Application Notes
Jul 2019

Set up a VMware ESXi Datastore via iSCSI in QNAP Enterprise Storage

Notices

This user manual provides detailed instructions of using the QNAP Enterprise Storage NAS. Please read carefully and enjoy the powerful functions of the Enterprise Storage NAS.

- The QNAP Enterprise Storage NAS is hereafter referred to as the ES NAS or the NAS.
- This manual provides the description of all the functions of the ES NAS. The product you purchased may not support certain functions dedicated to specific models.

Legal Notices

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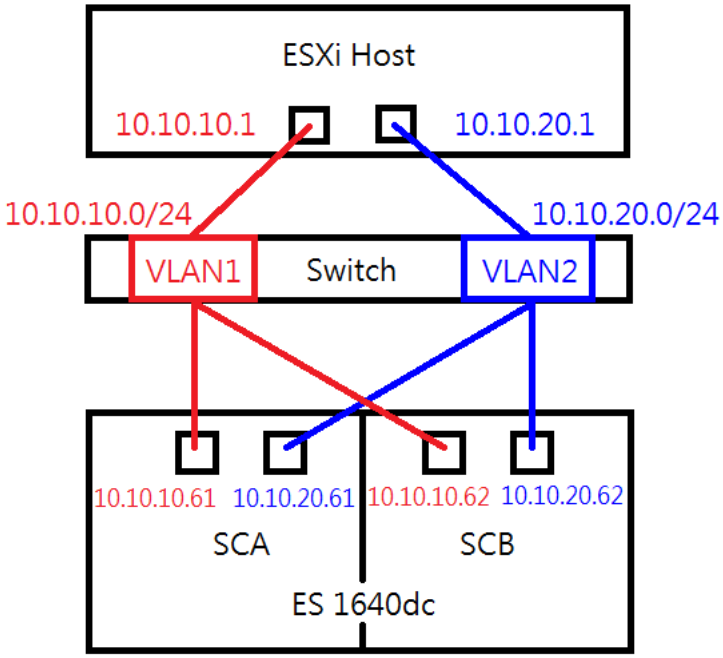
For VMware vSphere Windows Version

VMware and iSCSI Architecture

To use iSCSI Storage Area Networks (SAN), create a LUN on the iSCSI target (for example: the ES NAS) and mount it as a datastore on a host. The following diagram illustrates the deployment of iSCSI storage in a vSphere environment.



Note:

1 Gigabit Ethernet (1GbE) (or higher) is recommended for use in connecting to an iSCSI target.

Preparation for Installation

ESXi hosts are able to connect to the ES NAS via iSCSI. You can set up datastores (repositories for virtual machines) on the ES NAS that the ESXi hosts discover in your vSphere environment. We will demonstrate this implementation.

In our demonstration, the following configuration is used:

- Storage device: QNAP ES NAS series with QES (NAS operating system) version 1.1.4.
- vSphere ESXi hosts: VMware ESXi 6.0
- IP addressing: Static IP addresses are recommended for both ESXi hosts and the ES NAS.

Server and Storage Network Settings

Server Network Settings		
Role	IP	Description
ESXi host	192.168.217.1	VMware ESXi host
Data Network 1	10.10.10.1	10G Data port 1 in ESXi host
Data Network 2	10.10.20.1	10G Data port 2 in ESXi host

Storage Network Settings		
Setting	Value	Description
SCA Management IP	192.168.217.61	Management IP of controller A
SCA Ethernet1 IP	10.10.10.61	Data port 1 IP of controller A
SCA Ethernet2 IP	10.10.20.61	Data port 2 IP of controller A
SCB Management IP	192.168.217.62	Management IP of controller B
SCB Ethernet1 IP	10.10.10.62	Data port 1 IP of controller B
SCB Ethernet2 IP	10.10.20.62	Data port 2 IP of controller B
Pool allocate to SCA	Pool1	RAID6 pool at controller A

With the information listed in the above table, assuming a 100GB LUN is deployed on ES1640dc v2 controller A (SCA), it can be mounted using the following steps on the ESXi host.

Confirm these details before configuration

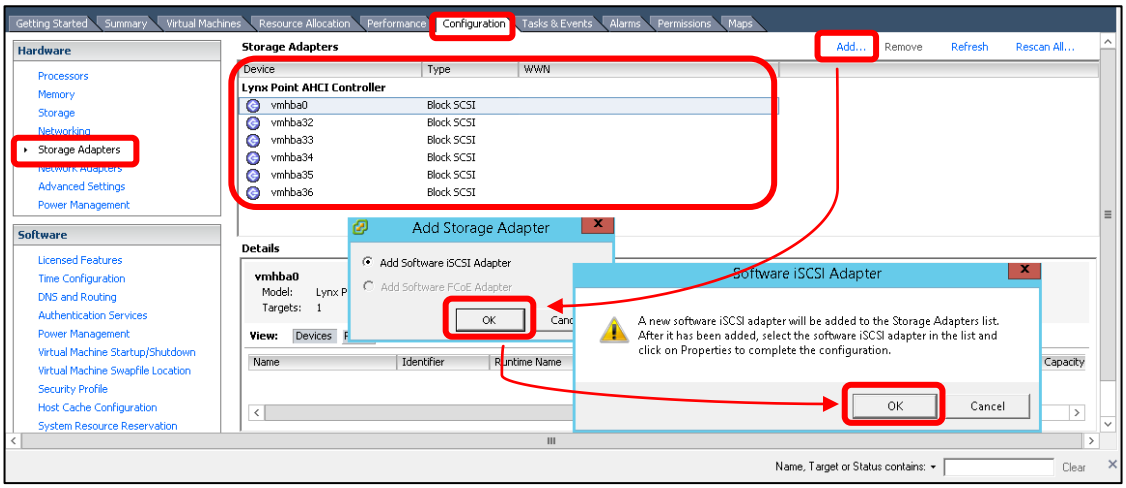
- All data ports, from the ESXi host and the ES NAS, should be in the same subnet.
- Available pools must be built before configuring iSCSI LUN on the ES NAS. For more information on creating a storage pool, read Network and Storage Settings of ES NAS High-Availability Network Storage Services.

Definition

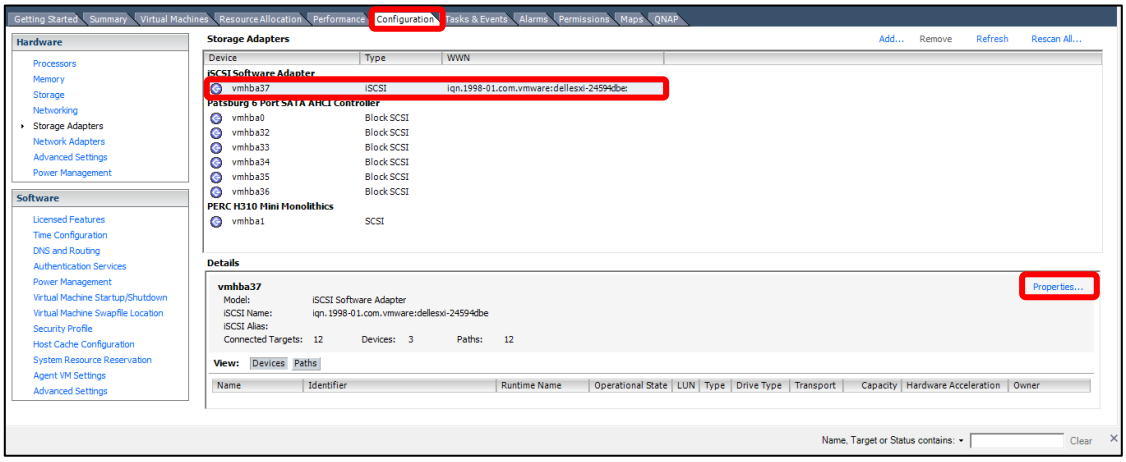
In this document, the VMware ESXi host is defined as the iSCSI Initiator, and the QNAP ES NAS is the iSCSI Target.

Add iSCSI Targets on VMware ESXi Hosts

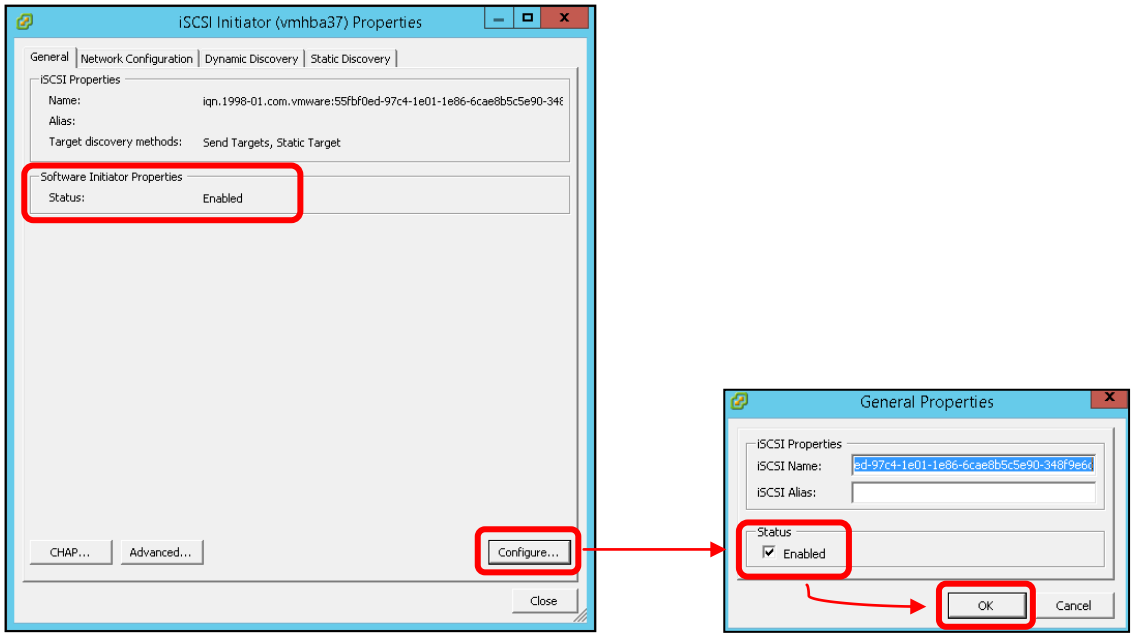
Step 1: Log in to vSphere Client, and select a host from the inventory panel. Go to the “Configuration” tab and click “Storage Adapters” in the Hardware panel. Click “Add…” on the top right of the window to add a storage adapter.



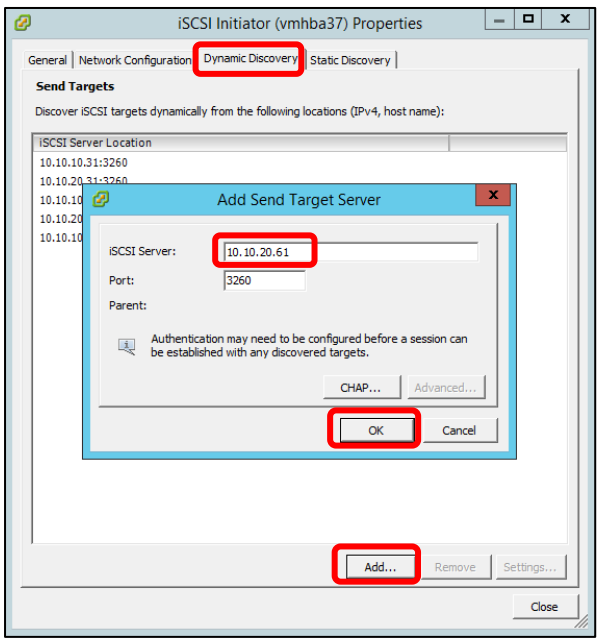
Step 2: A new software iSCSI adapter will be added to the Storage Adapter list. Select the new software iSCSI adapter on the list and click “Properties”.

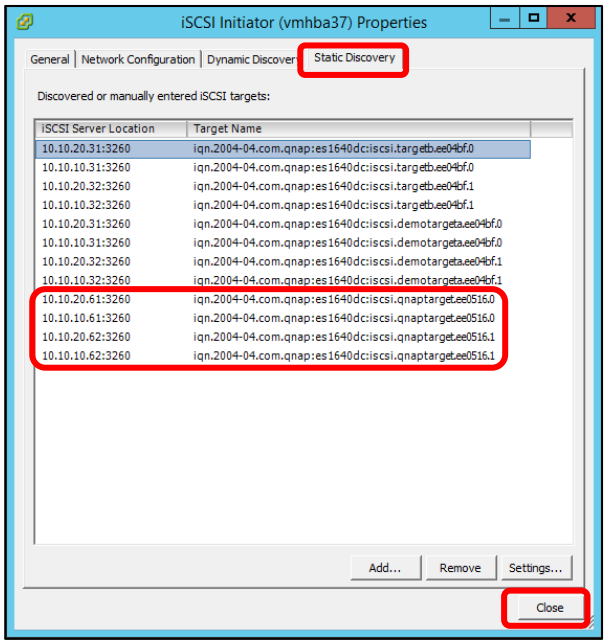


Step 3: Ensure the adapter is enabled. If not, click “Configure…”, check "Enabled" and click “OK”.

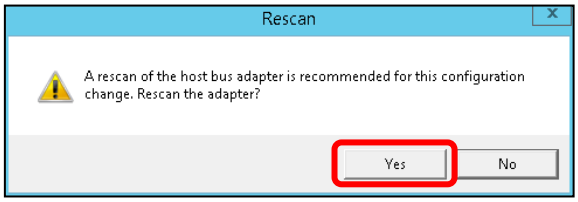


Step 4: After enabling the adapter, you must set up target discovery addresses so that the iSCSI adapter can determine which storage resource on the network is available. Go to the “Dynamic Discovery” tab and click “Add...” to add the data ports’ IP addresses of both controllers. Then go to the “Static Discovery” tab to view the names and IP addresses of these targets.





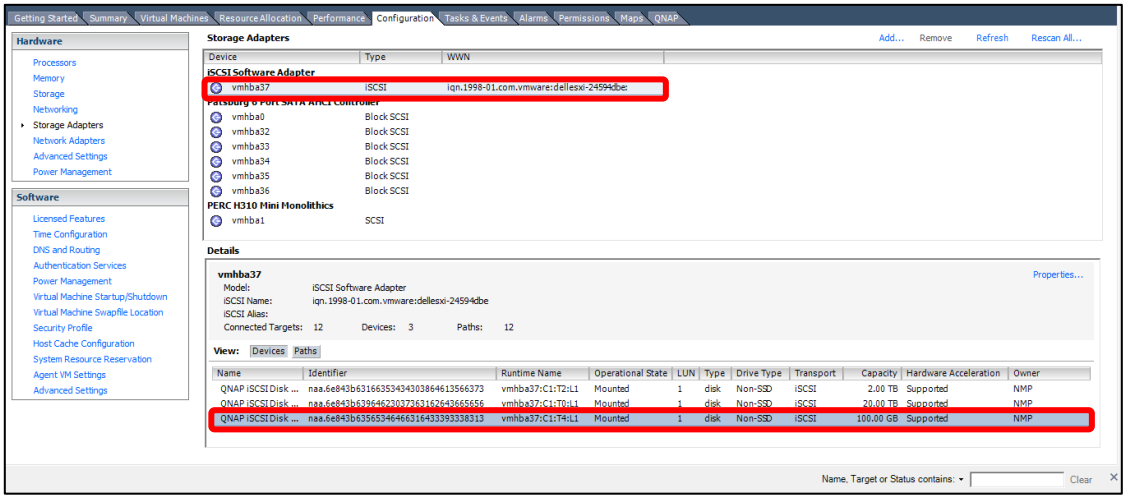
Step 5: Click “Close” to close the Properties window. The “Rescan” window will appear. Click “Yes”.



Note:

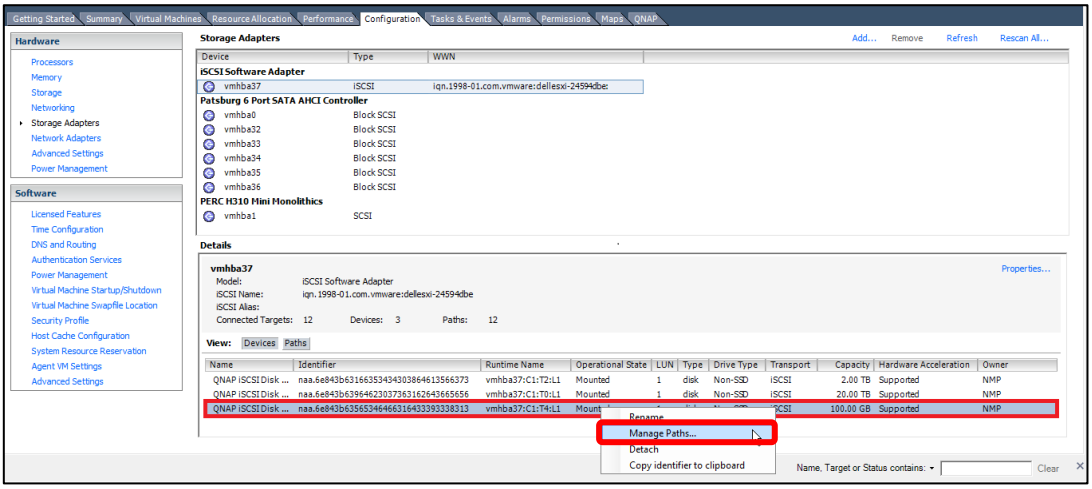
If CHAP is enabled in the ES NAS iSCSI Target, you should have the same configuration in “CHAP…” in the “Add Send Target Server” window.

Step 6: You can now find the corresponding iSCSI device for the added iSCSI adapter.

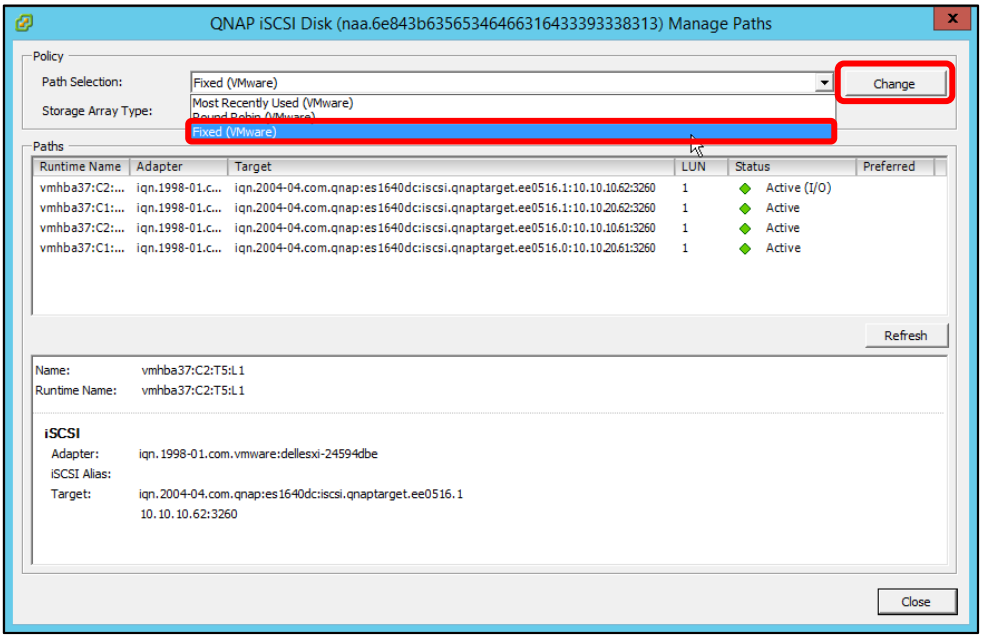


Configure the Path for iSCSI Connection

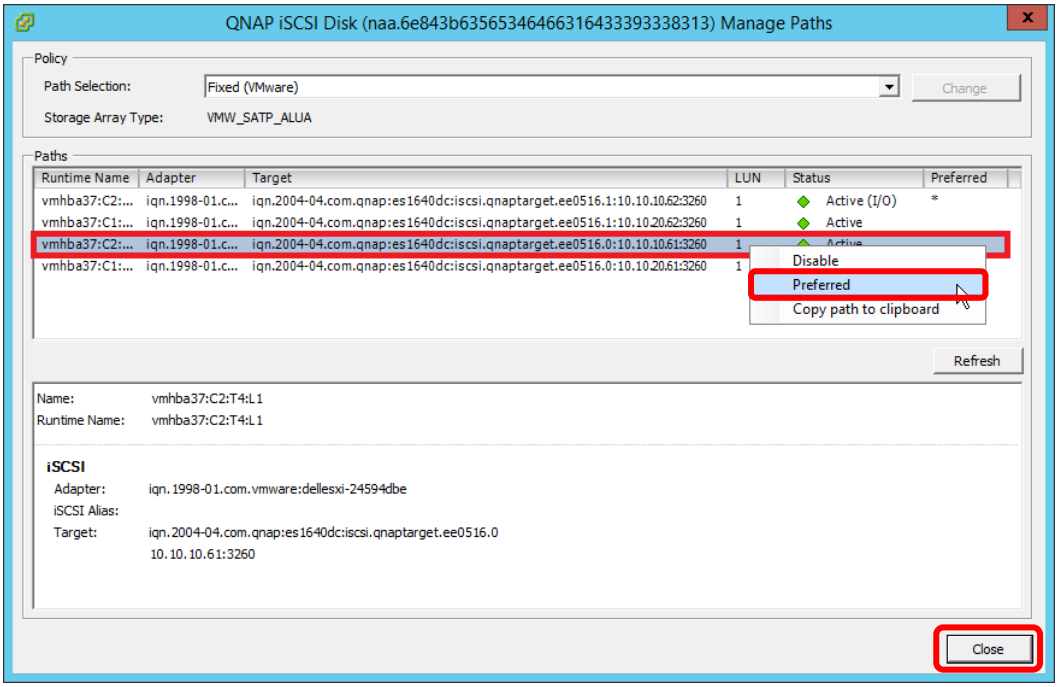
Step 1: Right-click on an iSCSI disk and select “Manage Paths…”



Step 2: Select “Fixed (VMware)” from the “Path Selection” drop-down menu as the path selection policy. Then click “Change” to apply the changes.



Step 3: Specify the preferred path by right-clicking the path you want to assign as the preferred path, and select “Preferred”. Then click “OK” to save your settings and exit the dialog box.



Note：

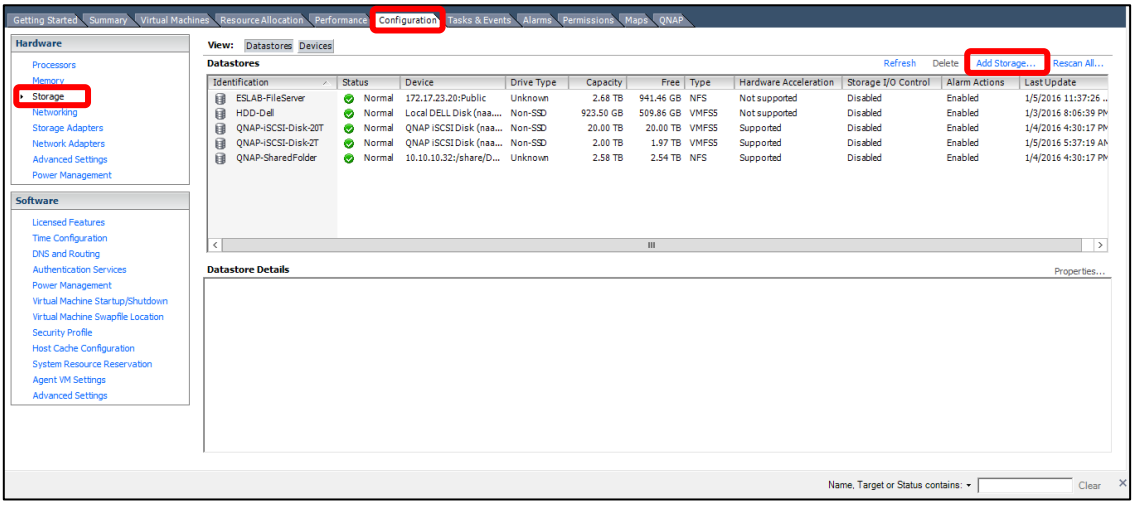
For better iSCSI performance, select the path or Ethernet port which belongs to the Storage Controller that owns the iSCSI LUN. In our example, we chose ports (10.10.10.61/10.10.20.61) which belong to SCA on which Pool 1 was created.

The data port shows below the Target name.

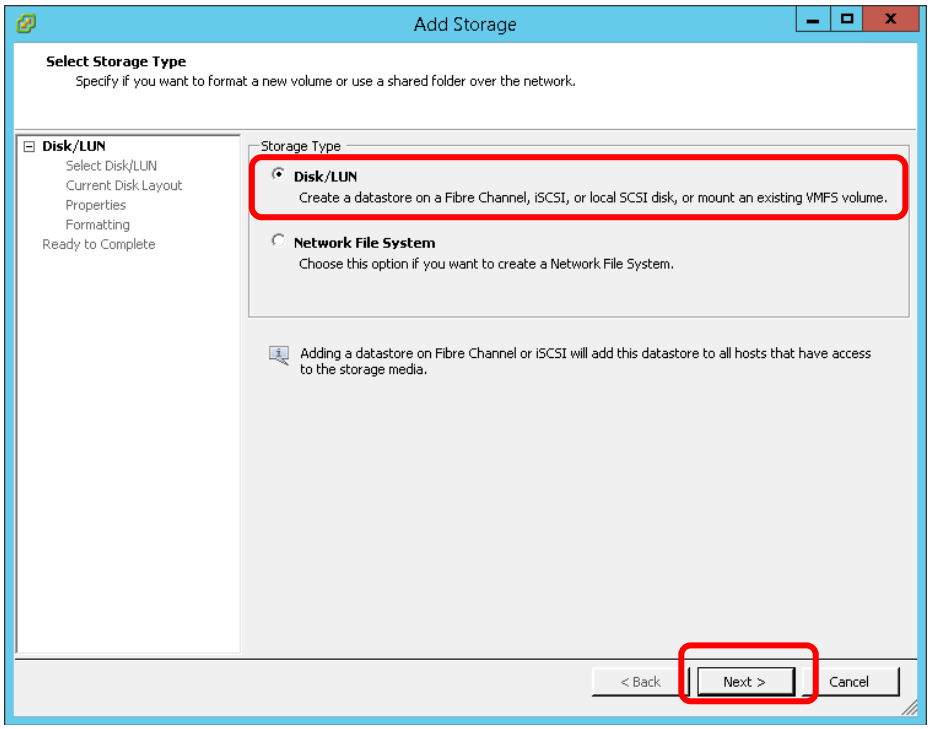
Create a VMFS Datastore in the vSphere Client

Before creating datastores, use the “Rescan” function for the adapters to discover newly-added storage devices.

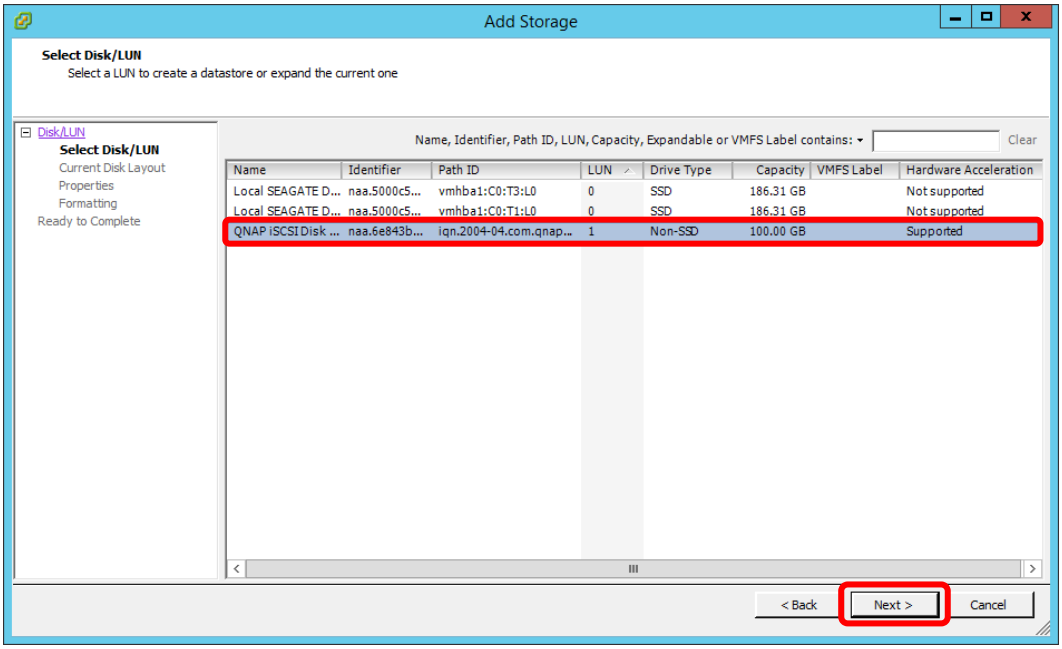
Step 1: Go to the “Configuration” tab and click “Storage” in the Hardware panel. Then click “Datastores” > “Add Storage”.



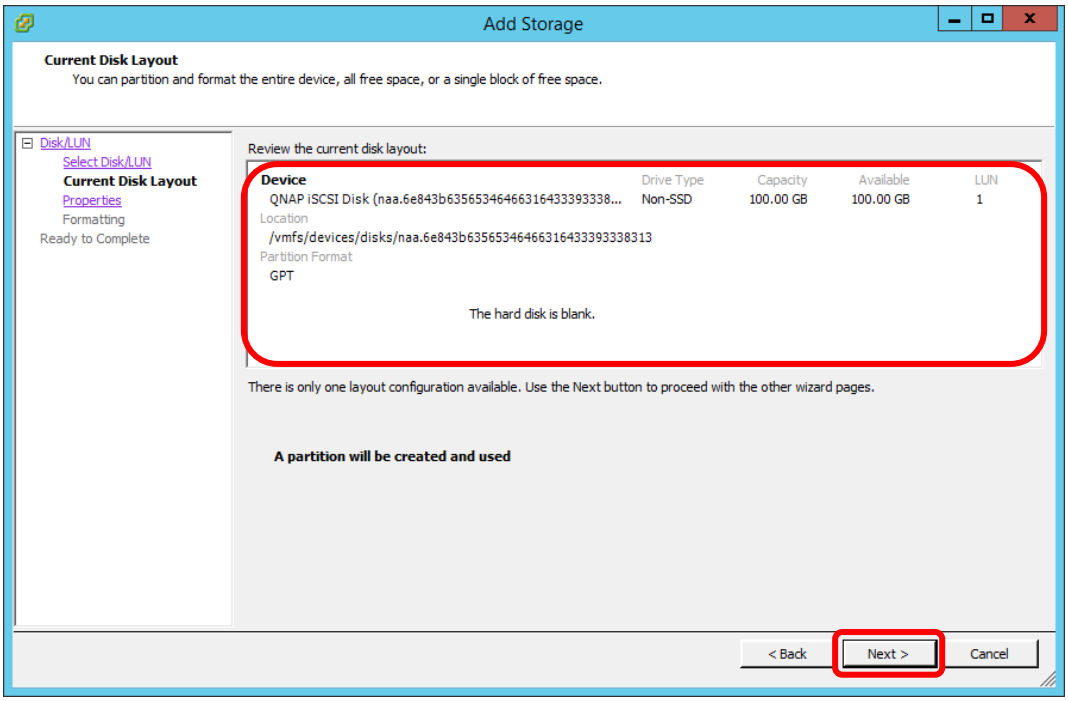
Step 2: Select “Disk/LUN” as the Storage Type and click “Next”.



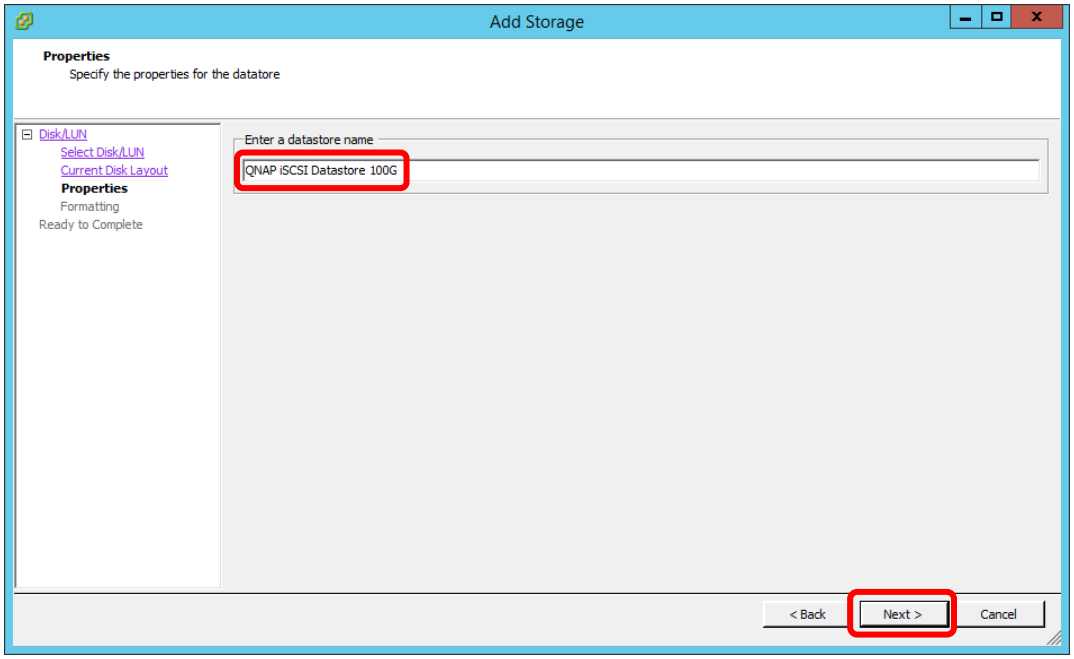
Step 3: Select the iSCSI device to use for your datastore and click “Next”.



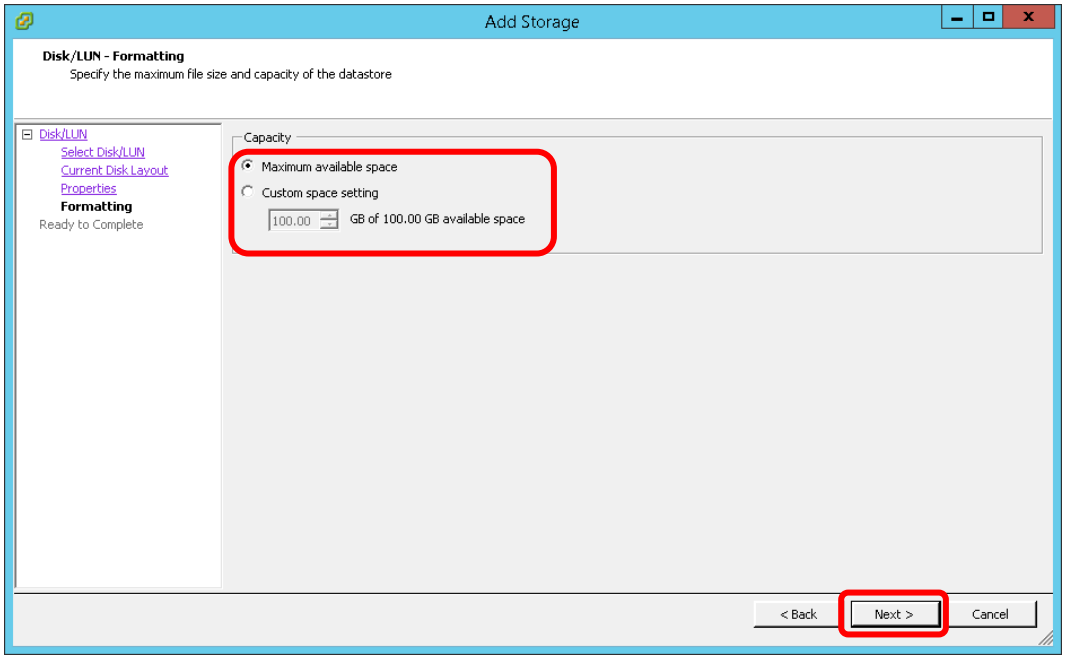
Step 4: The “Current Disk Layout” page presents the information about this iSCSI disk and its space usage. Confirm the settings and click “Next”.



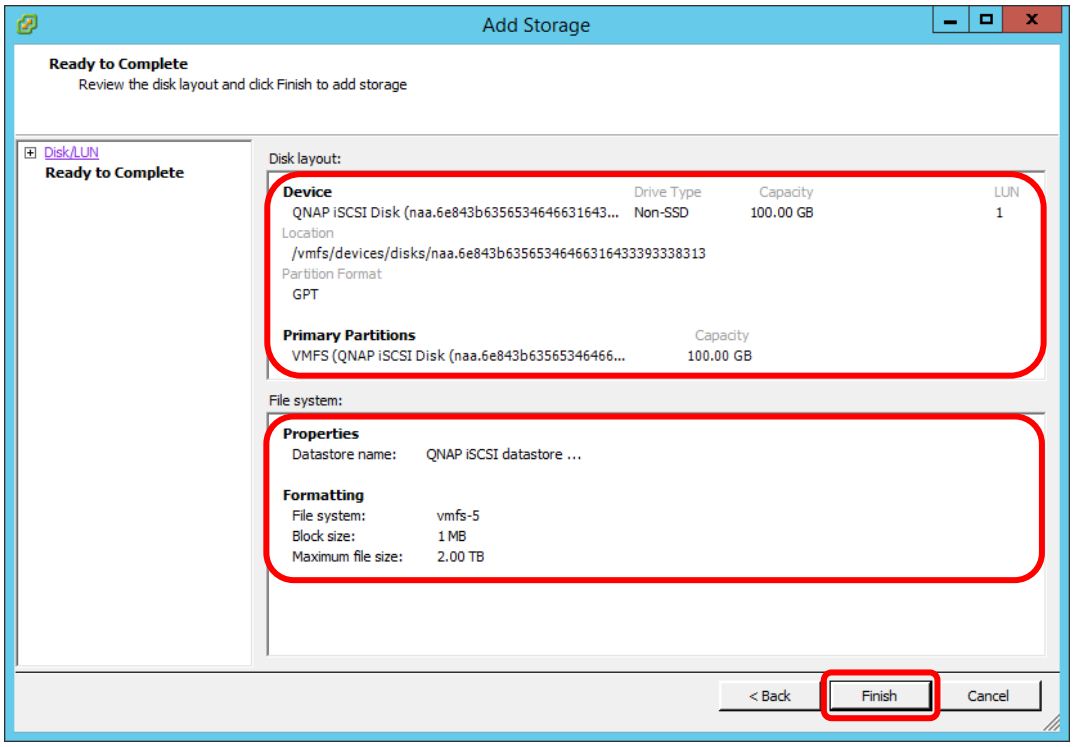
Step 5: Enter a name for the datastore and click “Next”.



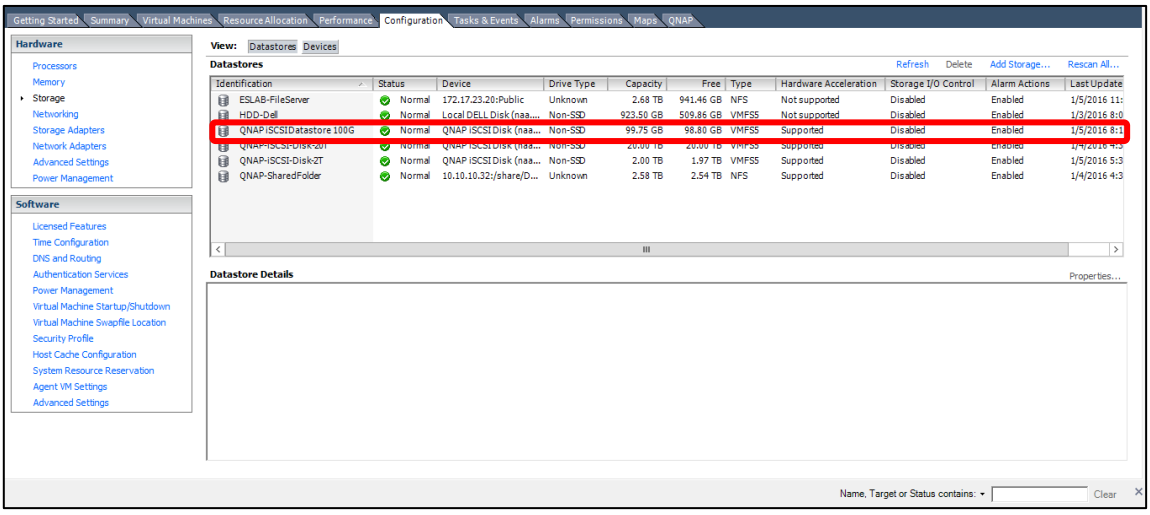
Step 6: Adjust the capacity values and click “Next”. By default, the entire space on the storage device is available.



Step 7: Review the datastore configuration information and click “Finish”.



Step 8: The newly-created datastore on the iSCSI-based storage device will be listed.



For VMWare vSphere Web Client 6.0

VMware and iSCSI Architecture

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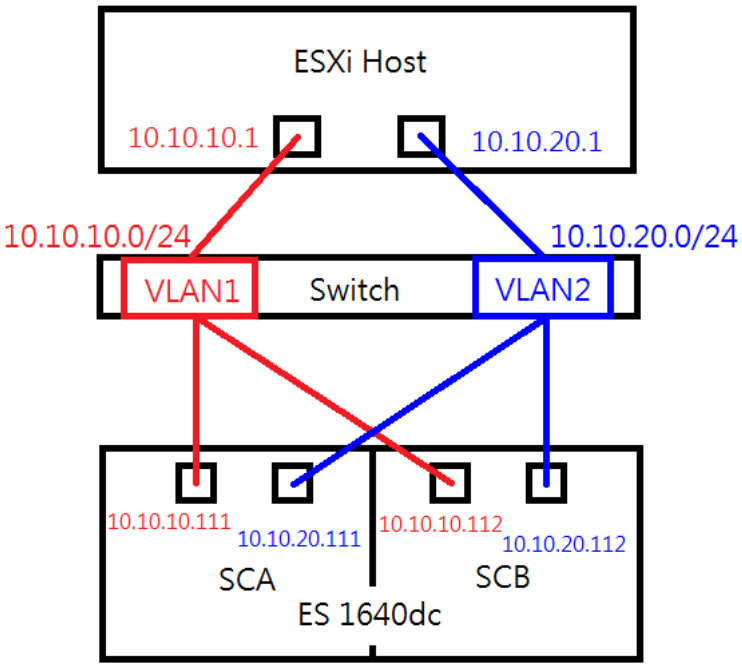

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Server Network Settings		
Role	IP	Description
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Data Network 1	10.10.10.1	10G Data port 1 in ESXi host
Data Network 2	10.10.20.1	10G Data port 2 in ESXi host

Storage Network Settings		
Setting	Value	Description
SCA Management IP	172.17.23.111	Management IP of controller A
SCA Ethernet1 IP	10.10.10.111	Data port 1 IP of controller A
SCA Ethernet2 IP	10.10.20.111	Data port 2 IP of controller A
SCB Management IP	172.17.23.112	Management IP of controller B
SCB Ethernet1 IP	10.10.10.112	Data port 1 IP of controller B
SCB Ethernet2 IP	10.10.20.112	Data port 2 IP of controller B
Pool allocate to SCB	Pool2	RAID6 pool at controller B

With the information listed in the table above, assuming a 100GB LUN is deployed on ES 1640 v2 controller B (SCB), it can be mounted using the following steps on the ESXi host.

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- All data ports, from the ESXi host and ES NAS, should be in the same subnet.
- Available pools must be built before configuring iSCSI LUN on the ES NAS. For more information on creating a storage pool, read Network and Storage Settings of ES NAS High-Availability Network Storage Services.

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Add iSCSI Targets on VMware ESXi Hosts

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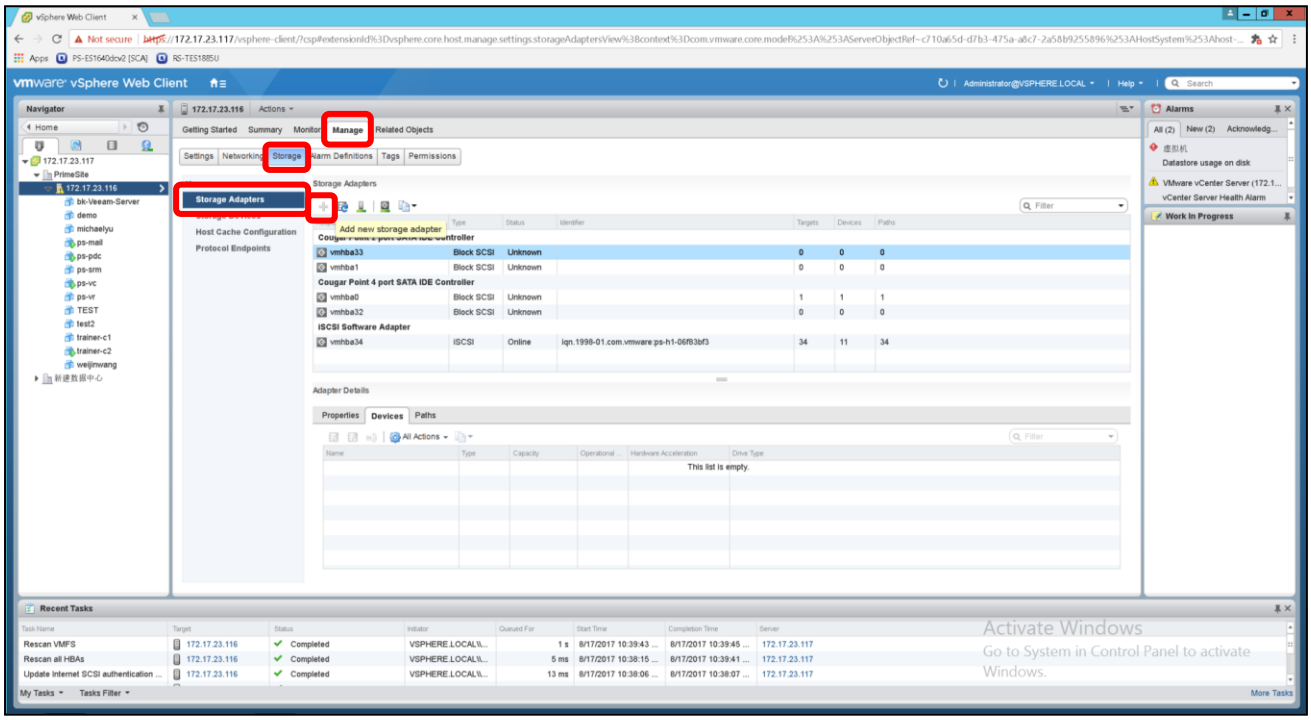

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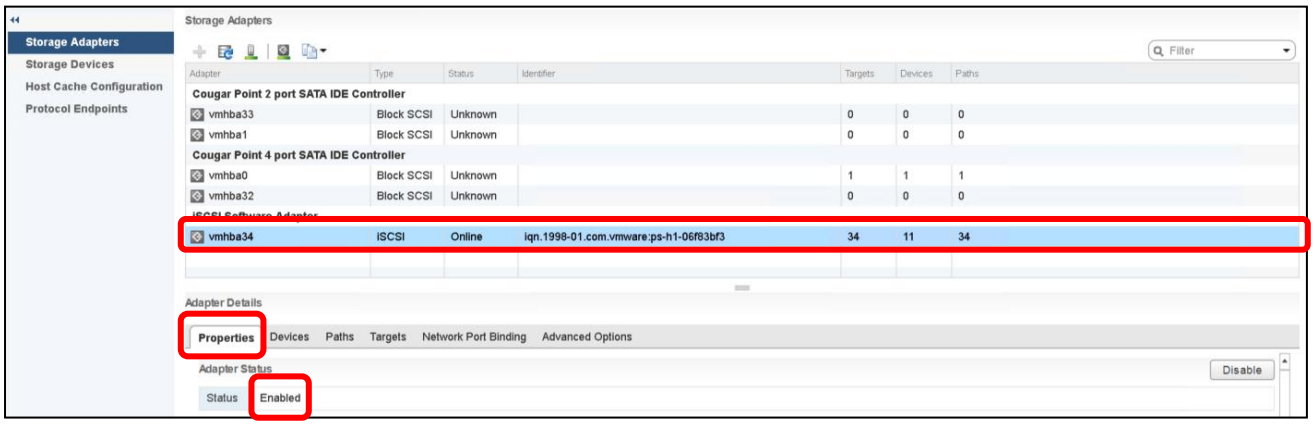
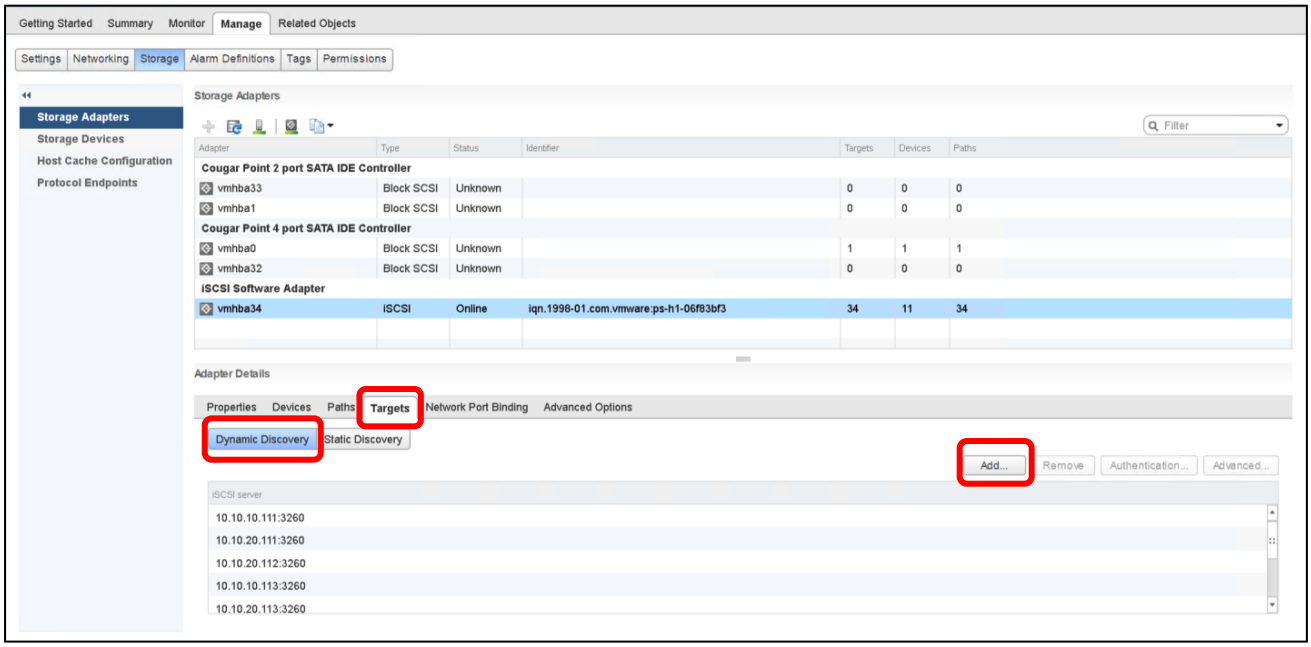
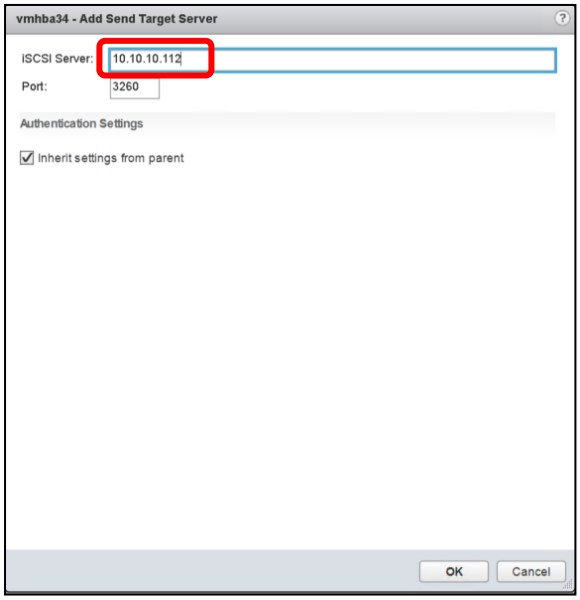
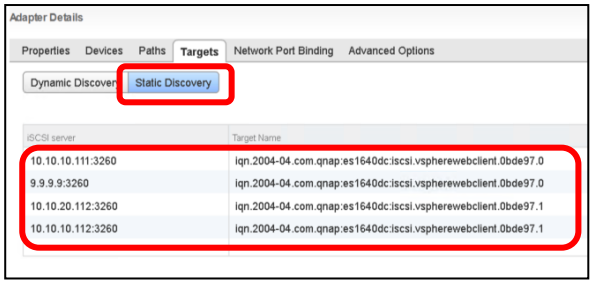


Step 3: Enable the adapter and set up target discovery addresses so that the iSCSI adapter can determine

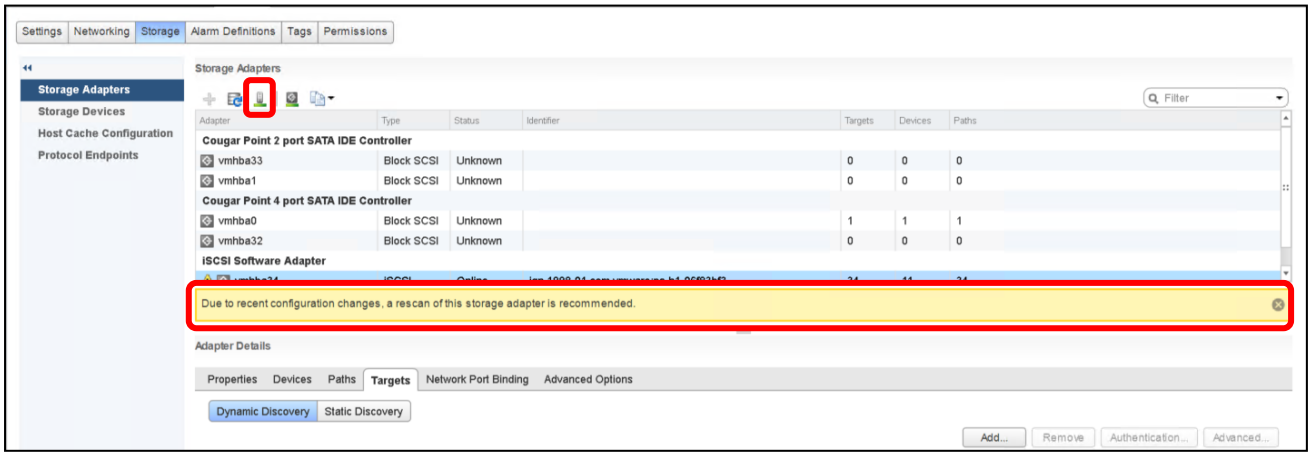
which storage resource on the network is available. Go to the “Targets” tab, click “Dynamic Discovery” and “Add...” to add the data ports’ IP addresses of both controllers. Then go to the “Static Discovery” tab to view the names and IP addresses of these targets. If you remove a static target added by dynamic discovery, the target might be returned to the list the next time a rescan happens, the HBA is reset, or the host is rebooted.







Step 4: Click “Rescan” to scan the newly-added devices.



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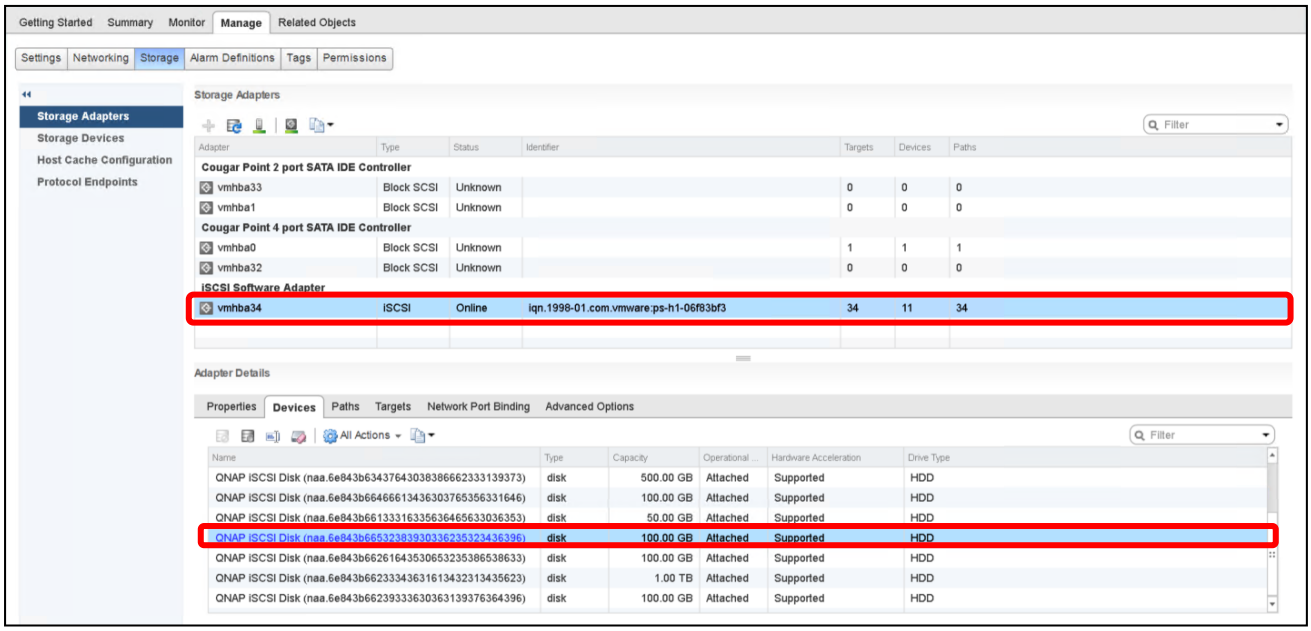
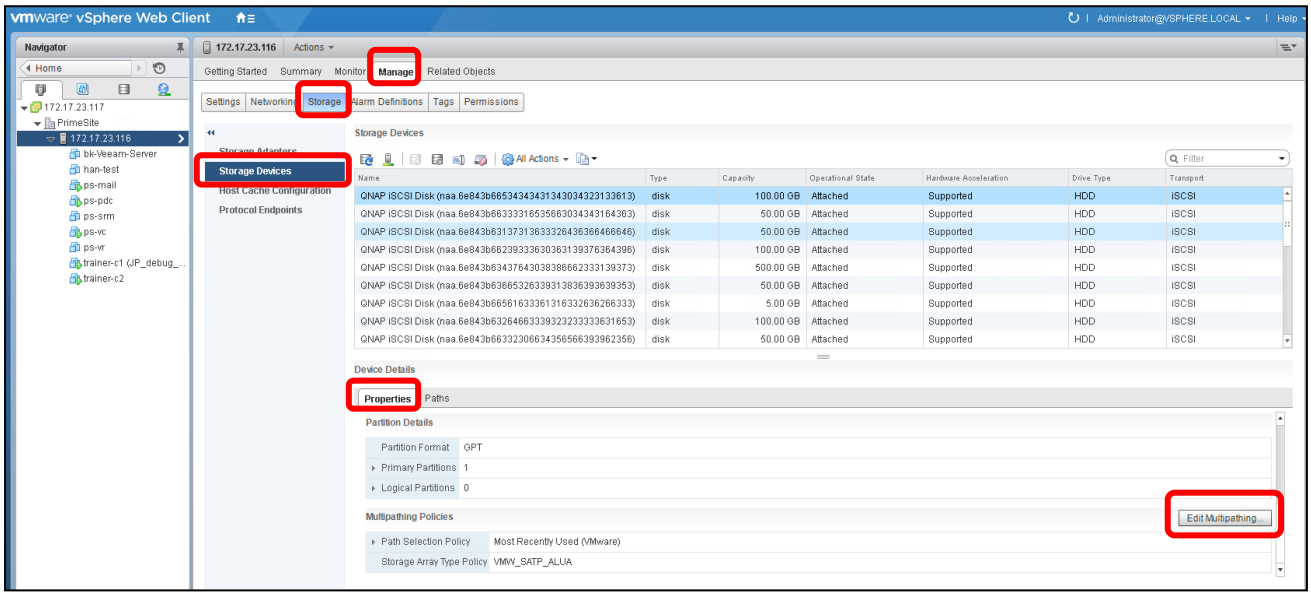
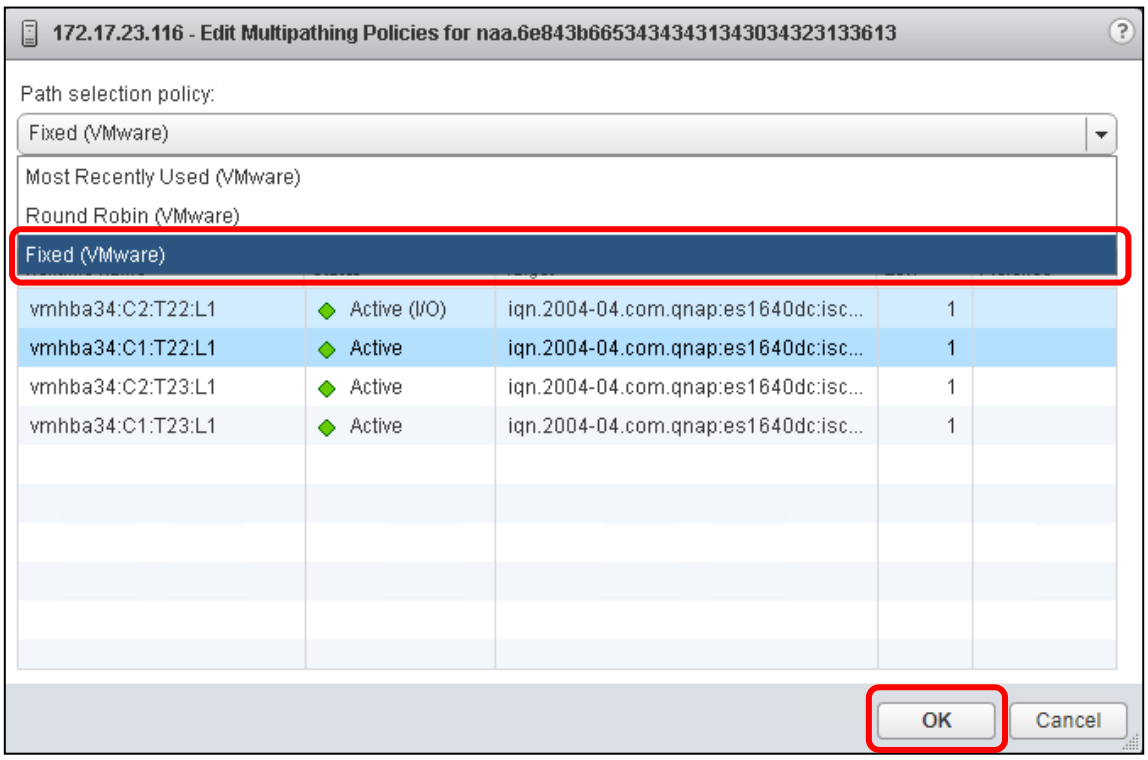


Configure the Path for iSCSI Connection

Step 1: Click “Manage” > “Storage” > “Storage Devices”, select the iSCSI Disk, then click “Properties” > “Edit Multipathing...”



Step 2: Select “Fixed (VMware)” in Path selection policy, then select one path as the preferred path and click “OK”.



Note：

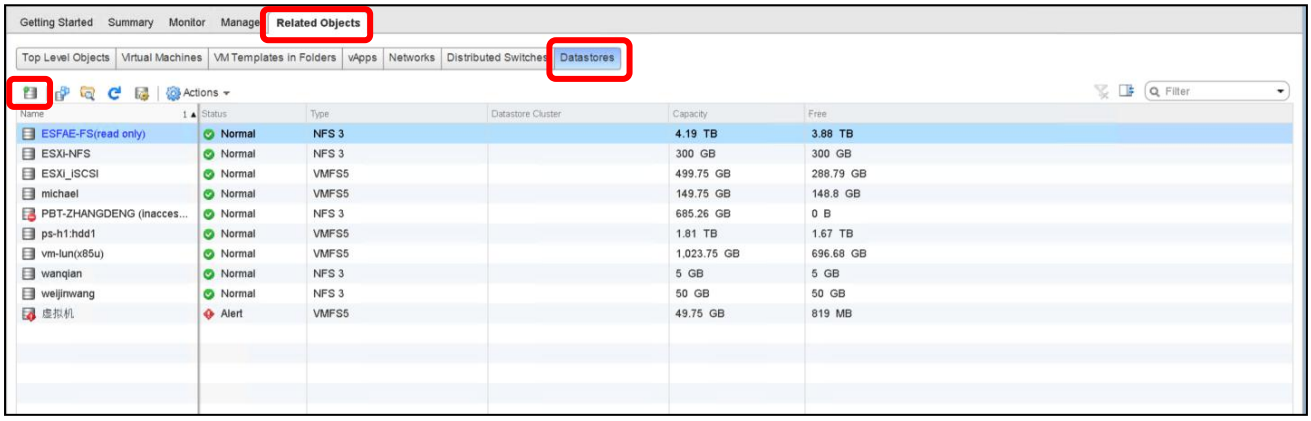
For better iSCSI performance, select the path or Ethernet port which belongs to the Storage Controller that owns the iSCSI LUN. In our example, we chose ports (10.10.10.111/10.10.20.111) which belong to SCB on which Pool 2 was created.

The data port will be listed in the Target name.

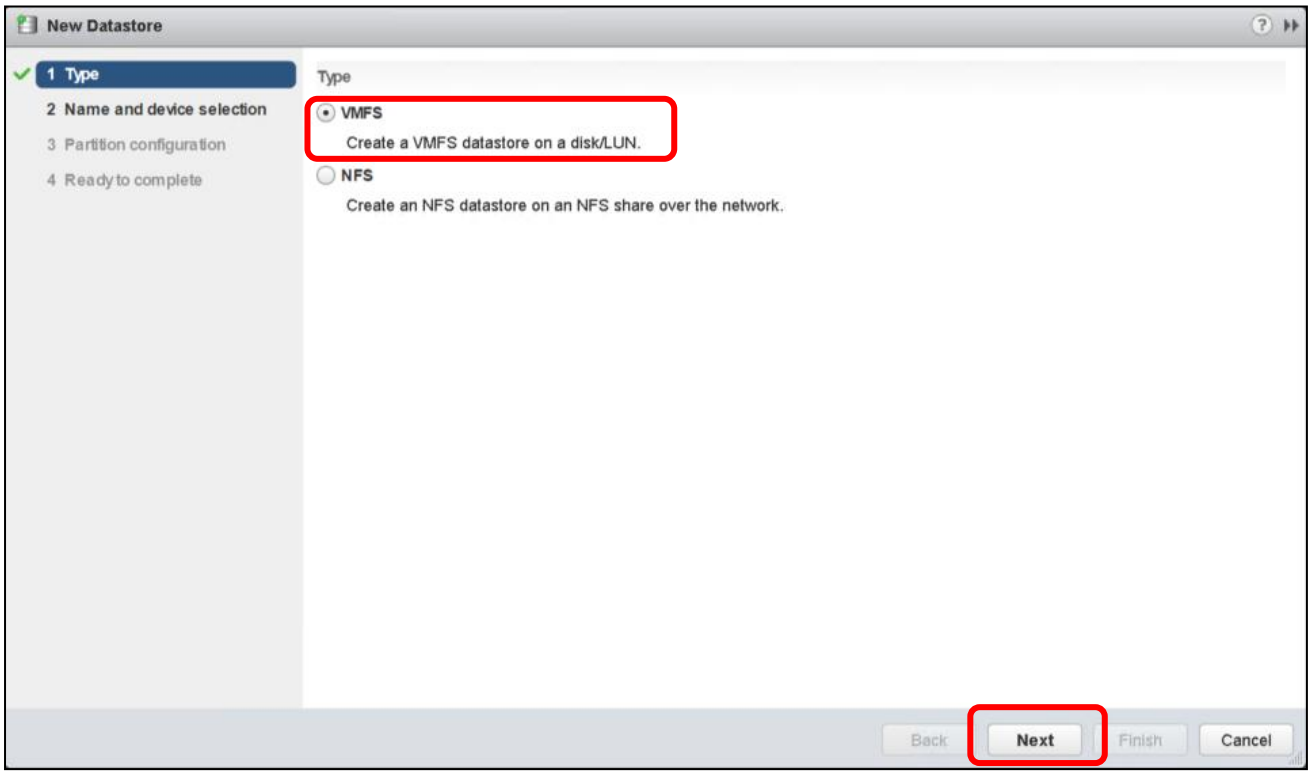
For example:
iqn.2004-04.com.qnap:es1640dc:iscsi.qnaptarget.ee0516.0:10.10.10.111:3260

Create a VMFS Datastore in the vSphere Client

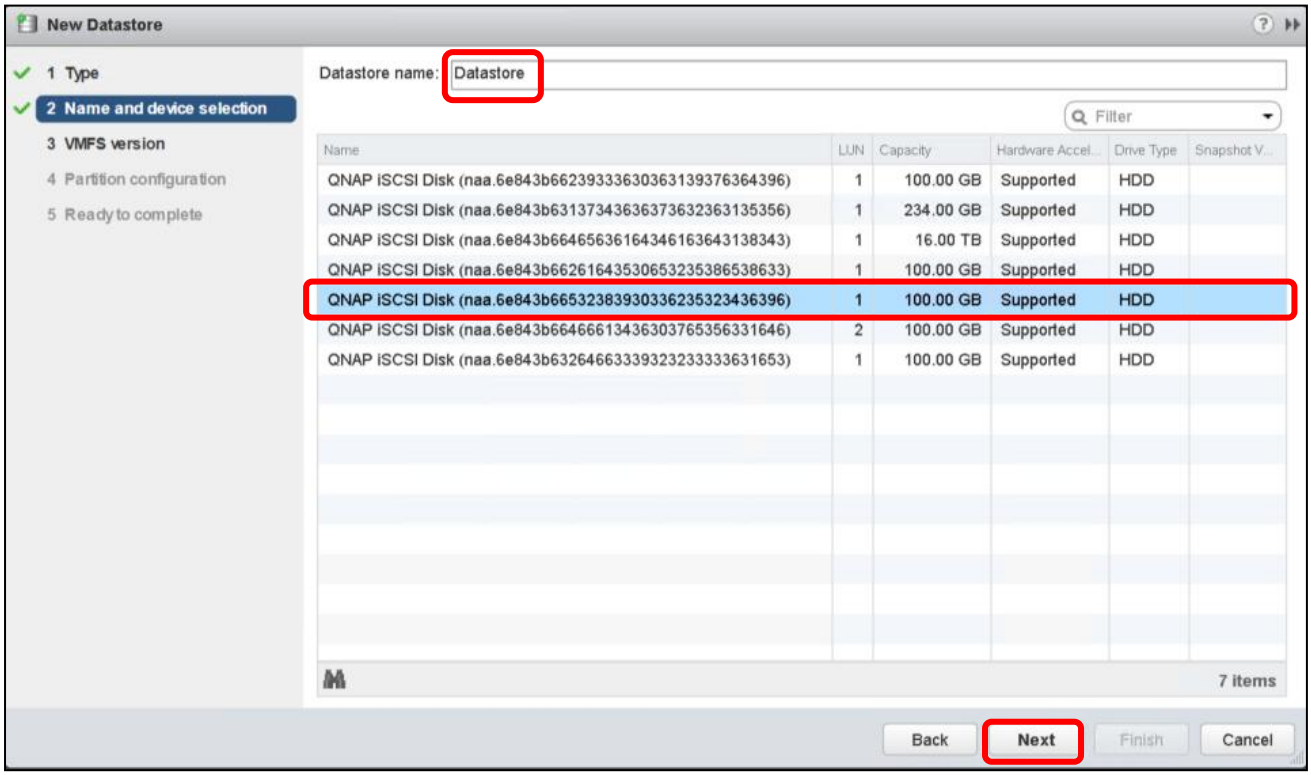
Step 1: Go to the “Related Objects” tab and then go to the “Datastores” tab. Click the “Create a new datastore” icon.



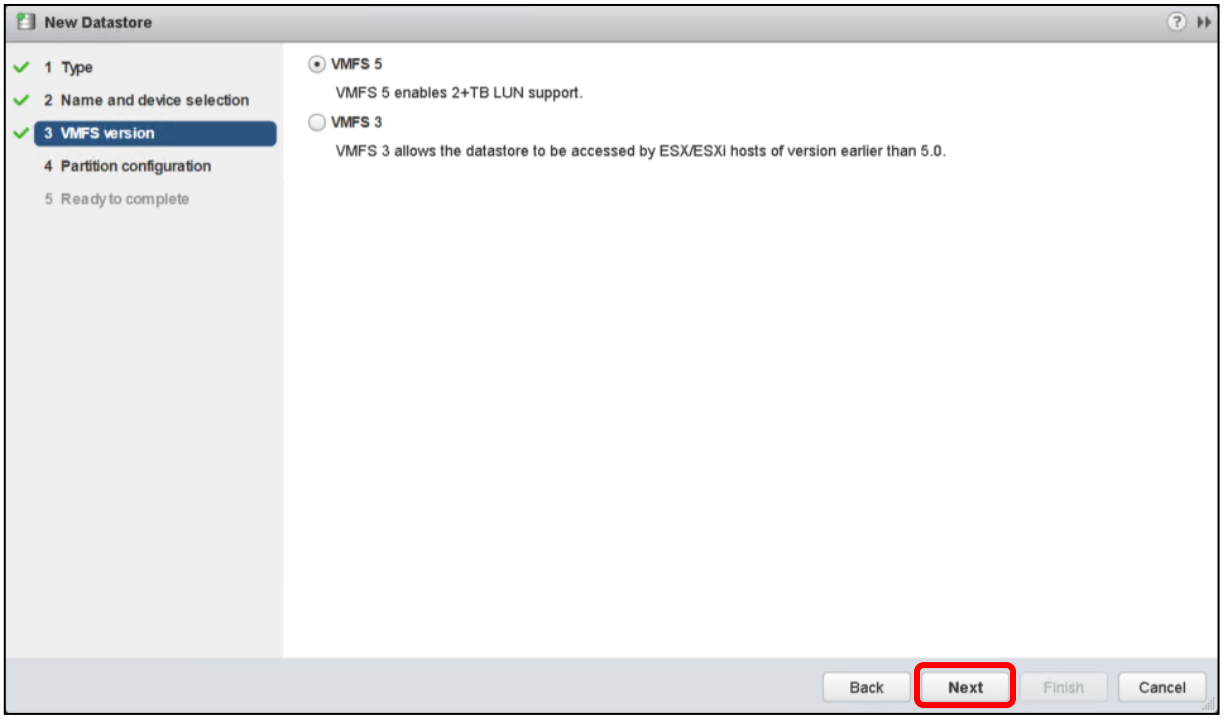
Step 2: Select “VMFS” as the Type and click “Next”.



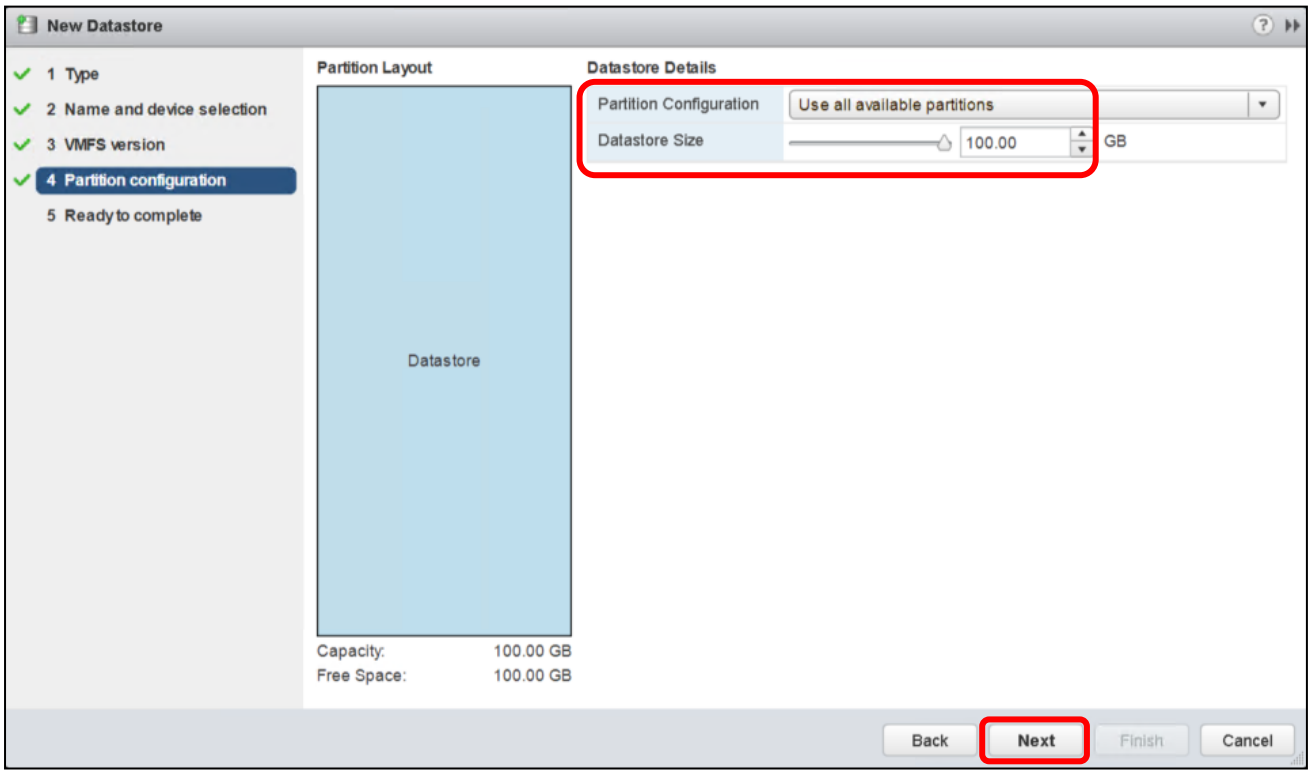
Step 3: Enter a name for the datastore and select the iSCSI device to use for your datastore. Click “Next”.



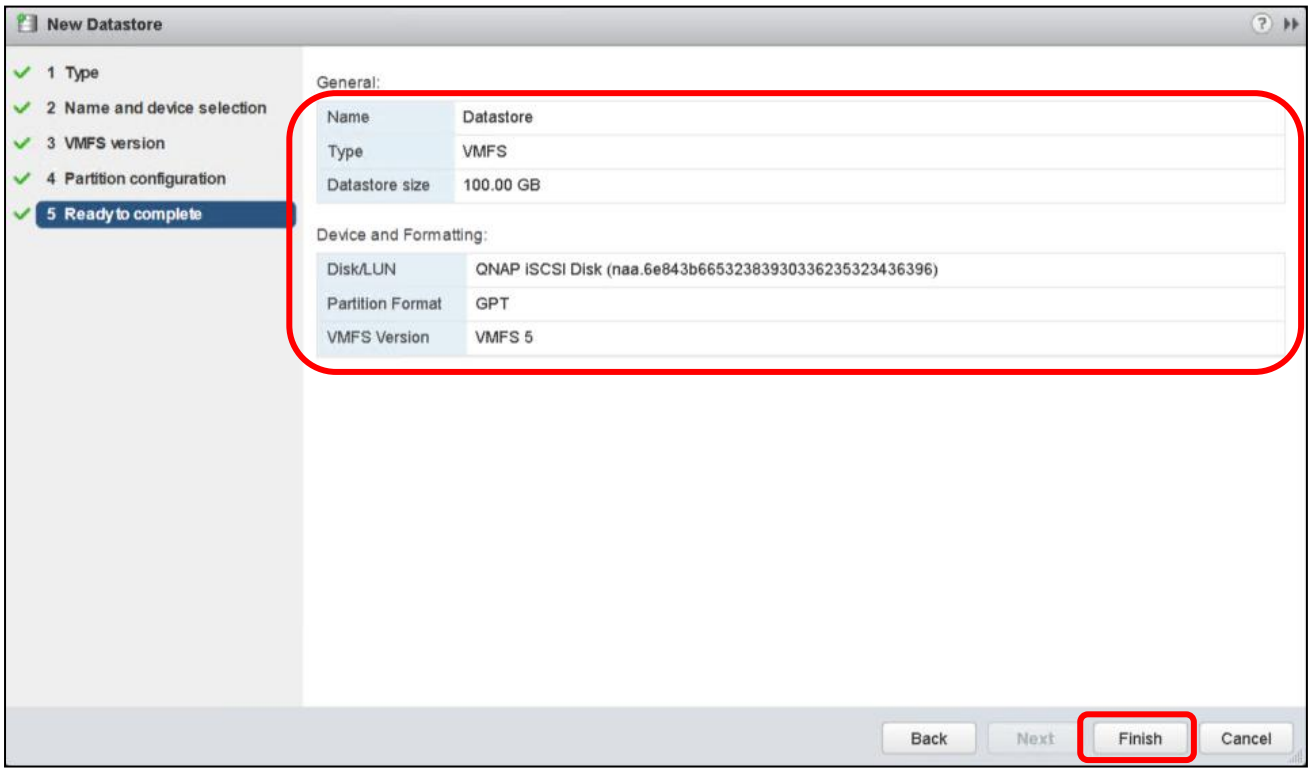
Step 4: Choose the proper VMFS version and click “Next”.



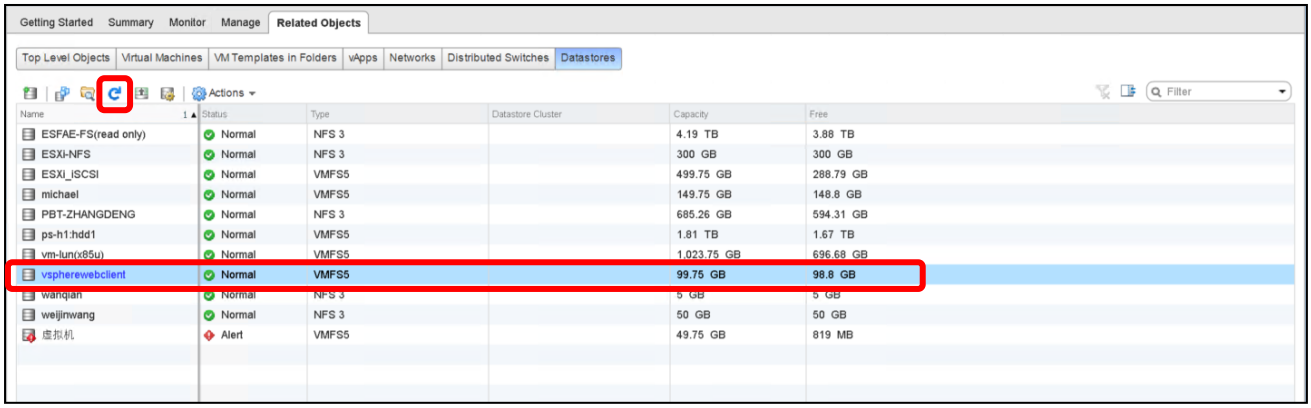
Step 5: Adjust the capacity values and click “Next”. By default, the entire space on the storage device is available.



Step 6: Review the datastore configuration information and click “Finish”.



Step 7: Click the “Recalculate” icon, and the datastore on the iSCSI-based storage device will be listed.



For VMWare vSphere Web Client 6.5

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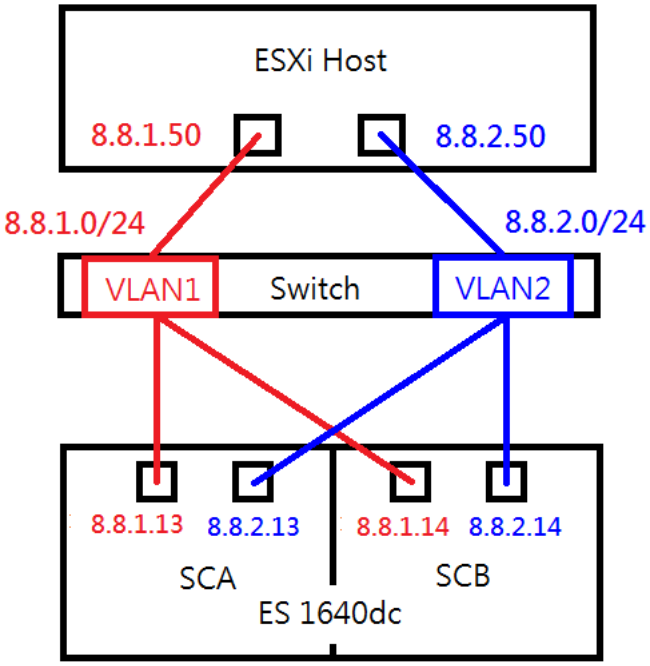

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- IP addressing: Static IP addresses are recommended for both ESXi hosts and the ES NAS.

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Role	IP	Description
ESXi host	192.168.1.50	VMware ESXi host
Data Network 1	8.8.1.50	10G Data port 1 in ESXi host
Data Network 2	8.8.2.50	10G Data port 2 in ESXi host

Storage Network Settings		
Setting	Value	Description
SCA Management IP	192.168.1.12	Management IP of controller A
SCA Ethernet1 IP	8.8.1.13	Data port 1 IP of controller A
SCA Ethernet2 IP	8.8.2.13	Data port 2 IP of controller A
SCB Management IP	192.168.1.13	Management IP of controller B
SCB Ethernet1 IP	8.8.1.14	Data port 1 IP of controller B
SCB Ethernet2 IP	8.8.2.14	Data port 2 IP of controller B
Pool allocate to SCB	Pool2	RAID6 pool at controller B

With the information listed in the above table, assuming a 100GB LUN is deployed on ES1640dc v2 controller B (SCB), it can be mounted using the following steps on the ESXi host.

Confirm these details before configuration

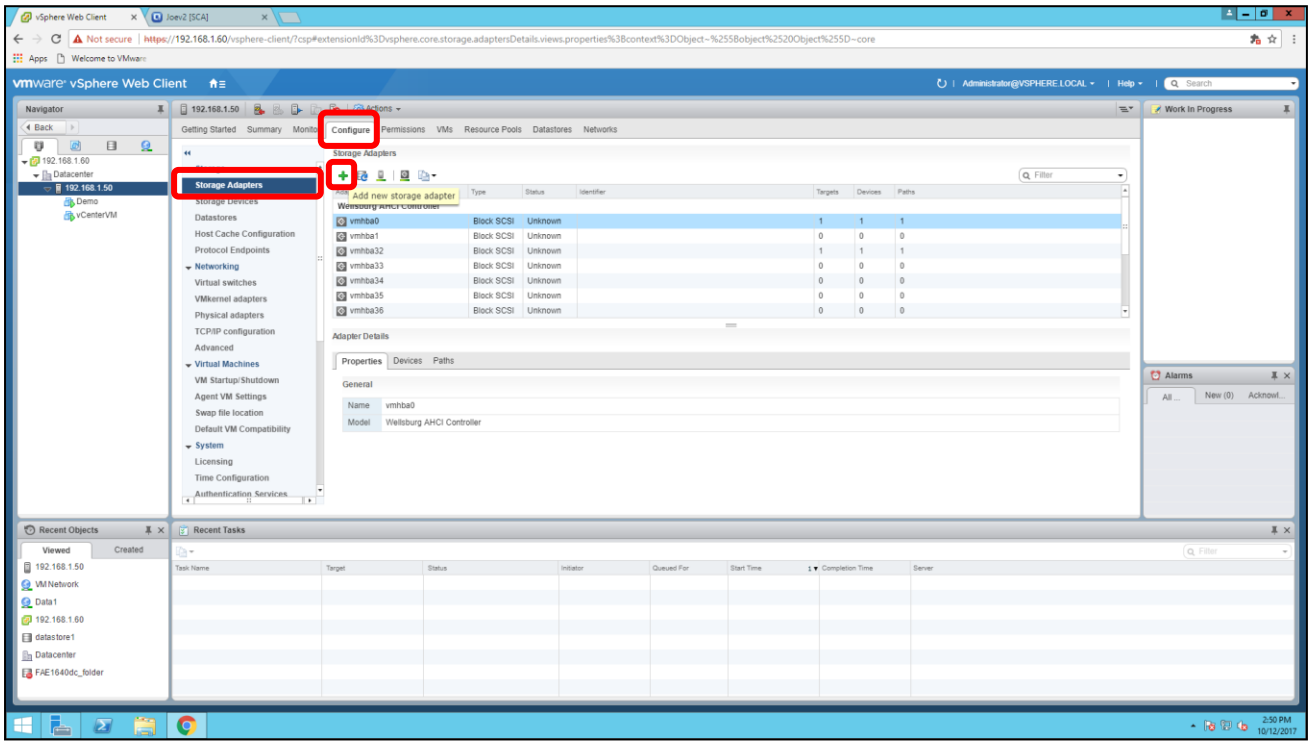
- All data ports, from the ESXi host and ES NAS, should be in the same subnet.
- Available pools must be built before configuring iSCSI LUN on the ES NAS. For more information on creating a storage pool, read Network and Storage Settings of ES NAS High-Availability Network Storage Services.

Definition

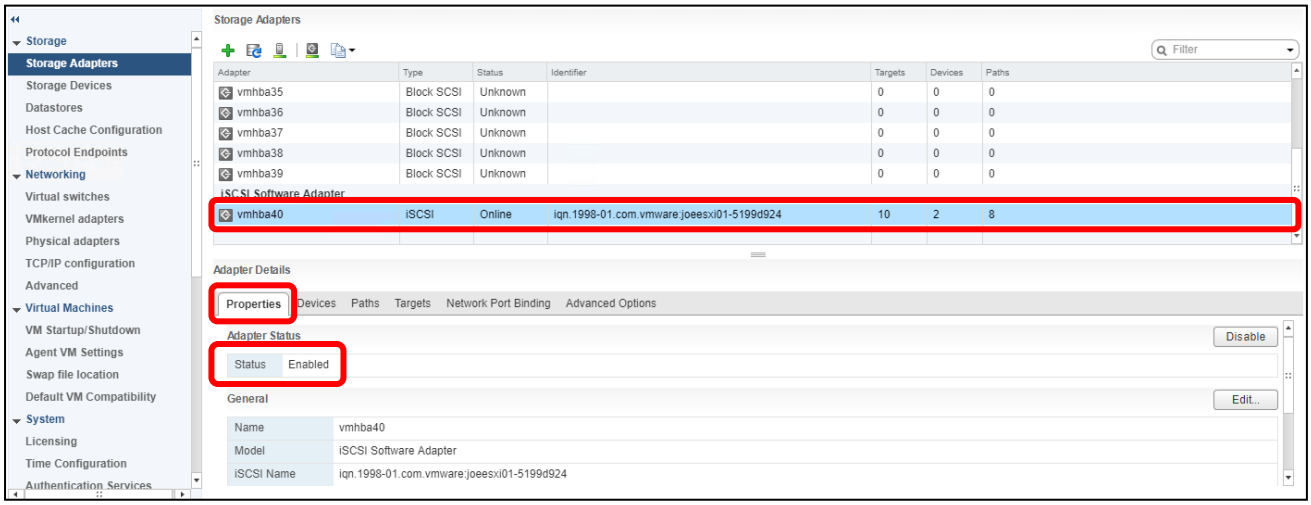
In this document, the VMware ESXi host is defined as the iSCSI Initiator, and the QNAP ES NAS is the iSCSI Target.

Add iSCSI Targets on VMware ESXi Hosts

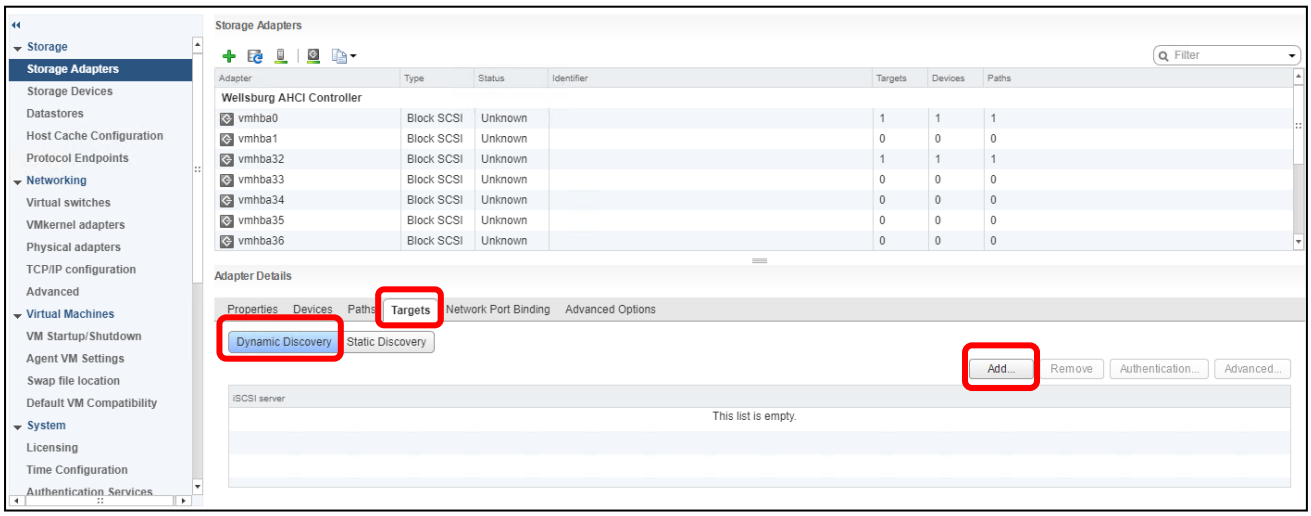
Step 1: Log in to the vSphere Web Client, and select a host from the inventory panel. Go to the “Configure” tab and then the “Storage Adapters” tab. Click “+” to add a new storage adapter.

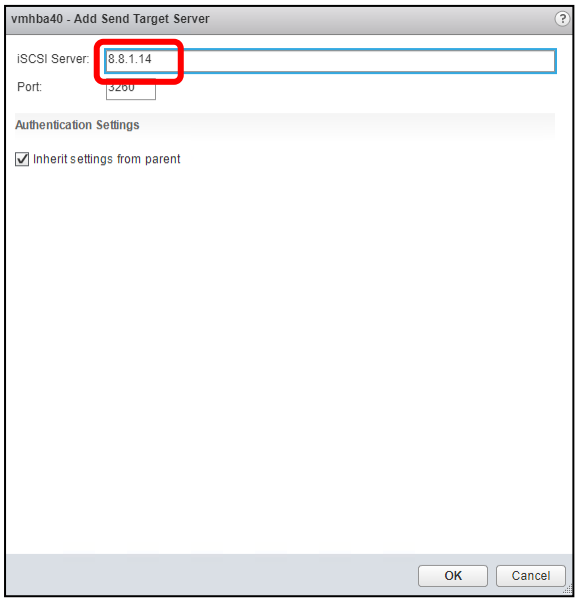


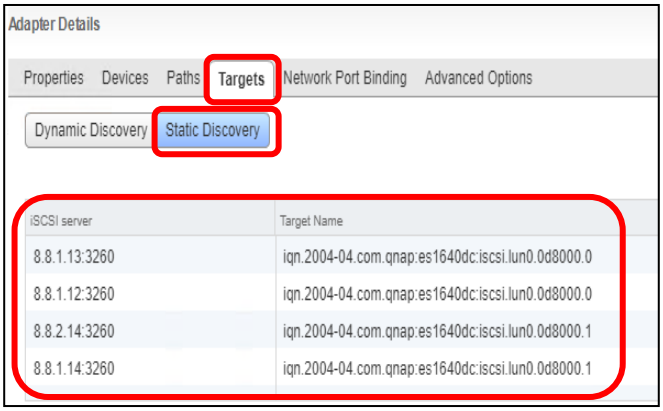
Step 2: A new software iSCSI adapter will be added to the Storage Adapter list. Select the new software iSCSI adapter in the list and click “Properties” to ensure the adapter is enabled.



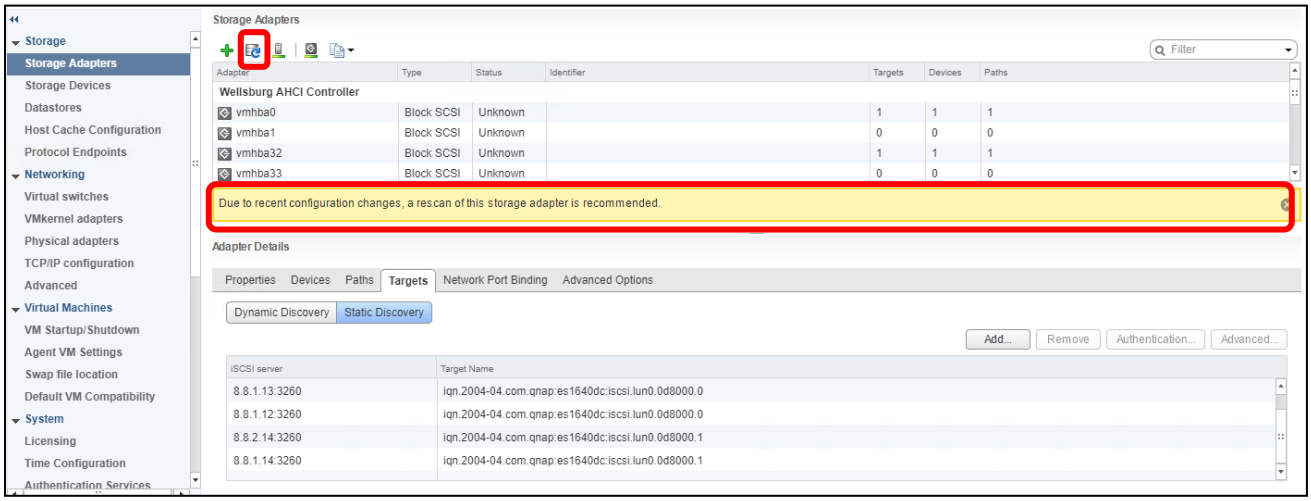
Step 3: After enabling the adapter, you must set up target discovery addresses so that the iSCSI adapter can determine which storage resource on the network is available for access. Go to the “Targets” tab, click “Dynamic Discovery” and then click “Add...” to add the data ports’ IP addresses of both controllers. Then go to the “Static Discovery” tab to view the names and IP addresses of these targets. If you remove a static target added by dynamic discovery, the target might be returned to the list the next time a rescan happens, the HBA is reset, or the host is rebooted.







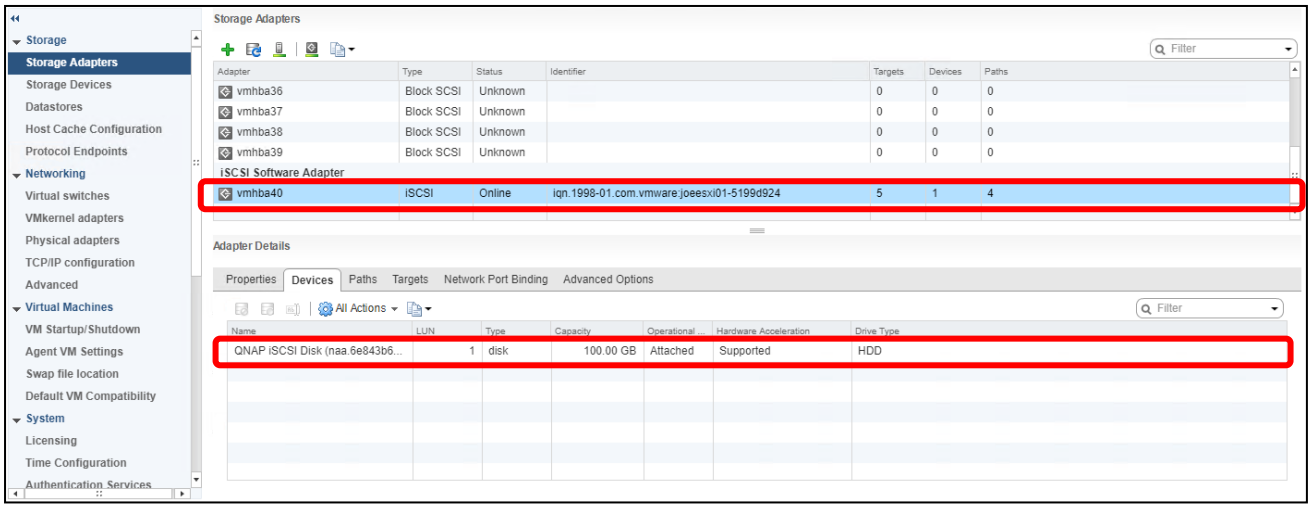
Step 4: Click “Rescan” to scan the newly-added devices.



Note：

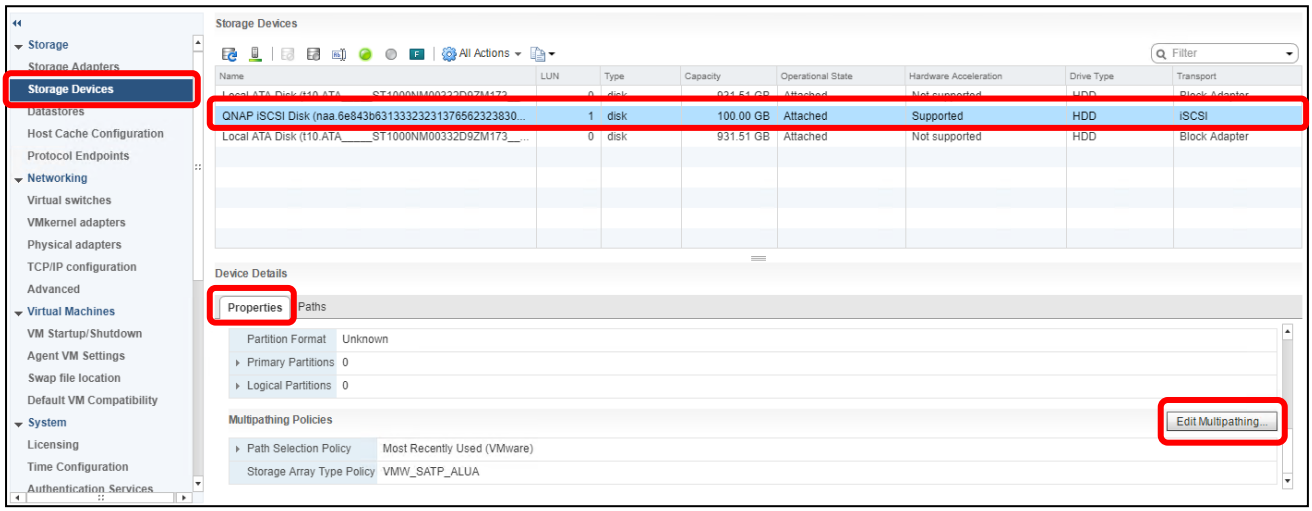
If CHAP is enabled in the ES NAS iSCSI Target, you should have the same configuration in “CHAP…” in the “Add Send Target Server” window.

Step 5: You can now find the corresponding iSCSI device for the added iSCSI adapter.

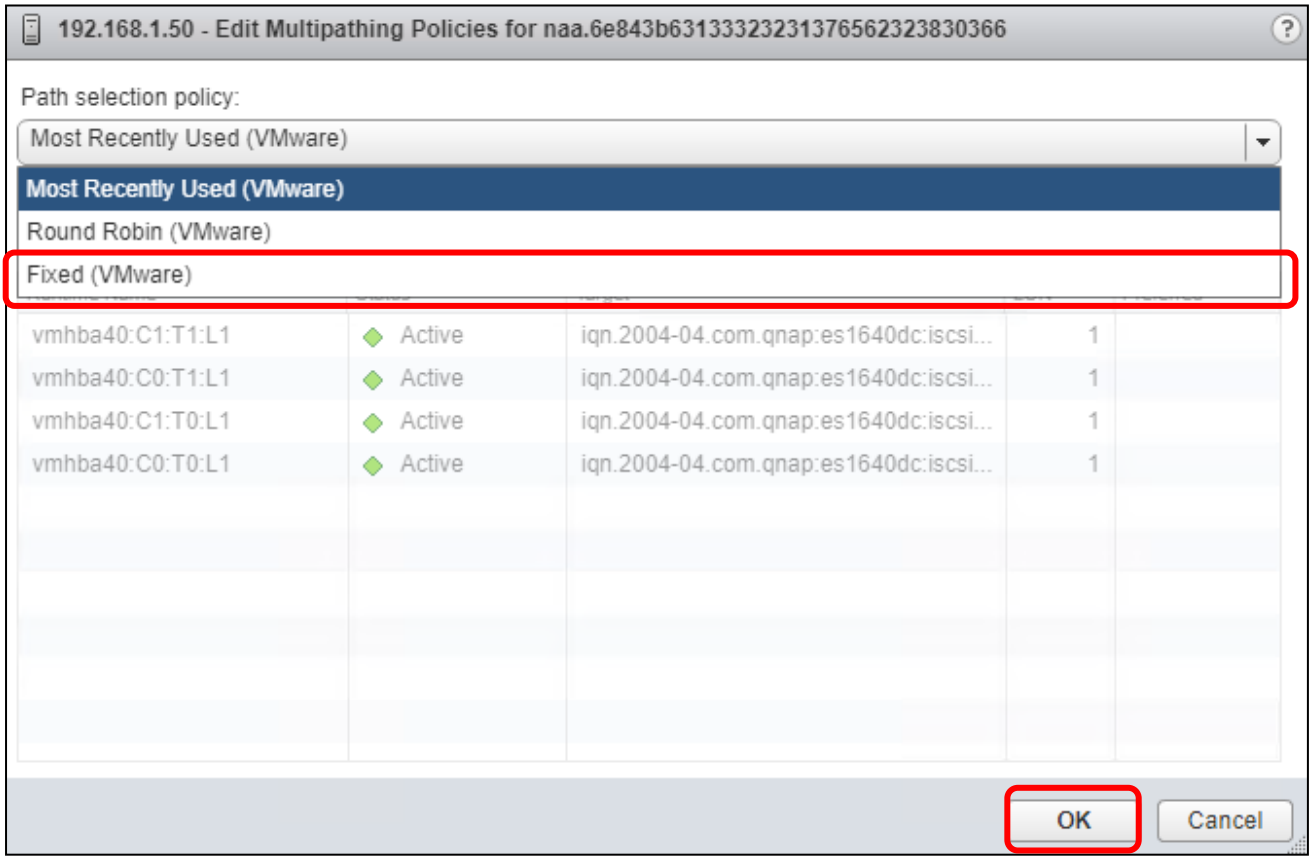


Configure the Path for iSCSI Connection

Step 1: Click “Storage Devices”, select the iSCSI Disk, and then click “Properties” > “Edit Multipathing...”



Step 2: Select “Fixed (VMware)” in Path selection policy, then select one path as the preferred path. Click “OK”.



Note：

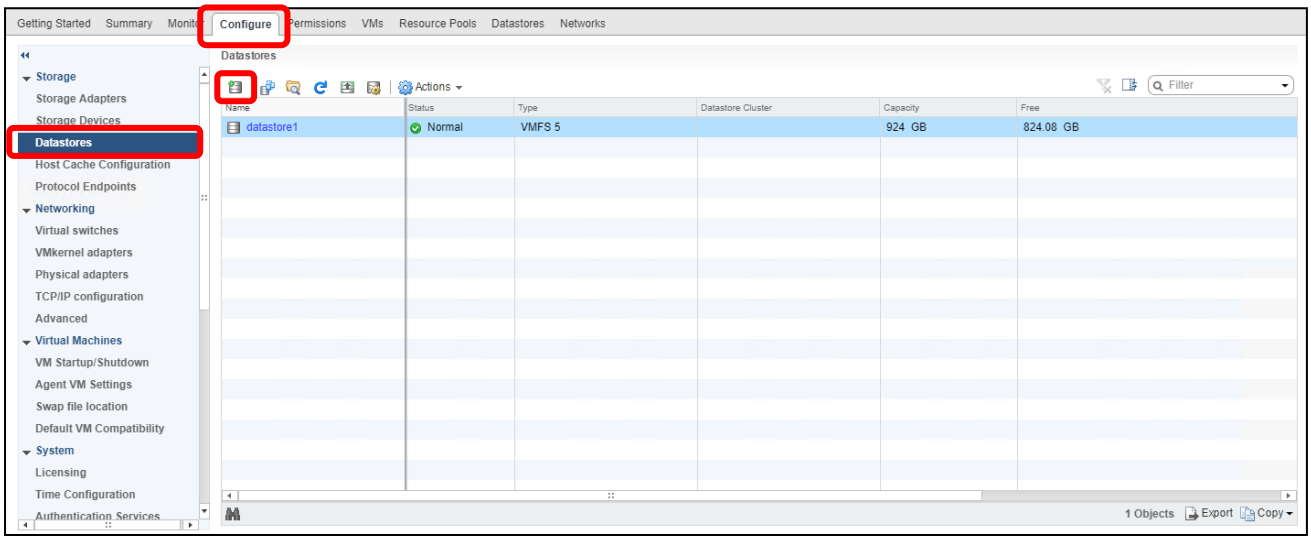
For better iSCSI performance, select the path or Ethernet port which belongs to the Storage Controller that owns the iSCSI LUN. In our example, we chose ports (8.8.1.14/8.8.2.14) which belong to SCB on which Pool 2 was created.

The data port shows after the Target name.

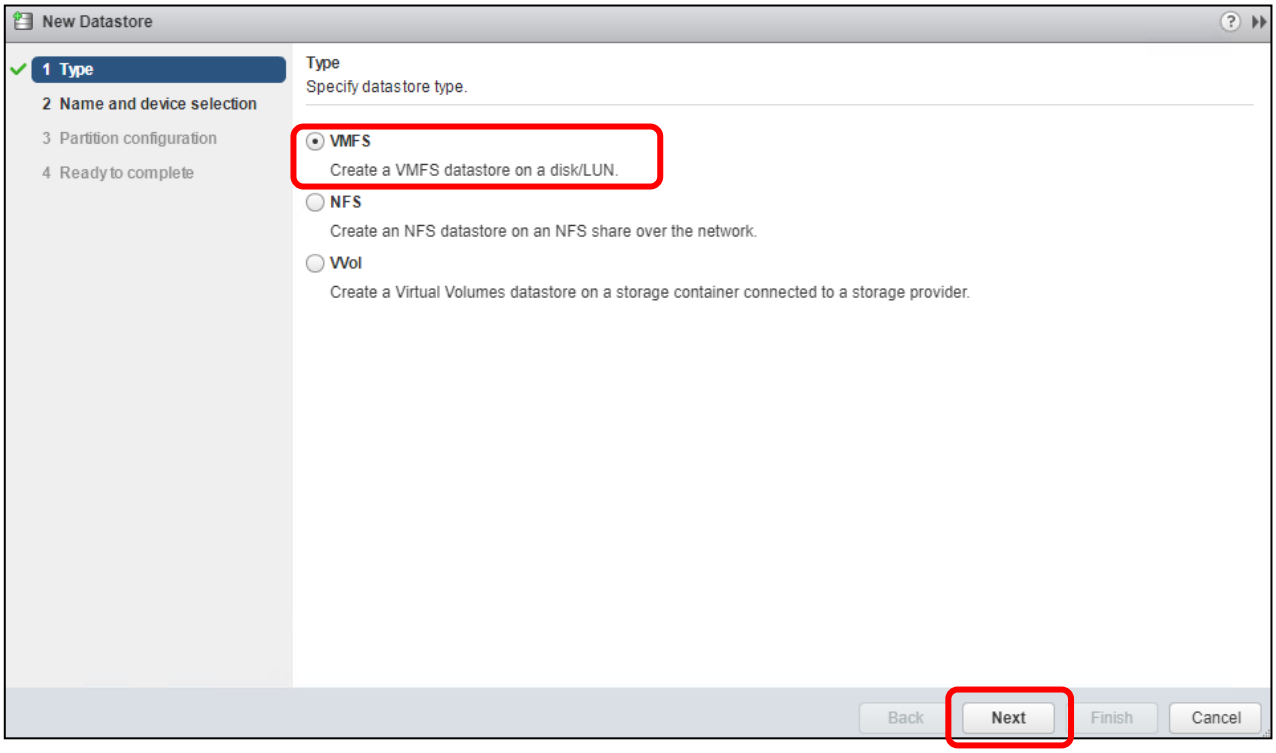
For example: iqn.2004-04.com.qnap:es1640dc:iscsi.lun0.0d8000:8.8.1.14:3260

Create a VMFS Datastore in the vSphere Client

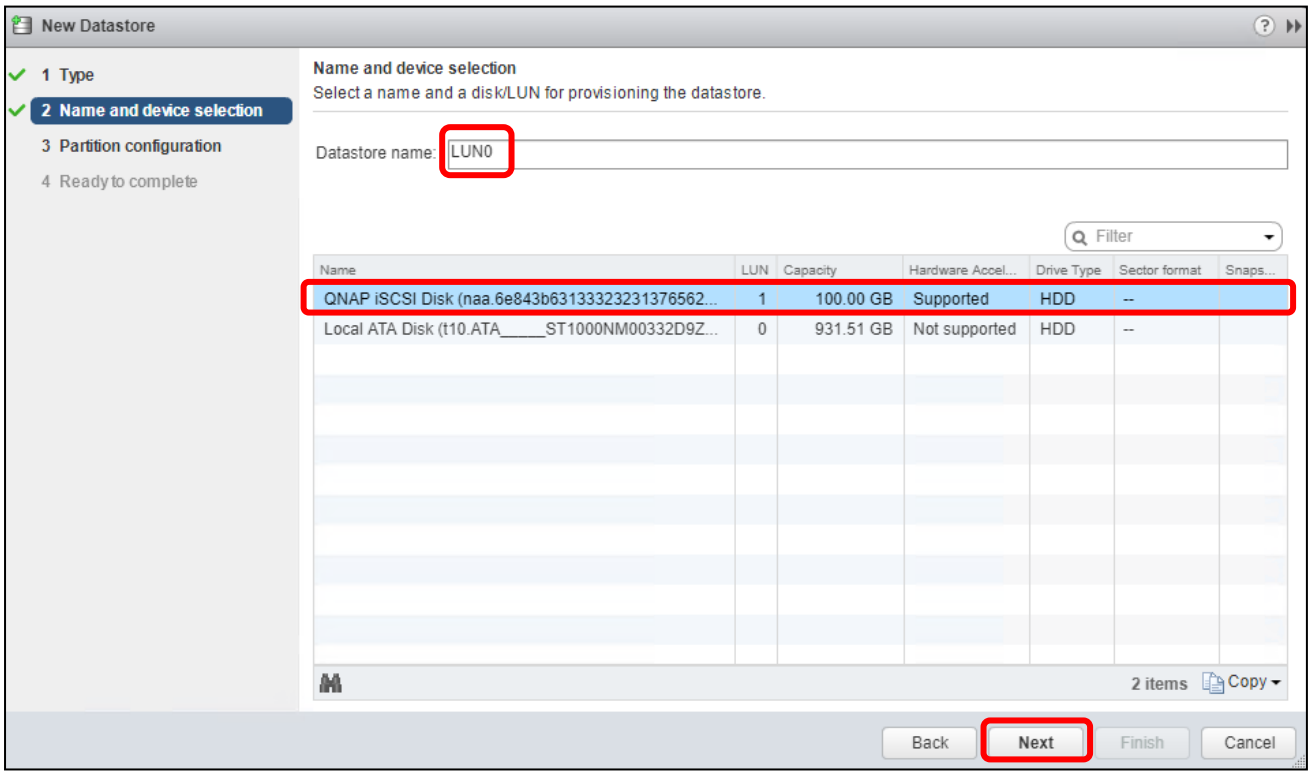
Step 1: Go to the “Configure” tab and then the “Datastores” tab. Click the “Create a new datastore” icon.



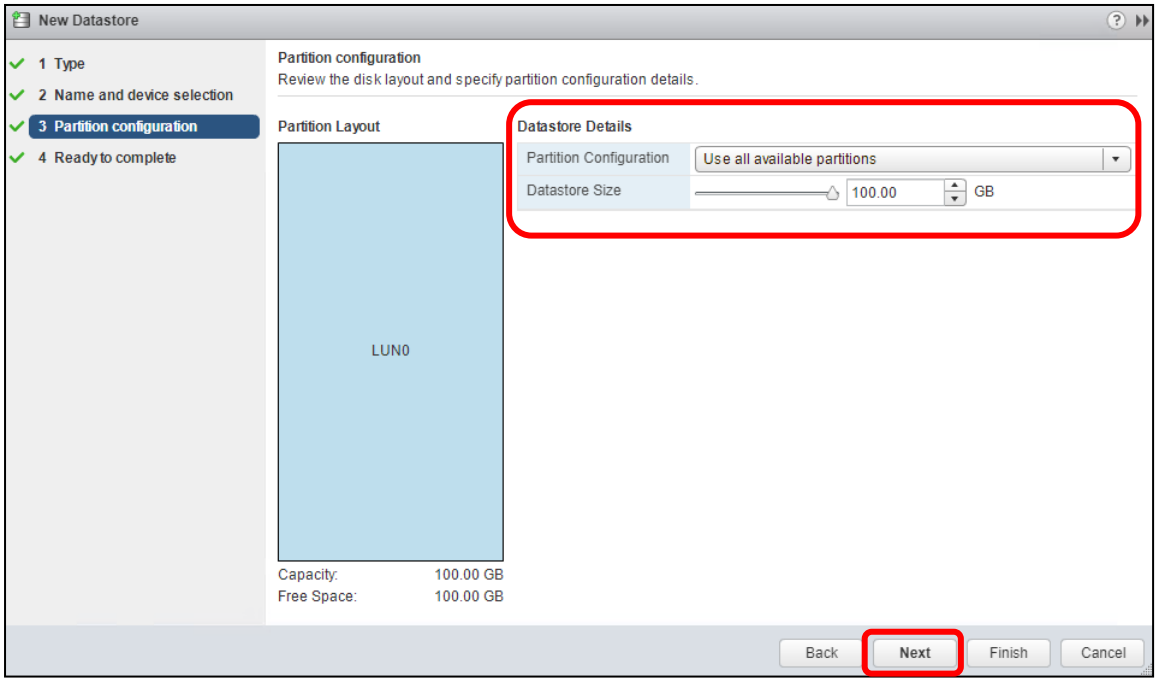
Step 2: Select “VMFS” as the Type and click “Next”



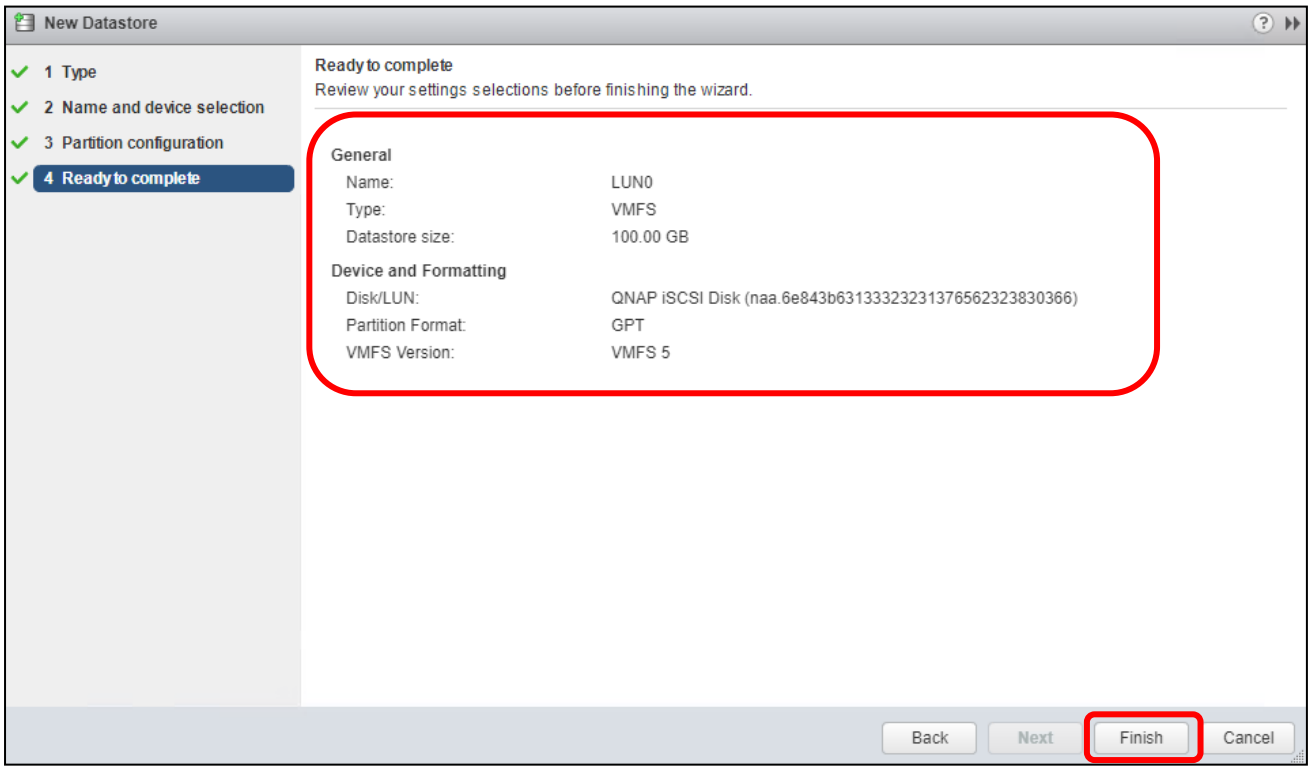
Step 3: Enter a name for the datastore and select the iSCSI device to use for your datastore. Click “Next”.



Step 4: Adjust the capacity values and click “Next”. By default, the entire space on the storage device is available.



Step 5: Review the datastore configuration information and click “Finish”.



Step 6: Click the “Recalculate” icon and the datastore on the iSCSI-based storage device will be listed.