iStorage Server: iSCSI SAN for ESX/ESXi Server

Monday, Apr 25, 2011

KernSafe Technologies, Inc.

www.kernsafe.com

Table of Contents

Overview

iStorage Server is a network based storage virtualization software powered by KernSafe Technologies, Inc. Being a powerful, full-featured and software-only iSCSI Target SAN solution, that can quickly convert existing Windows computer into IP SAN. Storage media of iSCSI Target can include existing storage devices such as the entire hard disks or partitions, CD-RWs, tapes and USB storage devices, as well as disk image file or CD image files including ISO9660(,iso), .bin, .mdf, .cdi, .b5i, .nrg, .ccd, .sub, .img, .raw and other image file formats. Furthermore, iStorage Server also supports a lot of features such as: VHD (Virtual Hard Disk) target, snapshots, STPI, RAID-1 and failover, these features are very important and poplar in storage industry world and make iStorage Server is suitable for any size of business.

VMware ESX and VMware ESXi are “bare-metal” hypervisors, meaning they install directly on top of the physical server and partition it into multiple virtual machines that can run simultaneously, sharing the physical resources of the underlying server. Each virtual machine represents a complete system, with processors, memory, networking, storage and BIOS, and can run an unmodified operating system and applications.

The functionality and performance of VMware ESX and ESXi are the same; the difference between the two hypervisors resides in their architecture and operational management. VMware ESXi is the latest hypervisor architecture from VMware. It has an ultra thin footprint with no reliance on a general-purpose OS, setting a new bar for security and reliability. The small footprint and hardware-like reliability of VMware ESXi enable it to also be available preinstalled on industry standard x86 servers.

This article demonstrates how iStorage Server works under VMware ESX Server. Such powerful combination will expand the application scope of your virtual server, thereby enabling WINDOWS server to expand the storage of your virtualized server. It also allows you to directly use the storage devices of the existing Windows server for VMware ESX Server. With IP SAN solution provided by iStorage Server, you may set up operating system, install application and server software, as well as store data required by your virtual machines. Your ESX Server storage can be expanded in the following 3-most-commonly-used ways:

- Use Virtual Image File Disk Device to create a file-based virtual storage device for VMware ESX Server, this allows quick data migration and backup.

- Directly use the physical disk or partition of Windows server. This enables you to make good use of resource. No additional configurations, just add the storage media to iSCSI Targets.
- Use CD/DVD/RW bridge device or Virtual CD/DVD to map physical CD/DVD drives or CD/DVD image files (iso, .bin, .mdf, .cdi, .b5i, .nrg, .ccd, .sub, .img, .raw) on your Windows server to CD/DVD devices on VMware ESX Server virtual machine.

After iStorage Server 2.0, it supports server side mirroring, synchronous replication and failover which allows user to create a high-availability iSCSI SAN for VMware ESX / ESXi Server.

Install ESX Server

You need a server running ESX Server. ESX Server must first be installed on to a suitable machine that will be used to create the virtual environment. For learning how to obtain or install VMware ESX Server, please contact the VMware supplier.

Configuring on iStorage Server

Choose the Authentication Mechanism

Decide which authentication mechanisms you would want to use: **Anonymous, CHAP, IP address** or **Mixed** authentication.

1) Anonymous:

All initiators will get full access permission without any authorization required.

2) CHAP (Challenge-handshake authentication protocol)

All initiators need to specify a CHAP user and secret to connect to the target. iStorage Server has a built-in user called “Guest”, which is used for initiators without CHAP secret specified.

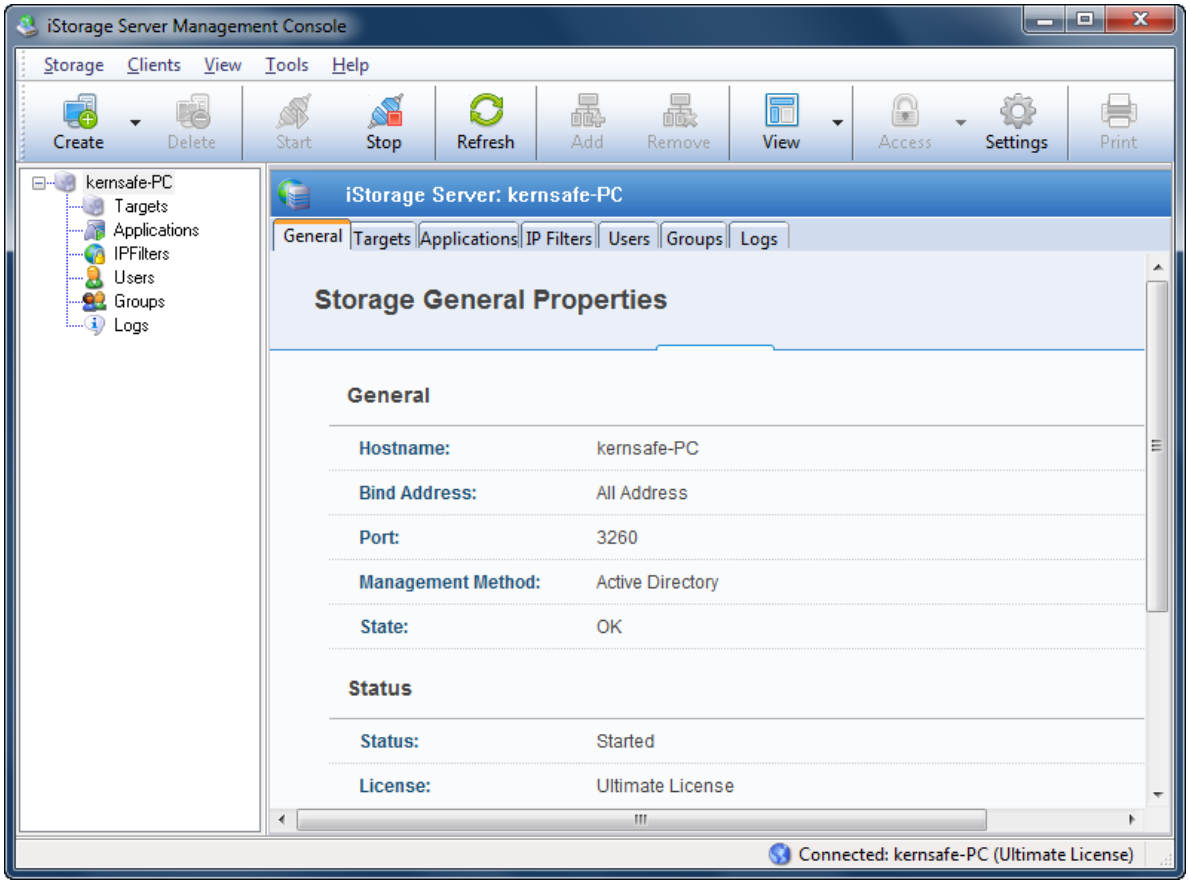
3) IP Filters

All initiators will be authorized by the incoming IP address defined by IP Filter roles.

4) Mixed

Security policy is determined by both CHAP and IP Filters.

Open **iStorage Server Management Console.**

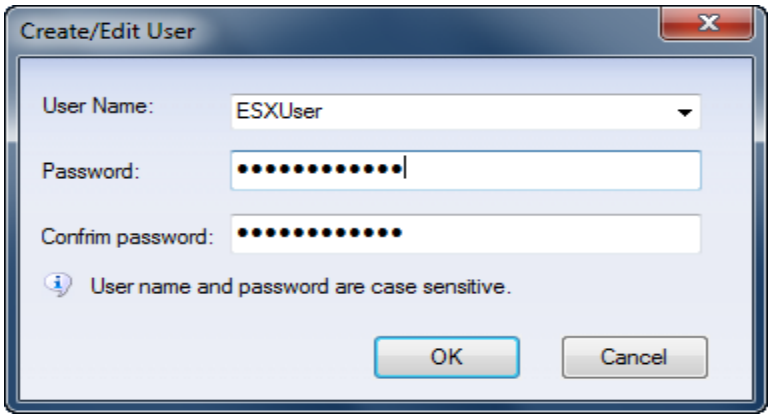


Create User

Right click **Users** Tree Node on the left tree view.

Press **Add** button in the tool bar.

The **Create/Edit User** dialog is shown.



Type user name and password as you like, but we recommend that the password should be 12-16 characters. We take the user name **ESXUser** and password **111111111111** as an example.

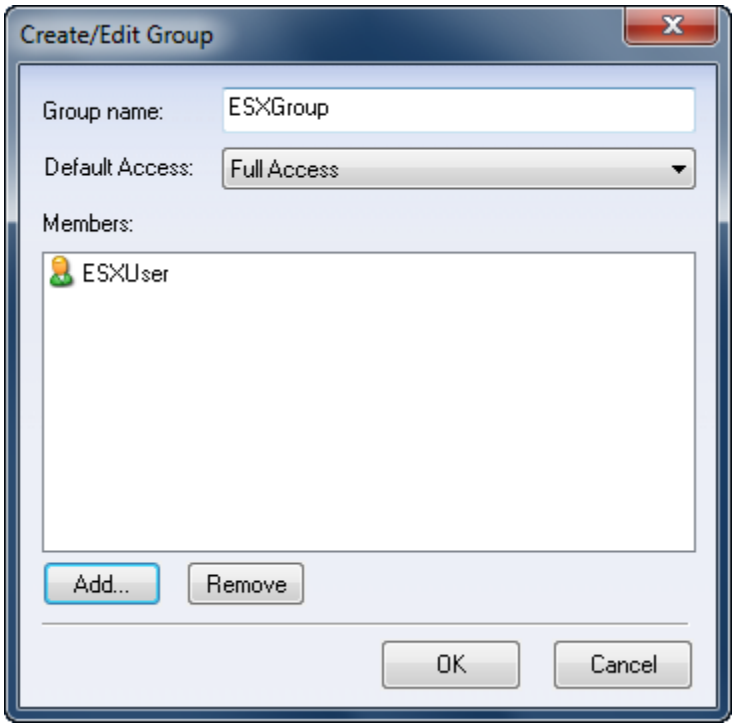
Press the **OK** button to complete creating user.

Create group

After creating user, we need a group to hold this user.

Right click the **Groups** tree node in the left tree view.

Press the **Add** button on the toolbar, the **Create/Edit Group** Dialog is shown.



Take a group name as you like, we take **ESXGroup** as an example.

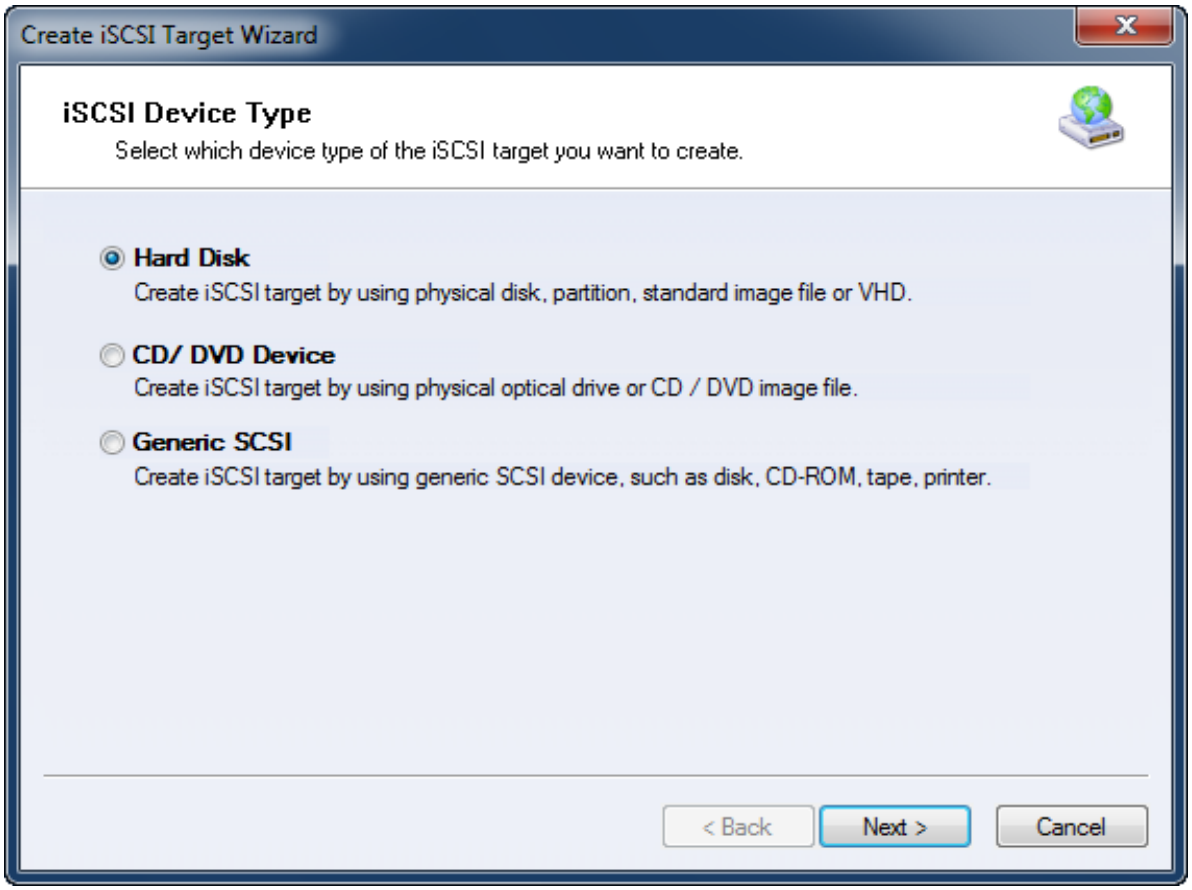
Press the **Add** button and then select the user which we just created.

Press the **OK** button to continue.

Create Target

Launch the **iStorage Server management consolle**, press the **Create** button on the toolbar, the **Create Device Wizard** is shown.

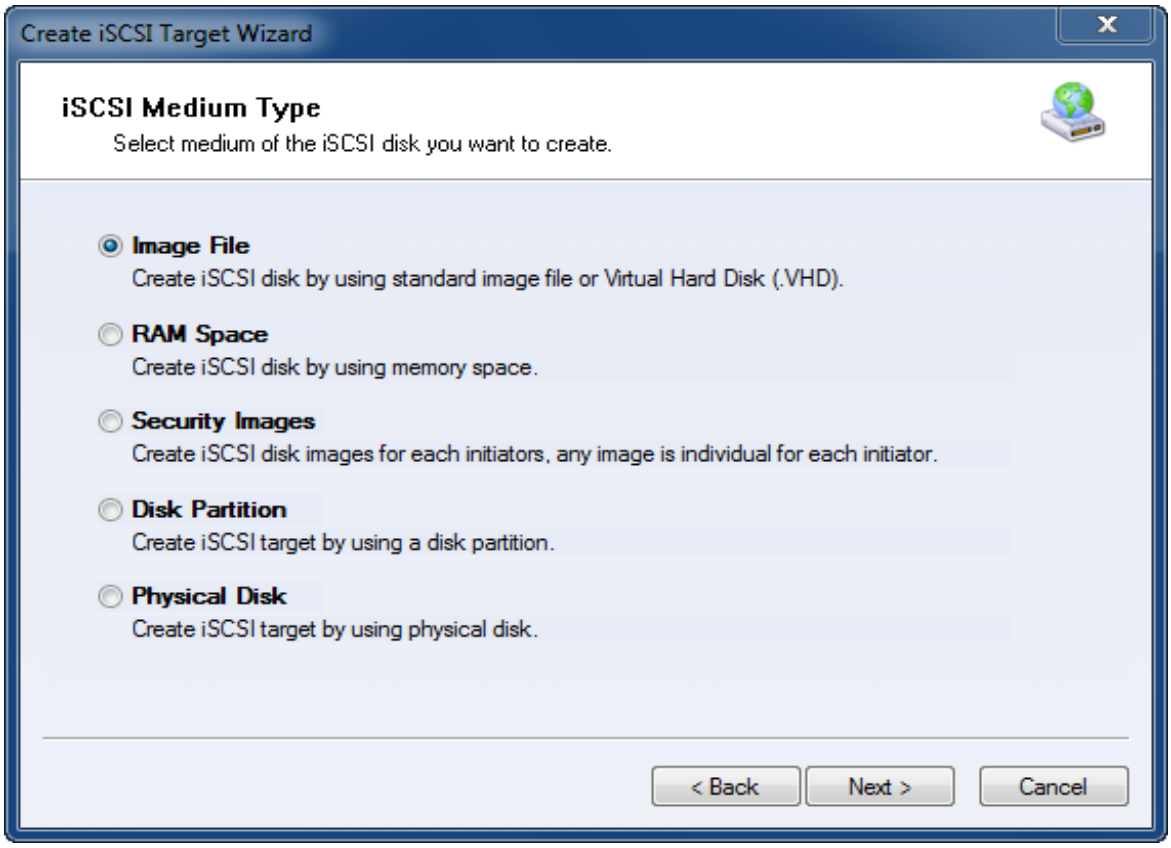
Select device type



Choose **Hard Disk**.

Press the **Next** button to continue.

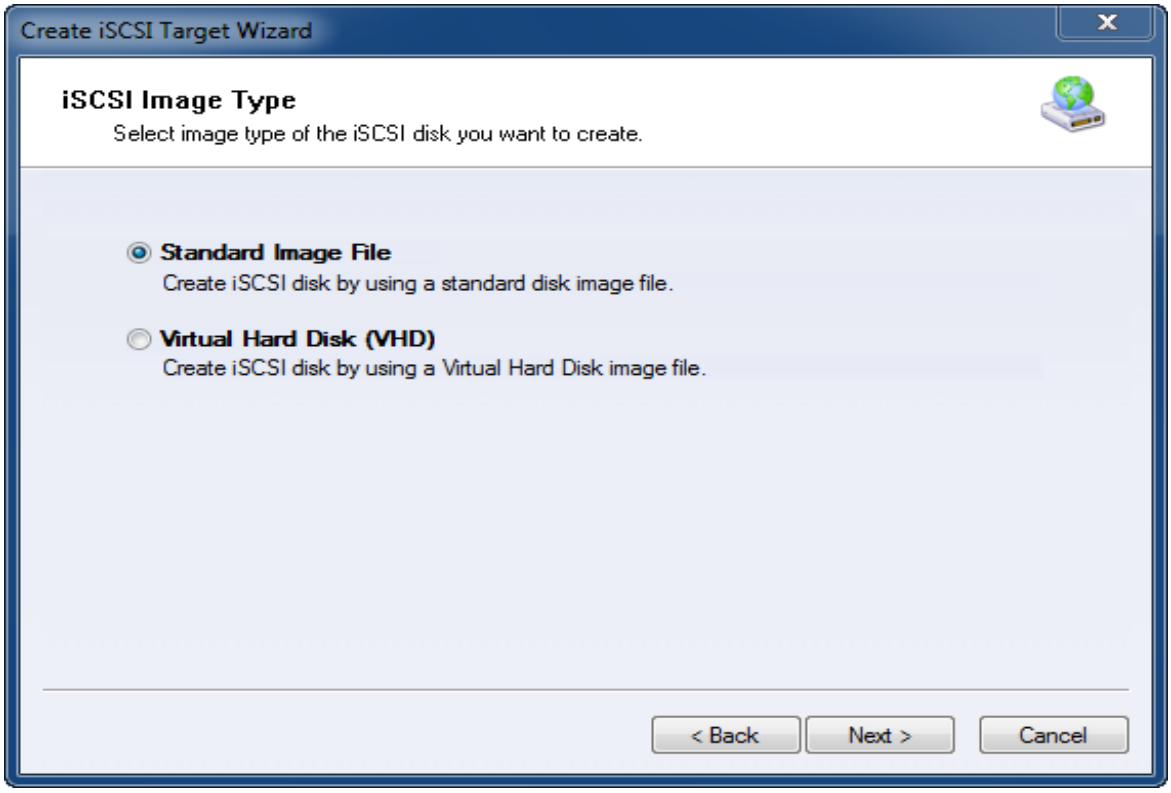
Select a medium type.



Choose **Image File** in **iSCSI Medium Type** window.

Then press **Next** button to continue.

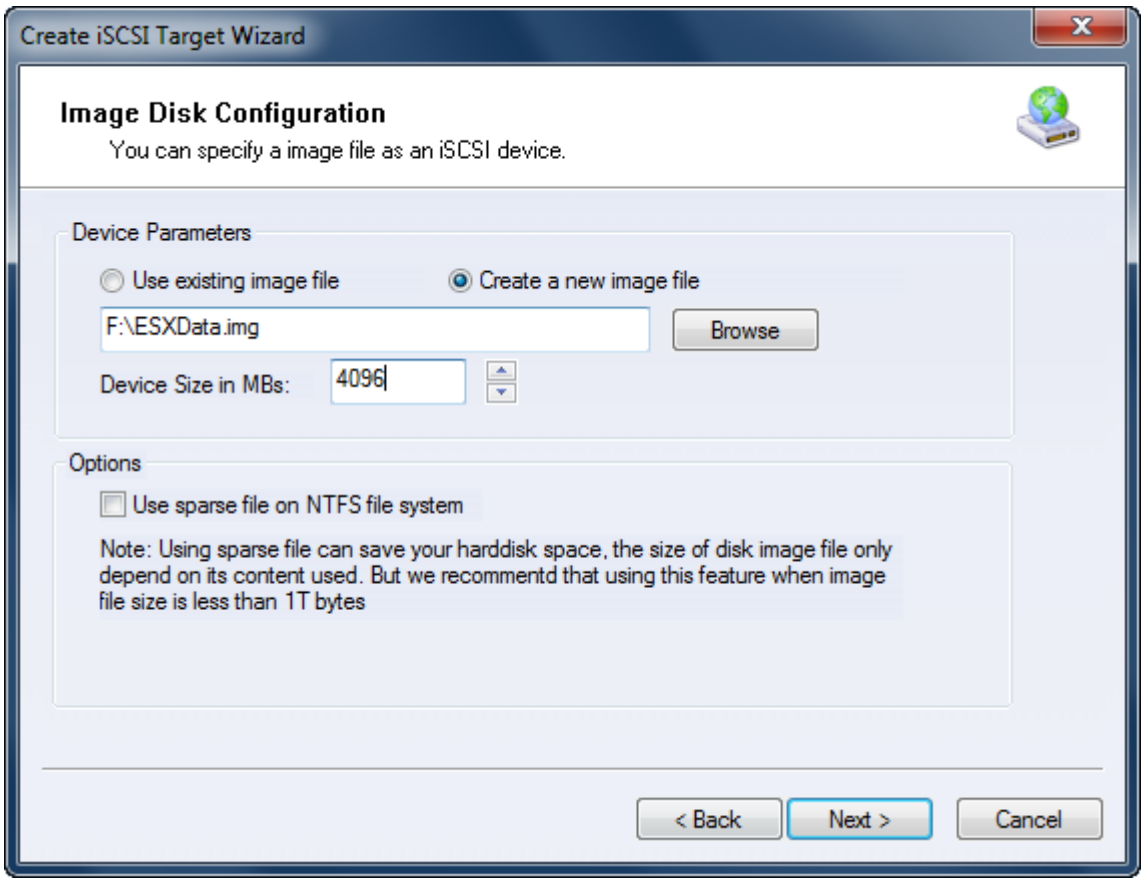
Select an Image type.



Choose **Standard Image File.**

Press the **Next** button to continue.

Specify image file path and size.



Choose **Create a new image file** to create a new image file or choose **Use existing image file** if you have one.

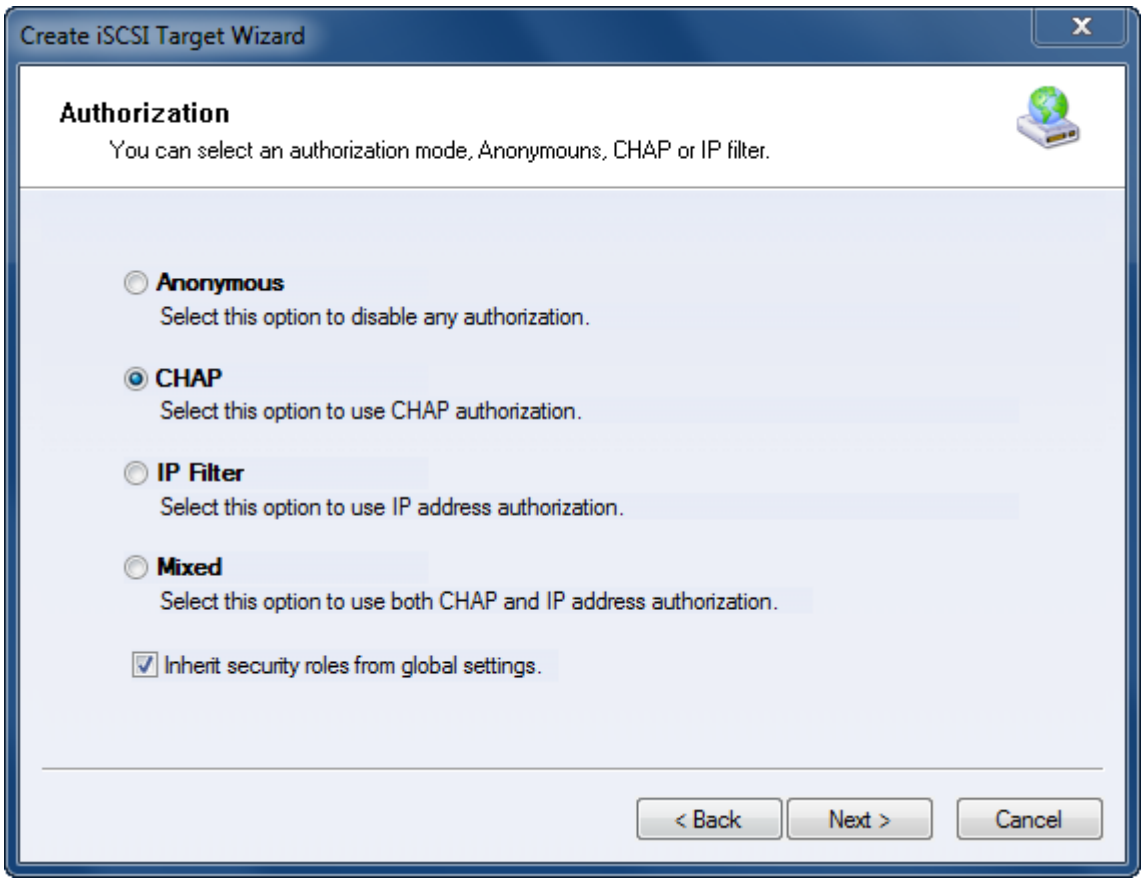
Specify image file full name path.

Specify the device size.

If you check **Use sparse file on NTFS file system**, the size of disk image file only depends on its content used, it can save your hard disk space.

Press the **Next** button to continue.

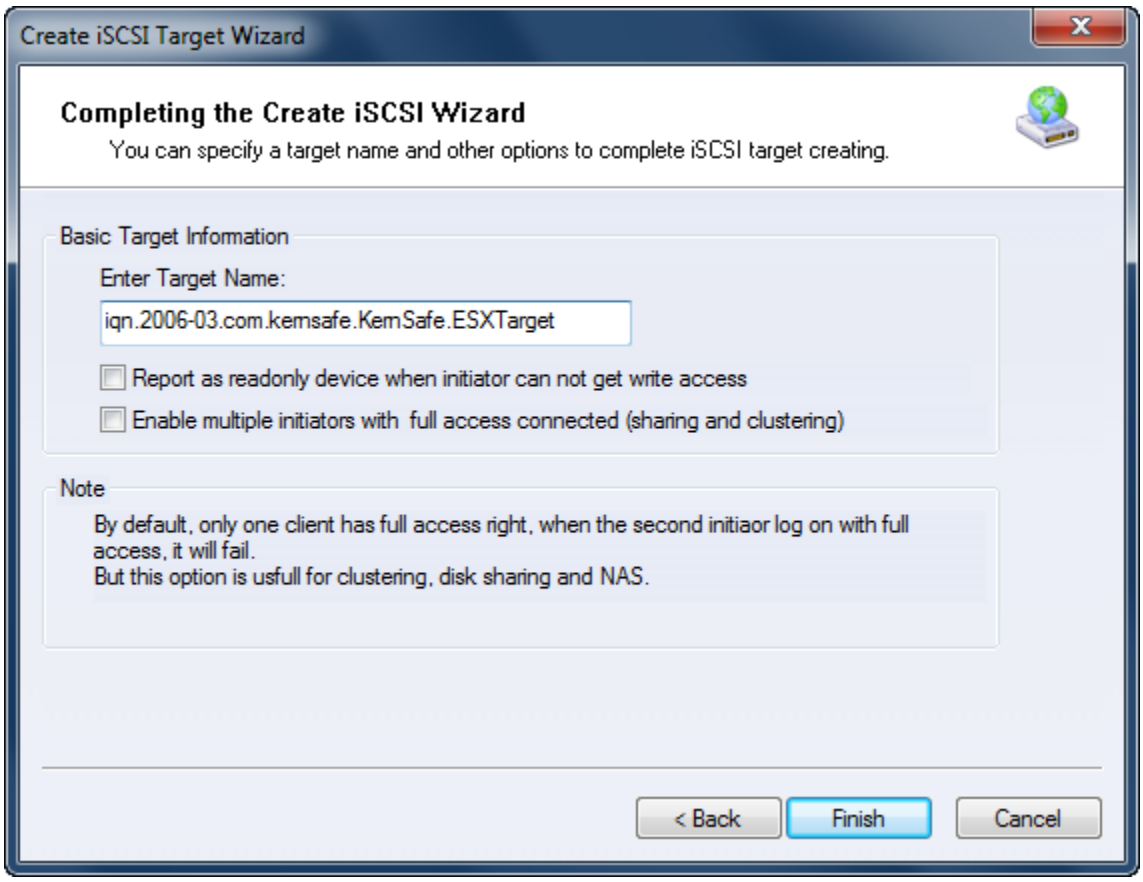
Set authorization mode.



Choose **CHAP** Authorization.

Press the **Next** button to continue.

Finish creating iSCSI Target.



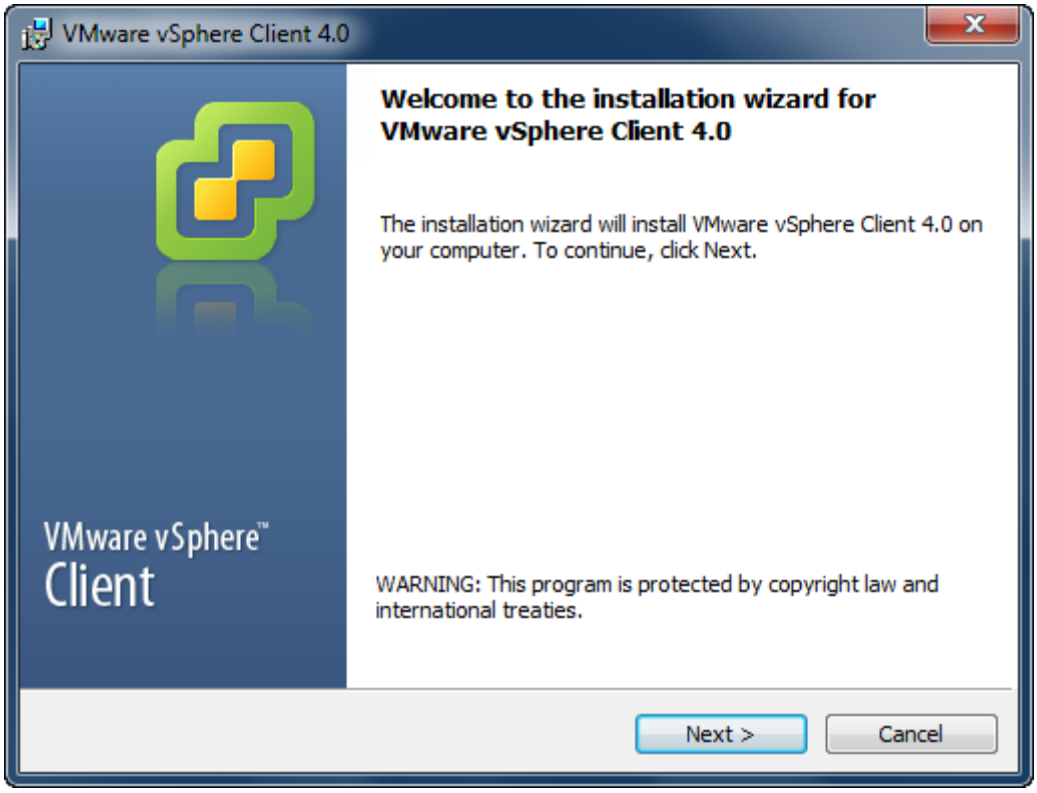
Type a target name in the Target Name field, or use the default.

Press the **Finish** button to continue.

Configure VMware ESX Server

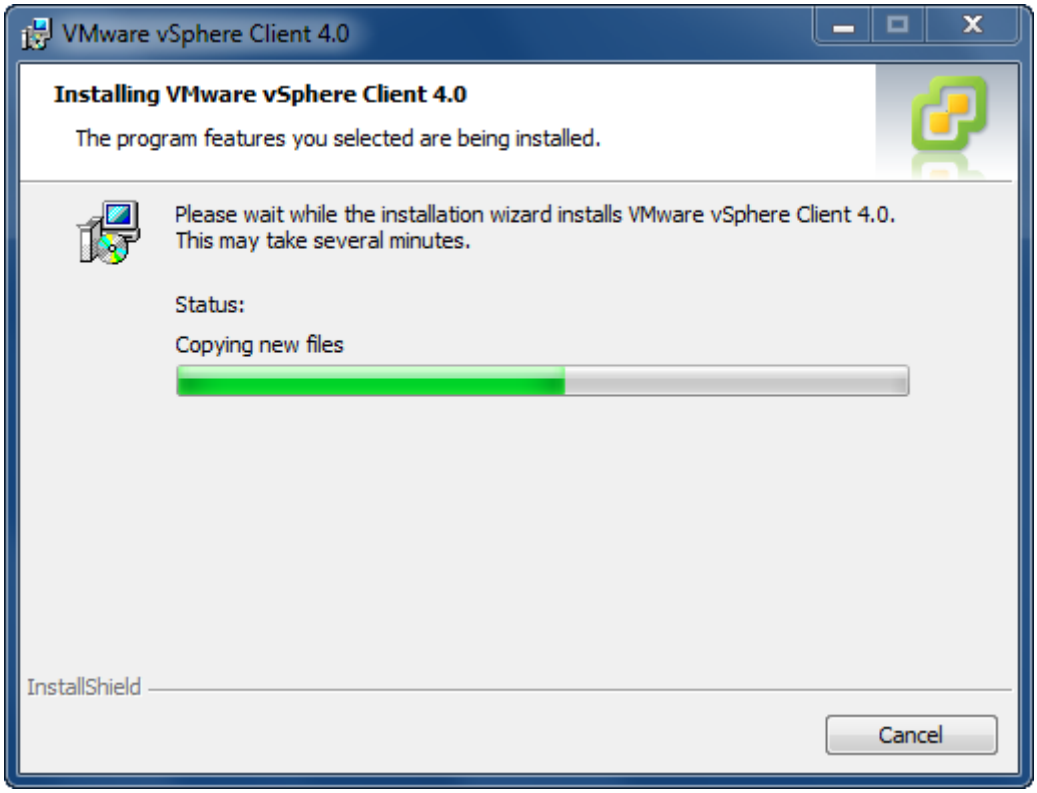
Install VMware Infrastructure Client 4.0

Run VMware Infrastructure Client installation, the following interface is shown.



Press the **Next** button to continue.

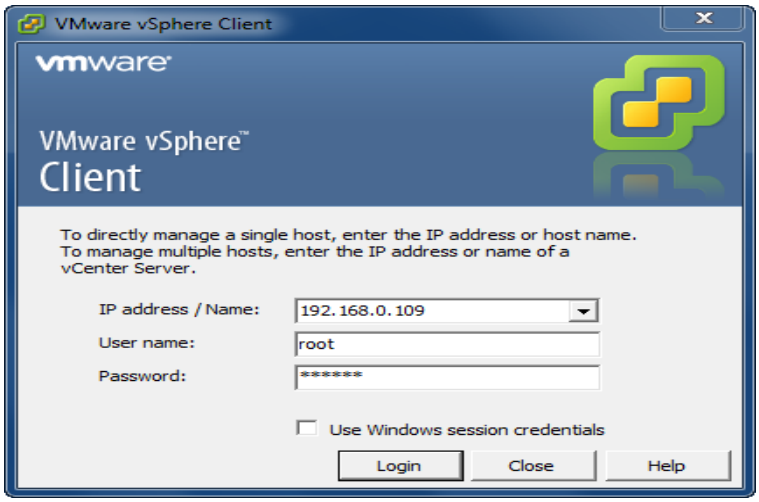
Install VMware Infrastructure Client.



After coping files is completed, press the **Finish** button to complete VMware Infrastructure Client installation.

Log on to ESX Server

Run VMware Infrastructure Client, VMware Infrastructure Client Log on dialog is shown.



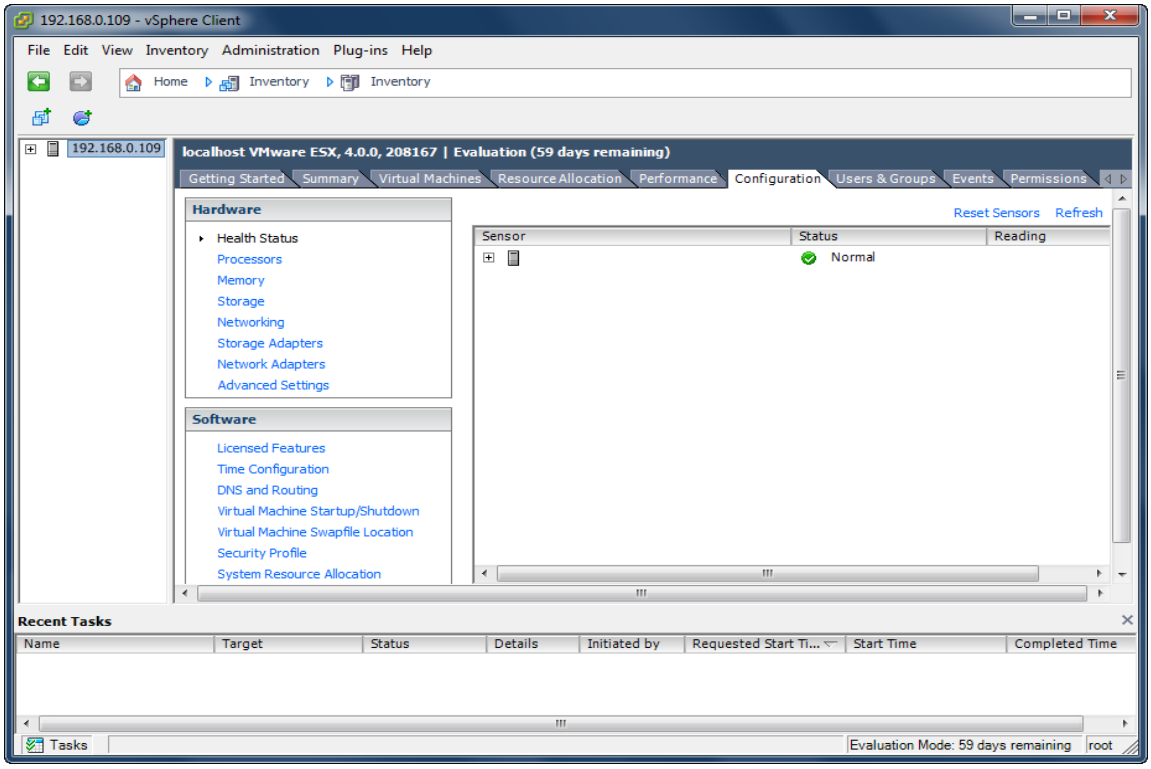
Type **IP address / Name** with which running ESX Server.

Type user name and password.

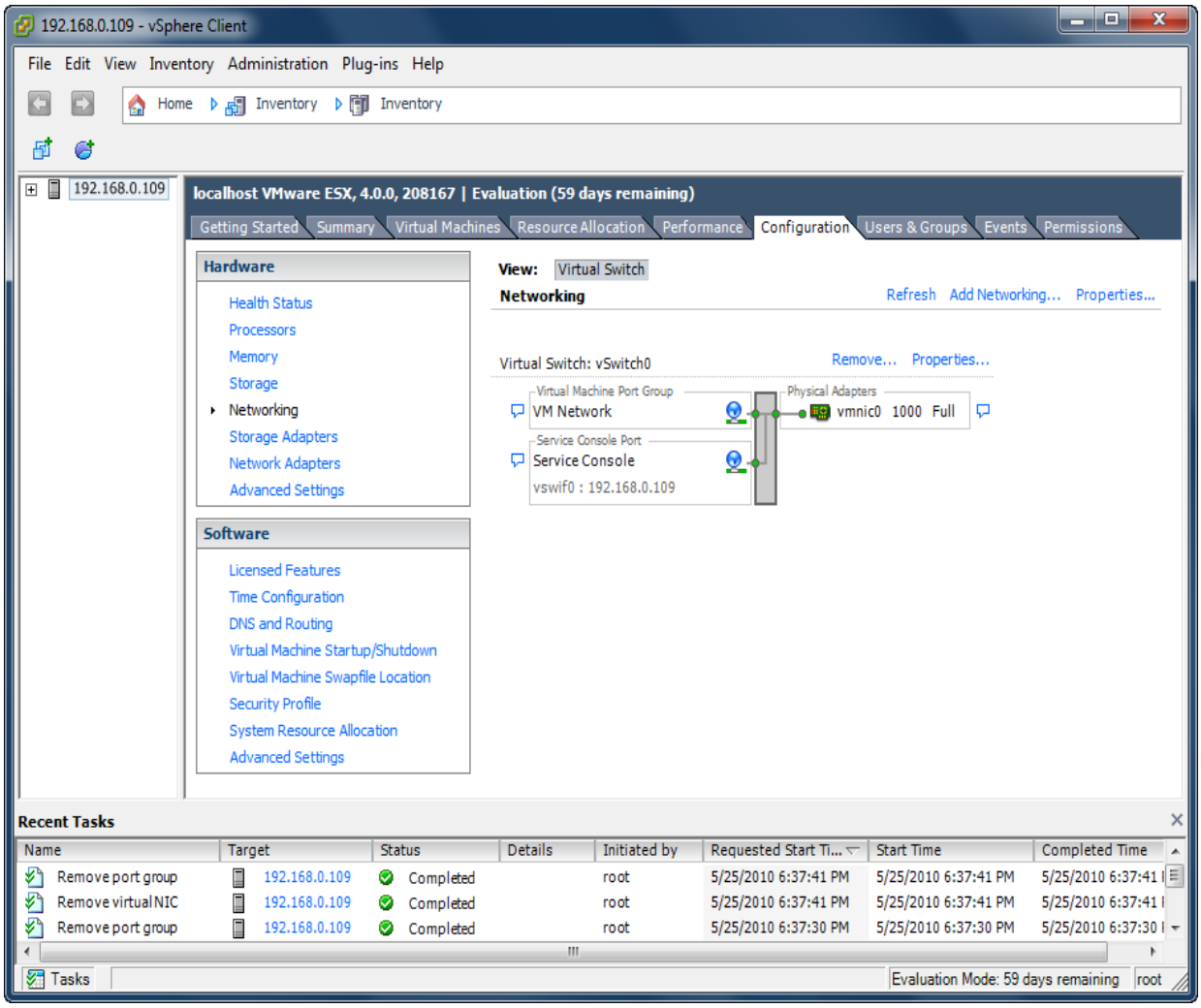
Press the Login button to continue.

Configure ESX Server's networking

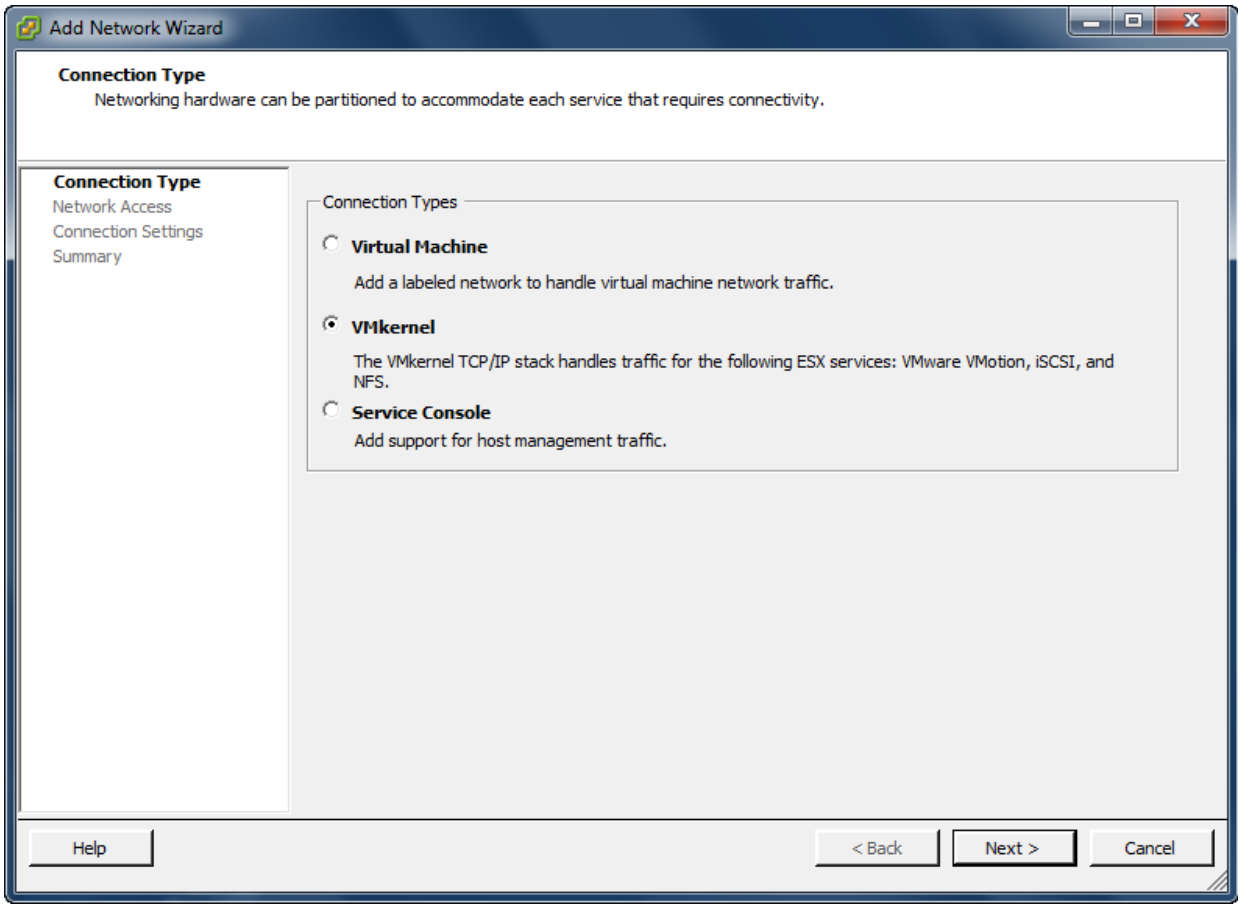
Open VMware Infrastructure Client.



Click **Networking** link in the **Hardware** group, the built-in Virtual Switch is shown.



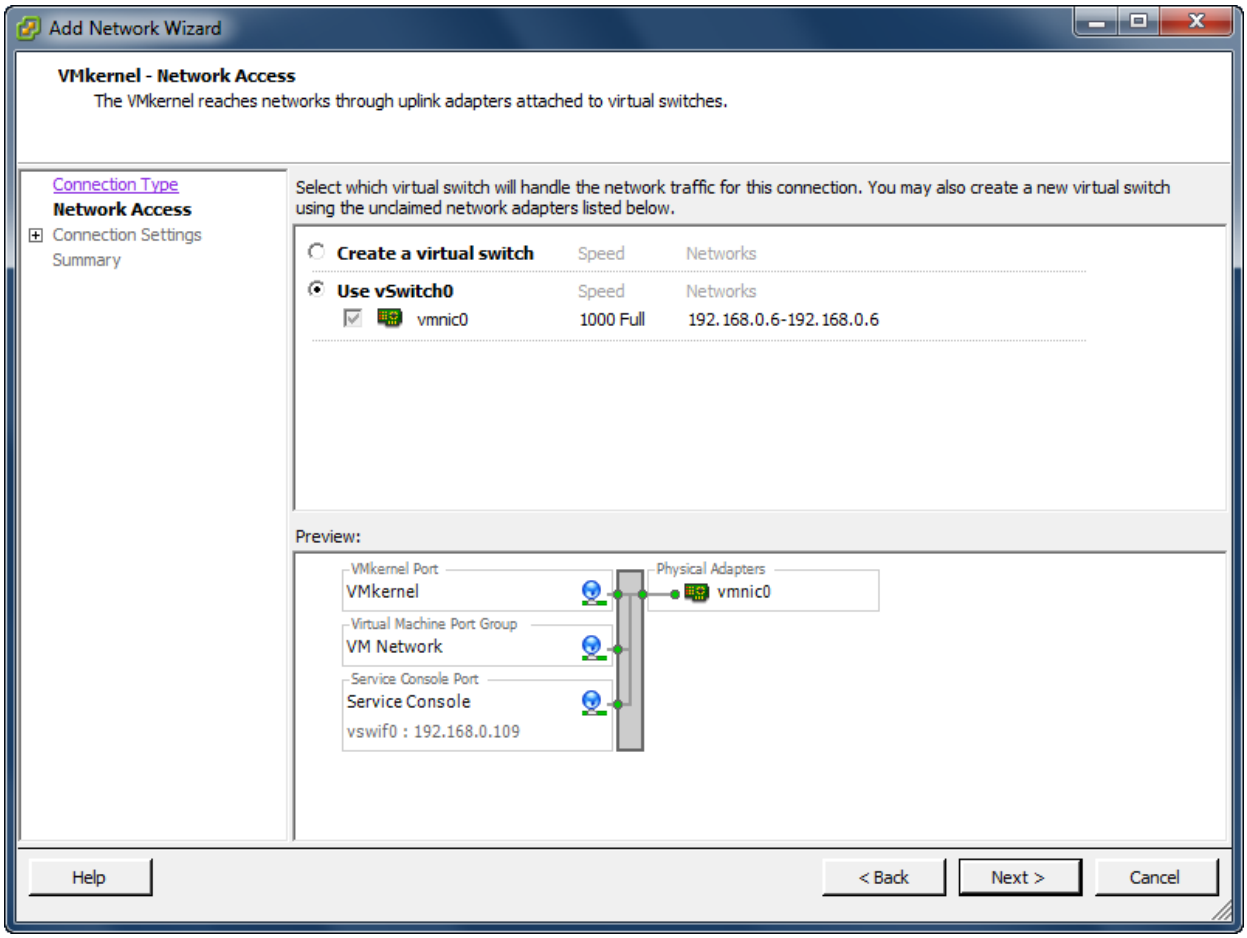
For using iSCSI, we need create a new Network, click **Add Networking** link, an **Add Network Wizard** is shown.



On the first page of this wizard, select **VmKernel** which allows your virtual machines can use the iSCSI.

Press the **Next** button to continue.

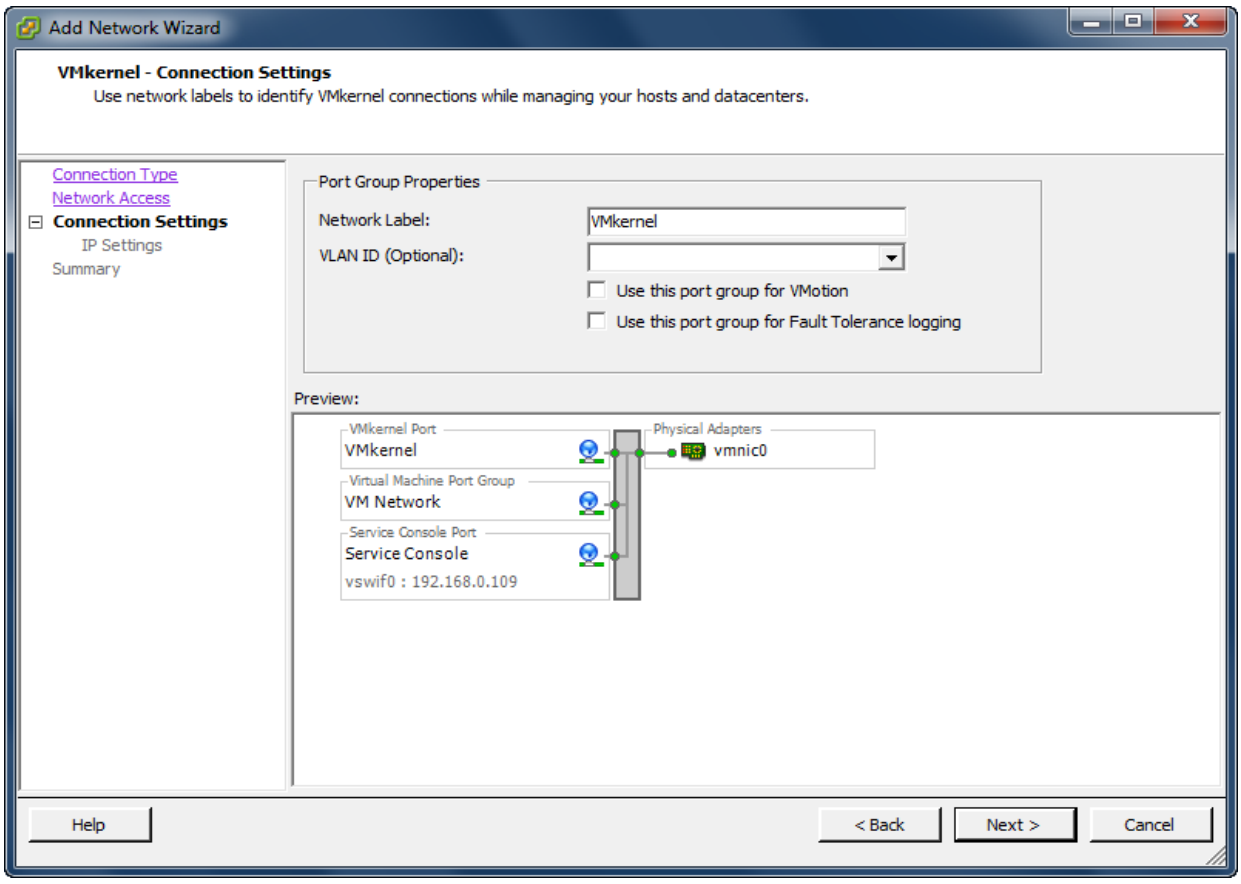
Select which virtual switch will handle the network traffic.



Select **User vSwitch0** option.

Press the **Nex**t button to continue.

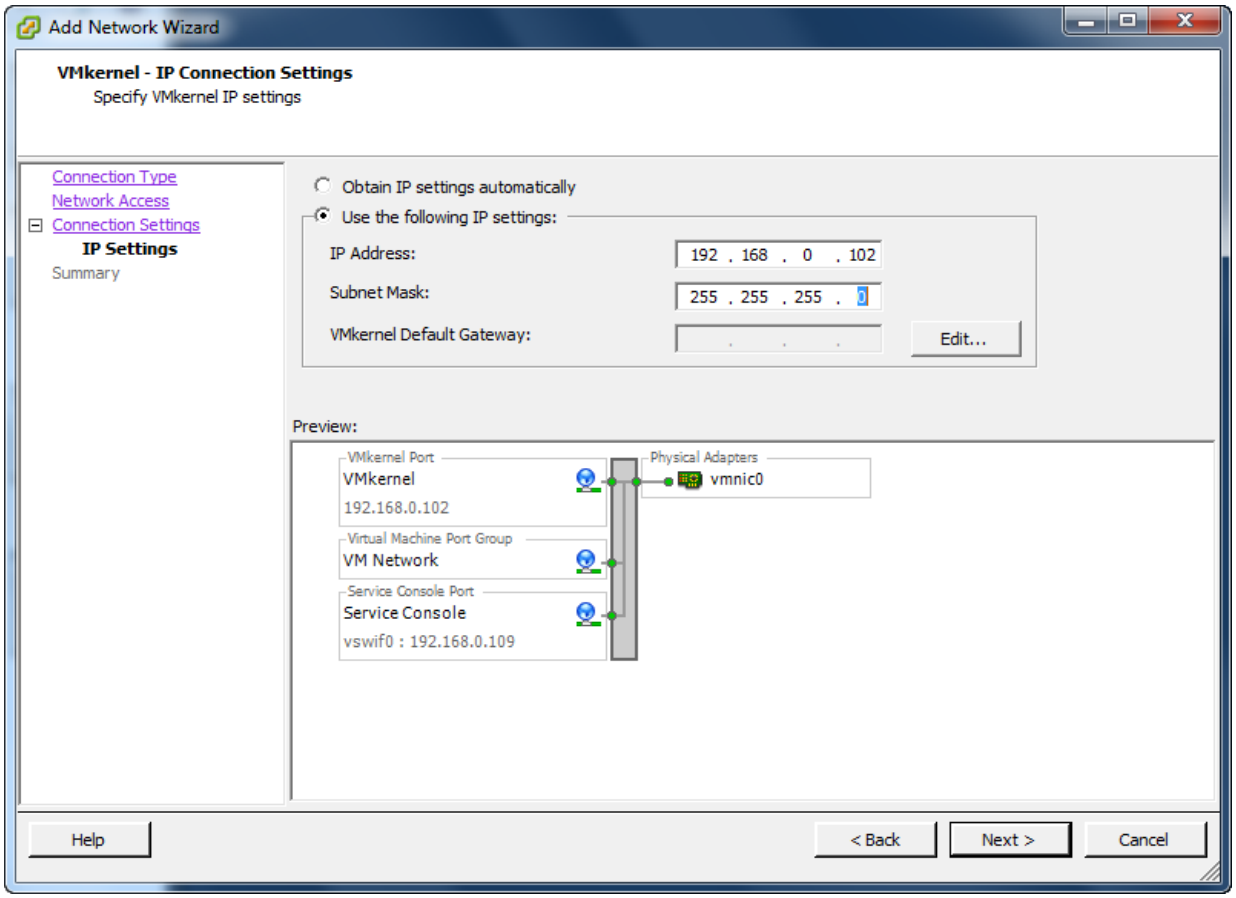
Type the identification of the network adapters.



Give the name of the new network.

Press the **Next** button to continue.

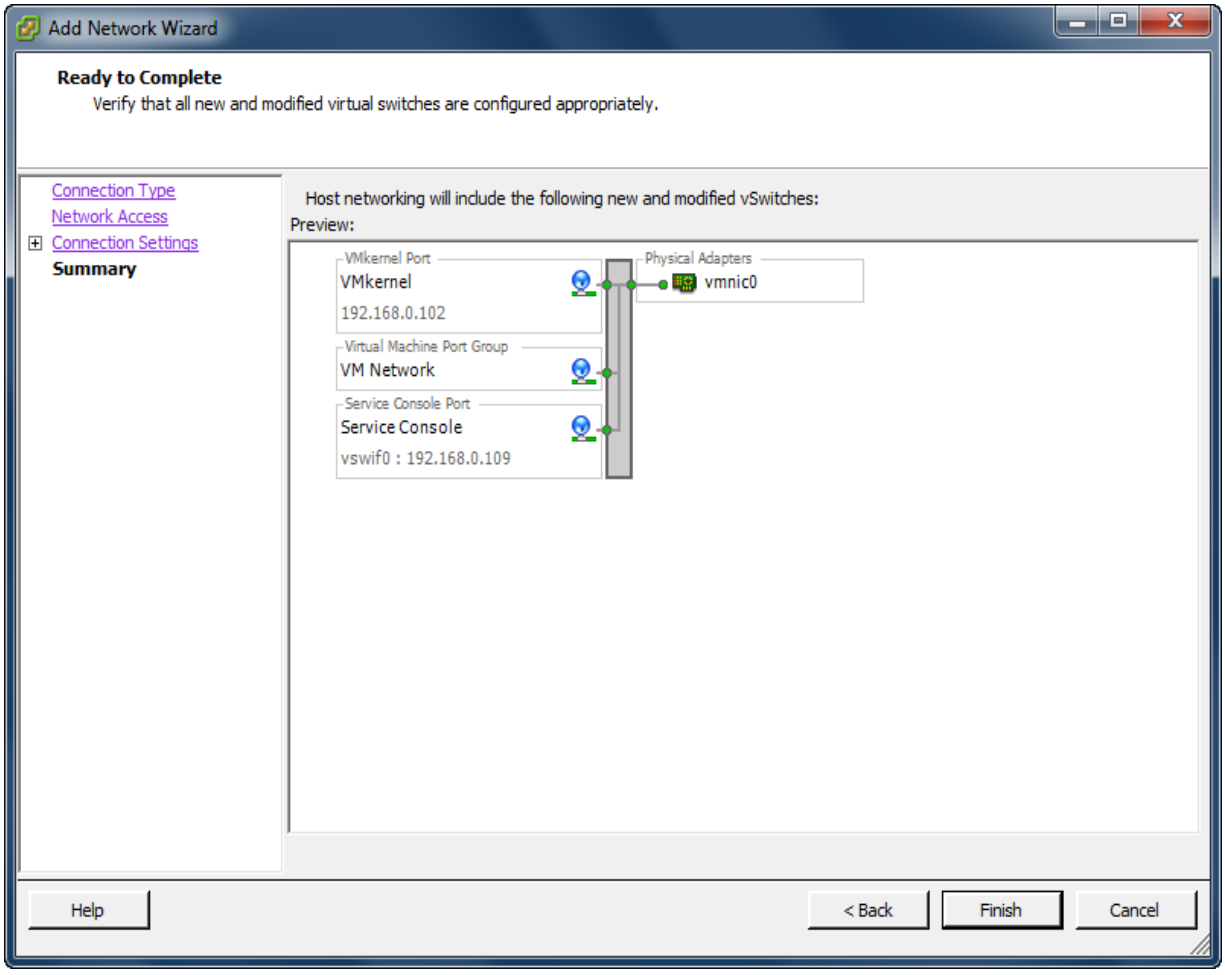
IP Settings



Input IP Address and Subnet mask, we take **192.168.0.102** and **255.255.255.0** as an example.

Press the **Next** button to continue.

Complete add networking



Check if the parameters are correct and press the **Back** button if any changes are required.

Press the **Finish** button to complete creating add networking.

Configure iSCSI Storage

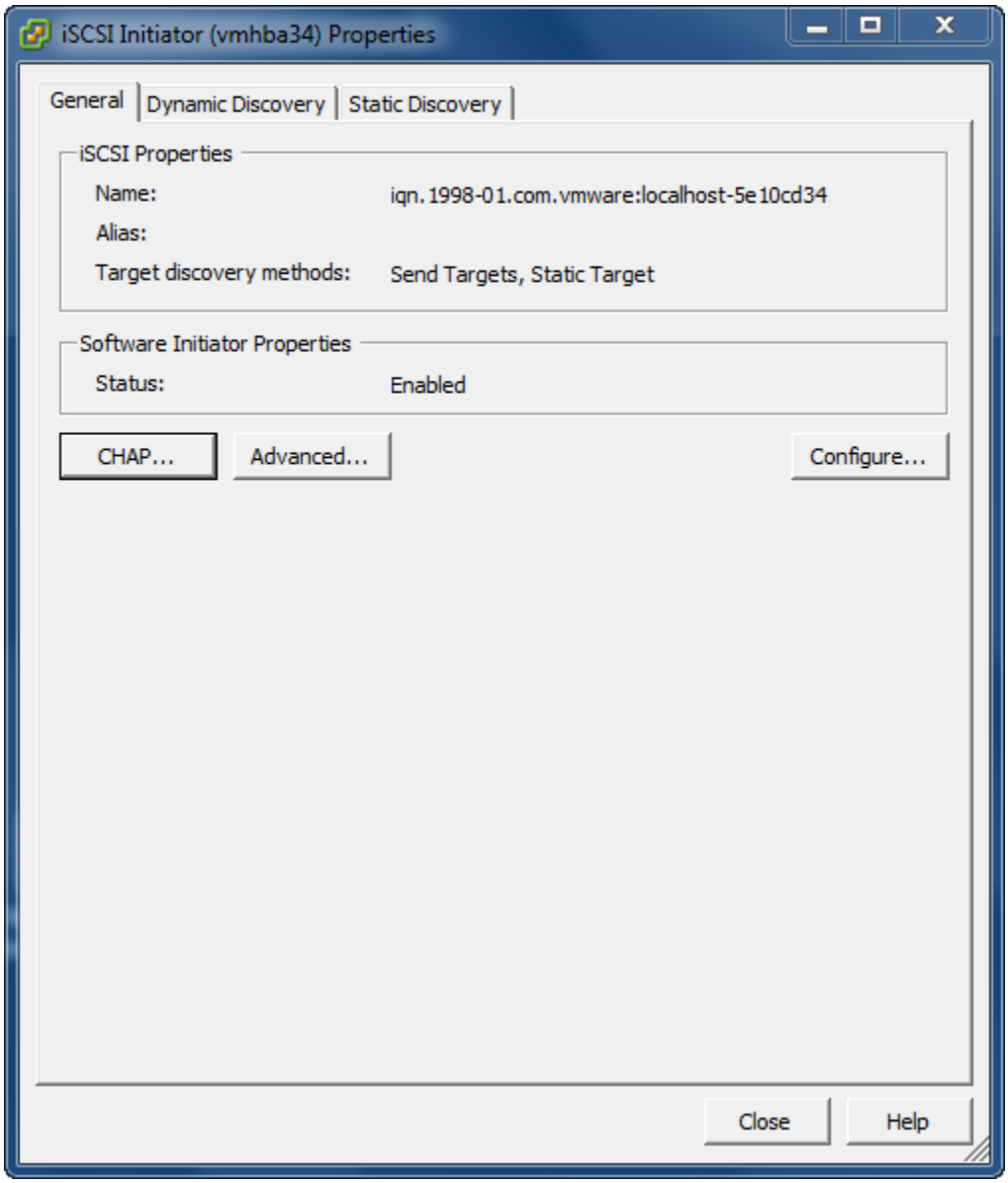
Click **Storage Adapters** link in the **Hardware** group.

Click **Properties** link.

The **iSCSI Initiator (vmmhba34) Properties** Dialog is shown.

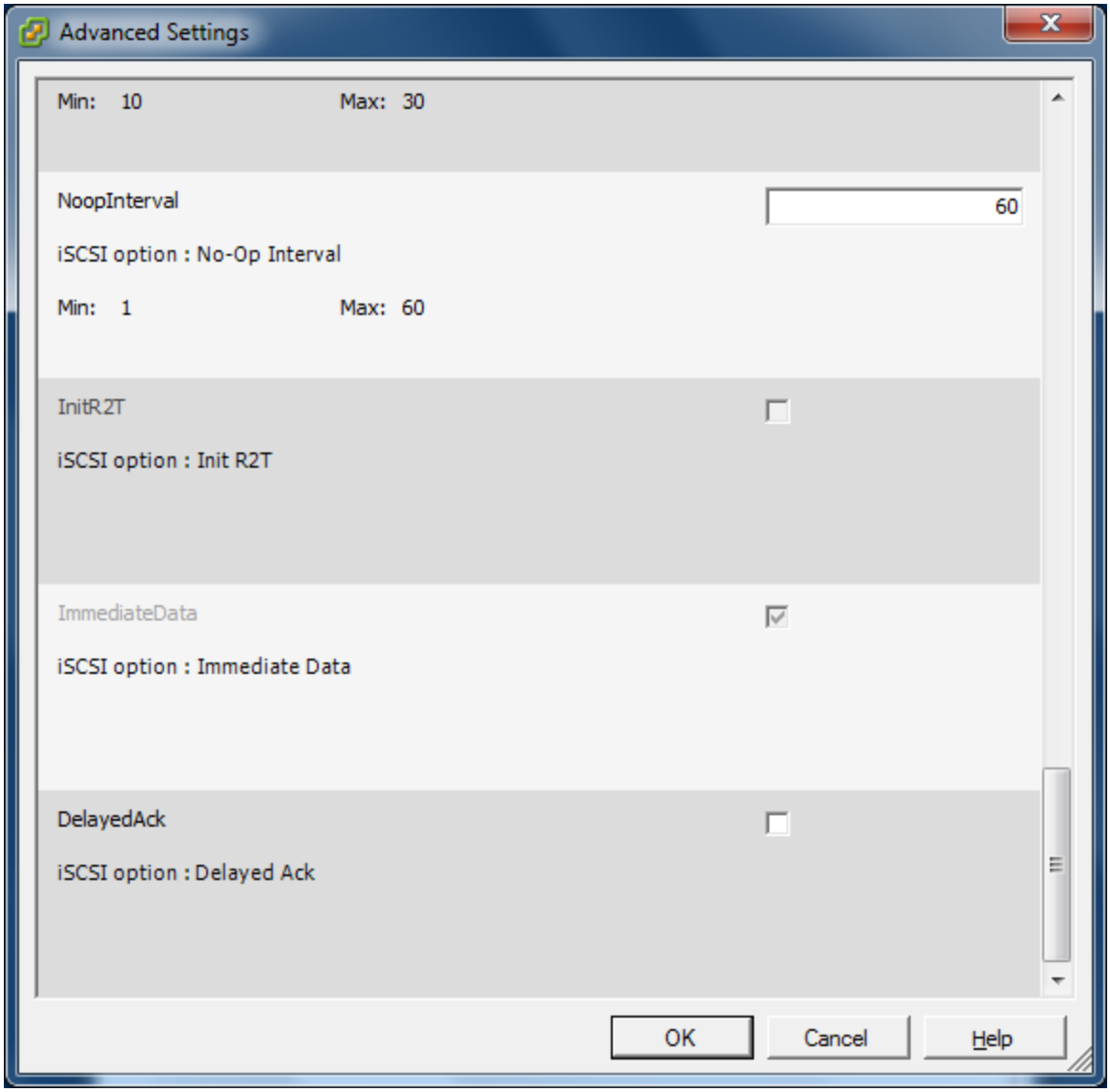
Now we need to disable **Delayed Ack**. Having Delayed Ack enabled can sometimes result in slow read performance that can interfere with High Availability between servers and SAN itself.

To read more about it, please visit:
http://kb.vmware.com/selfservice/microsites/search.do?language=en_US&cmd=displayKC&externalId=1002598

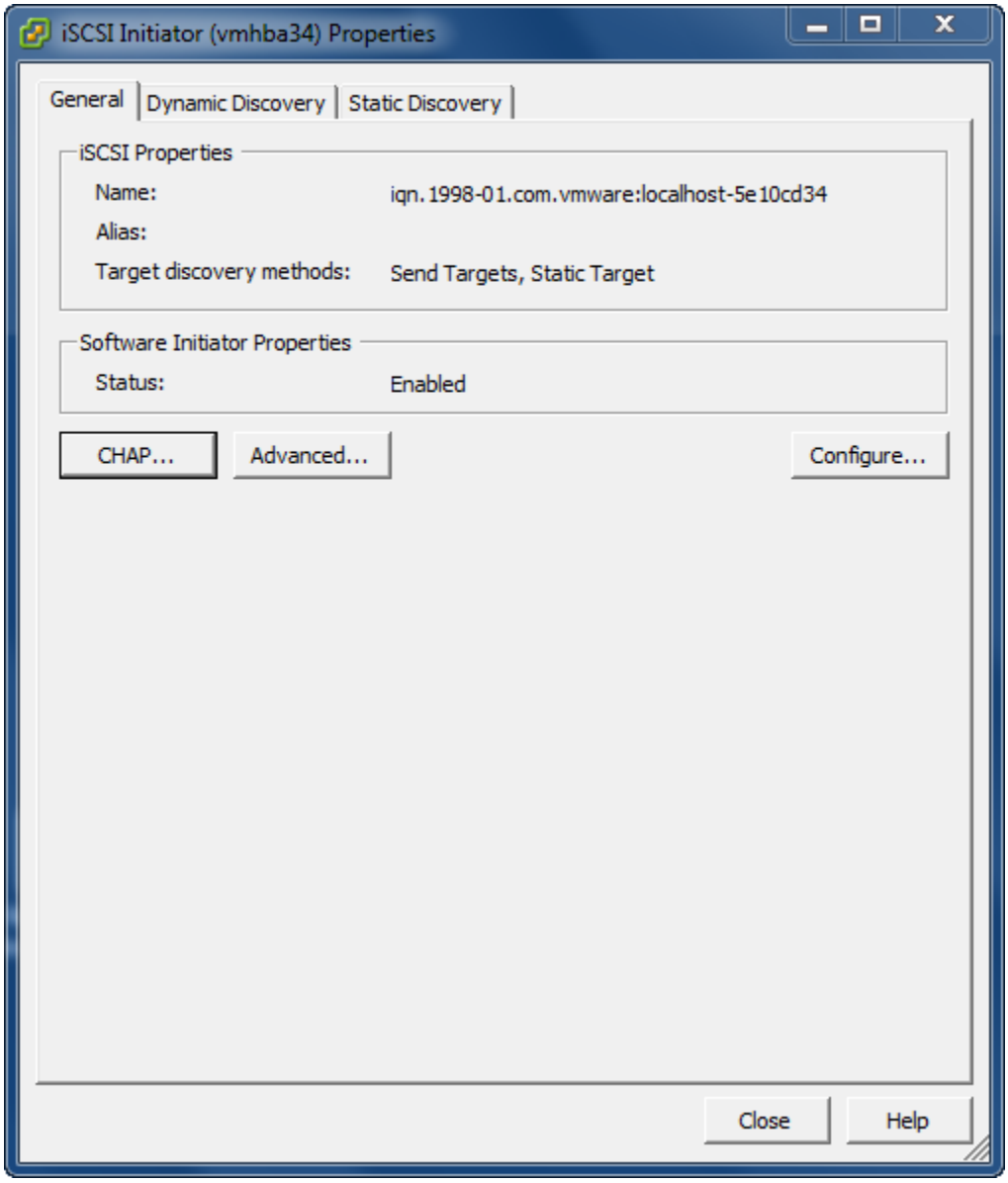


To disable delayed ACK, please click on **Advanced...** button.

Then please scroll down and uncheck **Delayed Ack**.



Press **OK** button to continue.

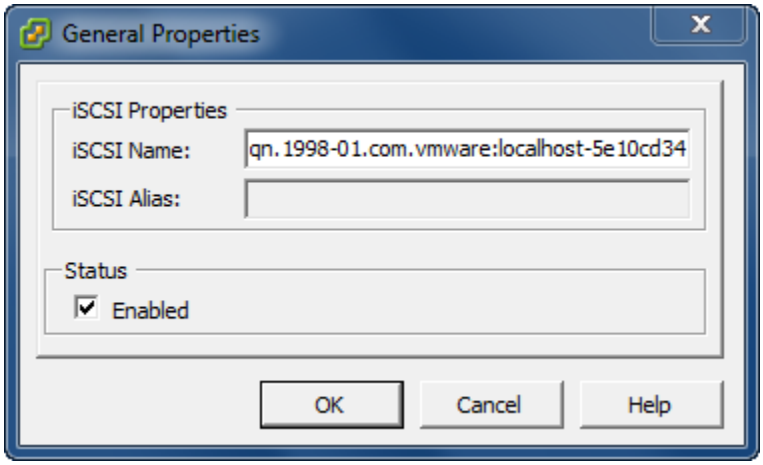


In the **General** page, press the **Configure…** button.

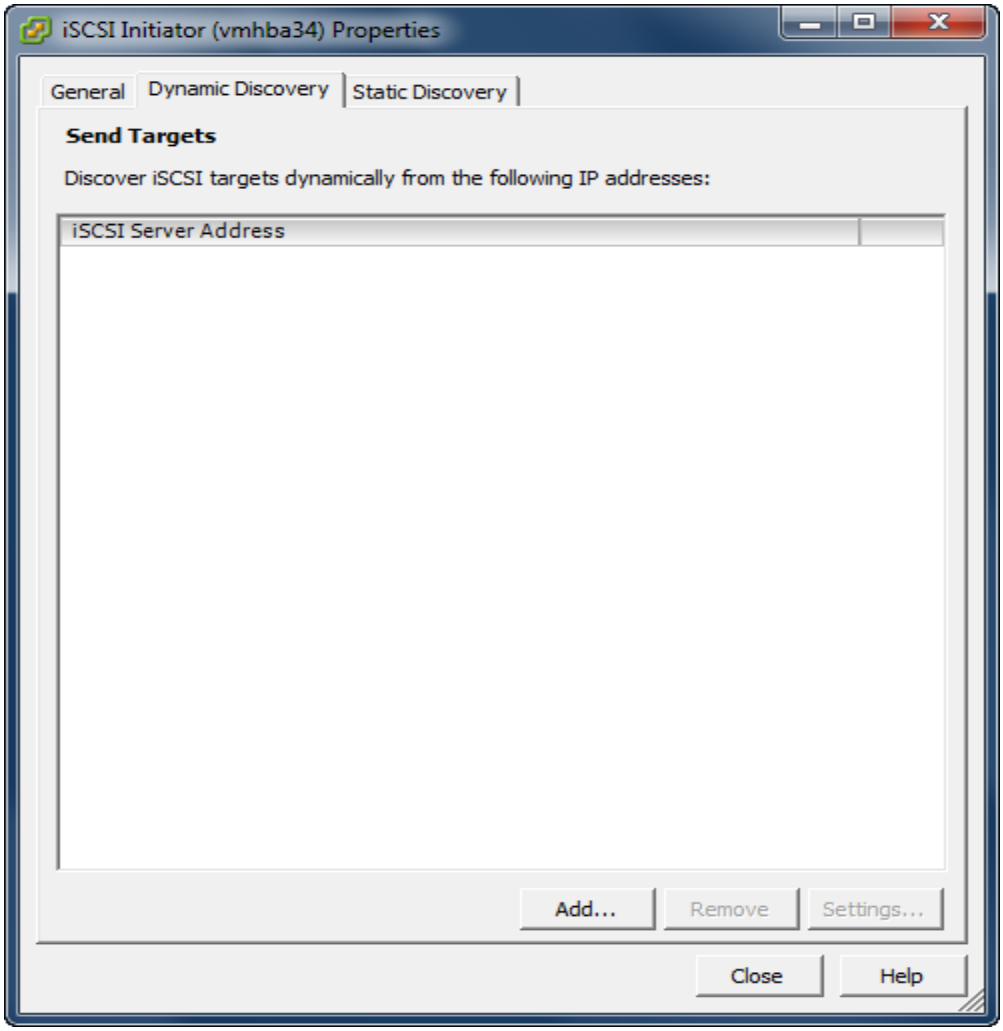
The **General Properties** dialog is shown.

Select **Enabled** check box in the **Status** group.

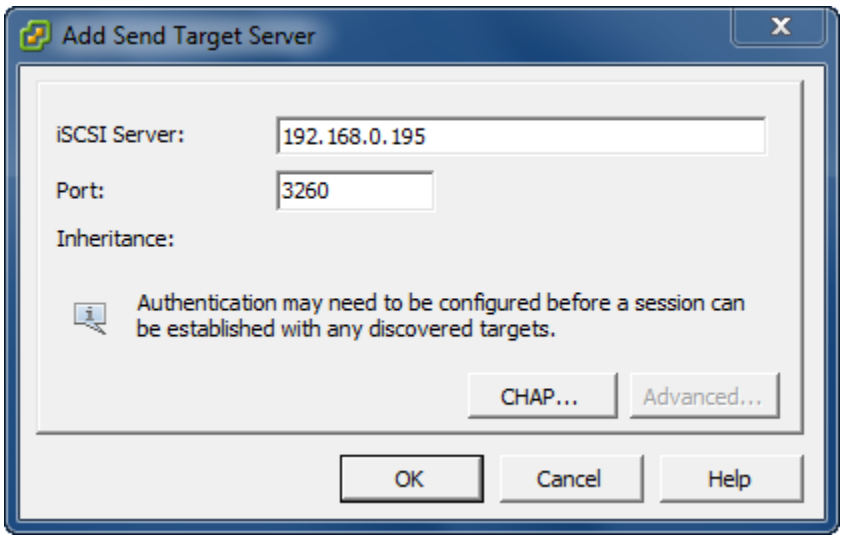
Press the **OK** button to continue.



Add iSCSI Target discovery.



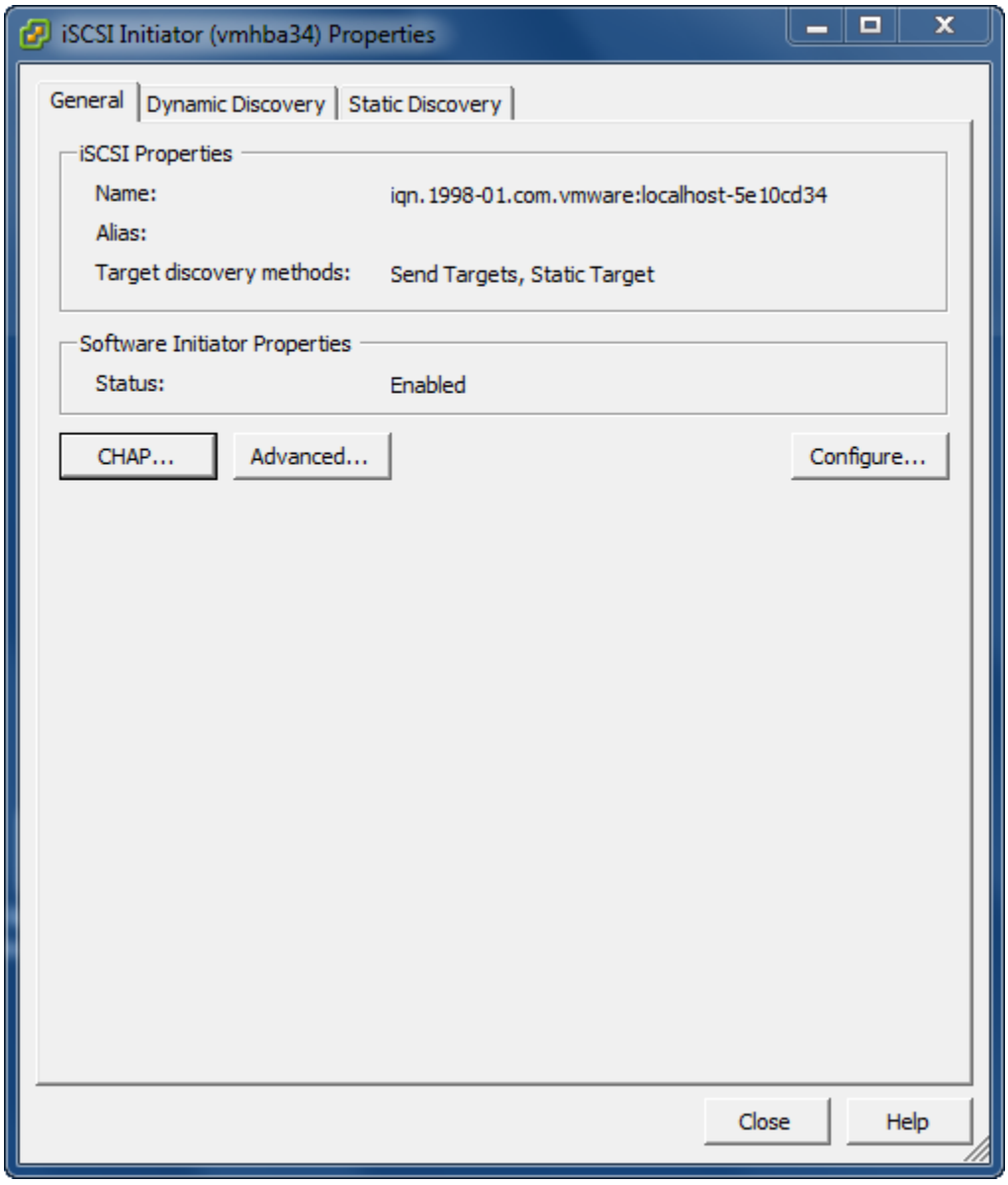
In **Dynamic Discovery** page, press the **Add** button, the **Add Send Targets Server** dialog is shown.



Input iSCSI Server address and port with which is running the iStorage Server.

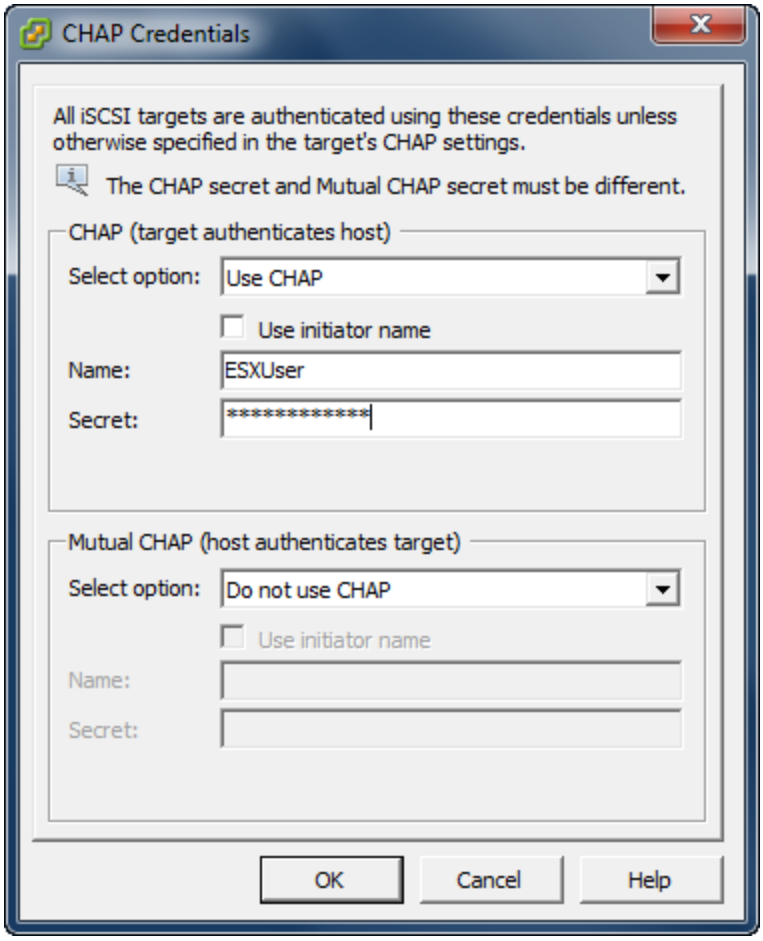
Press the **OK** button to proceed.

Specify CHAP authentication information.



If you choose CHAP user authorization mode in target of iStorage Server, this step cannot be skipped.

Press the **CHAP** button, the **CHAP Credentials** dialog is shown.



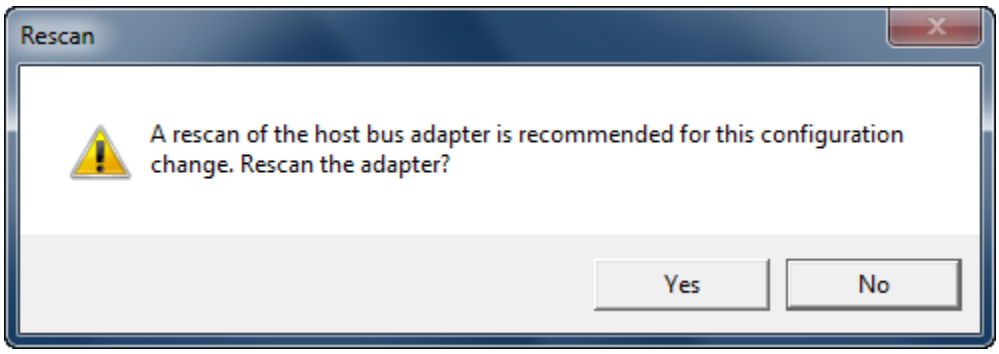
Type CHAP user name and secret in the **CHAP (target authenticates host)** group.

As described previously in this article, we have created a user named ESXUser so we will specify it in this dialog. Or if you do not choose CHAP authentication, you should select Do not use CHAP.

Press the **OK** button in this dialog.

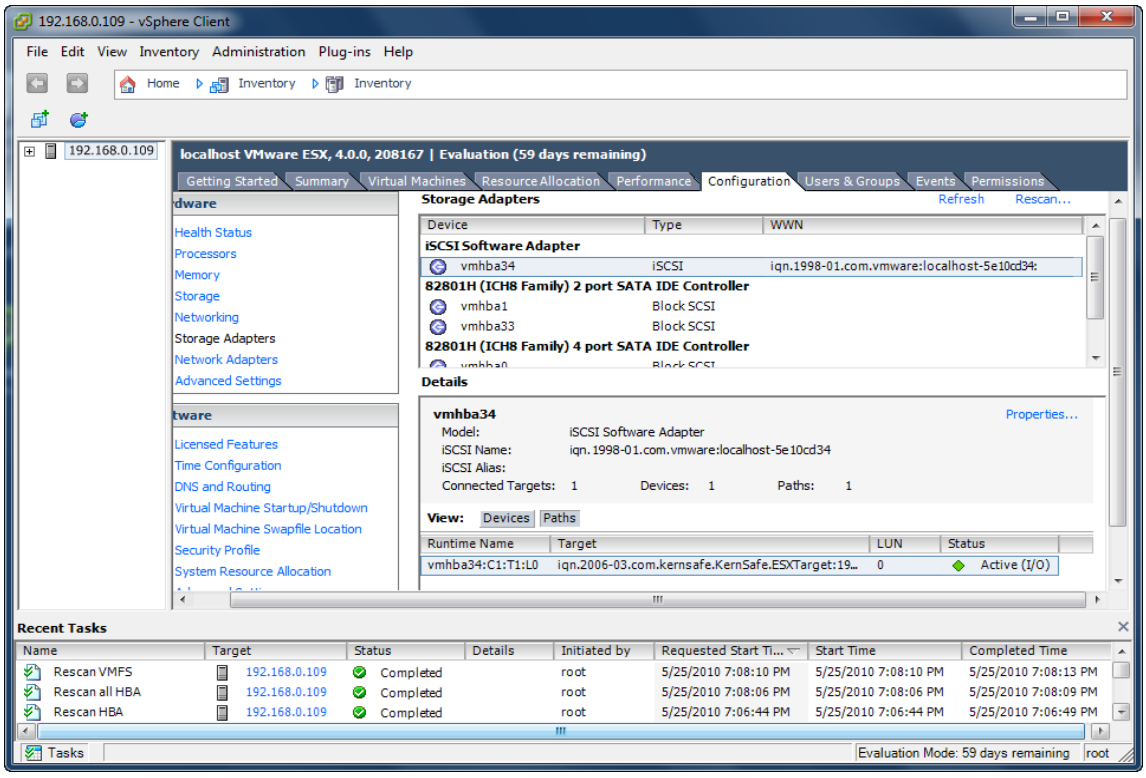
Press the **Close** button in the **iSCSI Initiator (vmmhba34) Properties** dialog to finish iSCSI Target configuration.

A prompt dialog is shown.



Press the **Yes** button to continue.

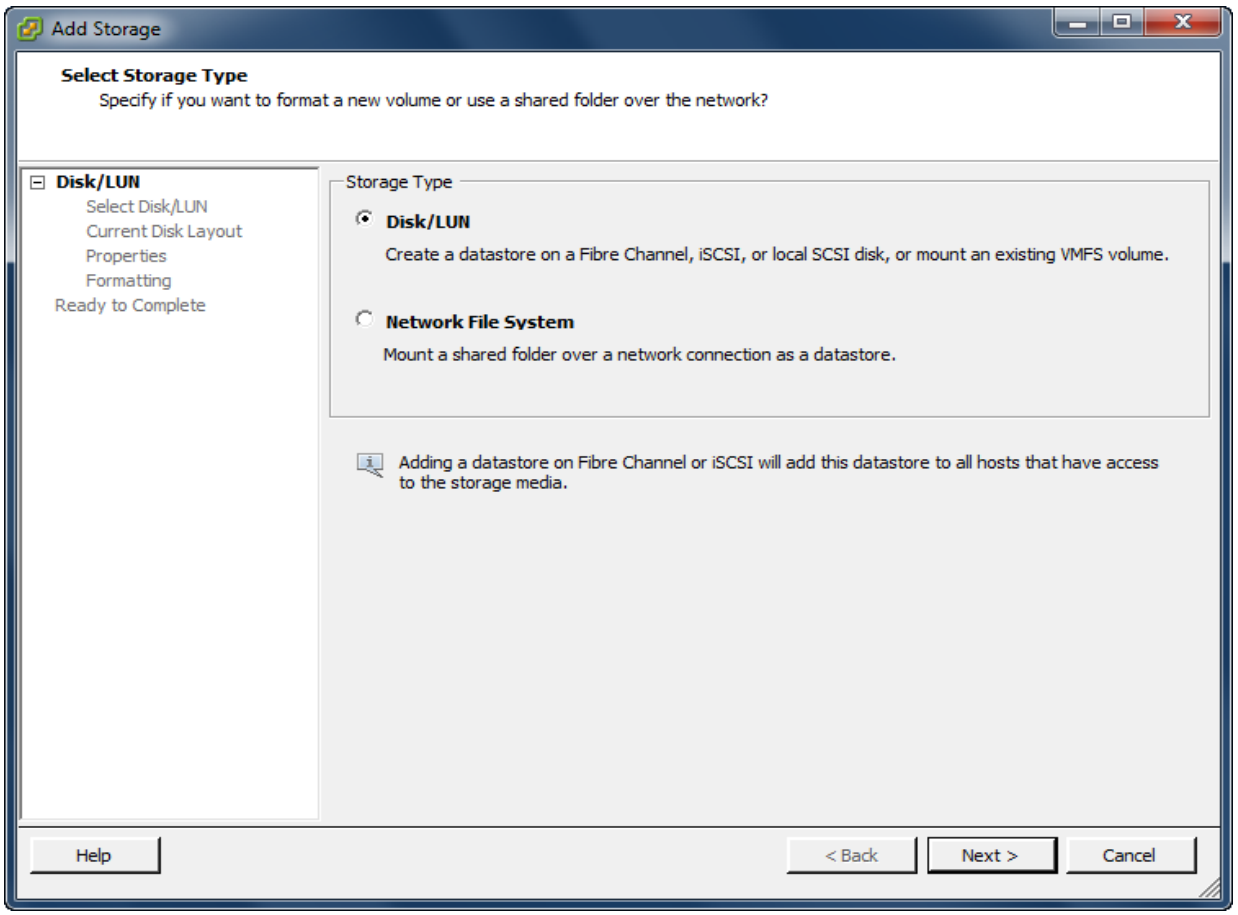
Please wait for a while, you will find an iSCSI device appears in the following interface:



Now, the iSCSI configuration is completed.

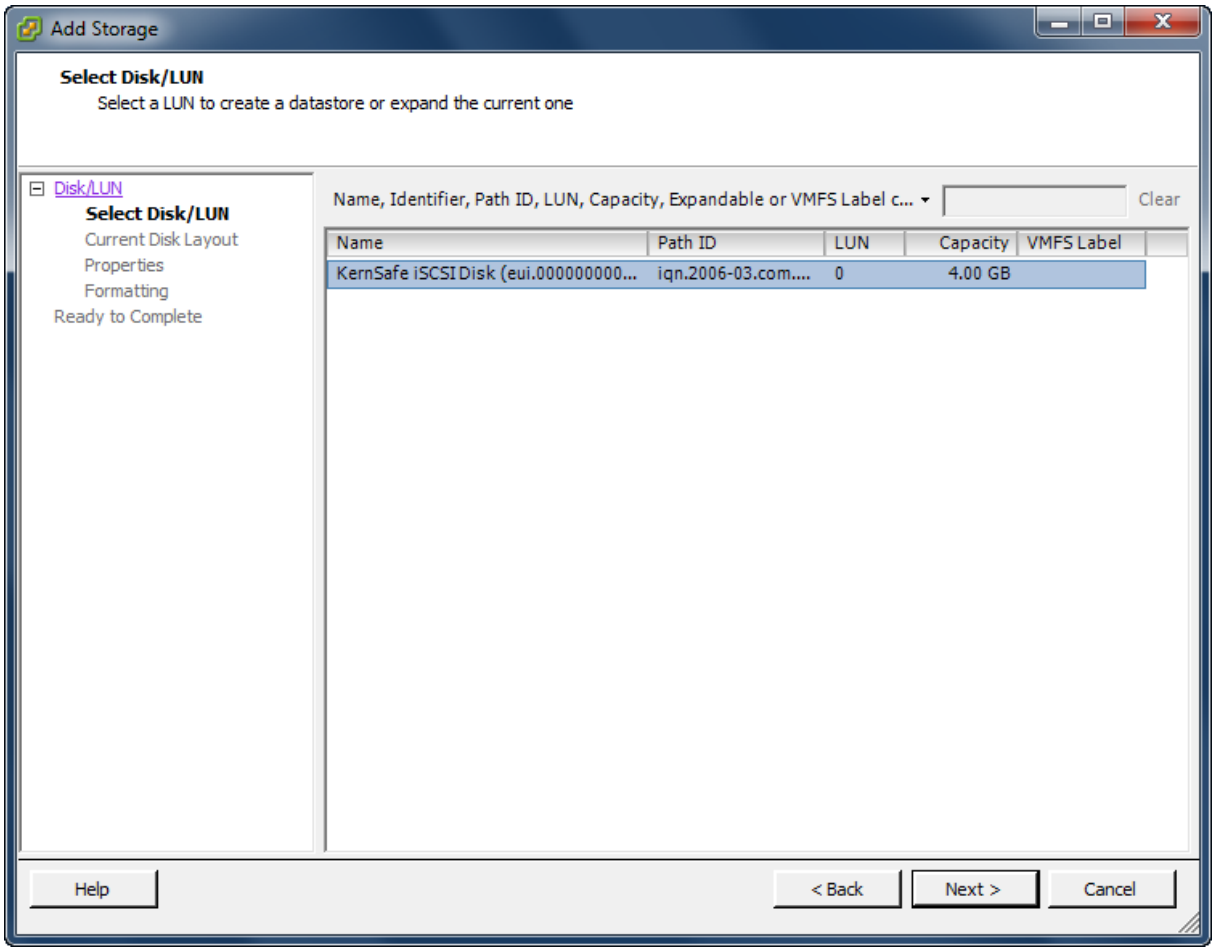
Configure Storage device

Click **Storage** link in the **Hardware** group.



Click **Add Storage** link, the **Add Storage Wizard** is shown.

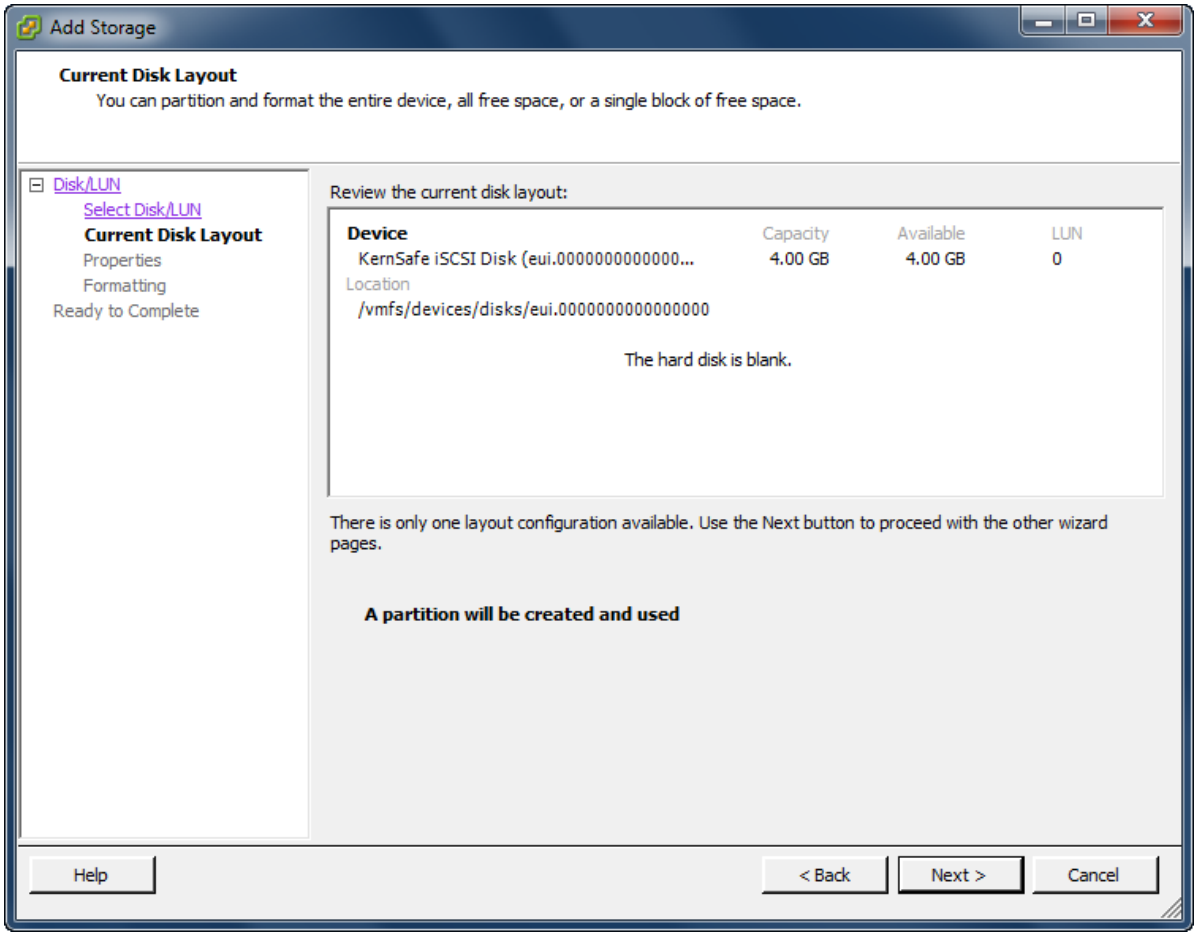
Select Disk/LUN



Select **KernSafe iSCSI Disk** device with the Identifier of **iqn.2006-03.com.kernsafe….**

Press the **Next** button to continue.

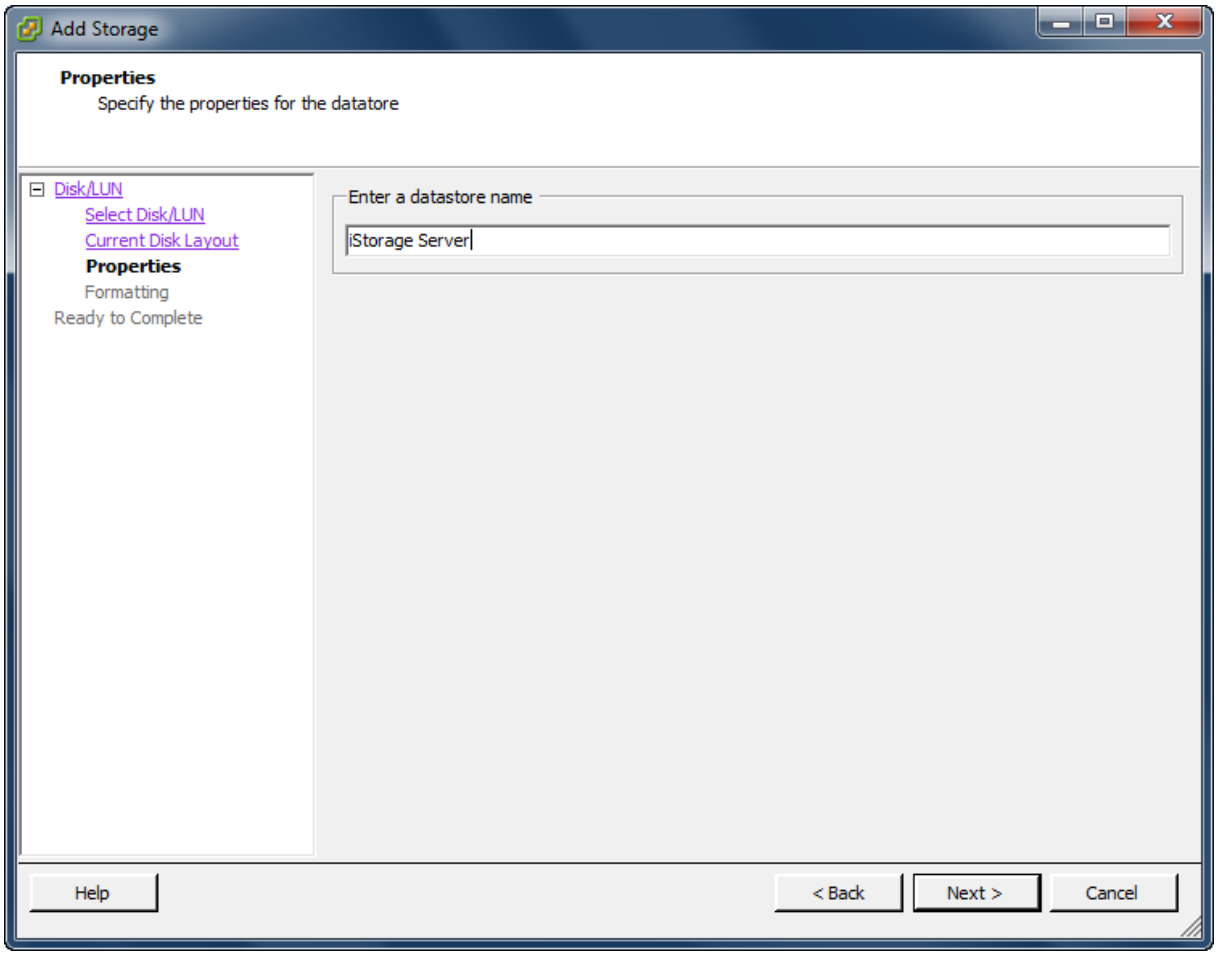
Partition and format the entire device.



Just use the default.

Press the **Next** button to continue.

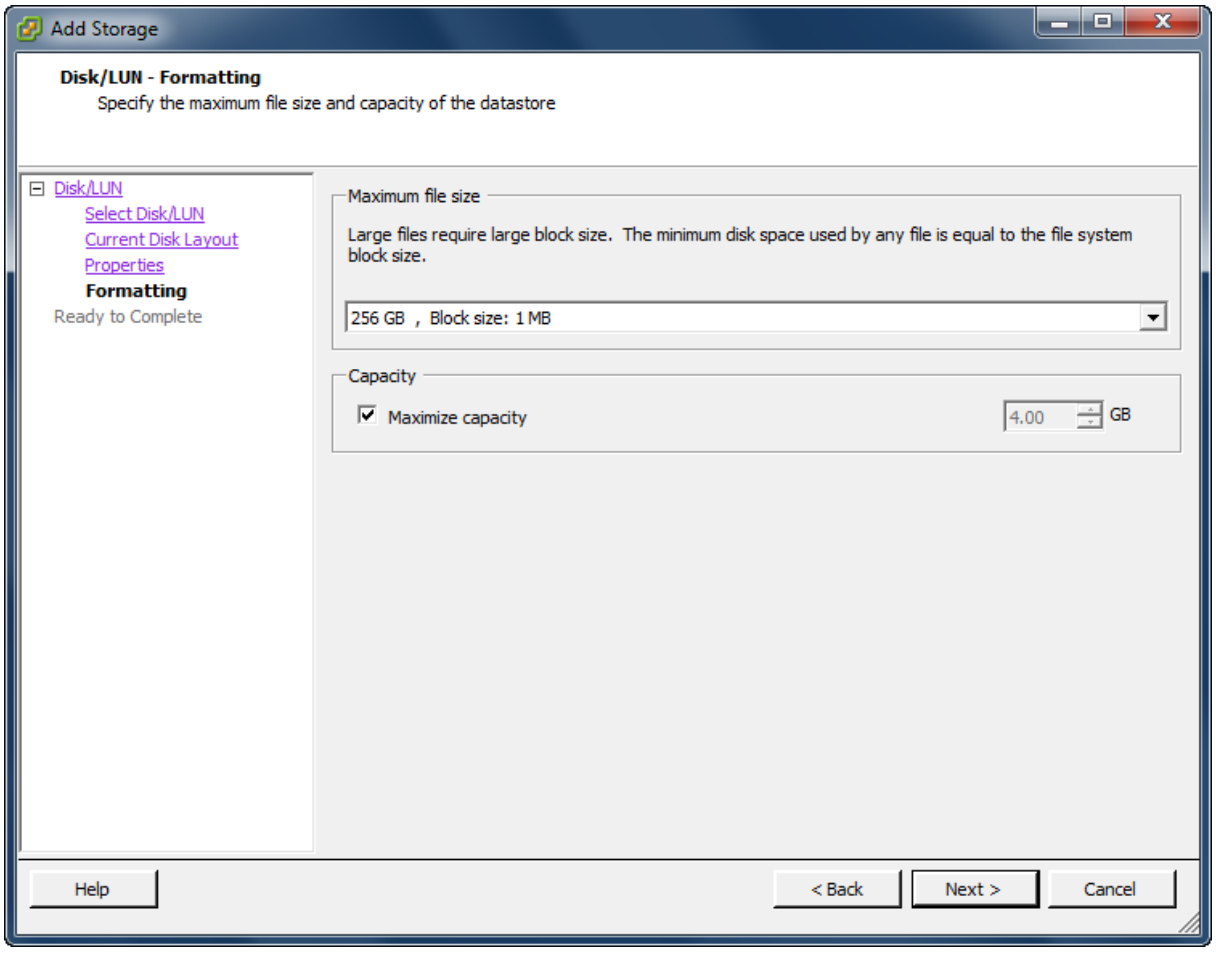
Type the data store name.



Type **iStorage Server** in the **Enter a datastore name**.

Press the **Next** button to continue.

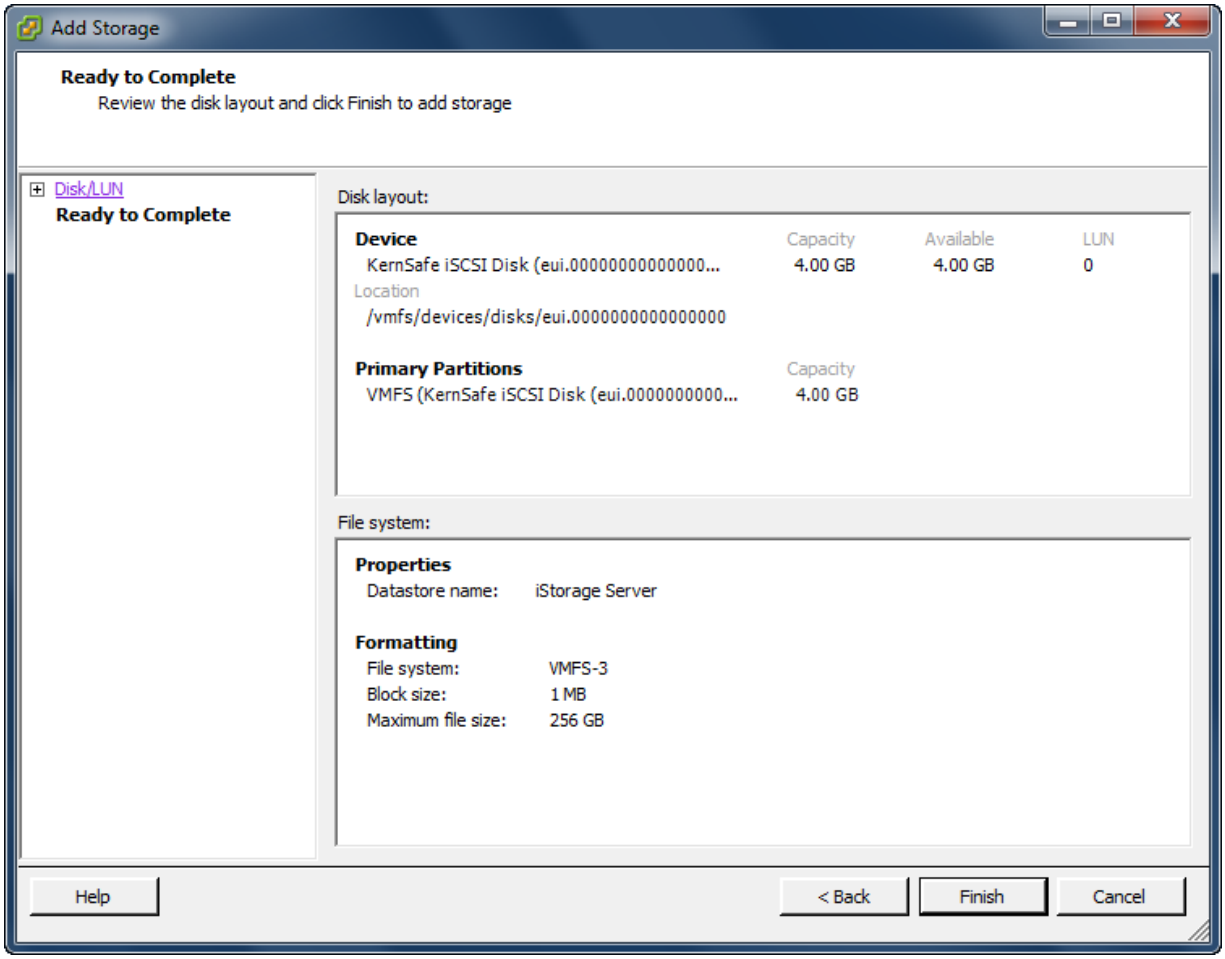
Format entire device



Leave the default recommend settings.

Press the **Next** button to continue.

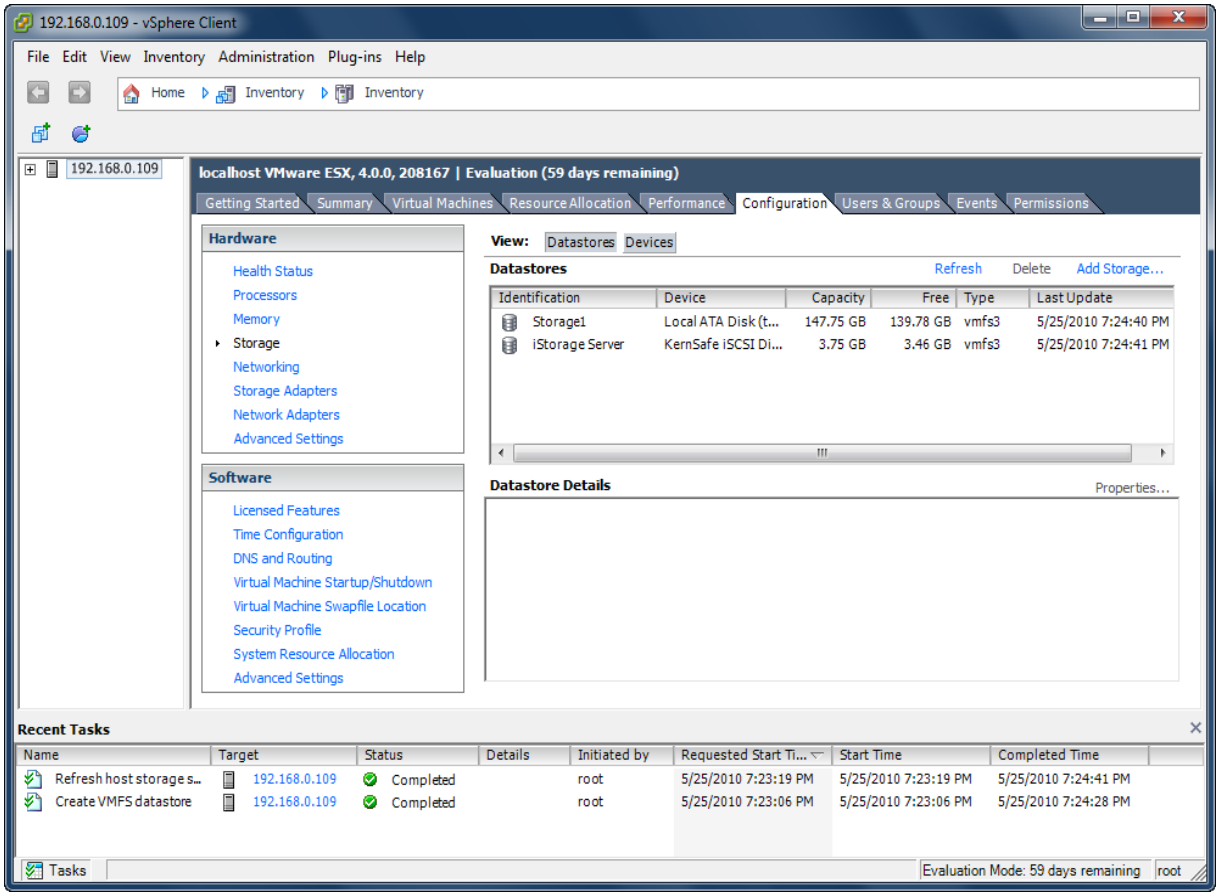
Complete data store creating



OK, now, the storage is going to be created, press the **Finish** button to finish the wizard.

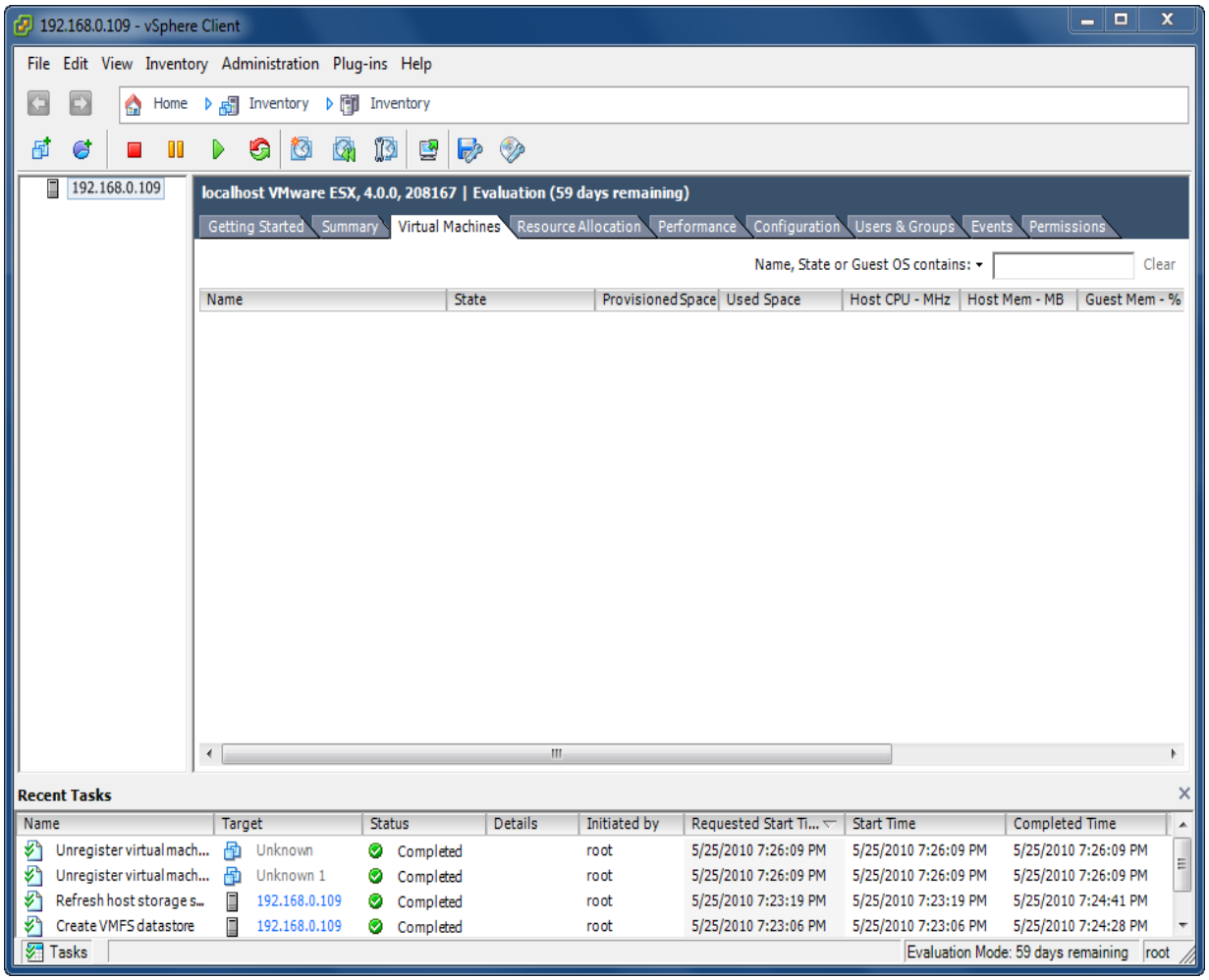
Press the **Yes** button in the following prompt dialog, so that the ESX Server formats the storage.

After this, you can see the storage device in the following interface.



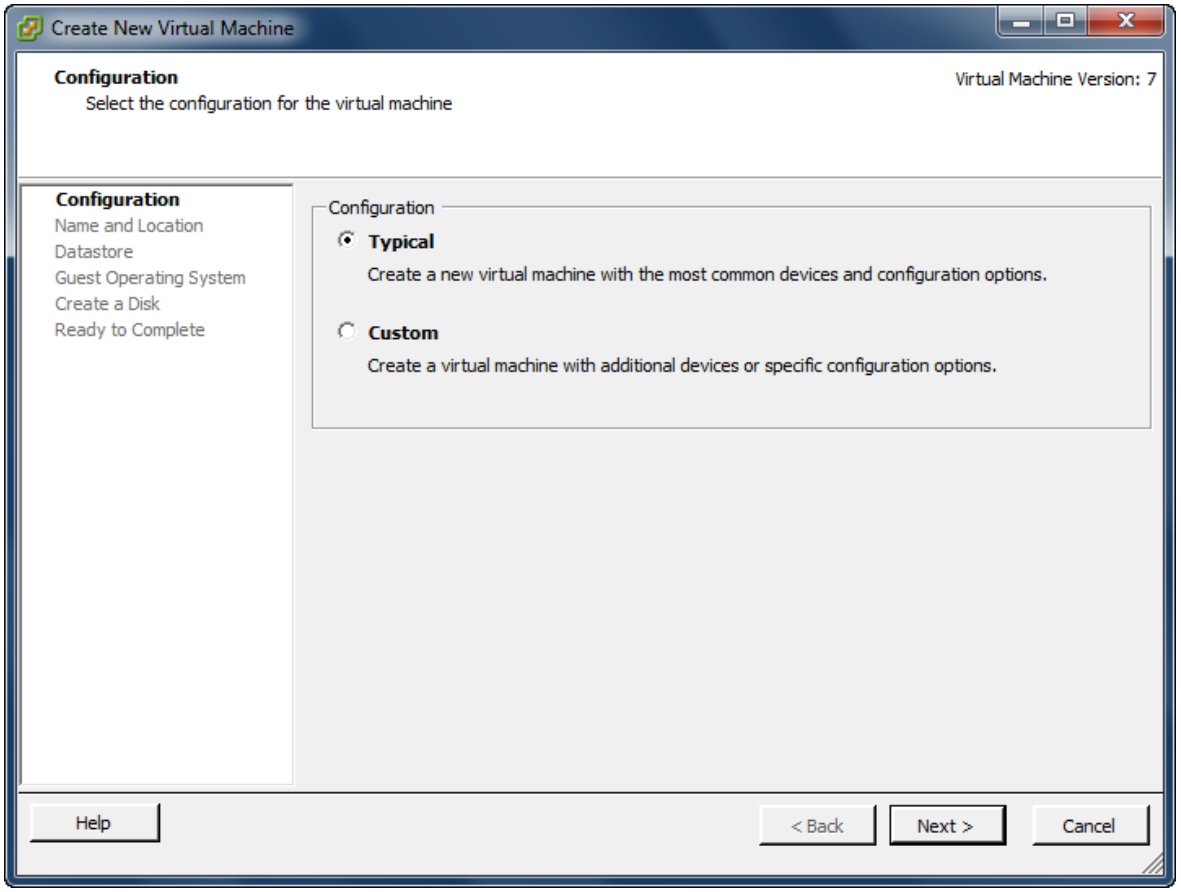
Now, we have the storage to store virtual machines, so next we will install virtual machine on it.

Manage and Install virtual machine



In the **Virtual Machine** tab page of VMware Infrastructure Client, right click on the black page, and then select **New Virtual Machine…,** the **New Virtual Machine Wizard** is shown.

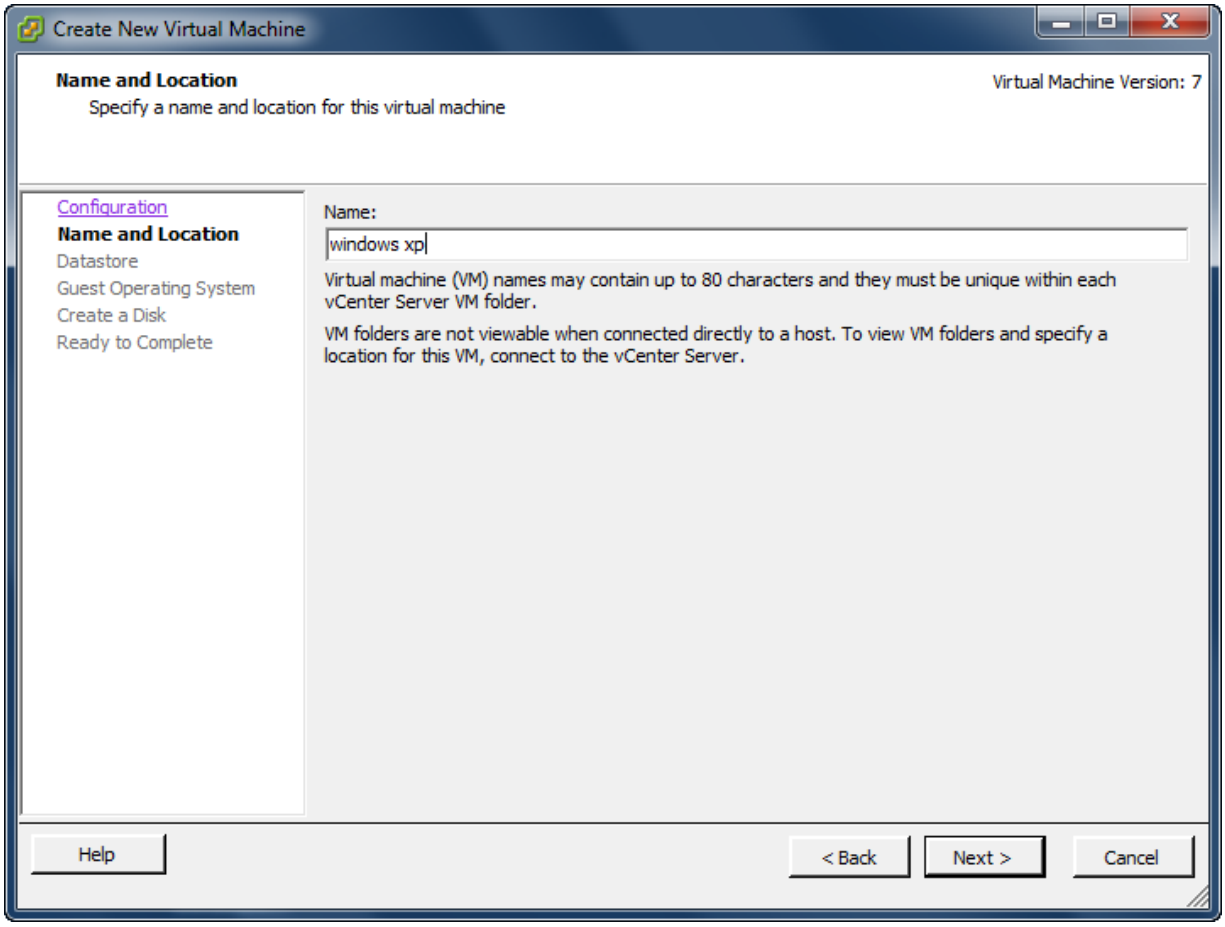
Select the appropriate configuration.



Select **Typical** option.

Press the **Next** button to continue.

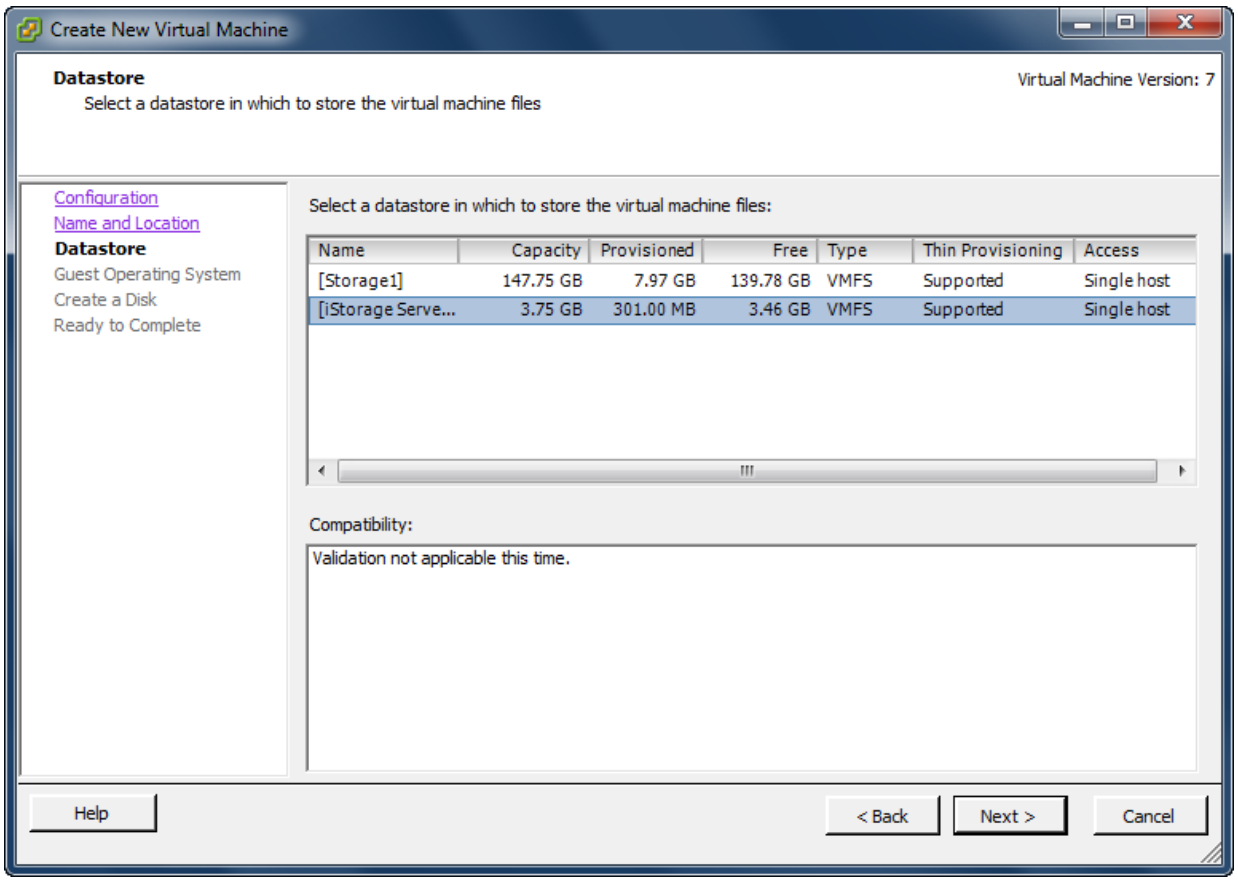
Type the virtual machine name.



Type in the virtual machine name, we take **windows xp** as an example.

Press the **Next** button to continue.

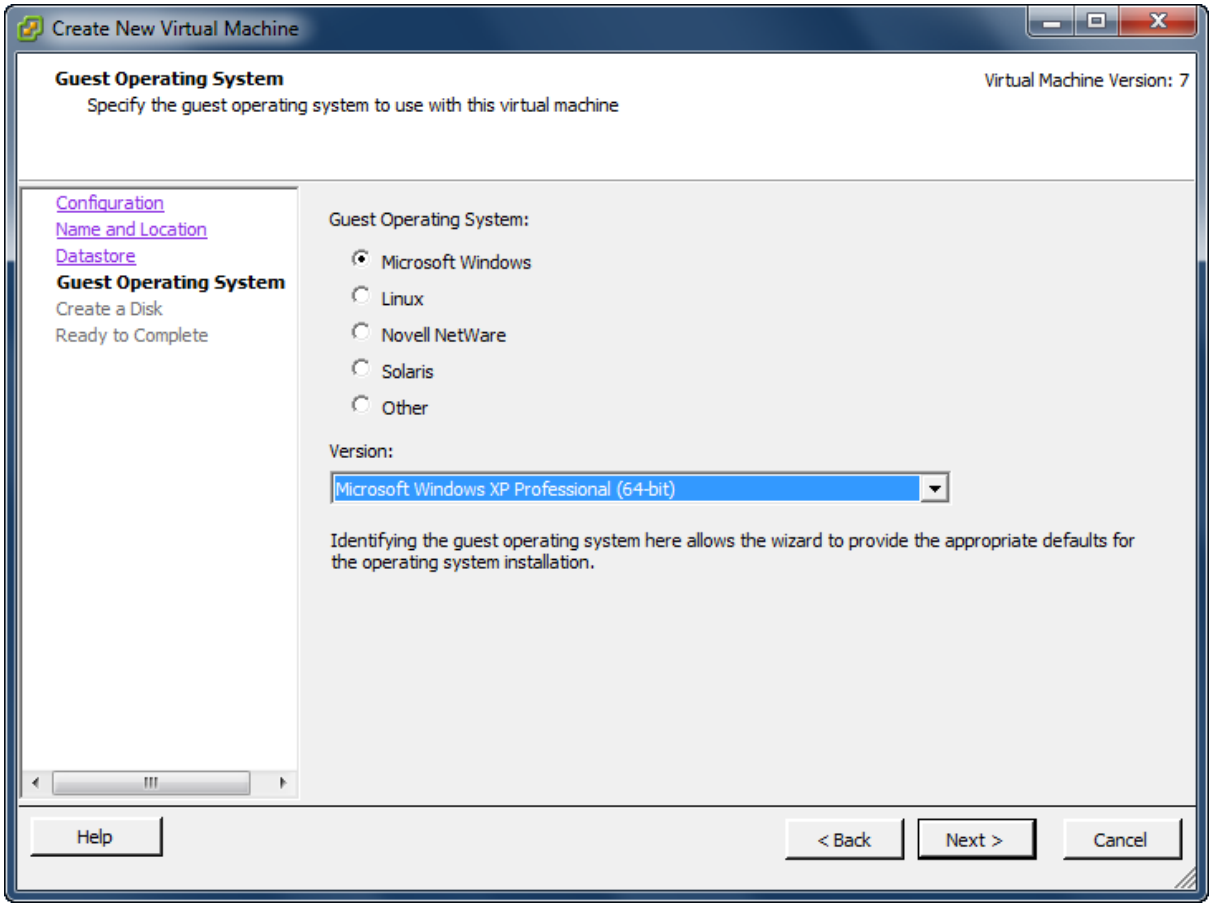
Choose a data store for storing files of the virtual machine.



Specify a data store to store the virtual machine, select **iStorage Server**.

Press the **Next** button to continue.

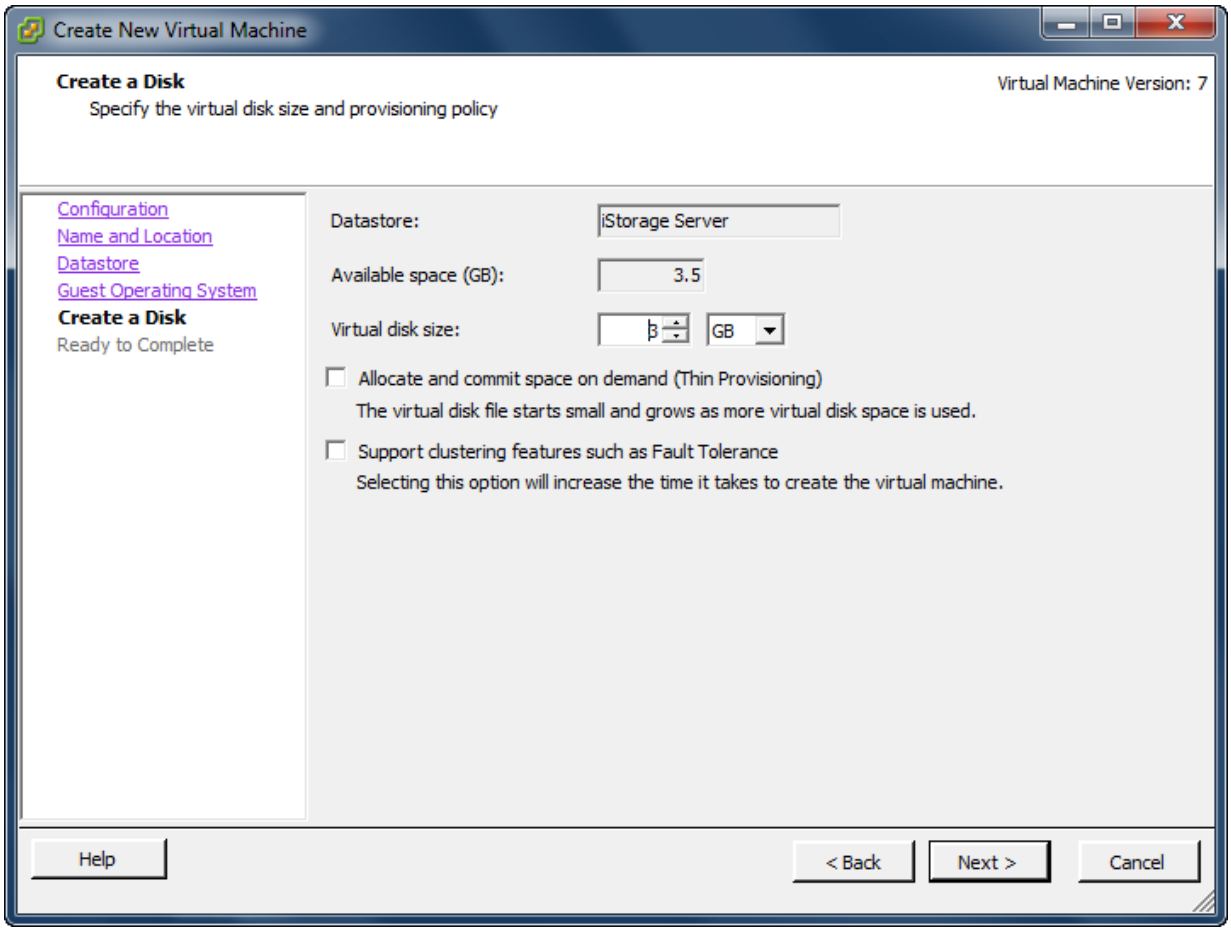
Choose the guest operation system.



Select operation system, we select **Microsoft Windows XP Professional (64-bit**) as an example.

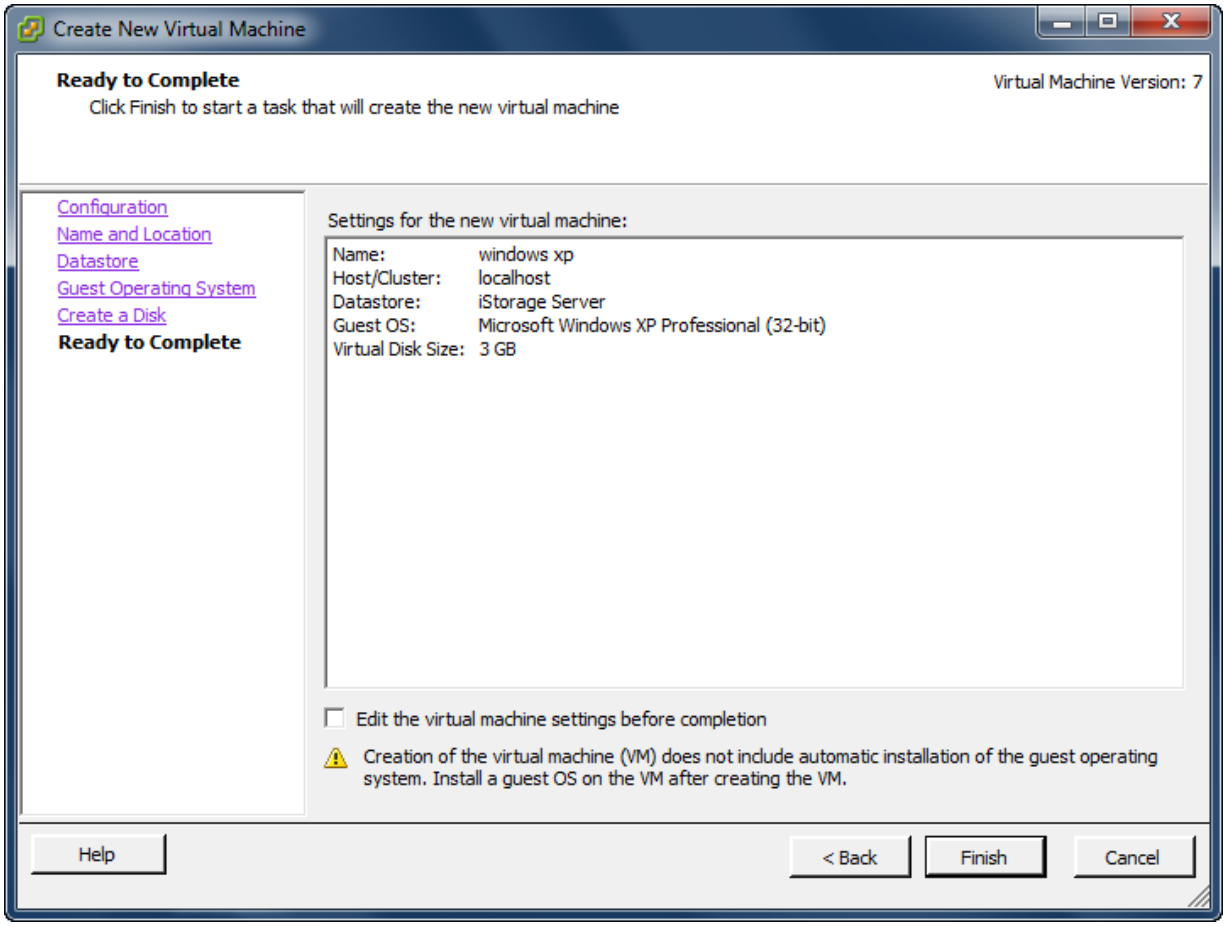
Press the **Next** button to continue.

Specify the size of virtual disk that will be used by the guest machine.

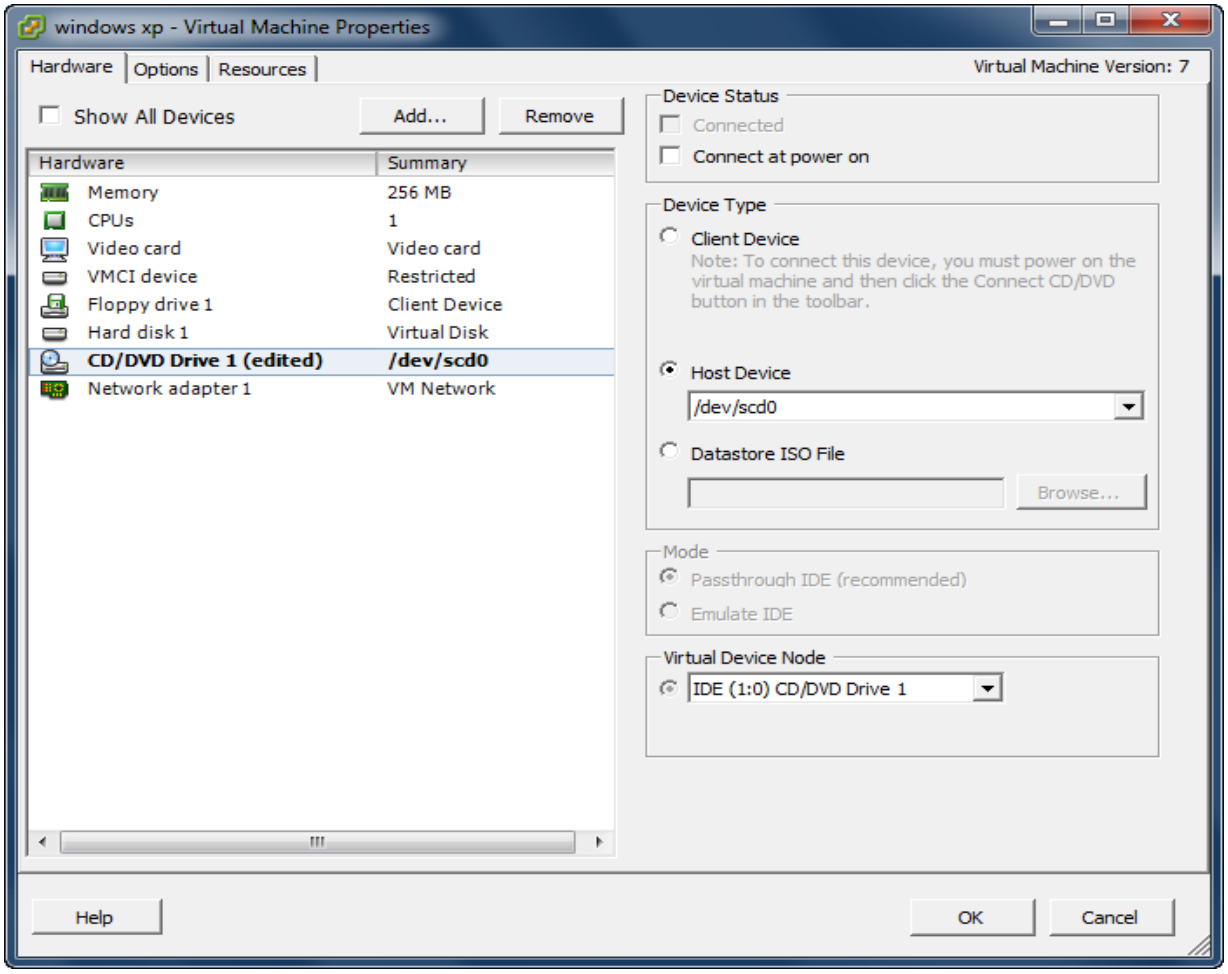


Press the **Next** button to continue.

Check if the parameters are correct and press the **Back** button if any changes are required.



Right click on the **Windows XP**, select **Edit Settings…** on the pop-up menu, the **Virtual Machine Properties** widow is shown. In this window, we click **CD/DVD Drive1 (edited)** link in the **Hardware** group and then select **Host Device** we will install OS form client computer.

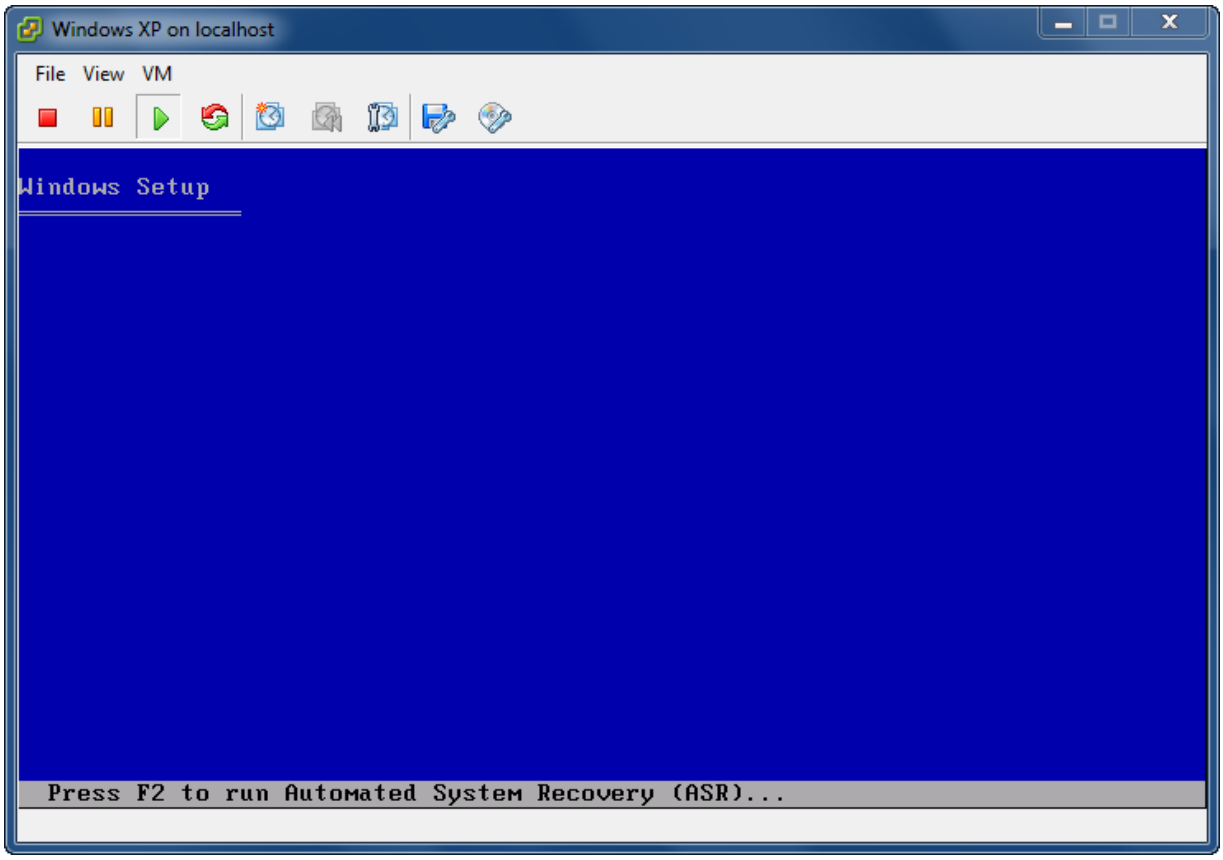


Choose the **Connect at power on** checkbox.

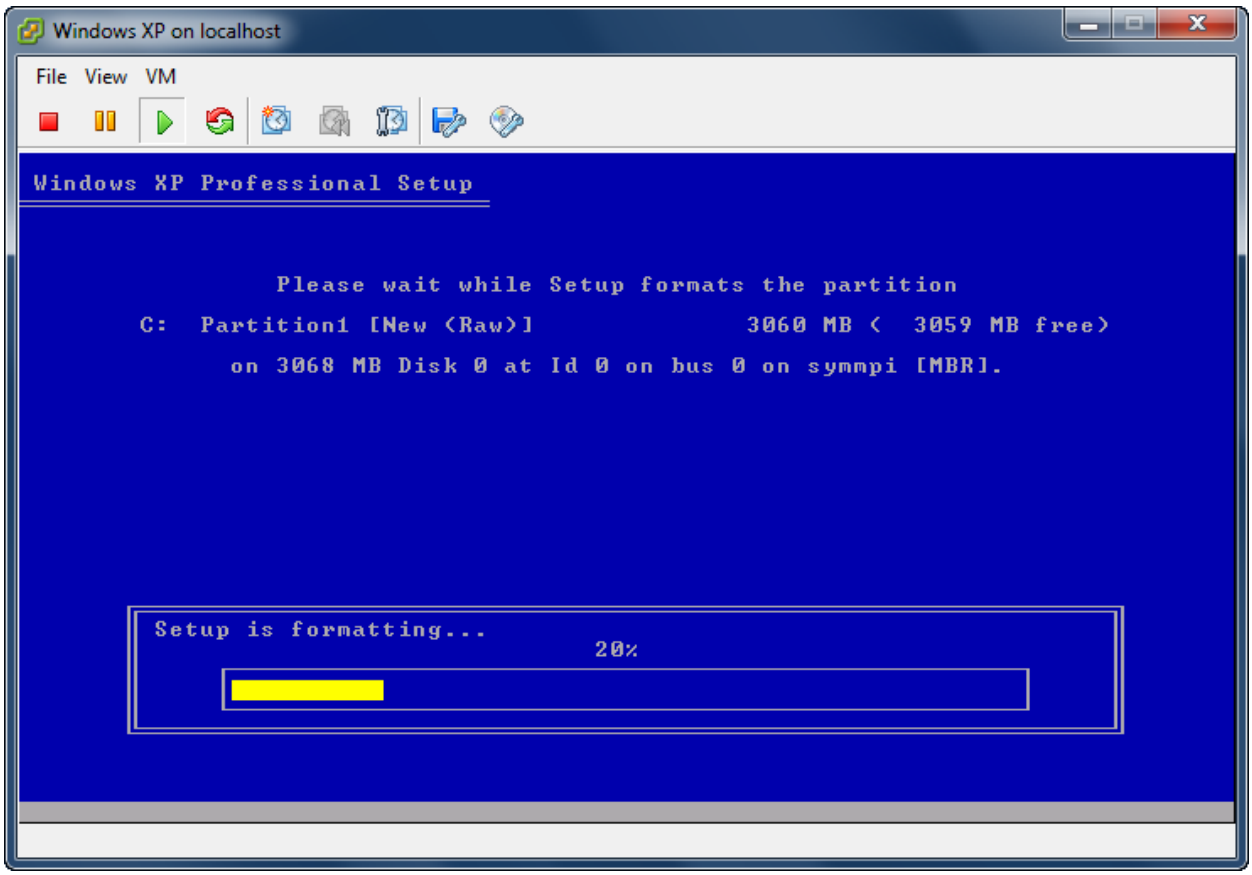
Press the **OK** button to continue.

Press the **Finish** button to complete creating of virtual machine.

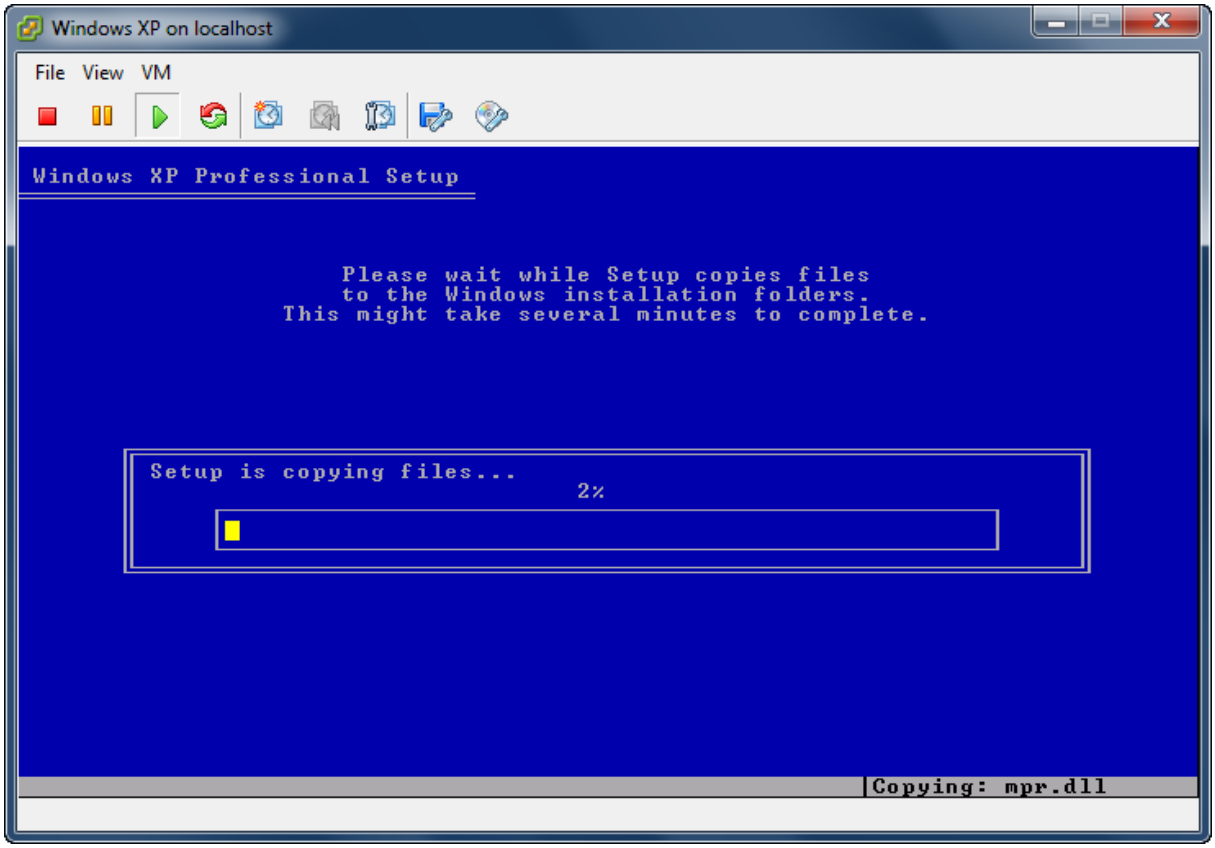
Insert windows XP installation CD, and then power on the virtual machine just created, you will see the windows XP installation interface:



Formats the partition C:


Windows XP on localhost
File View VM
Windows XP Professional Setup
Please wait while Setup formats the partition
C: Partition1 [New (Raw)] 3060 MB (3059 MB free)
on 3068 MB Disk 0 at Id 0 on bus 0 on symmpi [MBR].
Setup is formatting...
20%

Copy files



Continue windows install

Likewise, you may install Windows Server 2003, Vista, Windows Server 2008 and Windows 7 or even any version of Linux as you wish.

Contact

Support:	support@kernsafe.com
Sales:	sales@kernsafe.com
Marketing:	marketing@kernsafe.com
Home Page:	http://www.kernsafe.com
Product Page:	http://www.kernsafe.com/product/istorage-server.aspx
Licenses	http://www.kernsafe.com/product/istorage-server/license-compares.aspx
Forum:	http://www.kernsafe.com/forum

KernSafe Technologies, Inc.

www.kernsafe.com