MAKING DATA SMART

Qsan Document - White Paper

How to configure iSCSI initiator in ESXi 6.x

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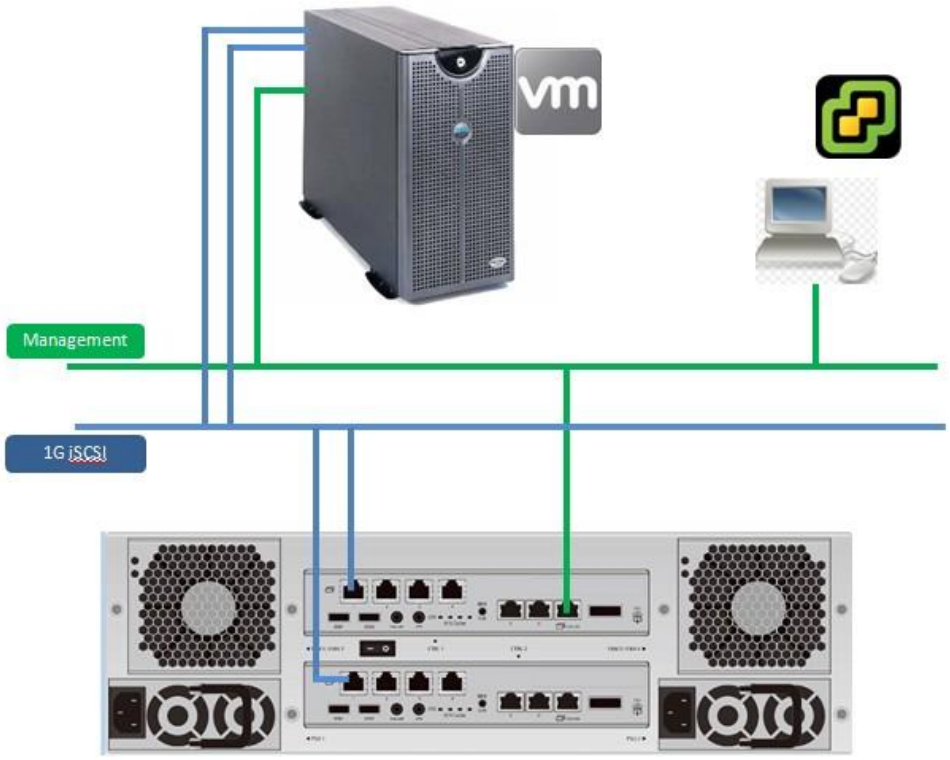
Introduction

In this document, we will guide users to understand how to use the software iSCSI initiator in ESXi 6.x to connect to Qsan AegisSAN LX P400Q dual controller system. We will also demonstrate the steps pertaining to how multipath I/O be configured with P400Q for achieving the expected throughput.

Environment

Host:	VMware ESXi server 6.0
NICs:	VMnic2 (management) VMnic0/VMnic1 (used for connecting to P400Q)
Storage:	Qsan AegisSAN LX P400Q-D316
Controller firmware:	V3.5.1
iSCSI data port:	172.16.135.10/24 172.16.136.10/24
LUN attached:	target10, LUN0, 3TB

Diagram

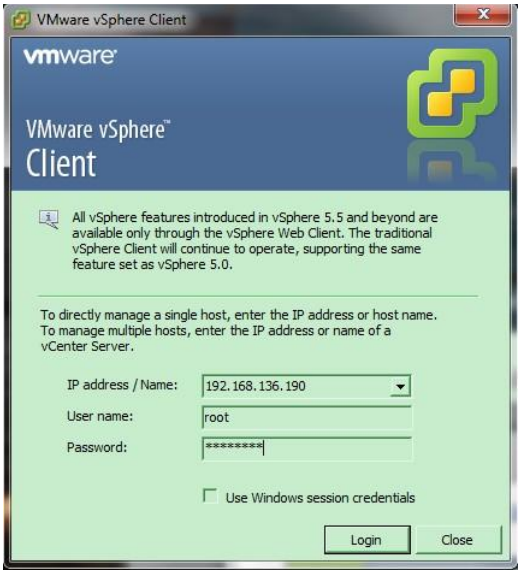


Configuration

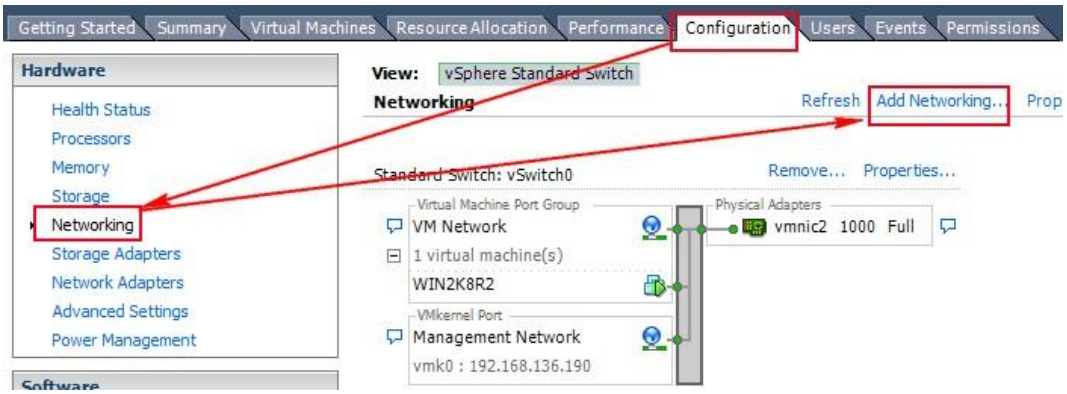
Logging iSCSI target using software iSCSI initiator

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.

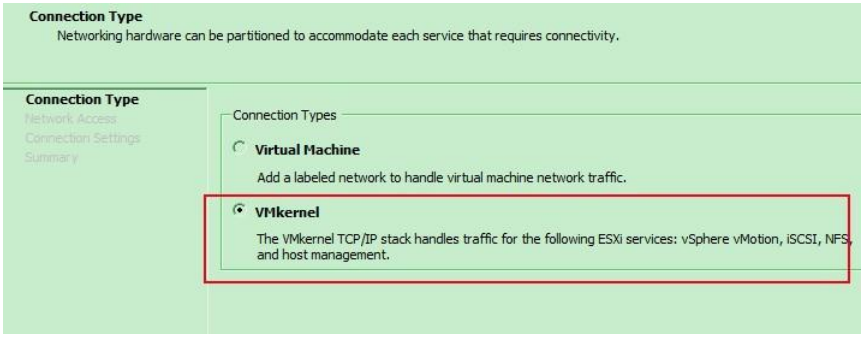
1. Login the ESXi server from VMware vSphere Client.



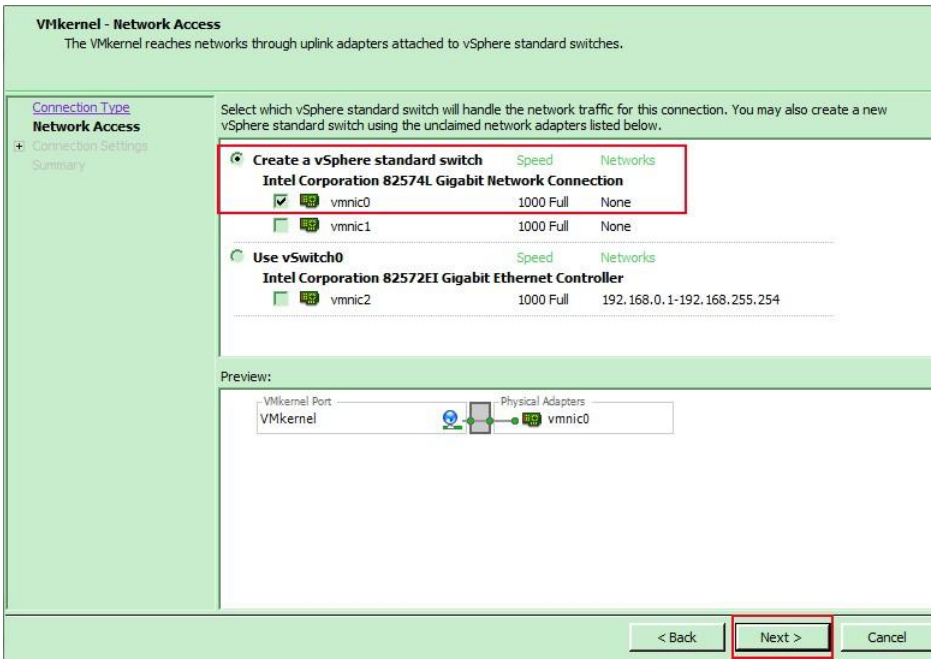
2. In **Configuration** tab, modify **Networking** setting to add a **VMkernel** network (It is the TCP/IP stack which handles traffic for ESXi server services, such as vMotion, iSCSI, and NFS).



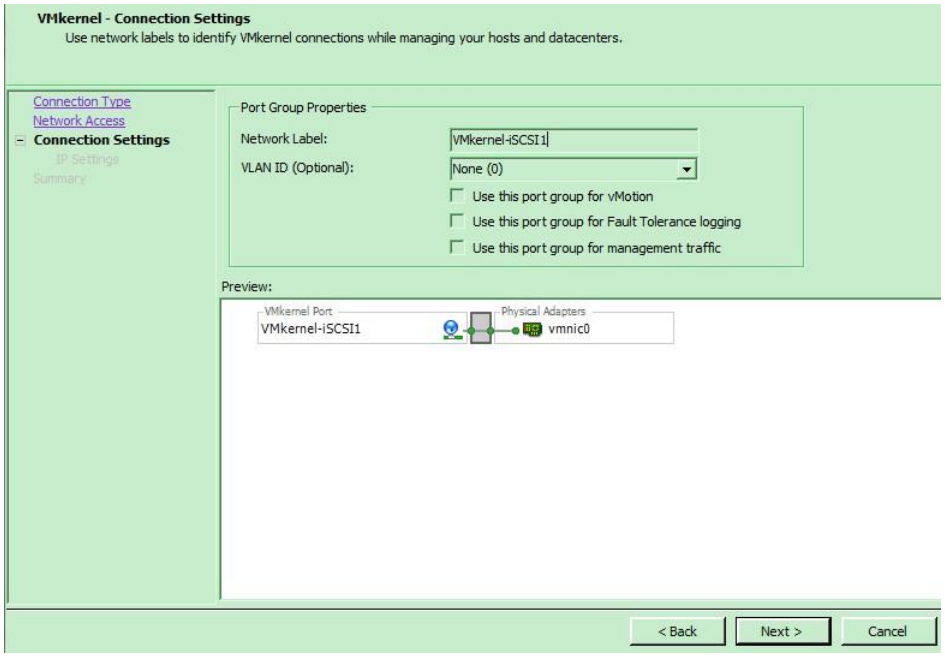
3. Make sure the **VMkernel** connection is selected.

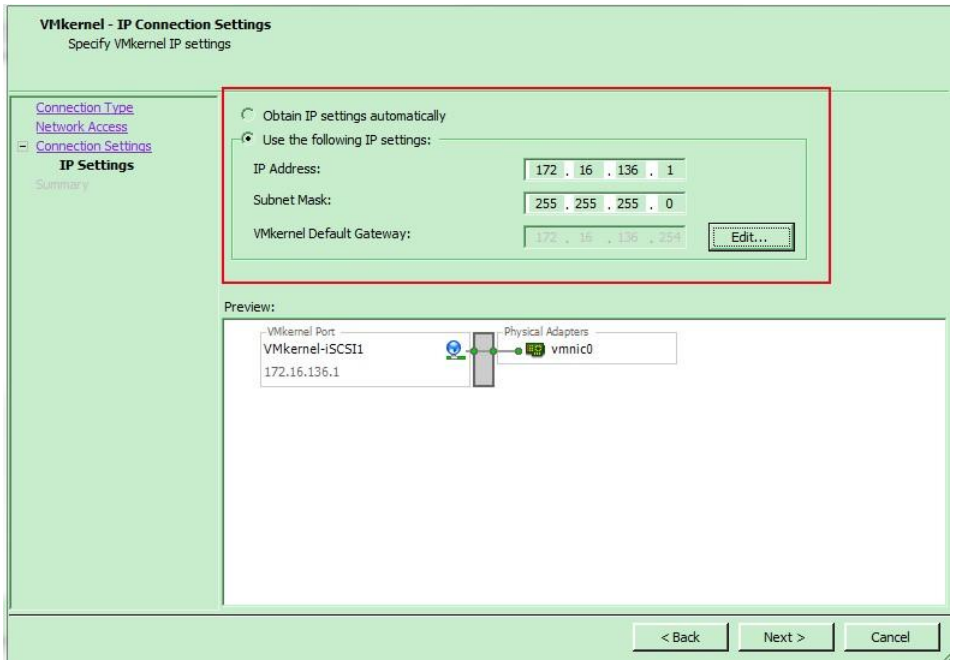


4. Create the first virtual switch and make sure to choose the right network interface which is connected to the same network with P400Q iSCSI data port.

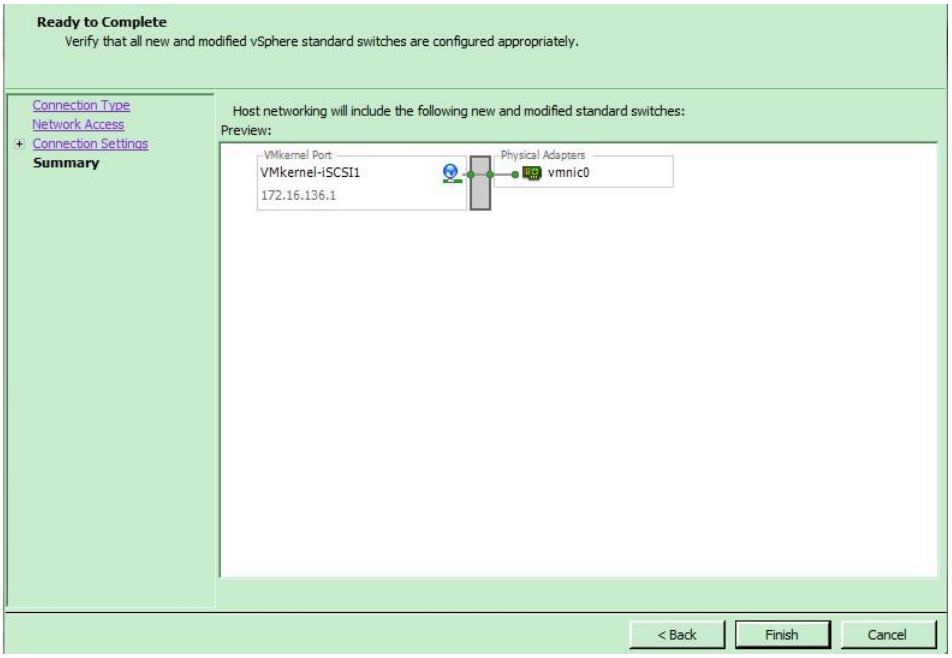


5. Specify **Network Label** and setup a proper **VMkernel** network IP which is used to connect to the iSCSI data port of P400Q.

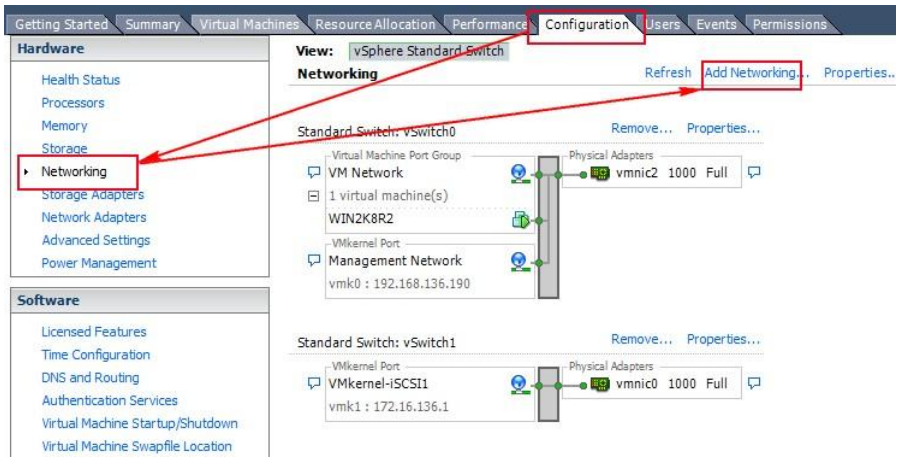


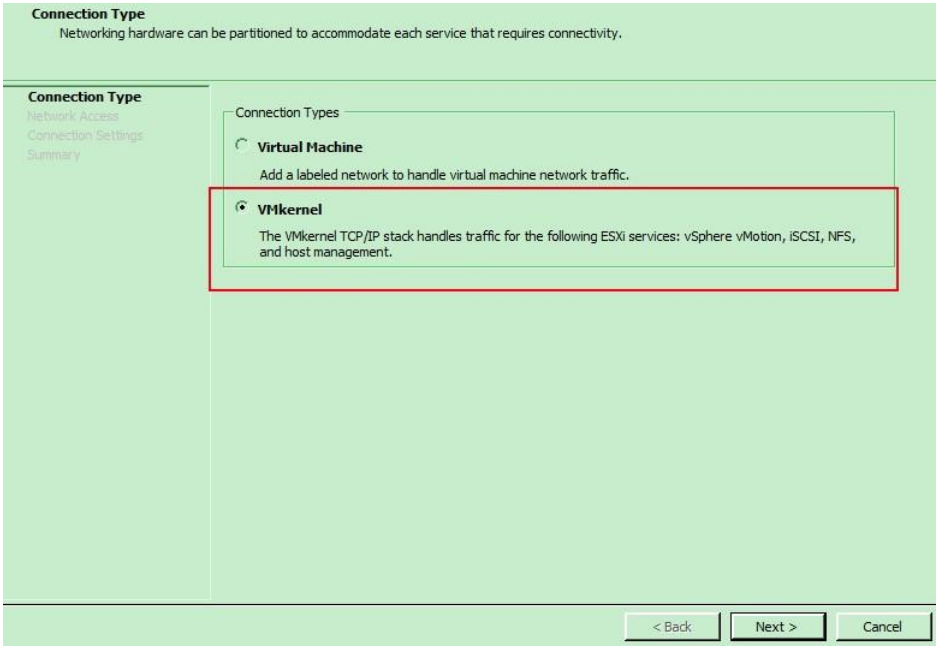


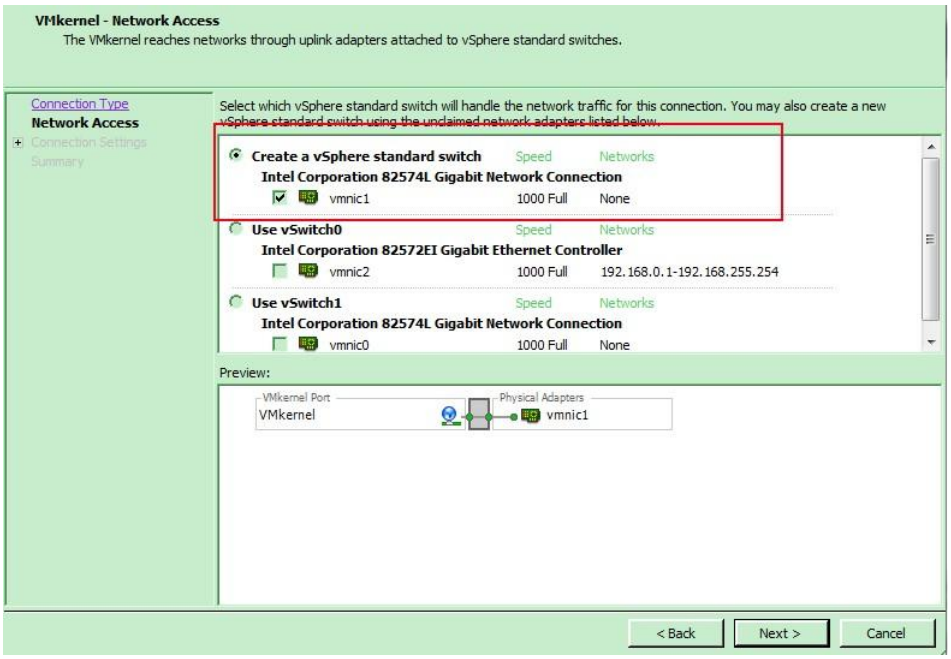
6. Check all configurations are correct, and then click **Finish** button.

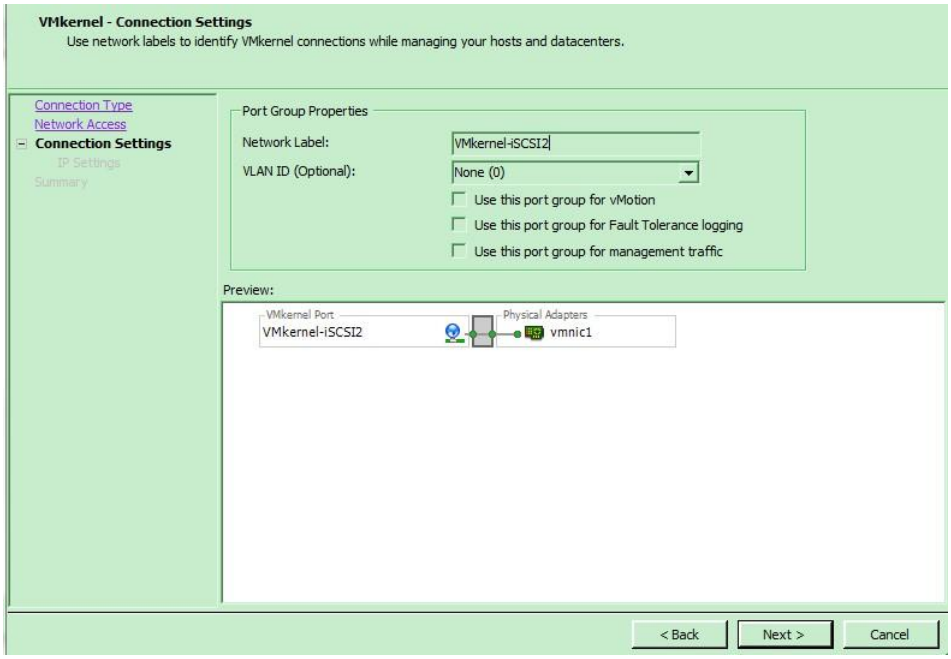


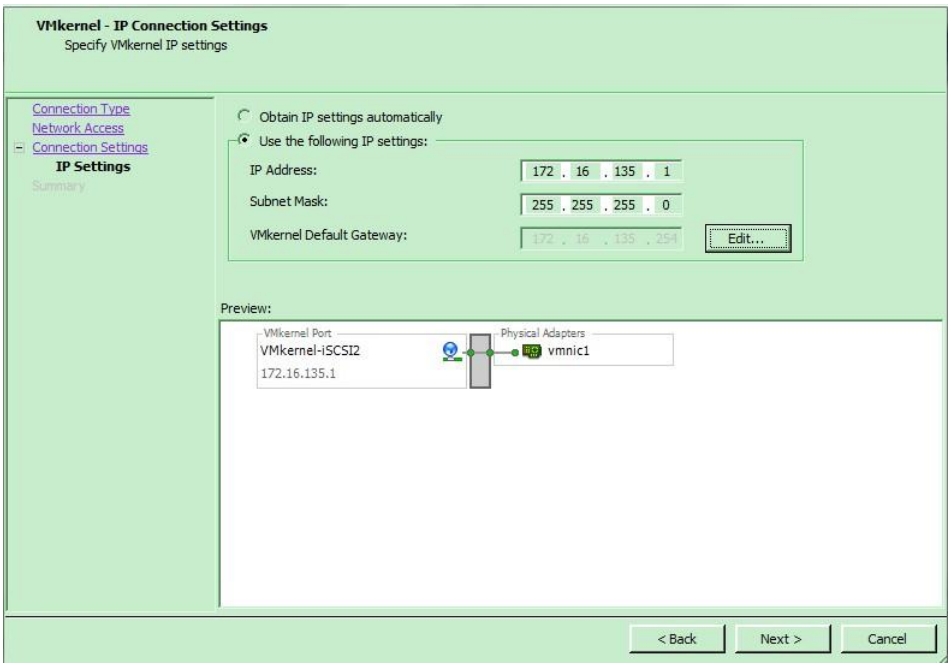
7. In order to create a multipath I/O session to the iSCSI target, it's necessary to add another **VMkernel** network, and we suggest to add another vSwitch for separating the network segment and preventing getting user confused

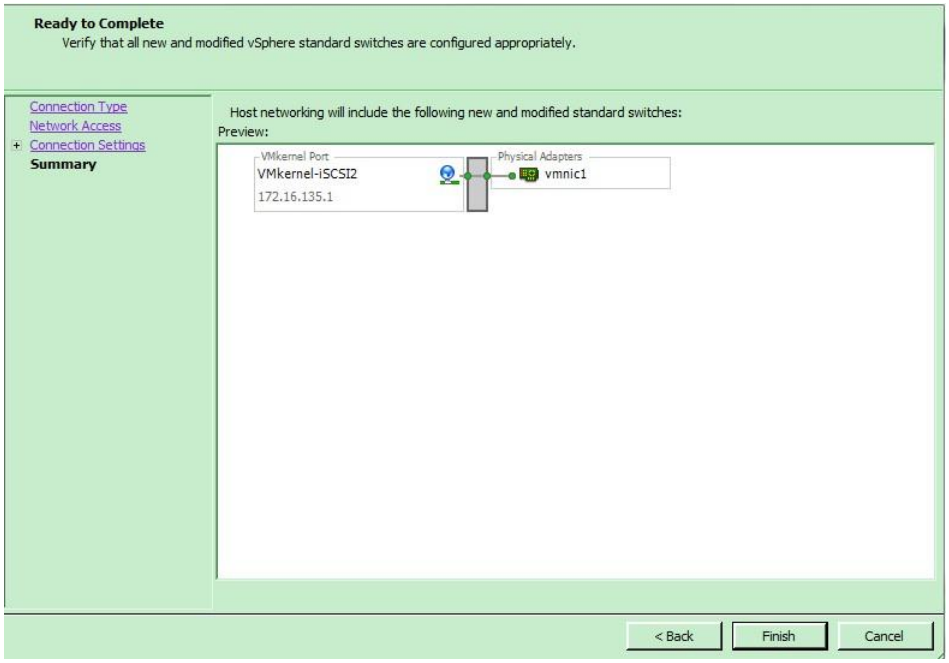


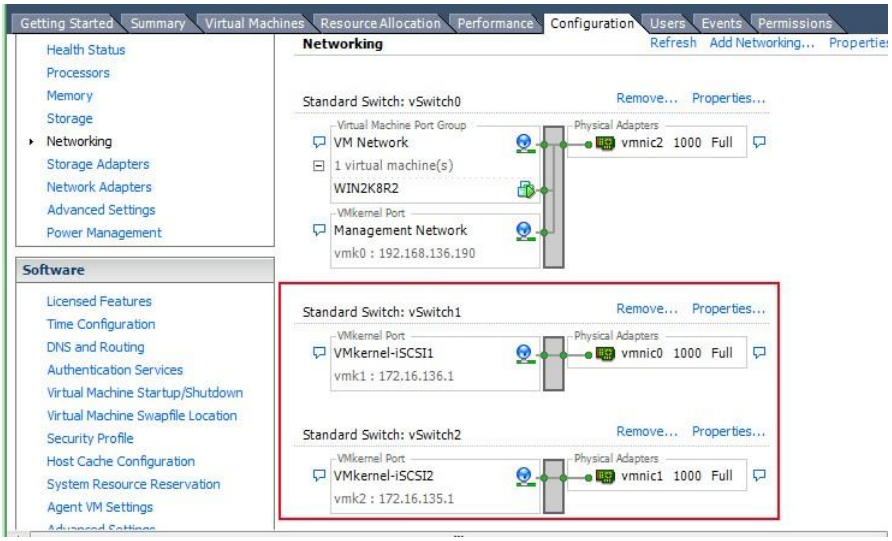




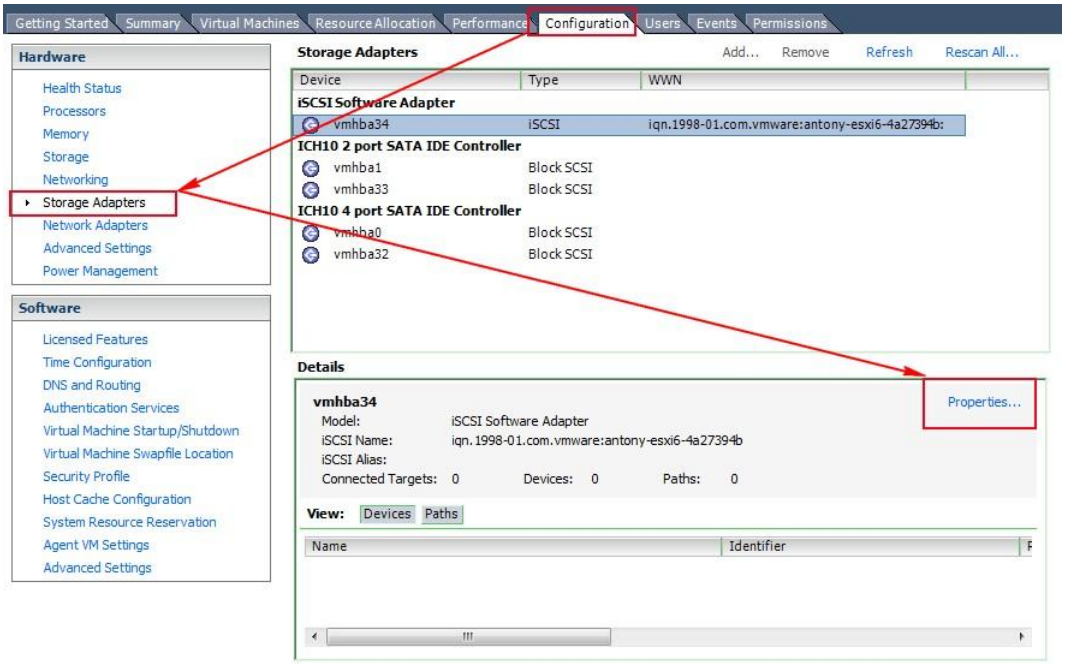




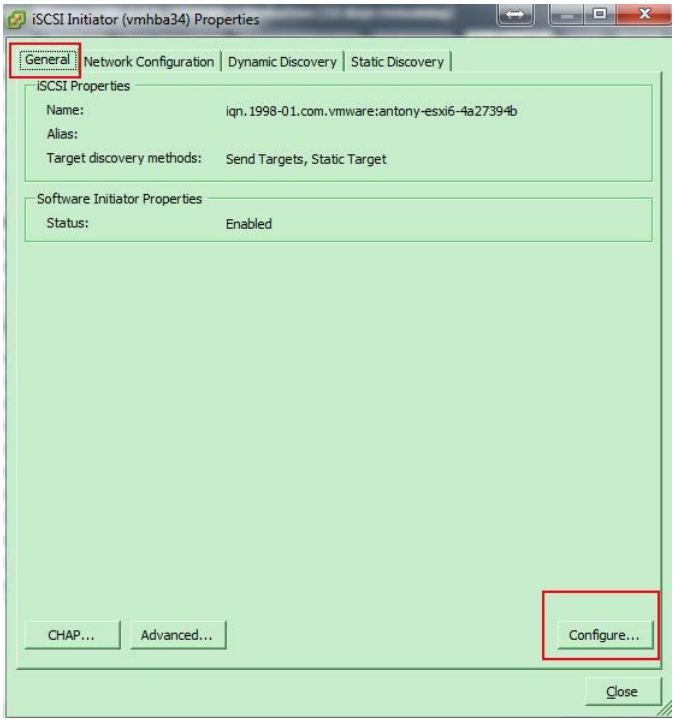




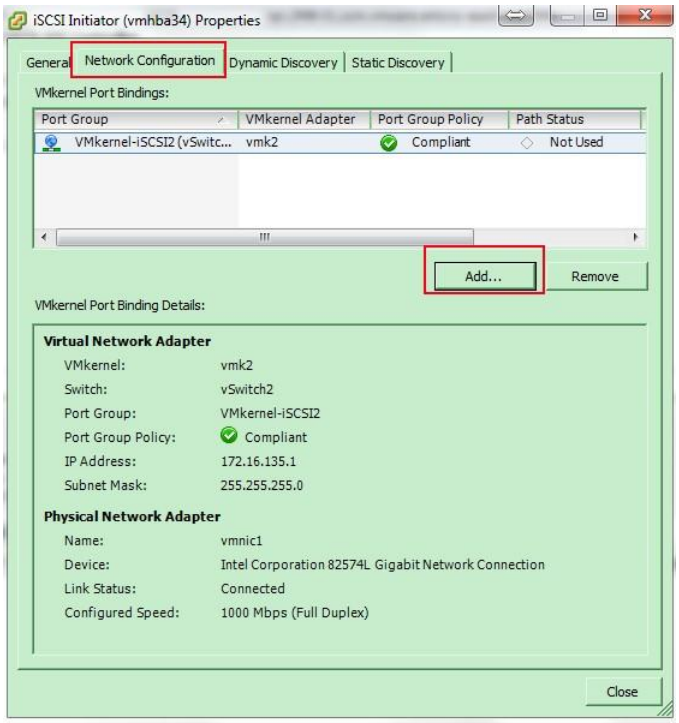
8. In **Configuration** tab, select **Storage Adapters** to list all available storage adapters. Choose **iSCSI Software HBA** and click **Properties** to modify the settings.

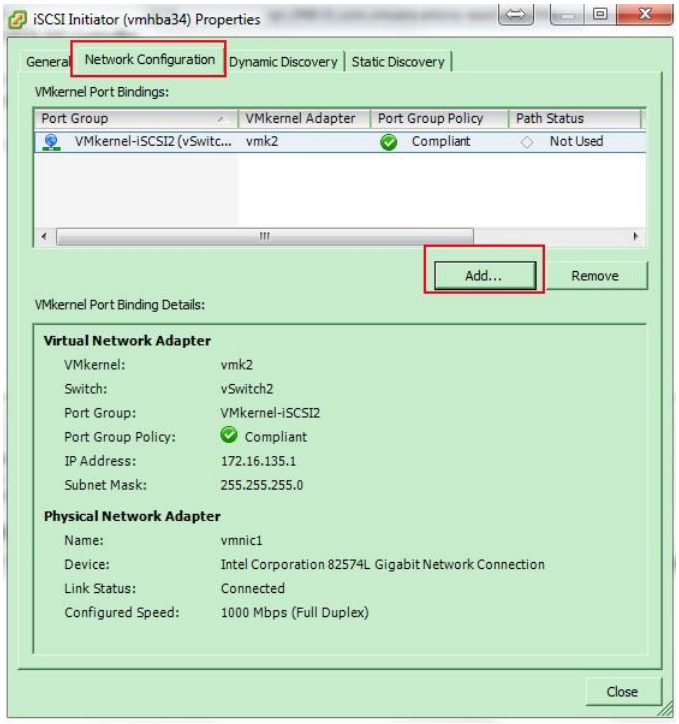


9. In **iSCSI initiator Properties**, select **General** tab and click **Configure** to enable iSCSI initiator.

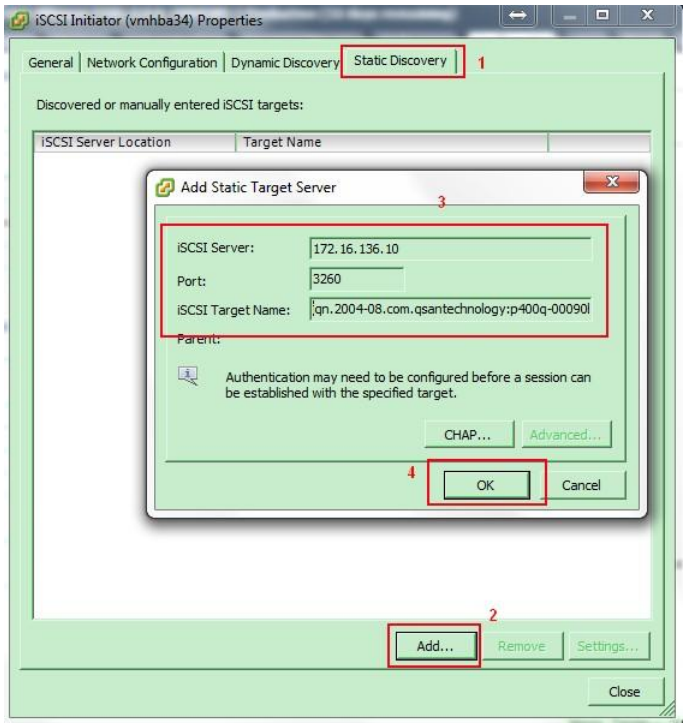


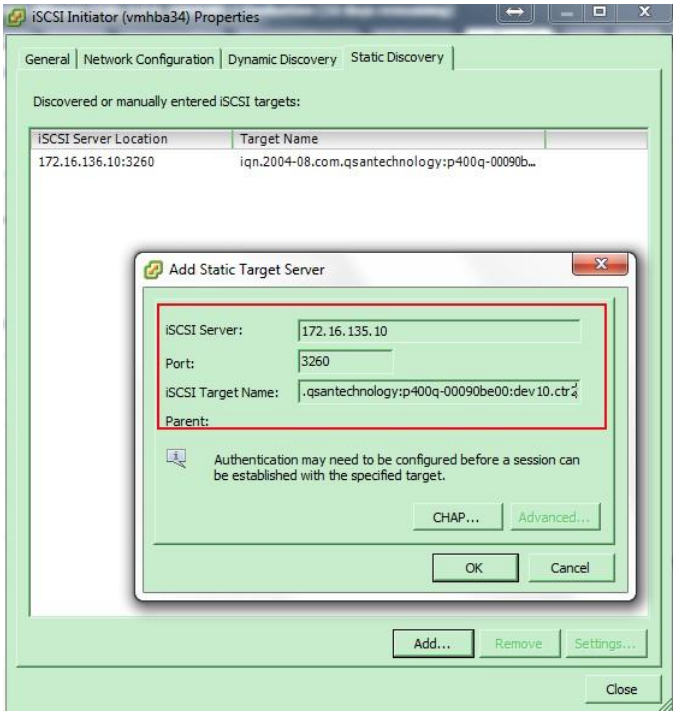
10. Next, please add another VMkernel port (default is one only) into the iSCSI initiator, so that the multipath session can be created smoothly.



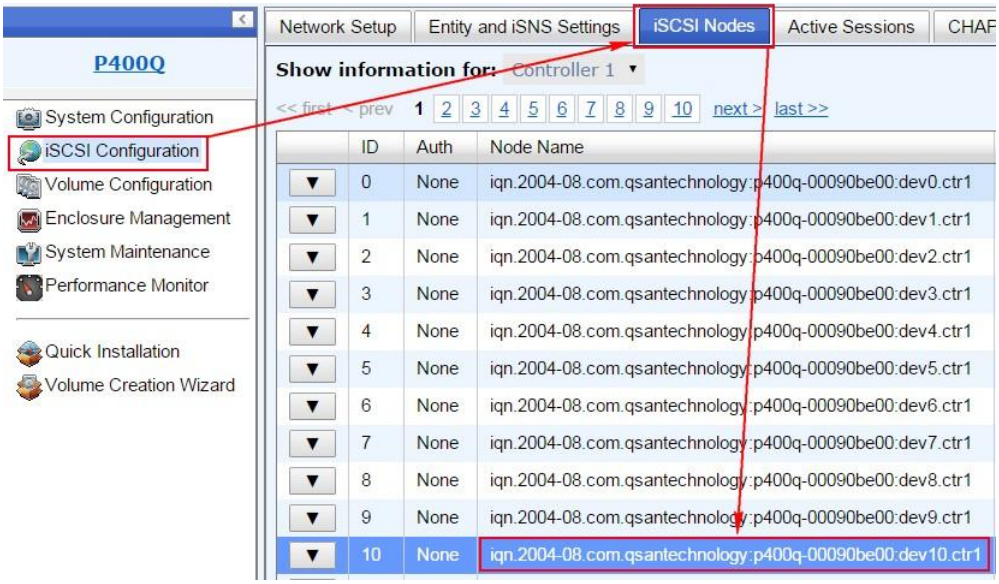


11. Go to **Static Discovery** tab, click **Add** button to set iSCSI target IP, here is iSCSI data port of P400Q.

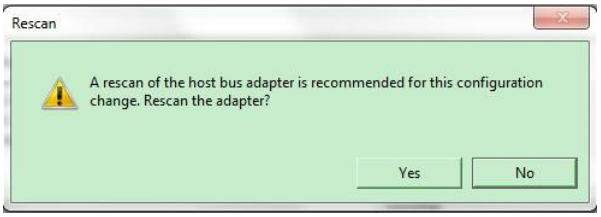




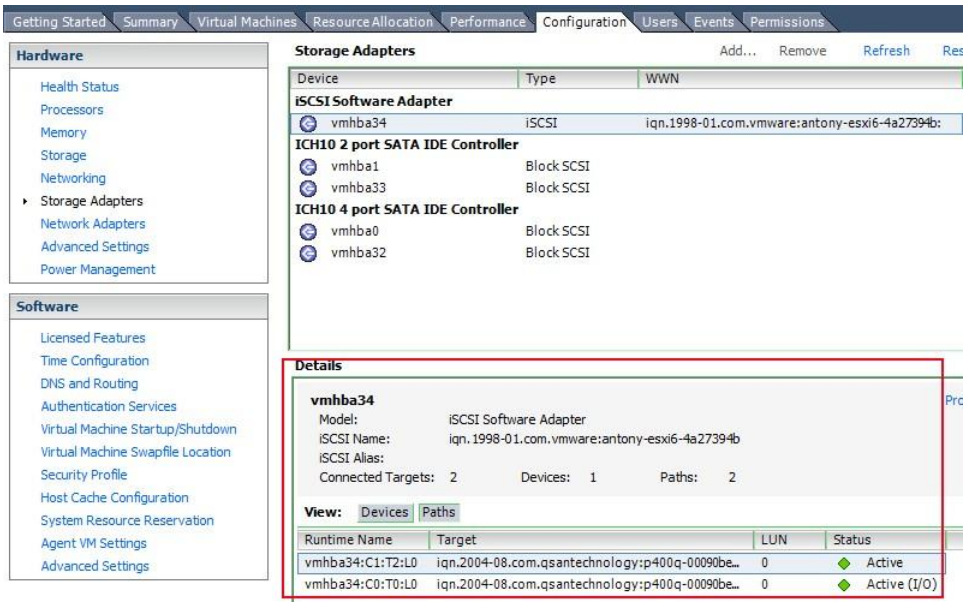
TIP:
The iSCSI target iqn can be found on web UI. Remember that the iqn is different if you are connecting to the iSCSI data port of controller1 and controller2 from ESXi server.



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

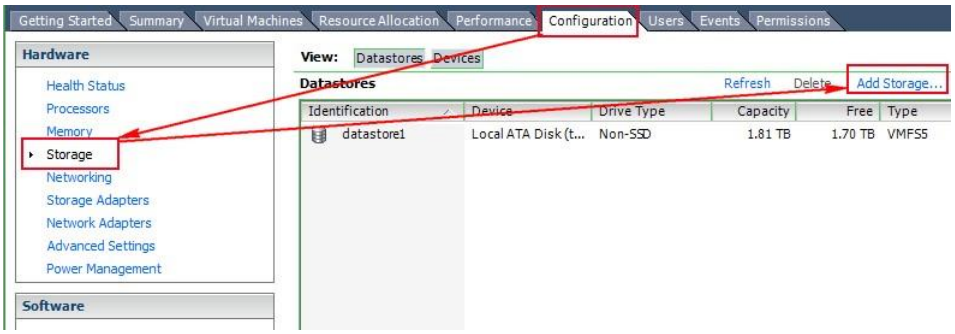


13. After rescanning, the available LUNs will be listed in the **Details** column when selecting the **iSCSI software adapter**. Although only one LUN is created on P400Q, there are two different physical paths to the same LUN, therefore the system displays two different records to the same LUN here.

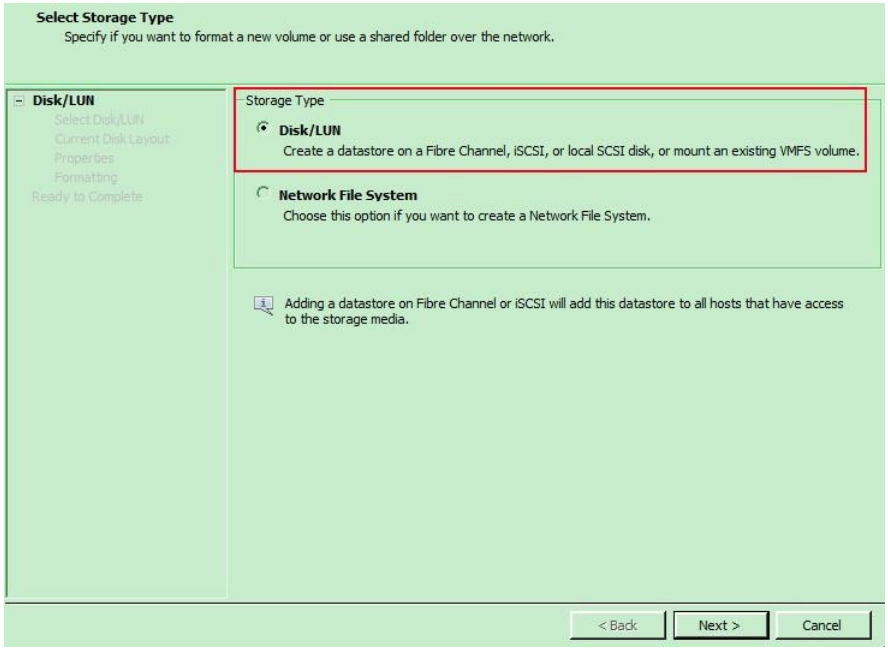


Add a new storage using the iSCSI LUN

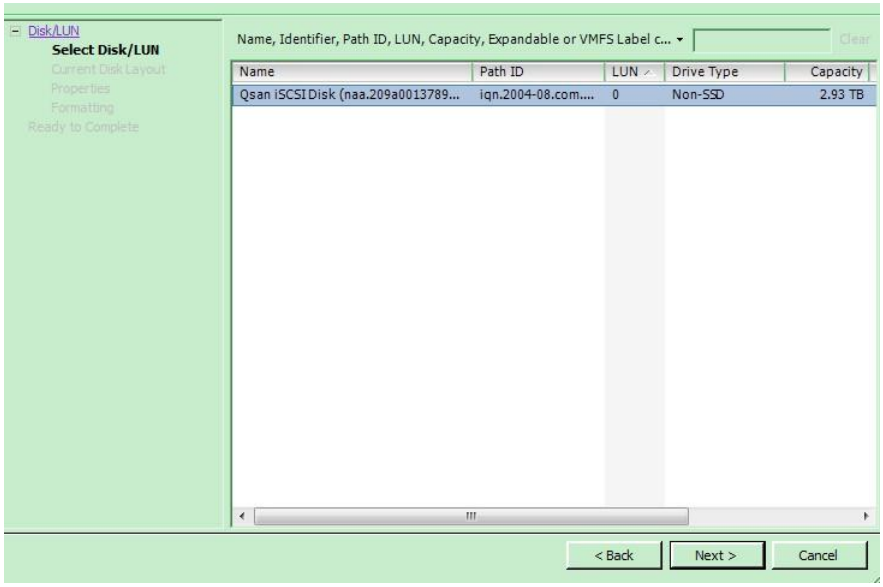
1. The LUN will be used as a virtual disk of the created guest OS. In **Configuration** tab, select **Storage** and click **Add Storage**.

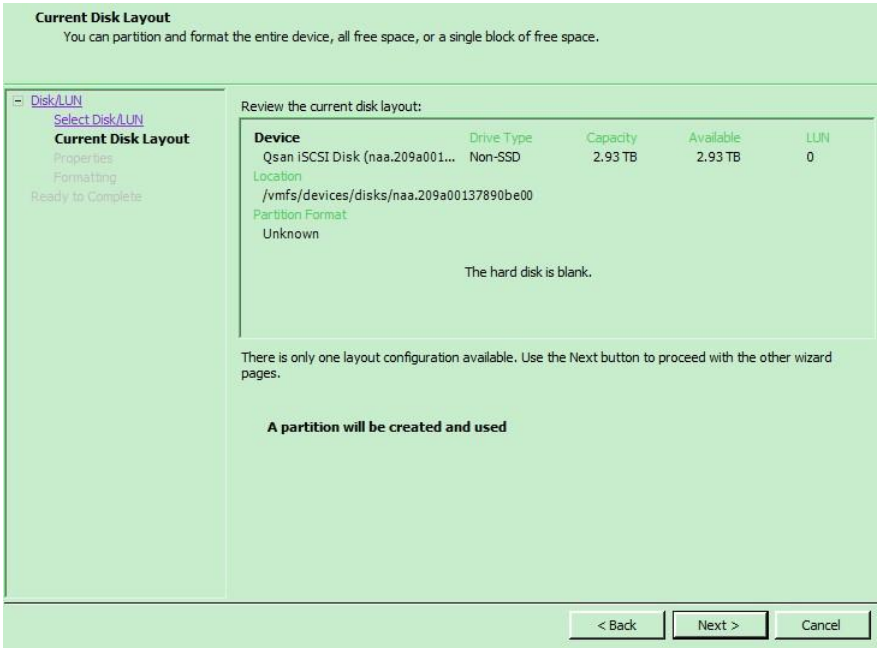


2. Select **Disk/LUN**, and click **Next** button.

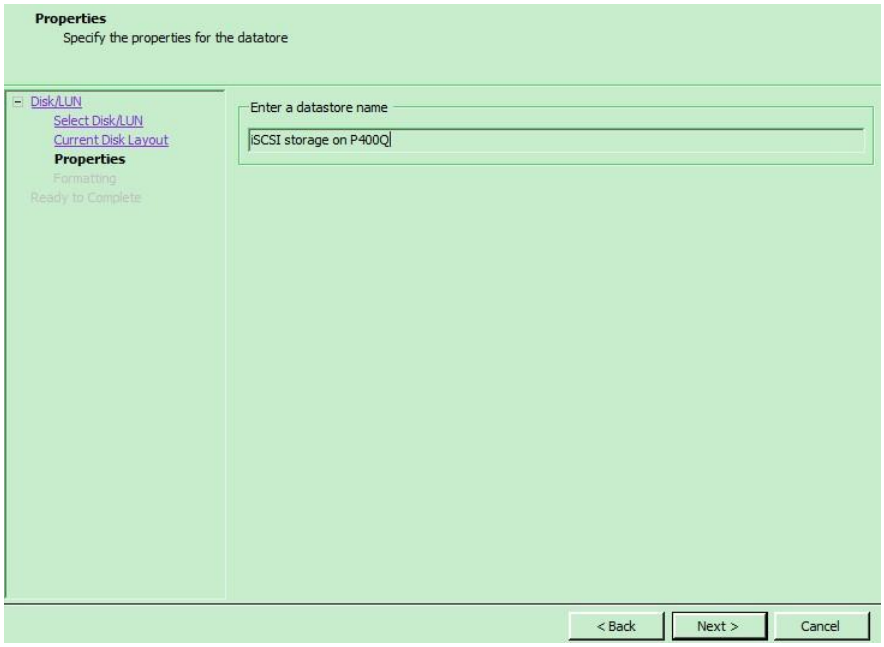


3. Select **Qsan iSCSI Disk**, and click **Next** button.



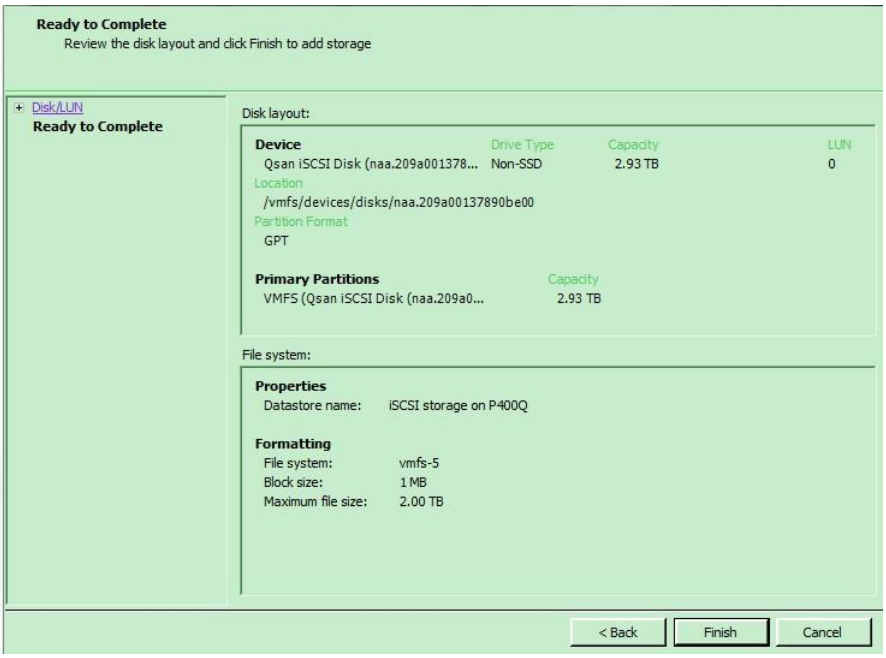


4. Enter a name for the new datstore, and click **Next** button.

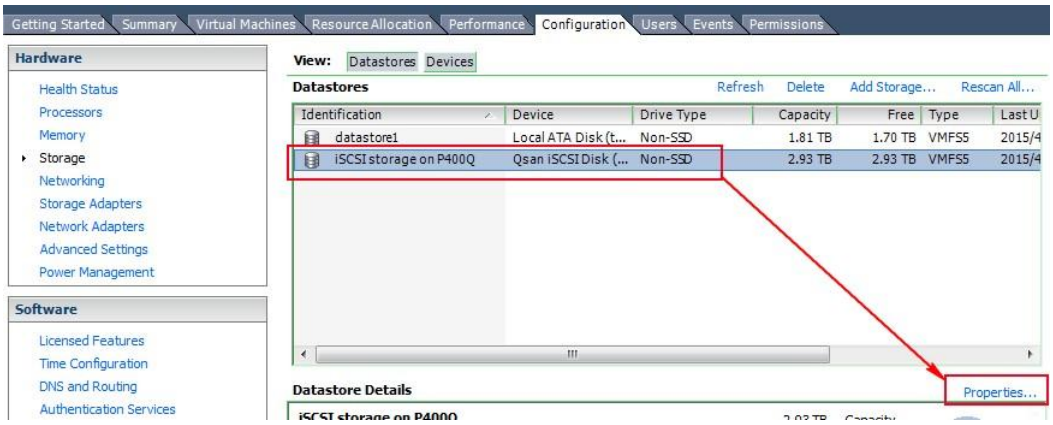


5. Click **Next** button.

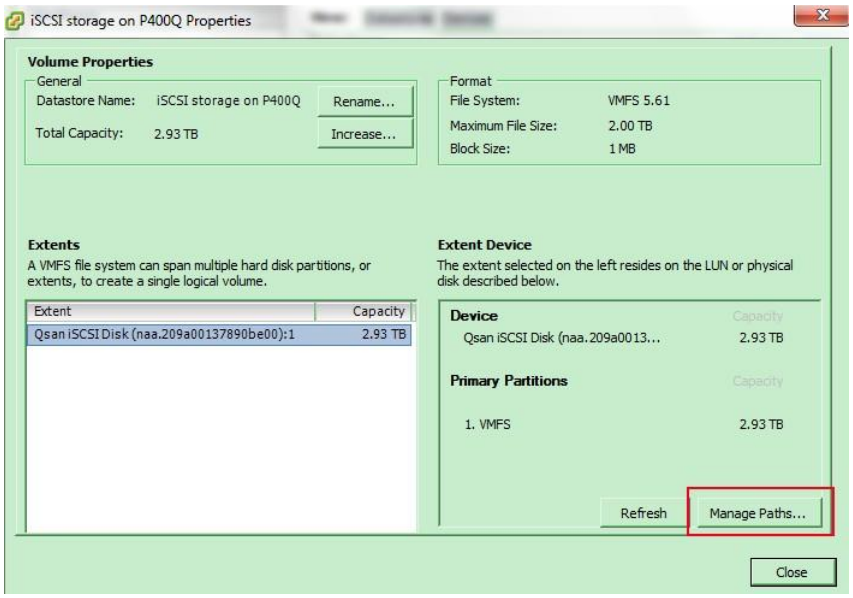
6. Check all settings, then click **Finish** button.



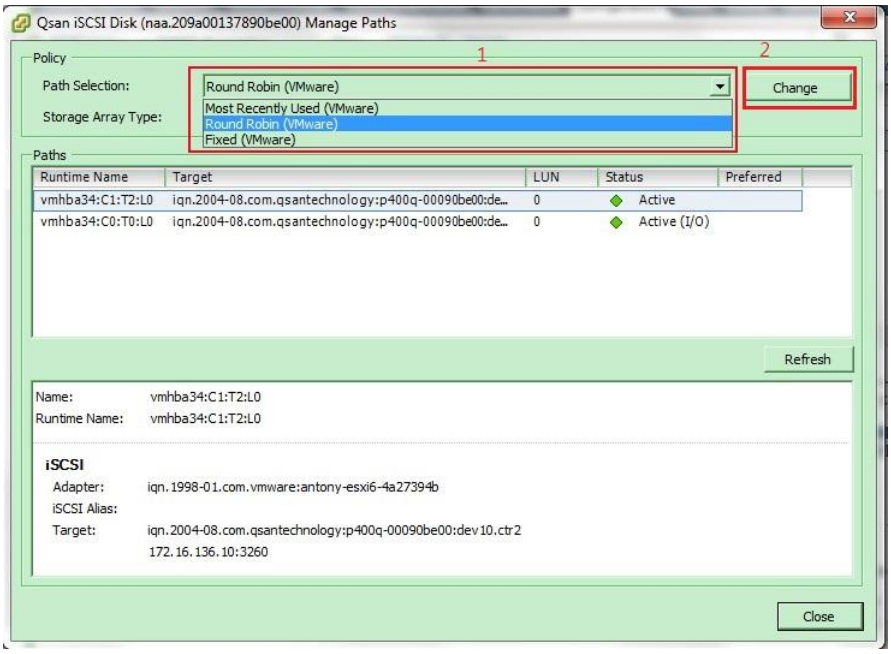
7. A new storage is added under **Datastores** of the ESXi server. The ESXi server provides settings to the multipath I/O. We can select the iSCSI storage and click **Properties** to modify the settings.

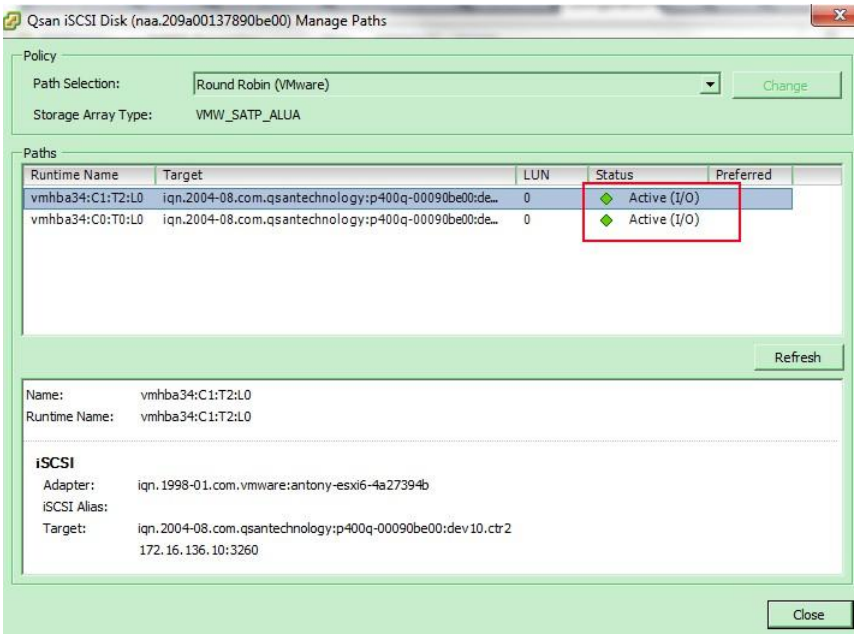


8. Select **Manage Paths** button.



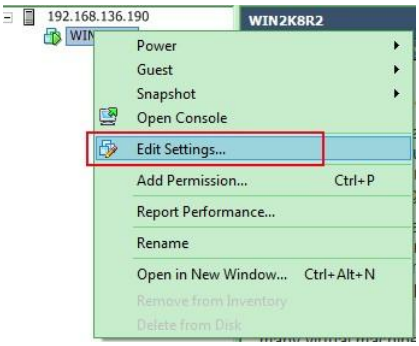
9. In **Manage Paths** window, it will display how many paths connect to this LUN and what path is active now. The policy is in **Fixed** mode by default, it can be modified by the drop-down menu. There are three types available, **Fixed**, **Most Recently Used**, and **Round Robin**. The difference 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.



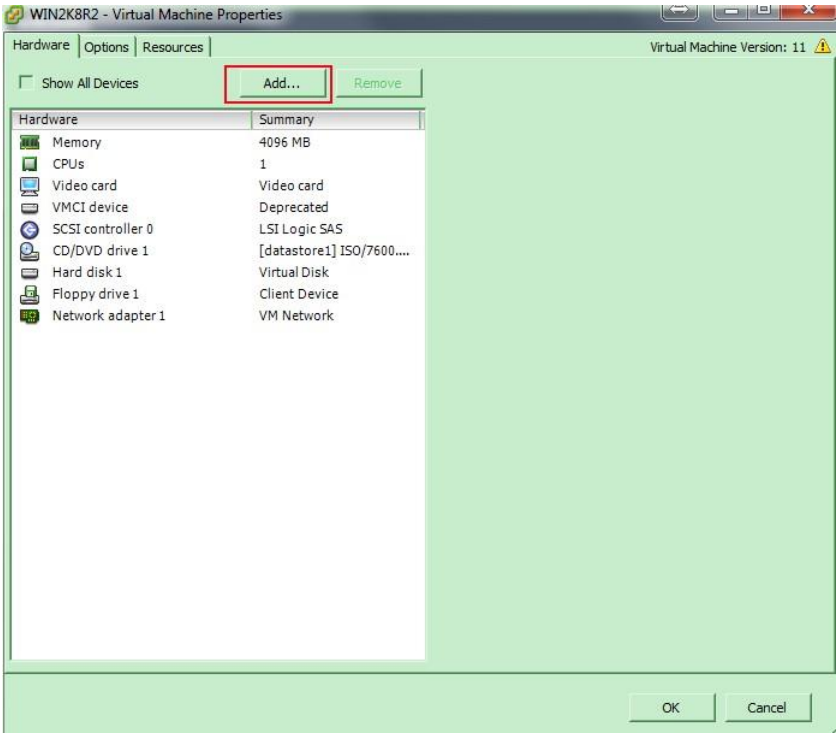


Add a new HDD to the created guest OS using the added datastore

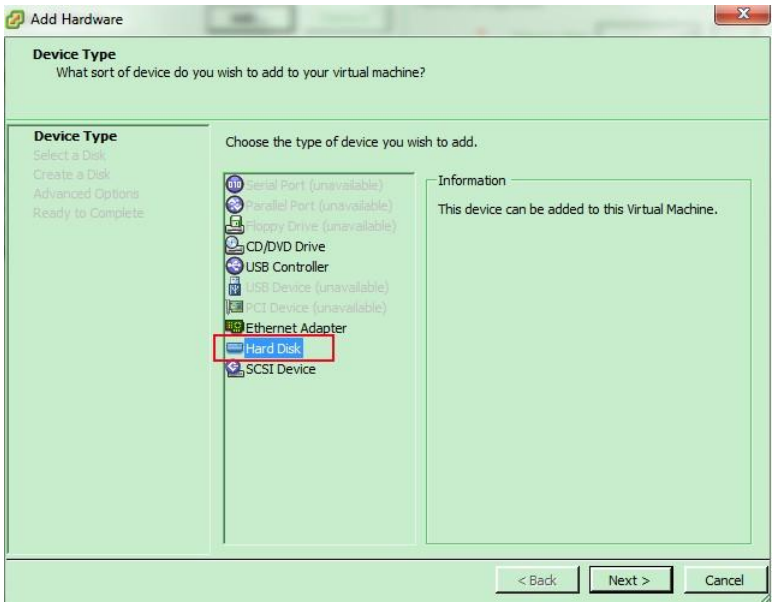
1. Now the datastore can be added as a virtual disk of guest OS. Right click on the guest OS and select **Edit Settings**.



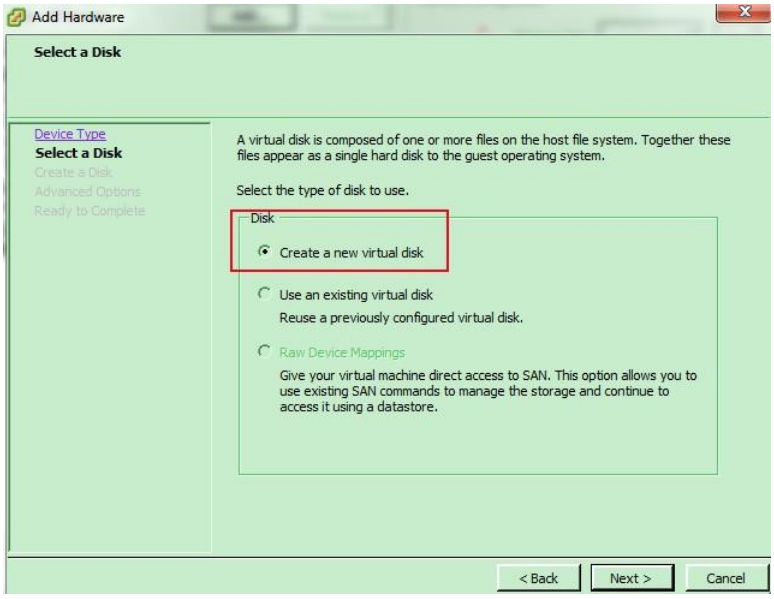
2. In the **Hardware** tab, click **Add** button.



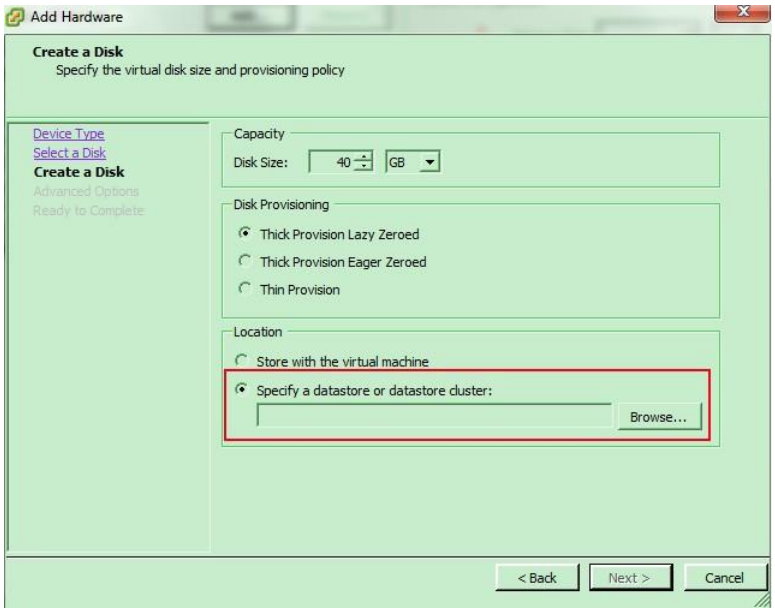
3. Select **Hard Disk**, and click **Next** button.



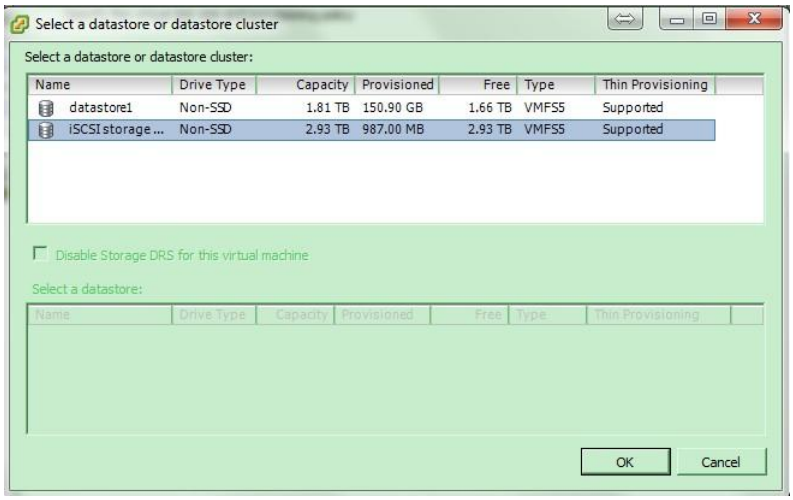
4. Choose **Create a new virtual disk**, and click **Next** button.



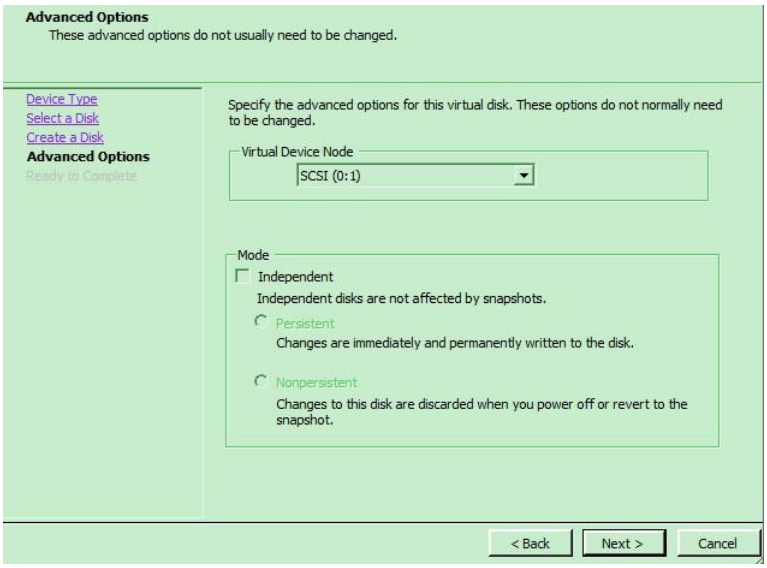
5. Select **Specify a datastore or datastore cluster**, and click **Browse** button.



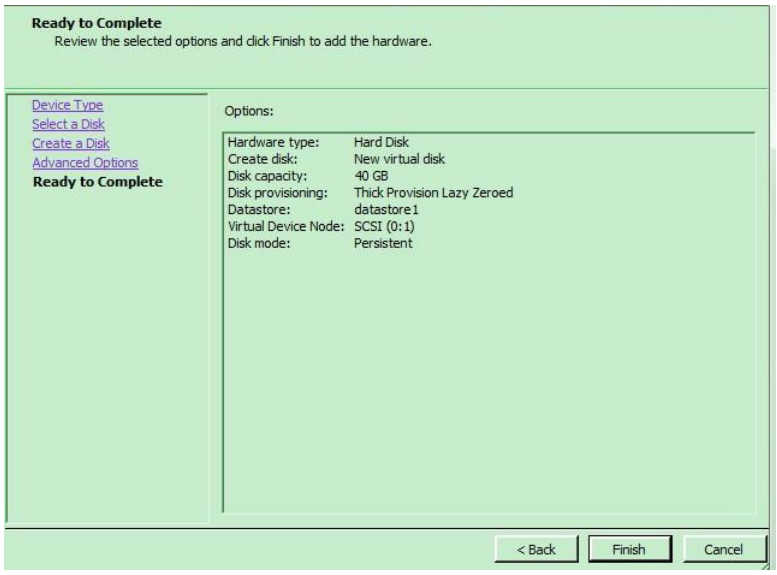
6. Select **iSCSI storage on P400Q**, and click **OK** button.



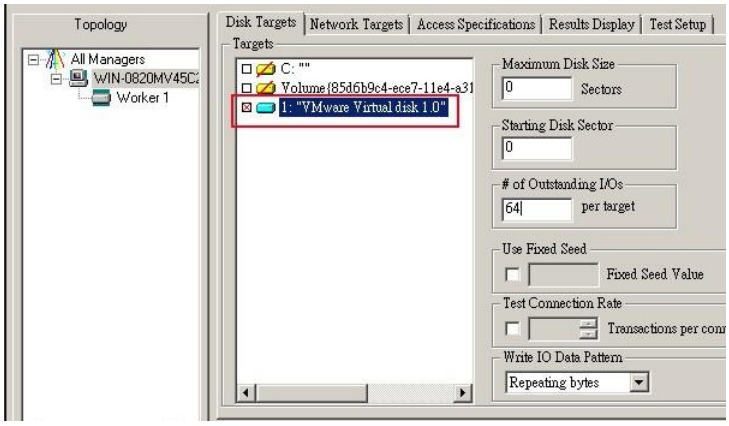
7. Leave all settings by default, click **Next** button.

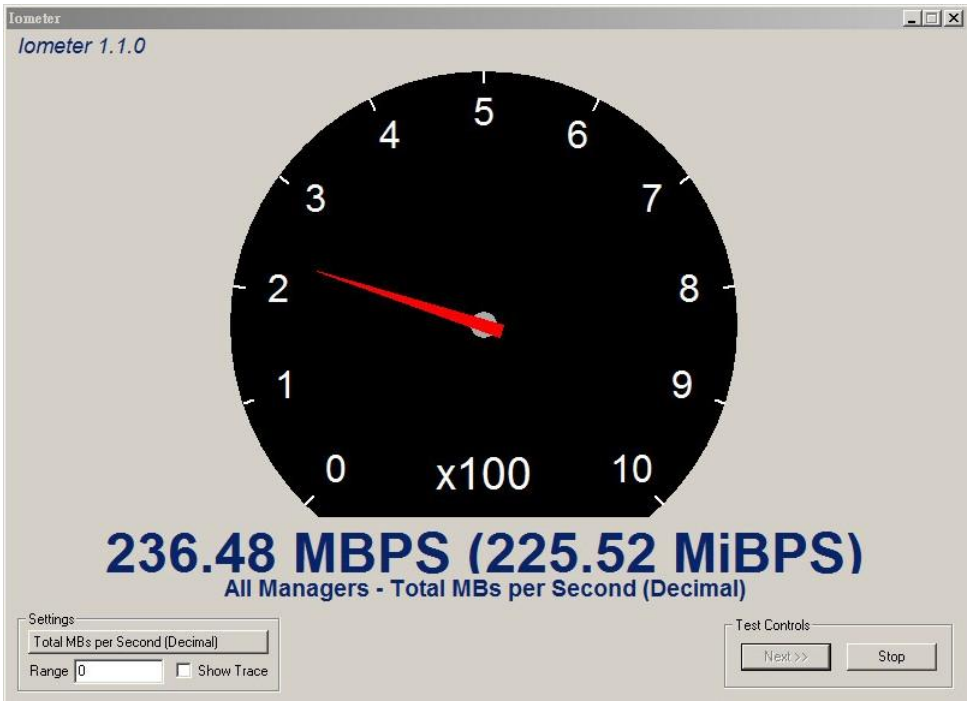


8. Check all settings, then click **Finish** button.



9. Verify that the multipath is working by IOmeter on the created guest OS.



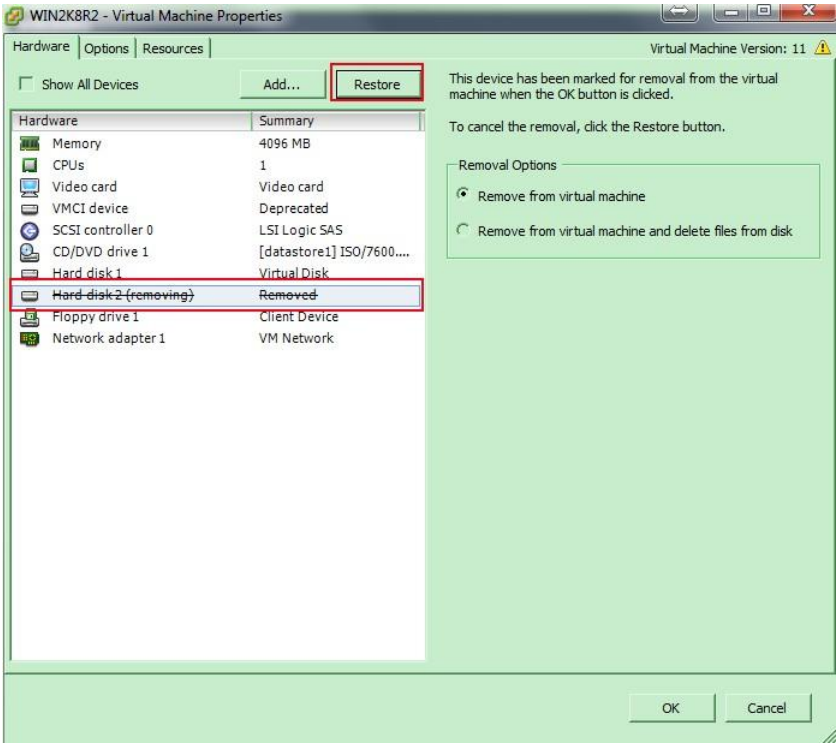


10. In this case we only have two iSCSI connections to the iSCSI target on P400Q, so the maximum throughput we get is expected.

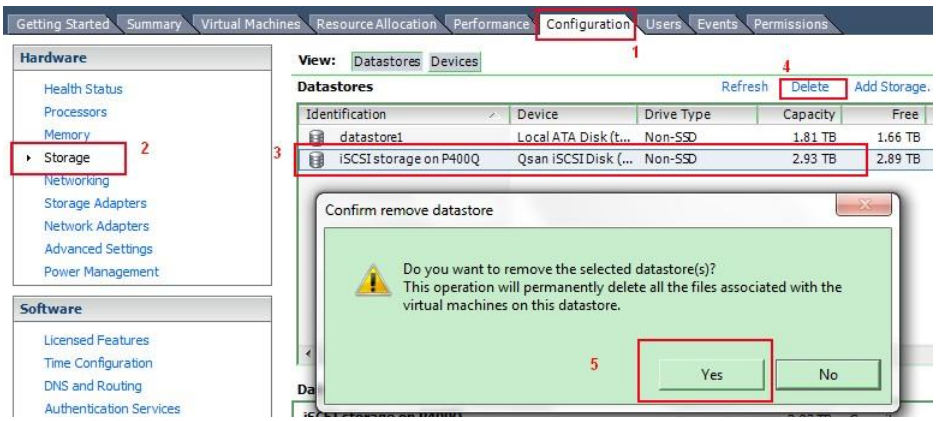
Logging iSCSI target directly from the guest OS

Users may also log in the iSCSI target on P400Q 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 P400Q, to prevent any possibility of data inconsistency caused by multiple host log in the same LUN in the same time.

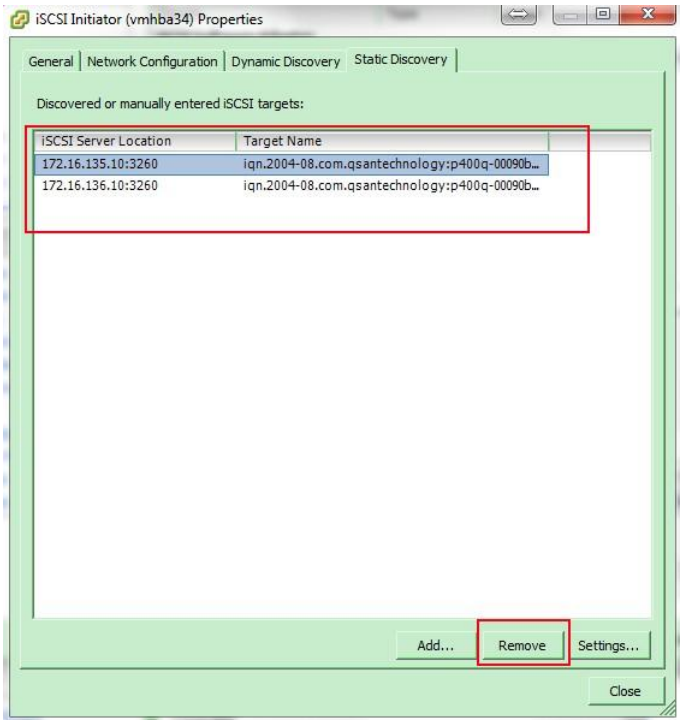
1. Remove the new added Hard disk on the guest OS.



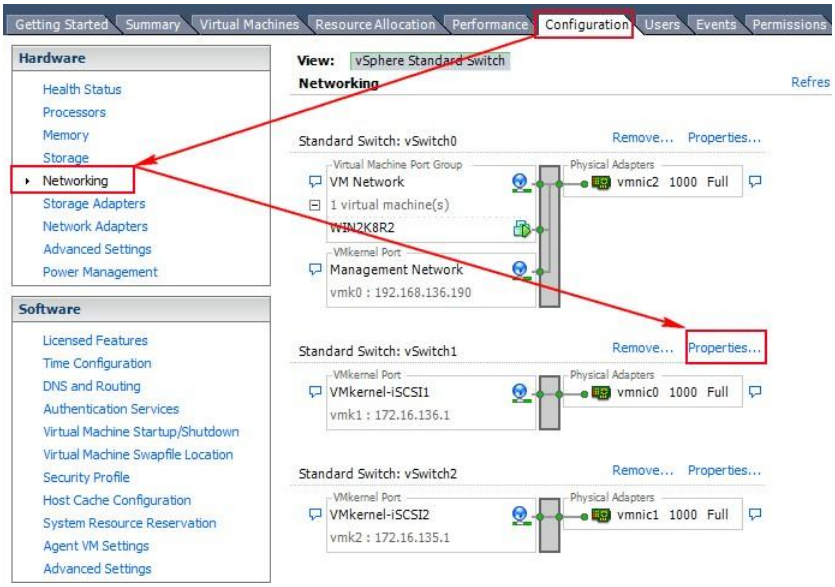
2. Remove the new added datastore on ESXi server.

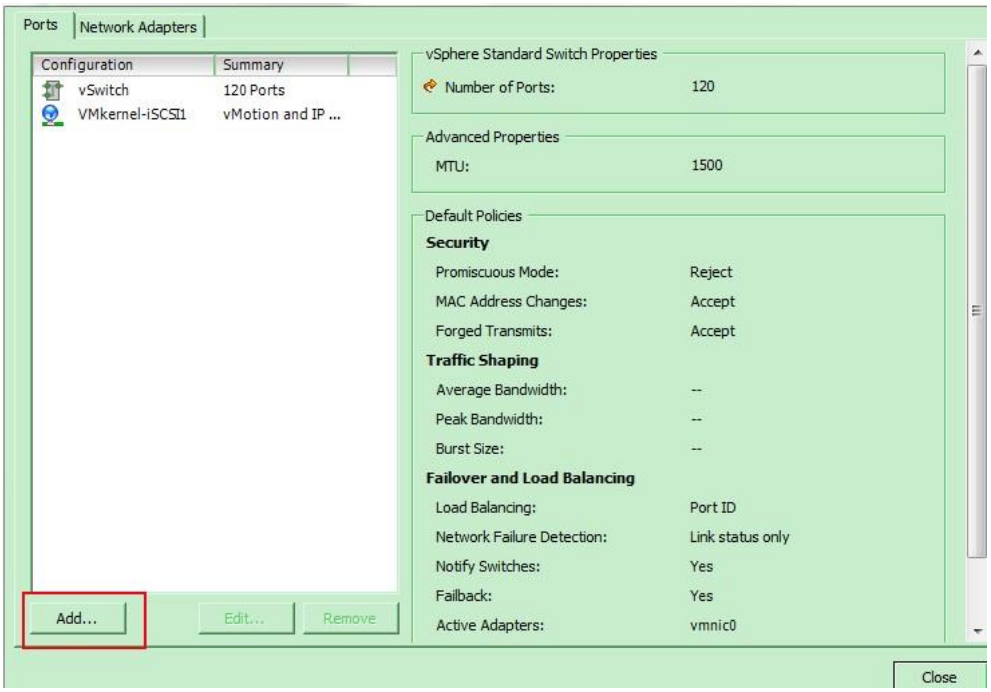


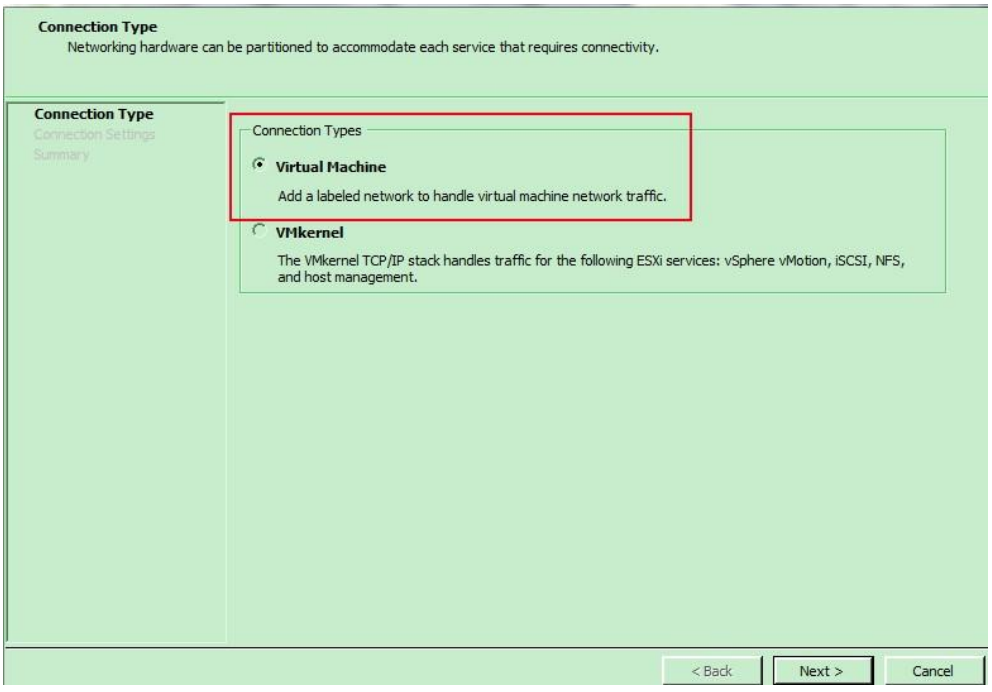
3. Log out both of the iSCSI targets.

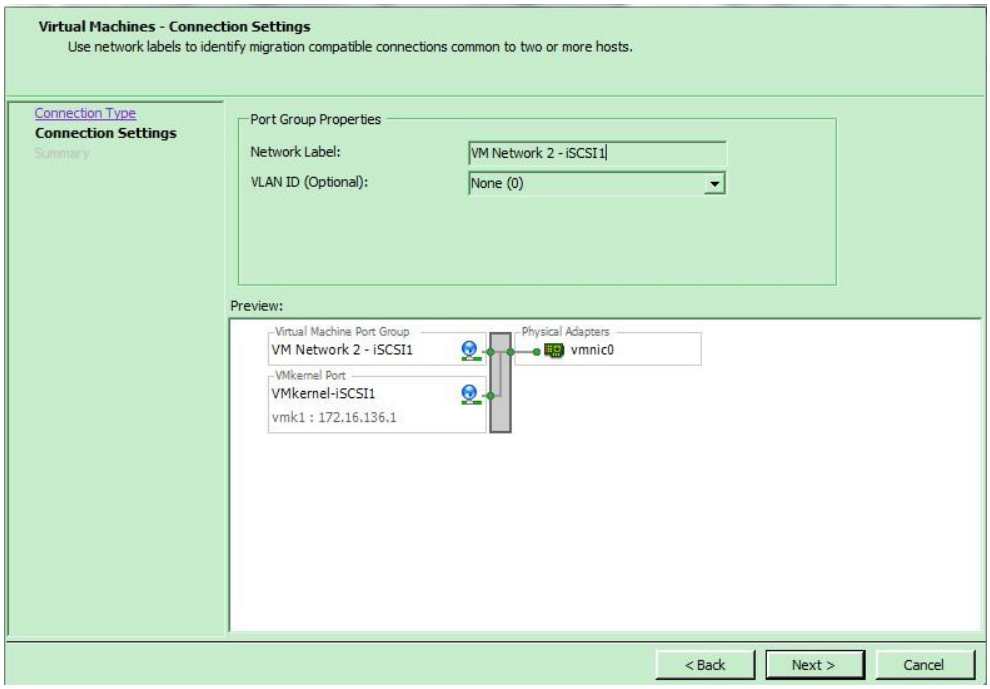


4. Add a new VM port group to each created vSwitch (VMkernel-iSCSI1, iSCSI2).

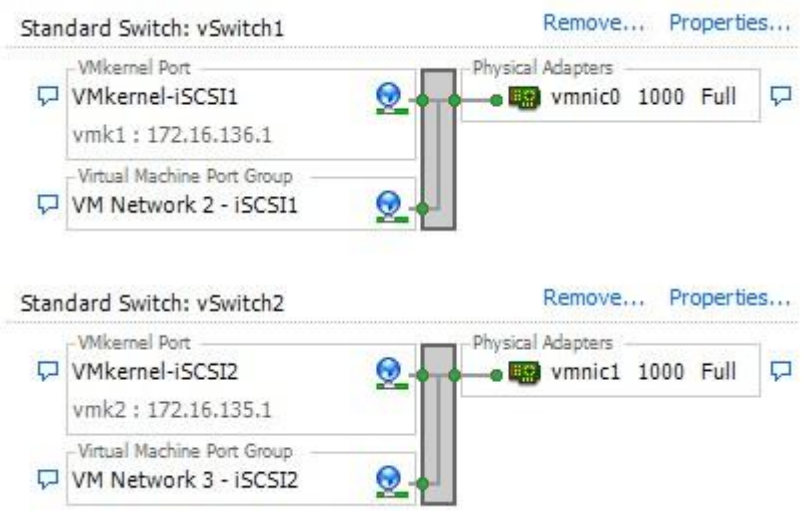




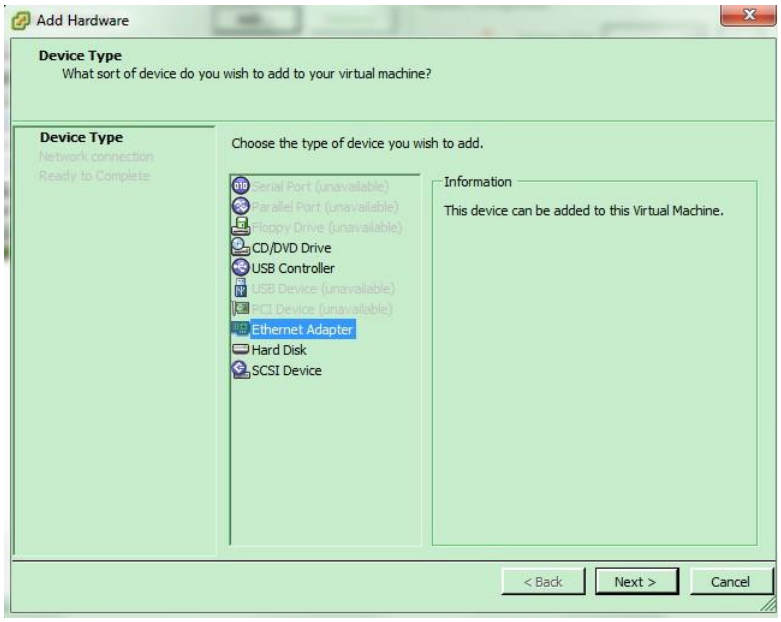


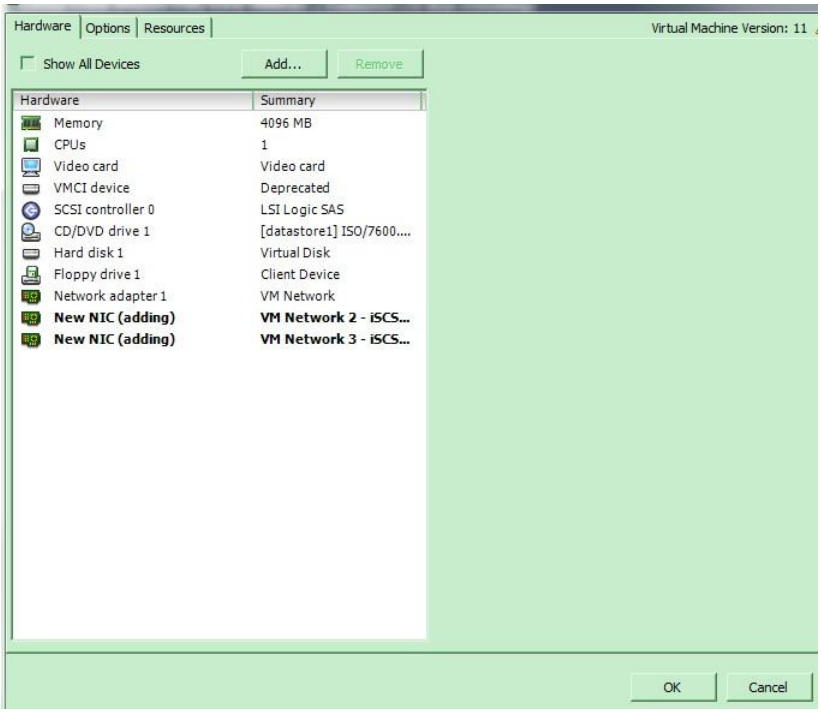


5. And so on for the other vSwitch, there will be another 2 VM port group available for VM guest OS.

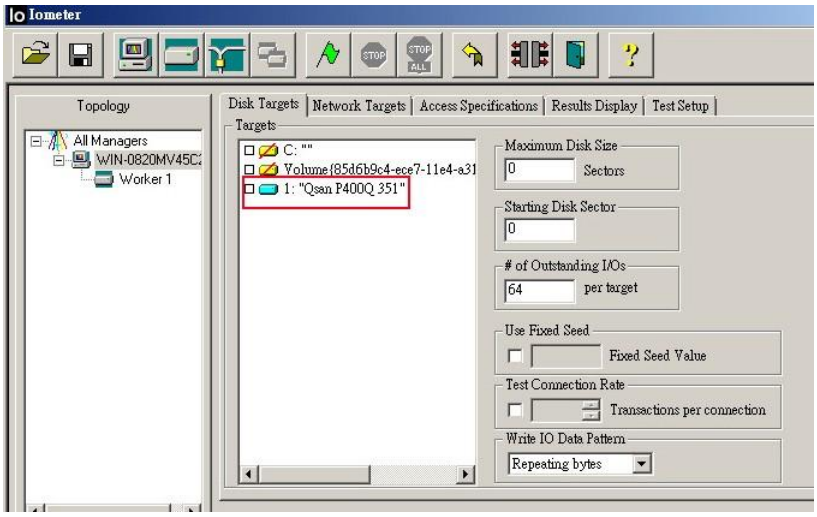


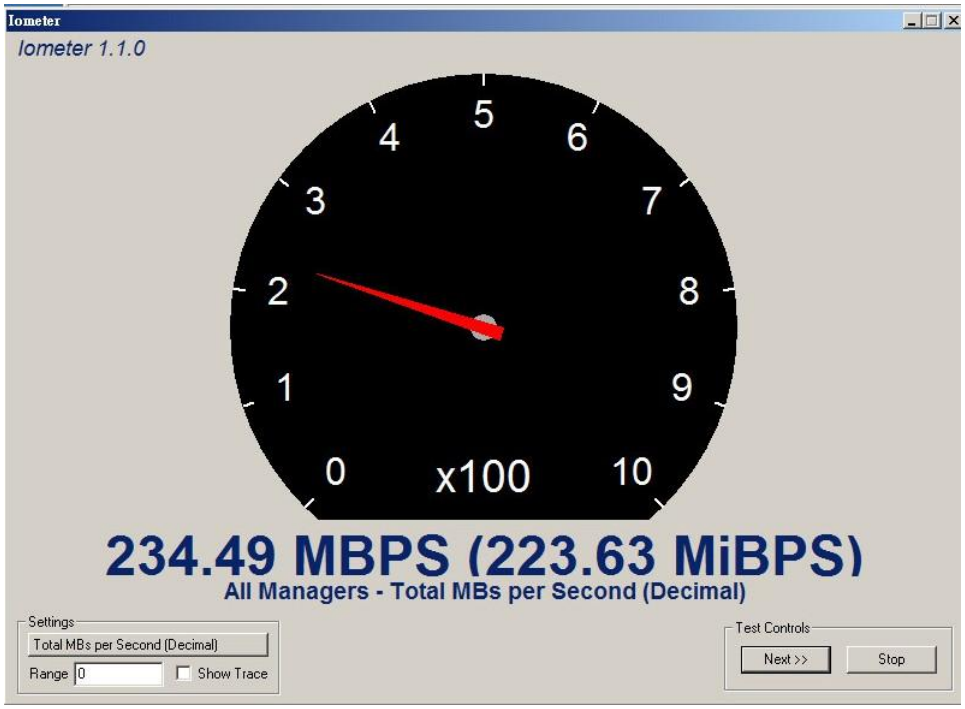
6. Add 2 more Ethernet NIC to the created guest OS, using the VM port group that is created.





7. Configure the new added 2 NICs on the guest OS, so that the guest OS can ping to iSCSI data port on the P400Q, and log in the iSCSI target.
8. Verify the performance via IOmeter.





Conclusion

Qsan AegisSAN LX series products provide Active-Active dual controller and support ALUA, user don't have to pre-configure any option on P400Q system to achieve the redundancy between ESXi server and P400Q, 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.

Applies To

- AegisSAN LX FW 3.5.1
- AegisSAN Q500: FW 3.5.0

Reference

- VMware documentation
  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