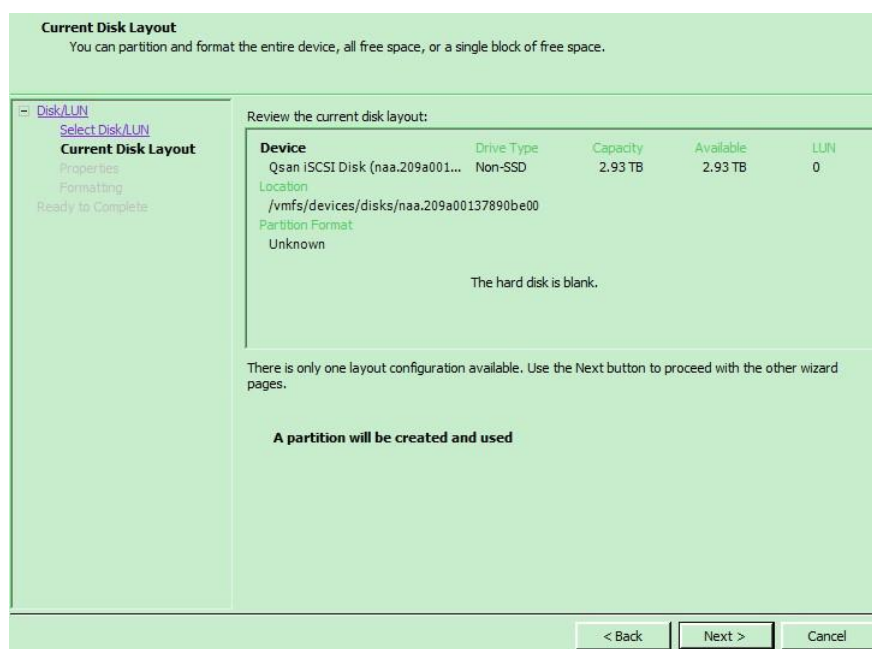
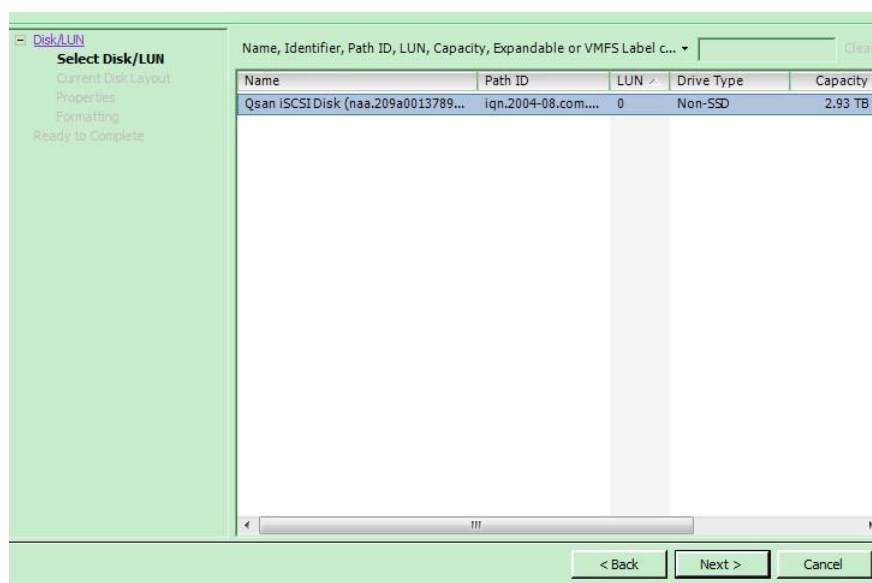
- The LUN will be used as a virtual disk of the created guest OS. In **Configuration** tab, select **Storage** and click **Add Storage**.



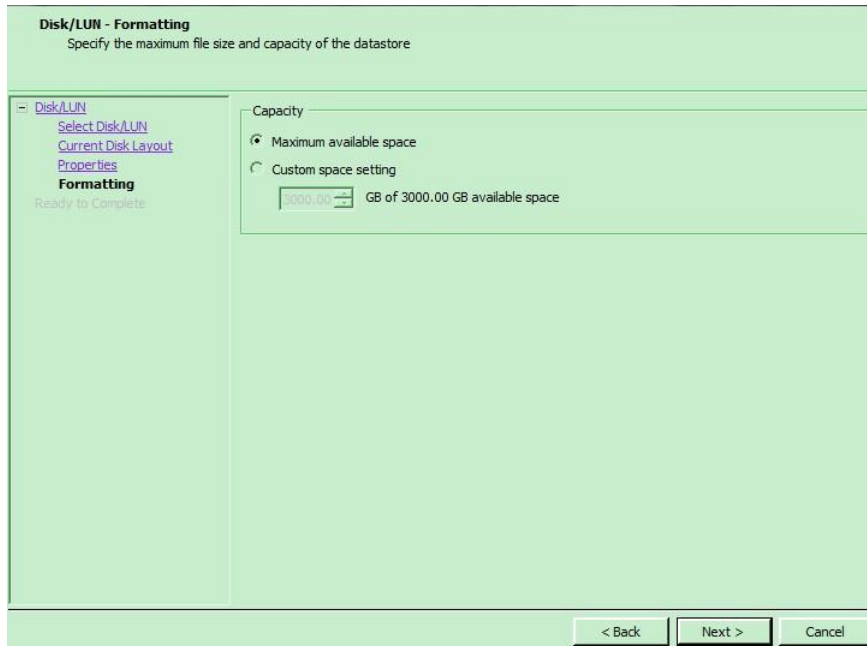
2. Select **Disk/LUN**, and click **Next** button.



3. Select **Qsan iSCSI Disk**, and click **Next** button.



4. Enter a name for the new datastore, and click **Next** button.
5. Click **Next** button.



6. Check all settings, then click **Finish** button.
7. A new storage is added under **Datastores** of the ESXi server. The ESXi server provides settings to the multipath I/O. We can select the iSCSI storage and click **Properties** to modify the settings.
8. Select **Manage Paths** button.
9. In **Manage Paths** window, it will display how many paths connect to this LUN and what path is active now. The policy is in **Fixed** mode by default, it can be modified by the drop-down menu. There are three types available, **Fixed**, **Most Recently Used**, and **Round Robin**. The difference between **Fixed** and **Most Recently Used** is that **Fixed** will make the active path to failback once the preferred path is restored from a failure status, but **Most Recently Used** policy will keep the active path stay in used. **Fixed** and **Most Recently Used** policies will use only one path to transfer the iSCSI network traffic at the same time, whereas **Round Robin** policy will use all available paths to transfer the data. Remember to click **Change** button for applying the setting.

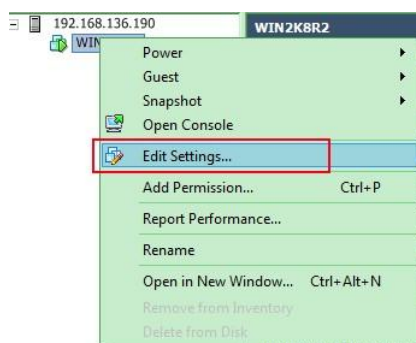


NOTE:

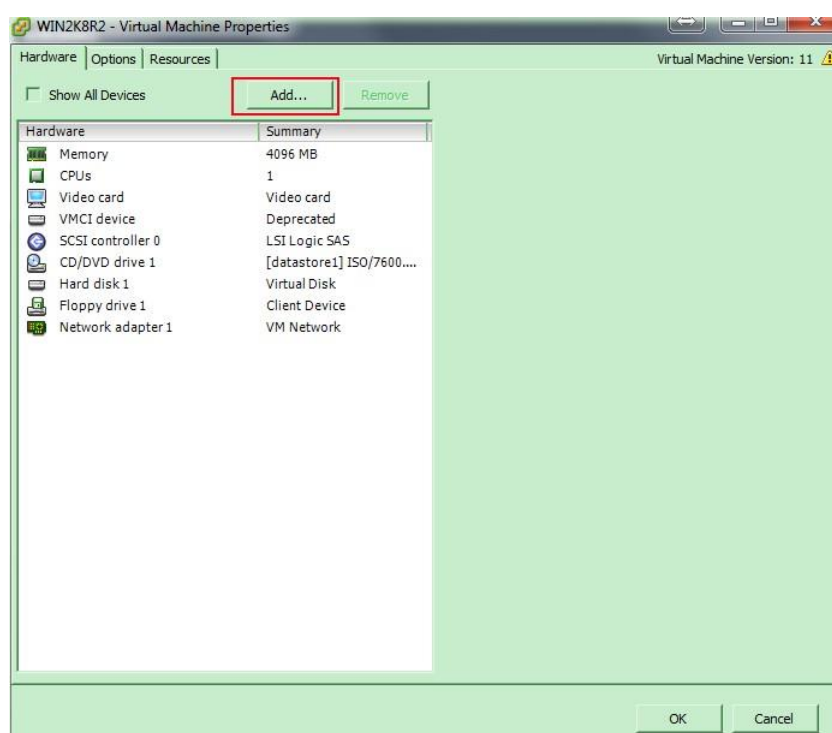
For more details, please refer to the Best Practice document - BP-Best Configuration to maximize performance in ESXi environment.

Add a New HDD to the Created Guest OS Using the Added Datastore

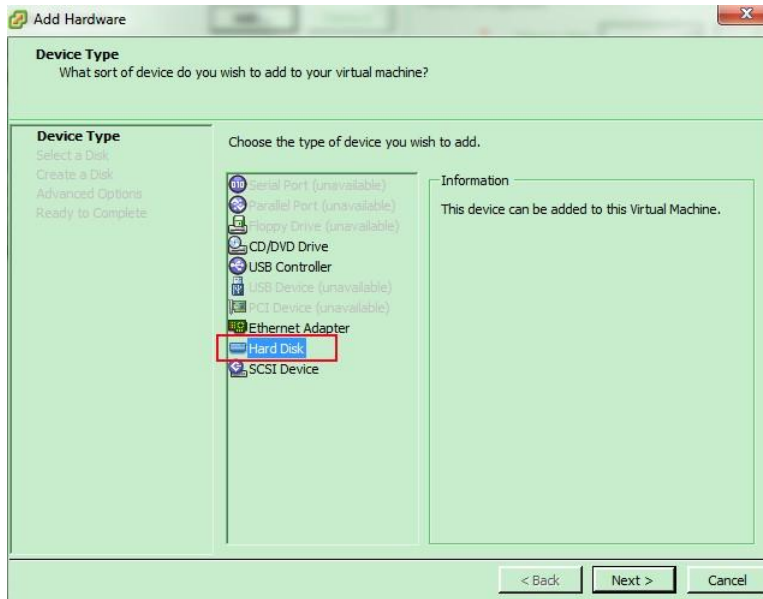
1. Now the datastore can be added as a virtual disk of guest OS. Right click on the guest OS and select **Edit Settings**.



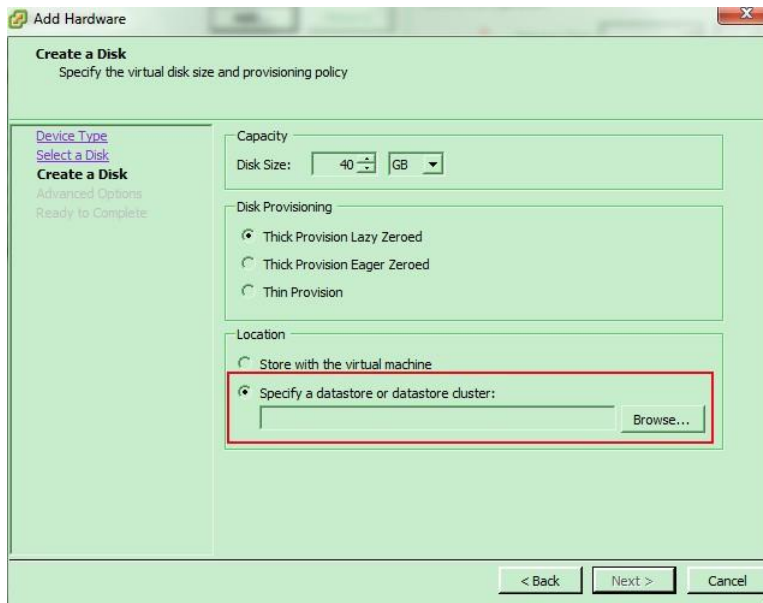
2. In the **Hardware** tab, click **Add** button.



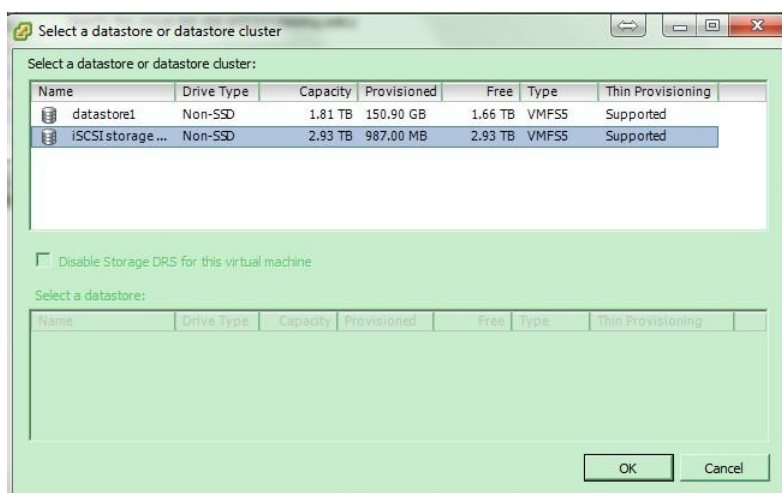
3. Select **Hard Disk**, and click **Next** button.



4. Choose **Create a new virtual disk**, and click **Next** button.
5. Select **Specify a datastore or datastore cluster**, and click **Browse** button.



6. Select iSCSI storage on XS5216, and click **OK** button.

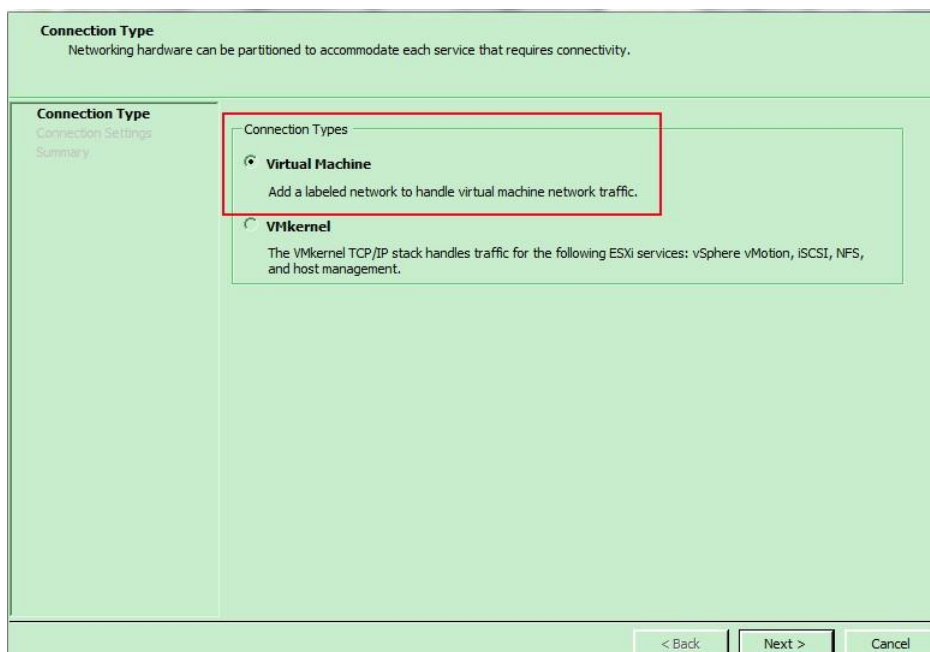
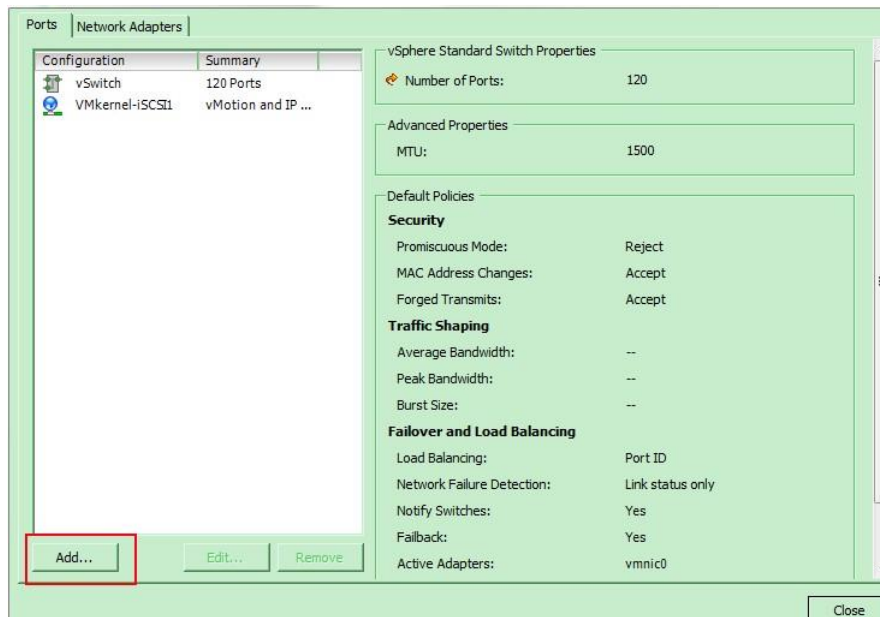


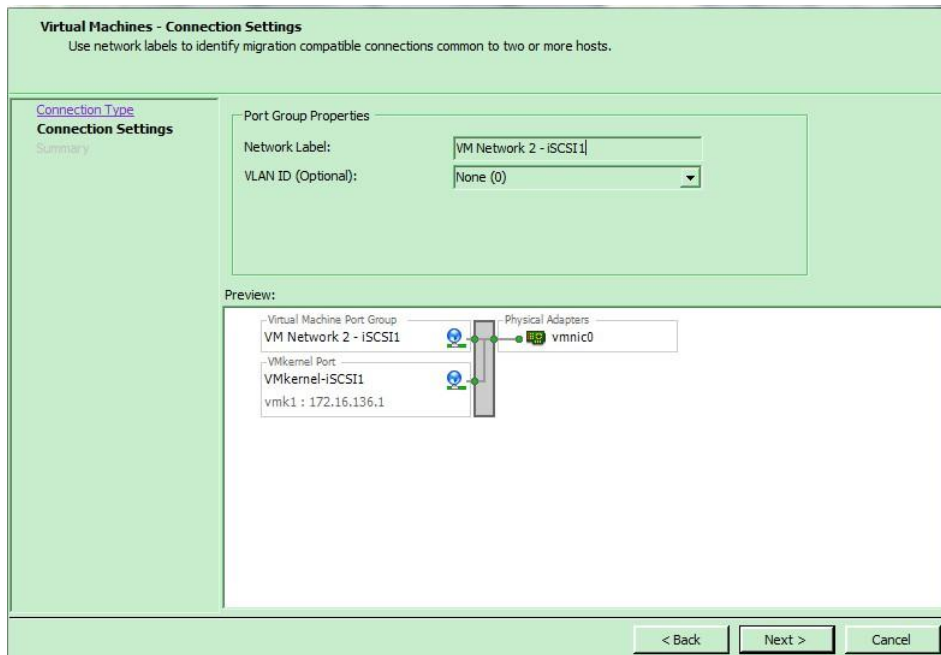
7. Leave all settings by default, click **Next** button.
8. Check all settings, then click **Finish** button.
9. Done

Logging iSCSI Target Directly from the Guest OS

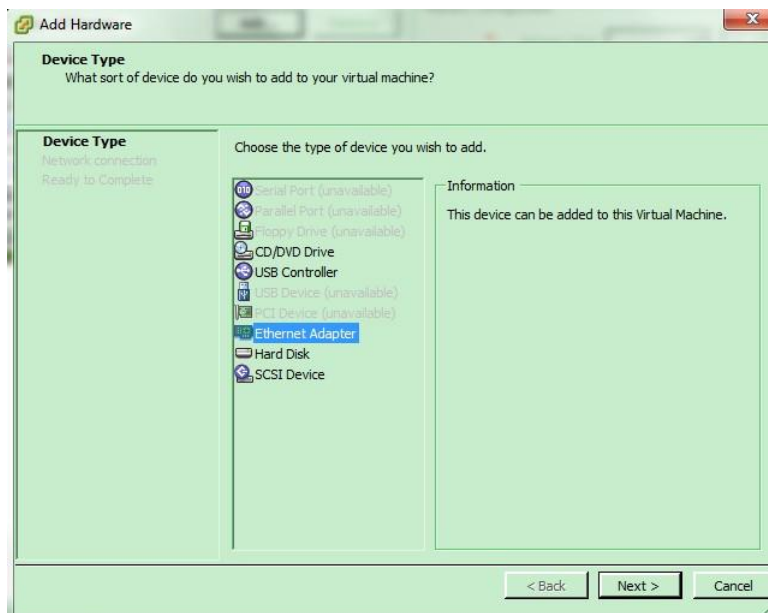
Users may also log in the iSCSI target on XCUBESAN XS5216-D directly from the created guest OS, however, before you try to do so, please make sure the LUN will only be used by this guest OS, otherwise you have to confirm that there is LUN masking well-configured on the XCUBESAN XS5216-D, to prevent any possibility of data inconsistency caused by multiple host log in the same LUN in the same time.

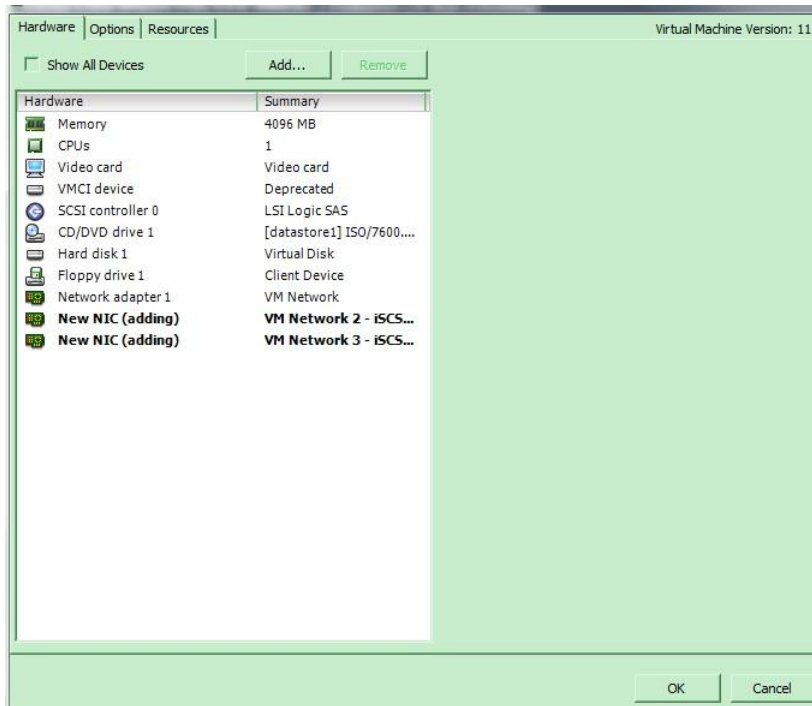
1. Remove the new added Hard disk on the guest OS.
2. Remove the new added datastore on ESXi server.
3. Log out both of the iSCSI targets.
4. Add a new VM port group to each created vSwitch (VMkernel-iSCSI1, iSCSI2).





5. And so on for the other vSwitch, there will be another 2 VM port group available for VM guest OS.
6. Add 2 more Ethernet NIC to the created guest OS, using the VM port group that is created.





7. Configure the new added 2 NICs on the guest OS, so that the guest OS can ping to iSCSI data port on the XS5216, and log in the iSCSI target.
8. Done.

Conclusion

QSAN XCubeSAN series products provide Active-Active dual controller and support ALUA, user don't have to pre-configure any option on XCubeSAN system to achieve the redundancy between ESXi server and XCubeSAN, just make sure the multipath I/O session is well-configured and the failover/back mechanism will automatically be executed once one of controllers gets failed.

Apply To

- XCubeSAN Series
- AegisSAN Q500 Series
- AegisSAN LX Series
- AegisSAN V100 Series

Reference

VMware Documentations

- <https://www.vmware.com/support/pubs/>

Obsolete QSAN White Paper

- [QWP200802-P150C-Connect_P150C_with_iSCSI_initiator_in_ESX3.5.pdf](#)
- [QWP200917-P300H-Connect_P300H_with_iSCSI_initiator_in_ESX4.0.pdf](#)