

# StarWind iSCSI SAN Software: Using StarWind with VMware ESX Server



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If you have questions about installing or using this software, check this and other documents first - you will find answers to most of your questions here or there. If you need further assistance, please contact us.

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## Guide

### Introduction

Virtualized hardware reduces the TCO for many applications. Using StarWind iSCSI Target for Windows will further enhance these virtualized resources.

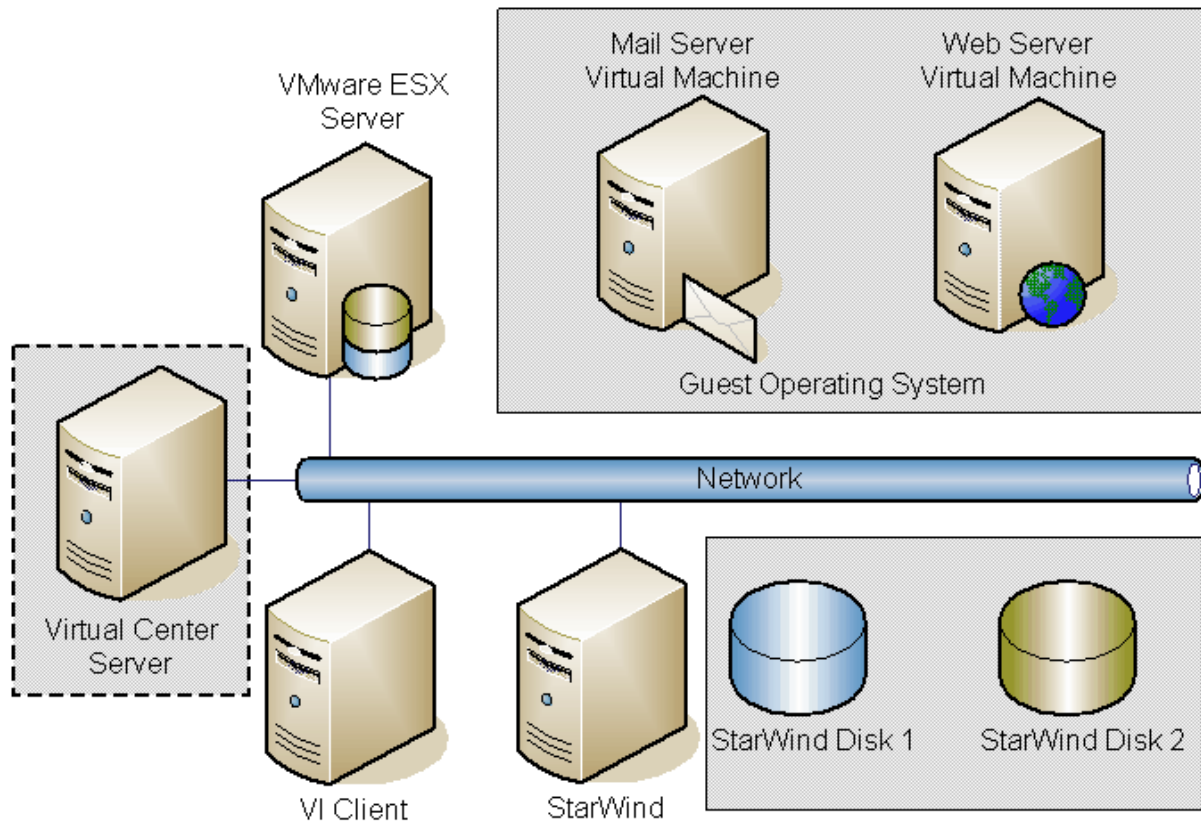


Figure 1. Virtual Machines stored on StarWind Disks

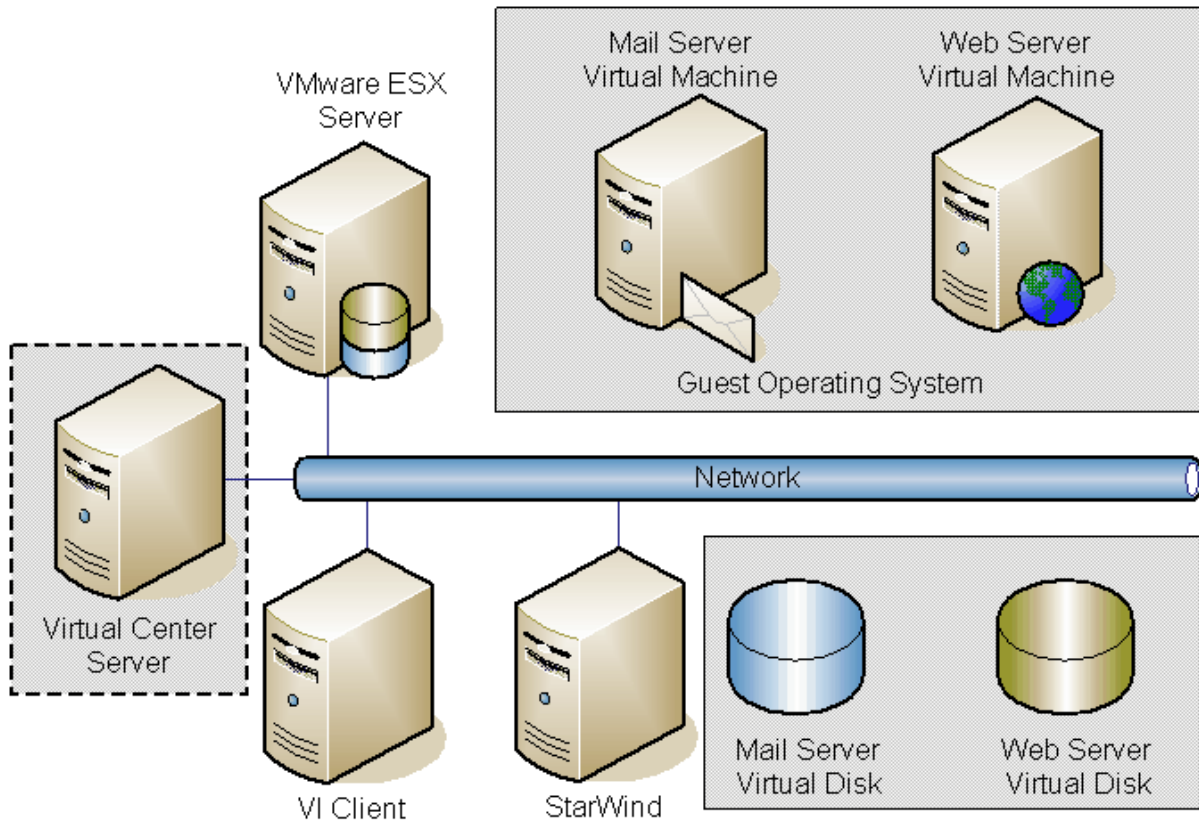


Figure 2. StarWind providing iSCSI Storage to Virtual Machines

## Installing ESX Server

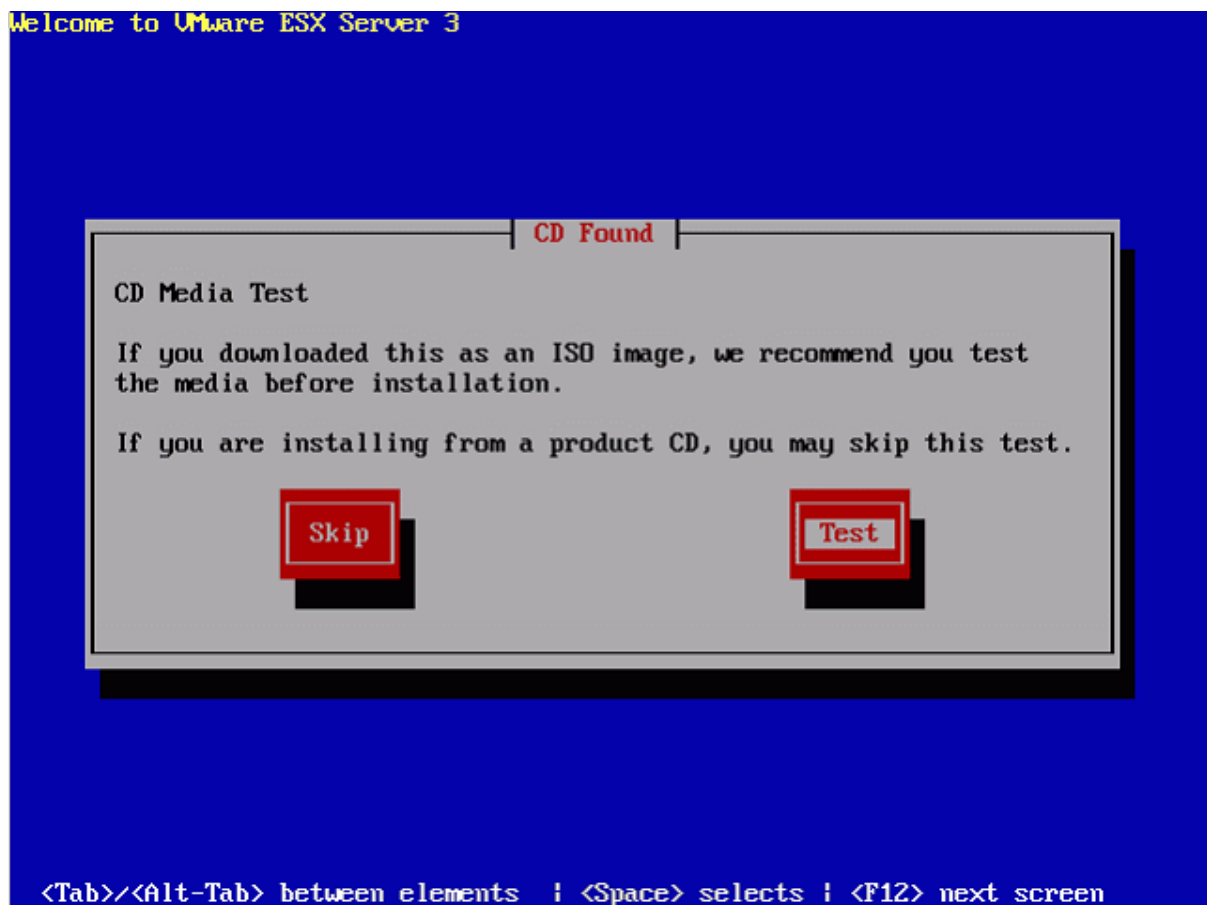
This section provides a brief introduction to installation of VMware's ESX Server. Please note that this does not replace installation instructions provided by VMware and are provided as a guide to using StarWind for Windows with ESX Server.

ESX Server must first be installed on to a suitable machine that will be used to create the virtual environment. Obtain the media from VMware; install it on to the host machine booting the machine with the CD or DVD media. Follow the instructions on the installation wizard to complete the process.



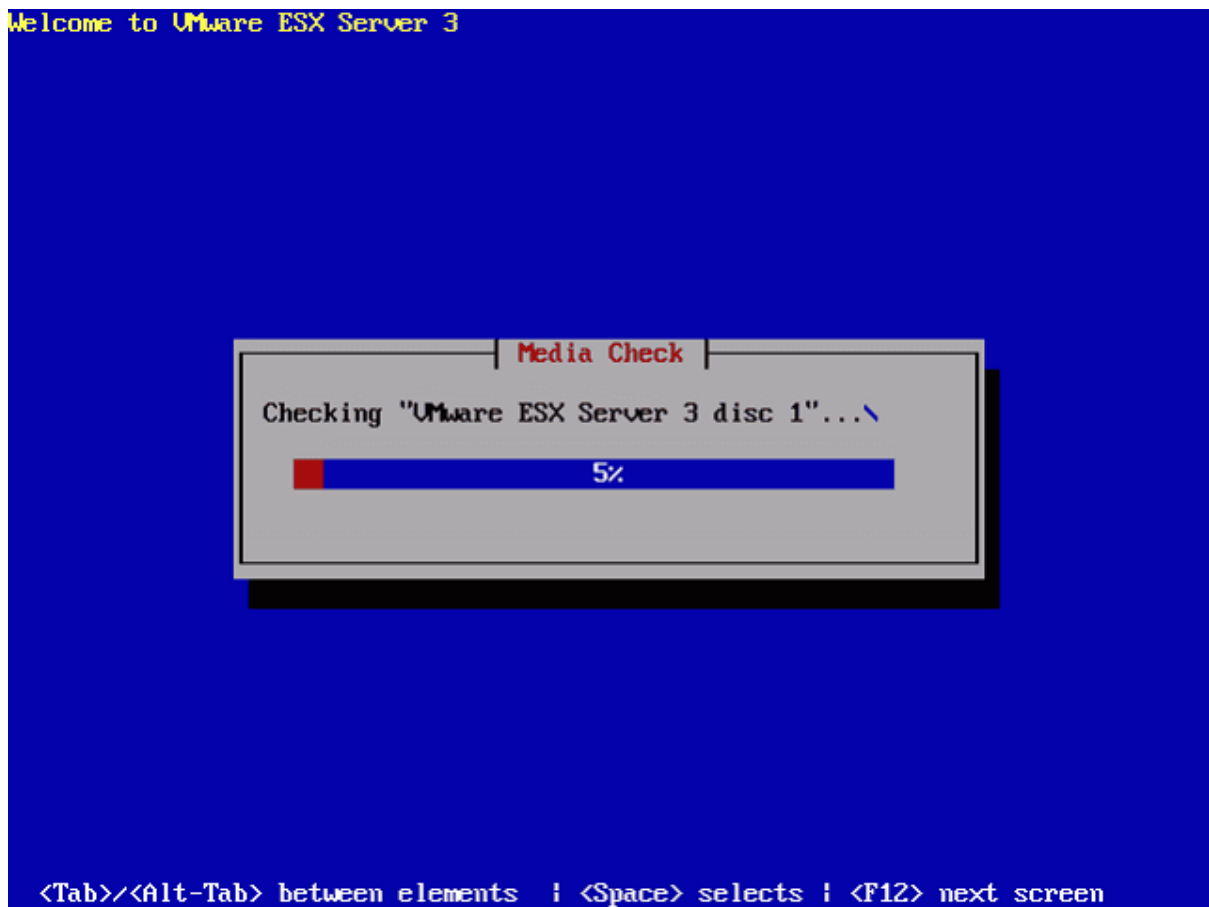
Hit **Enter** to start installation.

CD Found dialog appears.



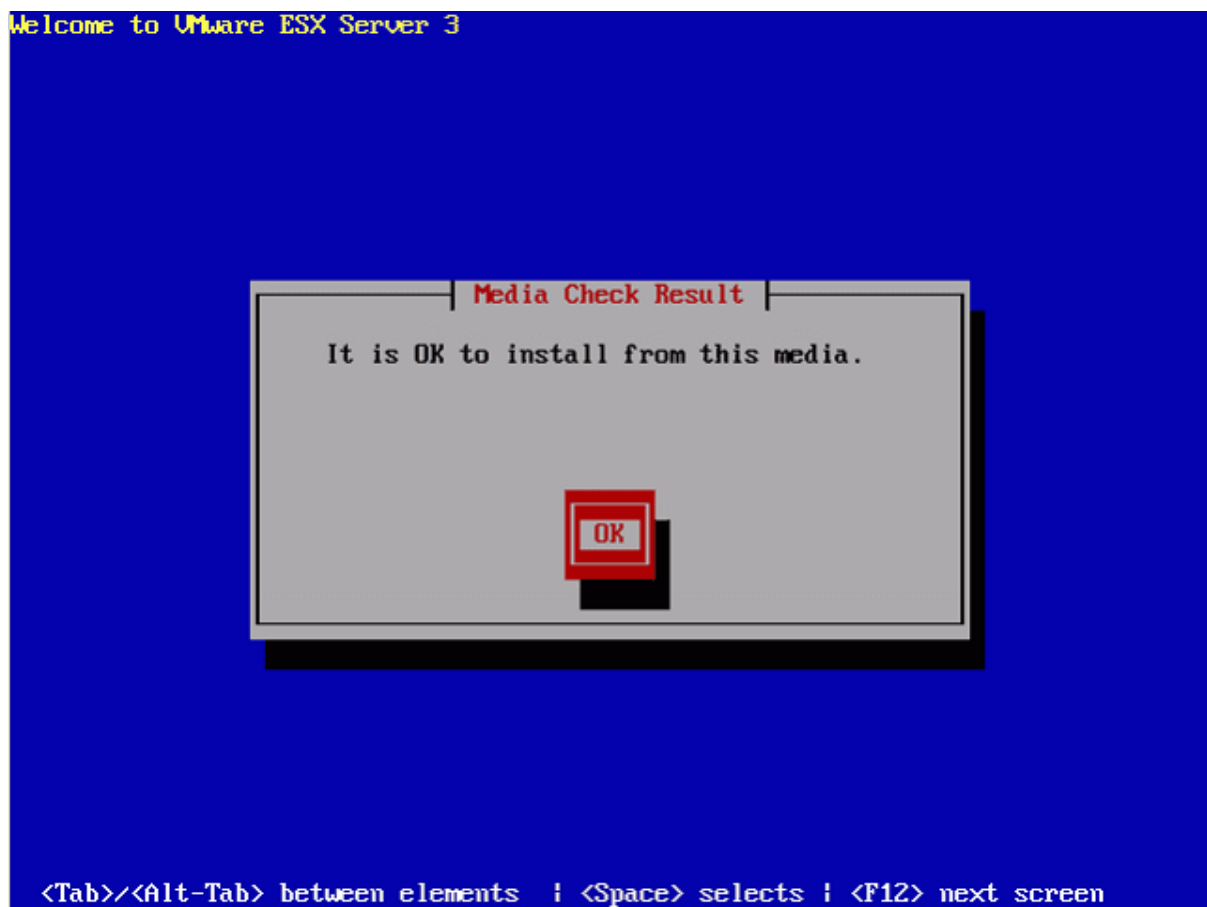
Press the **Test** button to start media test or **Skip** button to skip this test.

The progress of the Media test is shown.



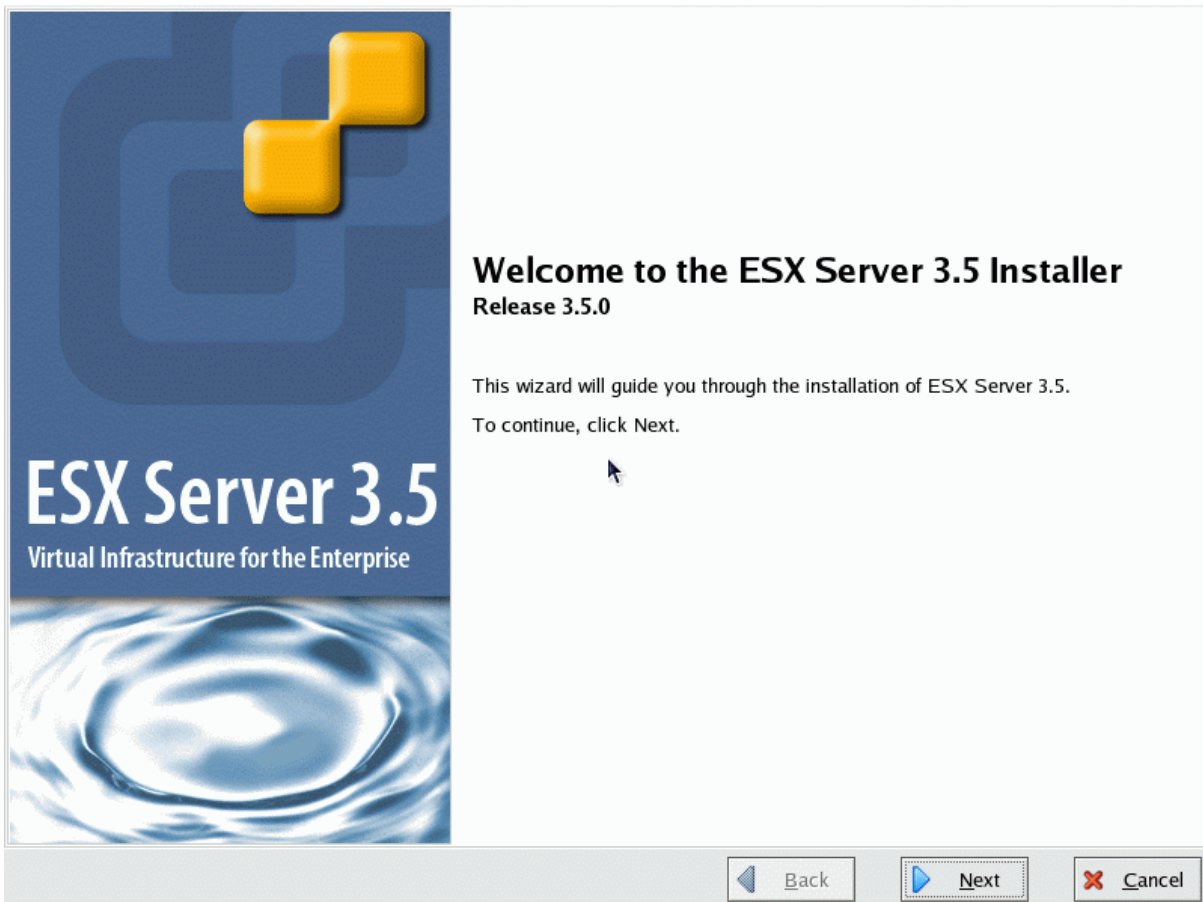


Media Check Result dialog appears.



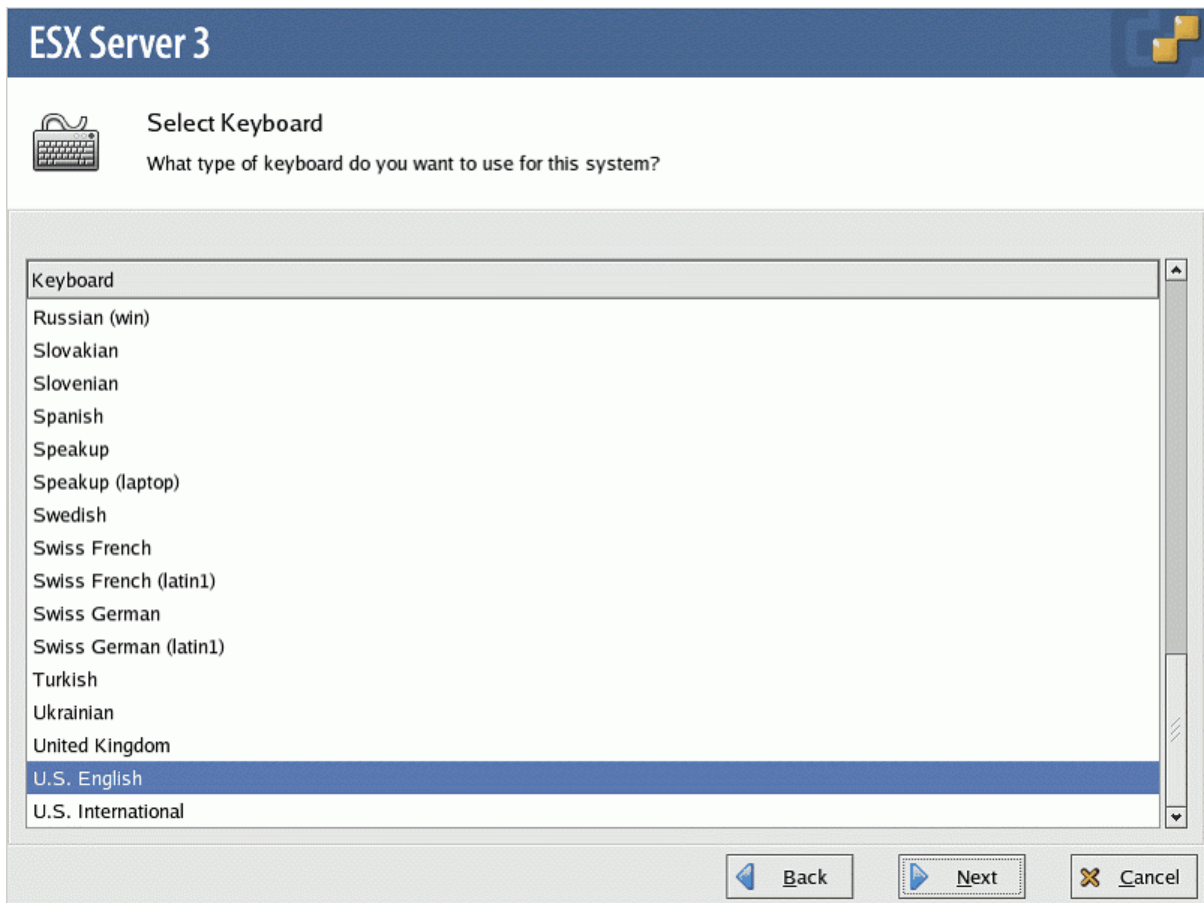
Press the **OK** button to continue.

The ESX Server 3 Installer Wizard will be shown.



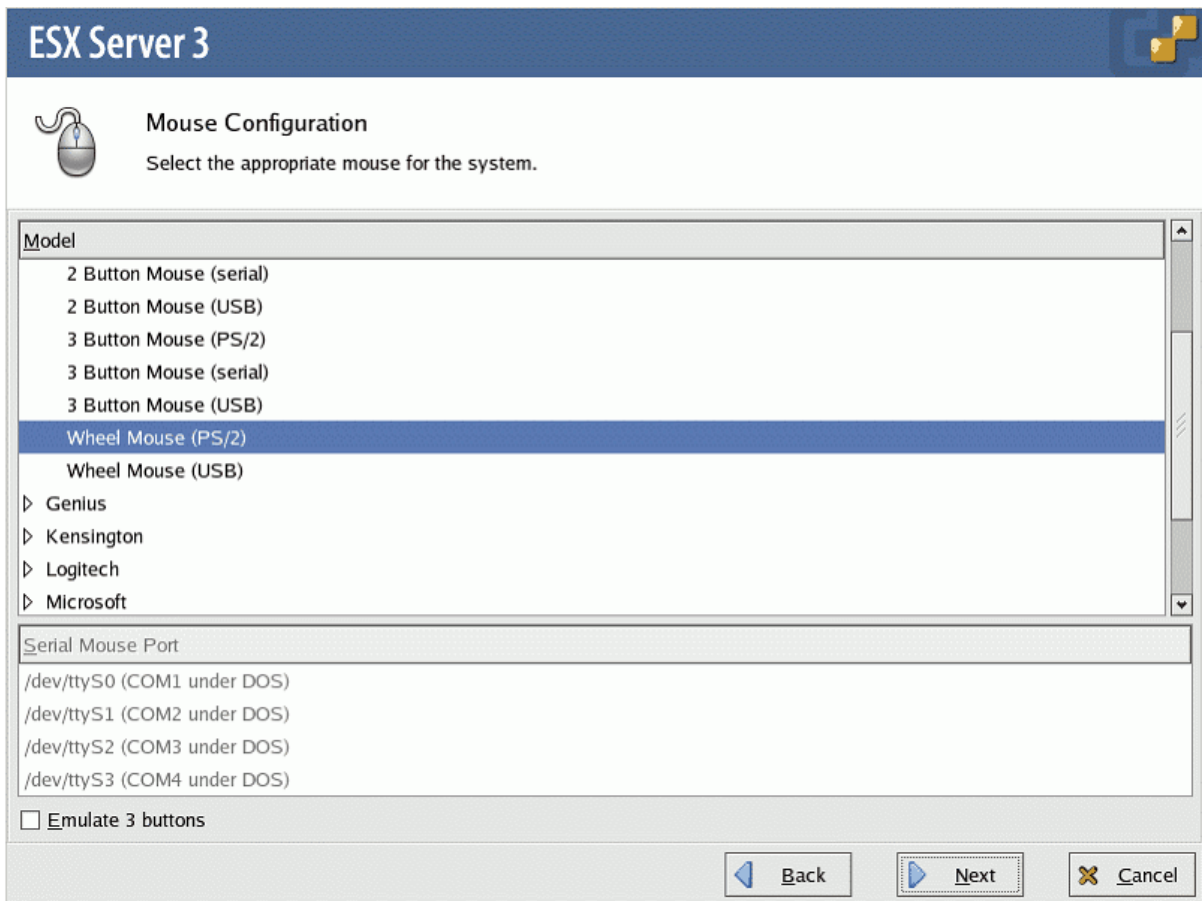
Press the **Next** button to continue.

Select the appropriate keyboard.



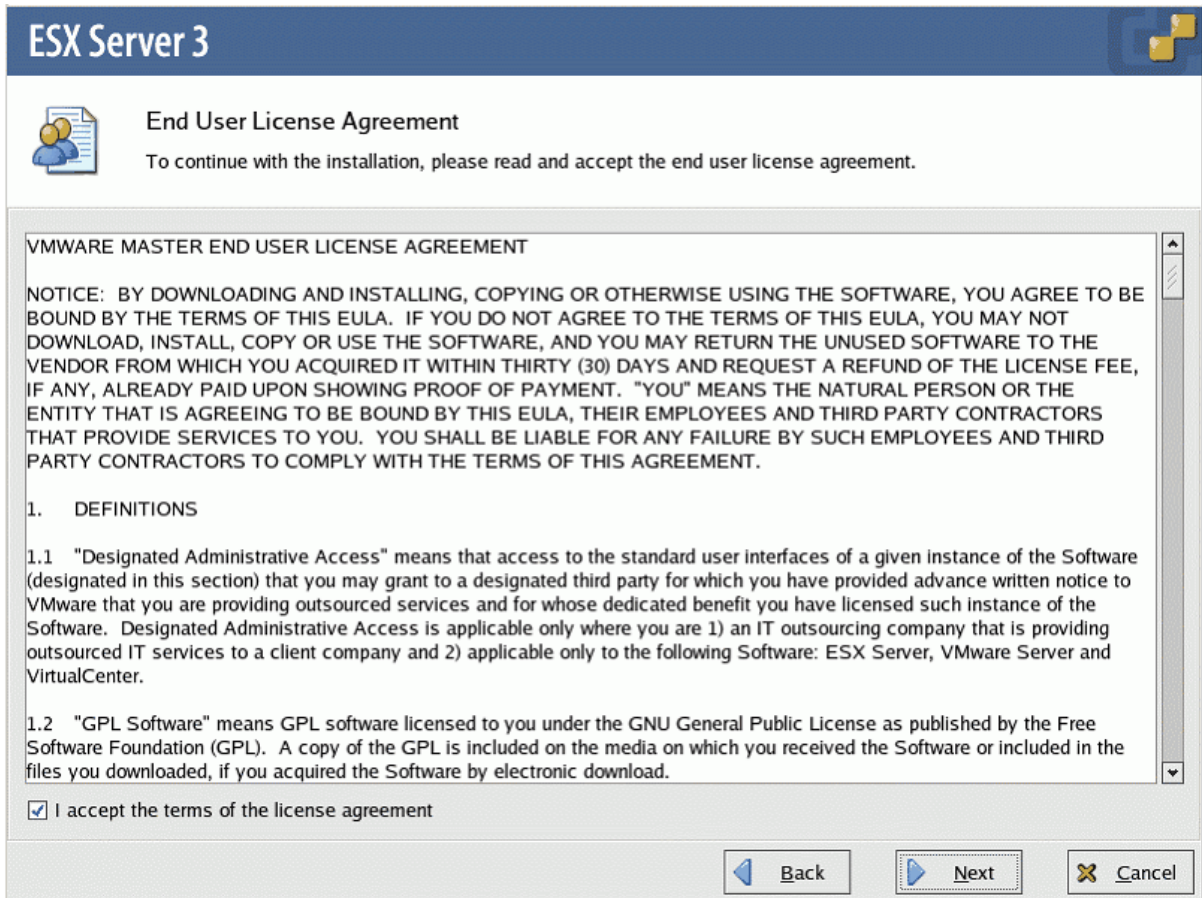
Press the **Next** button to continue.

Select the appropriate mouse type.



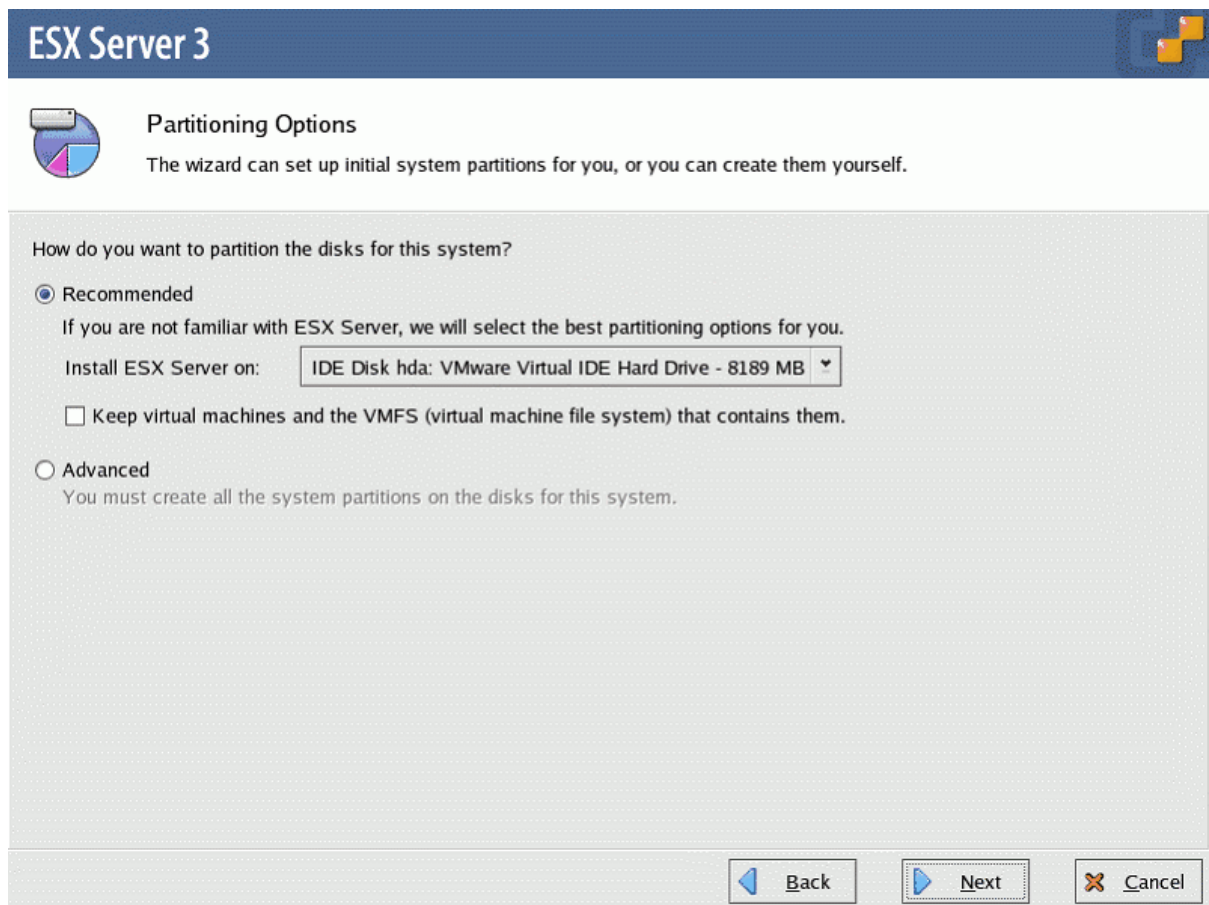
Press the **Next** button to continue.

End User License Agreement dialog appears.



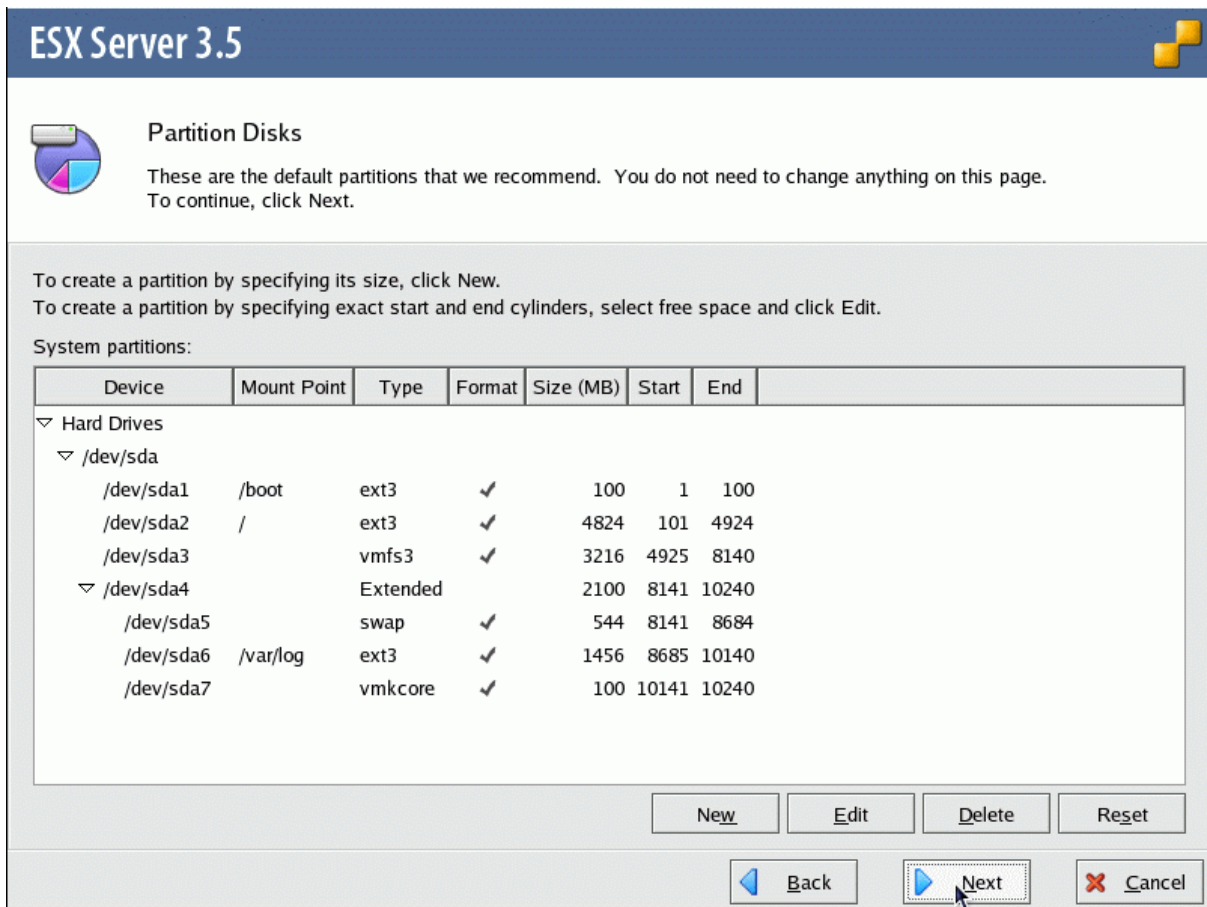
Accept the terms of the license agreement and press the **Next** button to continue the installation.

Set Partitioning options.



Press the **Next** button to continue.

Optionally you can edit the default partitioning settings.



The screenshot shows the 'Partition Disks' configuration window in ESX Server 3.5. The window title is 'ESX Server 3.5' and the subtitle is 'Partition Disks'. A pie chart icon is next to the subtitle. The text below the subtitle reads: 'These are the default partitions that we recommend. You do not need to change anything on this page. To continue, click Next.'

Below this text, there are instructions: 'To create a partition by specifying its size, click New.' and 'To create a partition by specifying exact start and end cylinders, select free space and click Edit.'

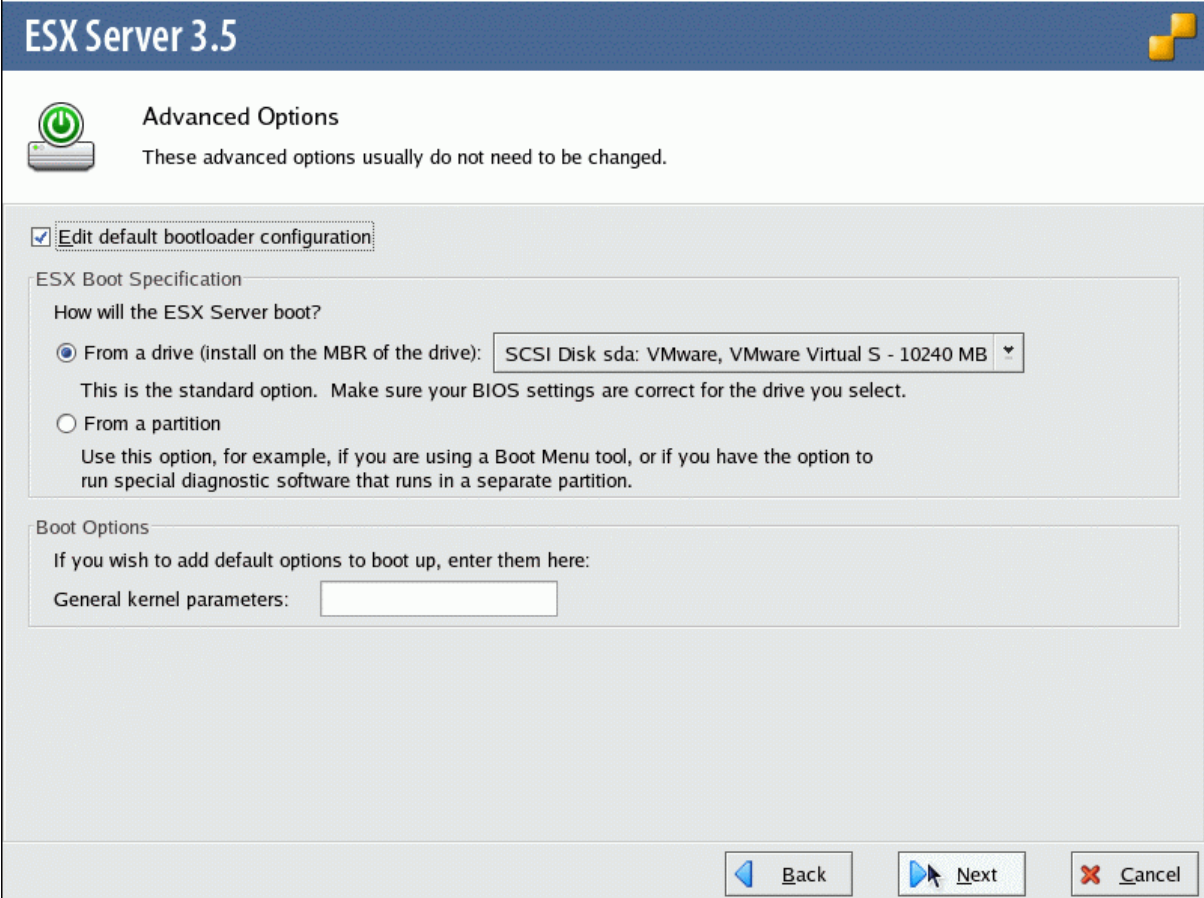
The main area is titled 'System partitions:' and contains a table with the following columns: Device, Mount Point, Type, Format, Size (MB), Start, and End. The table lists several partitions under the 'Hard Drives' section, specifically under '/dev/sda'.

Device	Mount Point	Type	Format	Size (MB)	Start	End
▼ Hard Drives						
▼ /dev/sda						
/dev/sda1	/boot	ext3	✓	100	1	100
/dev/sda2	/	ext3	✓	4824	101	4924
/dev/sda3		vmfs3	✓	3216	4925	8140
▼ /dev/sda4						
		Extended		2100	8141	10240
/dev/sda5		swap	✓	544	8141	8684
/dev/sda6	/var/log	ext3	✓	1456	8685	10140
/dev/sda7		vmkcore	✓	100	10141	10240

At the bottom of the window, there are several buttons: 'New', 'Edit', 'Delete', 'Reset', 'Back', 'Next', and 'Cancel'. The 'Next' button is highlighted with a mouse cursor.

Press the **Next** button to continue.

Specify the boot options.

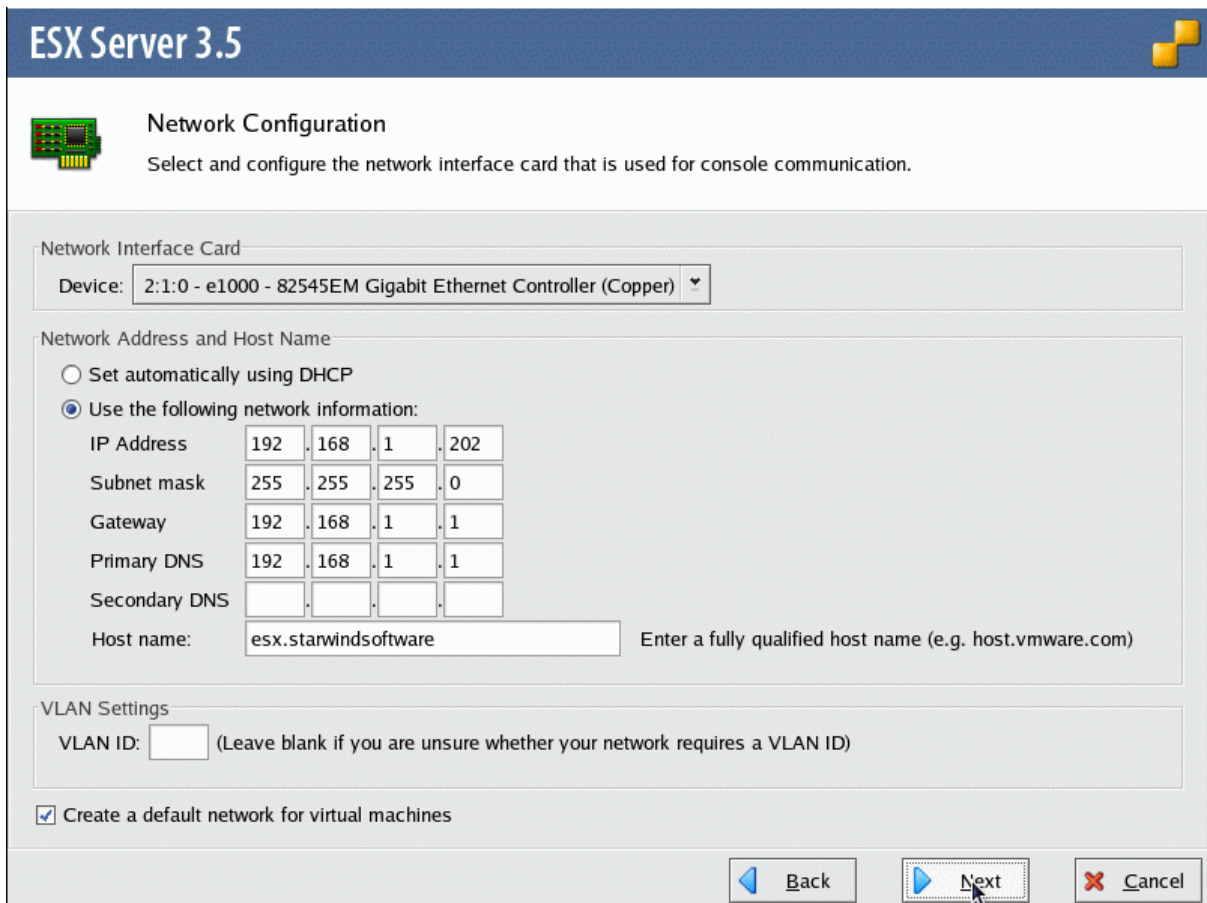


The screenshot shows the 'Advanced Options' dialog box for ESX Server 3.5. The title bar reads 'ESX Server 3.5'. Below the title bar, there is a green power icon and the text 'Advanced Options' followed by 'These advanced options usually do not need to be changed.' A checkbox labeled 'Edit default bootloader configuration' is checked. Under the heading 'ESX Boot Specification', the question 'How will the ESX Server boot?' is followed by two radio button options. The first option, 'From a drive (install on the MBR of the drive):', is selected and has a dropdown menu showing 'SCSI Disk sda: VMware, VMware Virtual S - 10240 MB'. Below this is the text 'This is the standard option. Make sure your BIOS settings are correct for the drive you select.' The second option is 'From a partition', with the text 'Use this option, for example, if you are using a Boot Menu tool, or if you have the option to run special diagnostic software that runs in a separate partition.' Under the heading 'Boot Options', the text 'If you wish to add default options to boot up, enter them here:' is followed by a text input field labeled 'General kernel parameters:'. At the bottom of the dialog are three buttons: 'Back', 'Next', and 'Cancel'.

Press the **Next** button to continue.



On the Network Configuration dialog, specify the network options.



**ESX Server 3.5**

**Network Configuration**  
Select and configure the network interface card that is used for console communication.

Network Interface Card  
Device: 2:1:0 - e1000 - 82545EM Gigabit Ethernet Controller (Copper)

Network Address and Host Name  
 Set automatically using DHCP  
 Use the following network information:

IP Address	192	168	1	202
Subnet mask	255	255	255	0
Gateway	192	168	1	1
Primary DNS	192	168	1	1
Secondary DNS				

Host name: esx.starwindsoftware Enter a fully qualified host name (e.g. host.vmware.com)

VLAN Settings  
VLAN ID: (Leave blank if you are unsure whether your network requires a VLAN ID)

Create a default network for virtual machines

Back Next Cancel

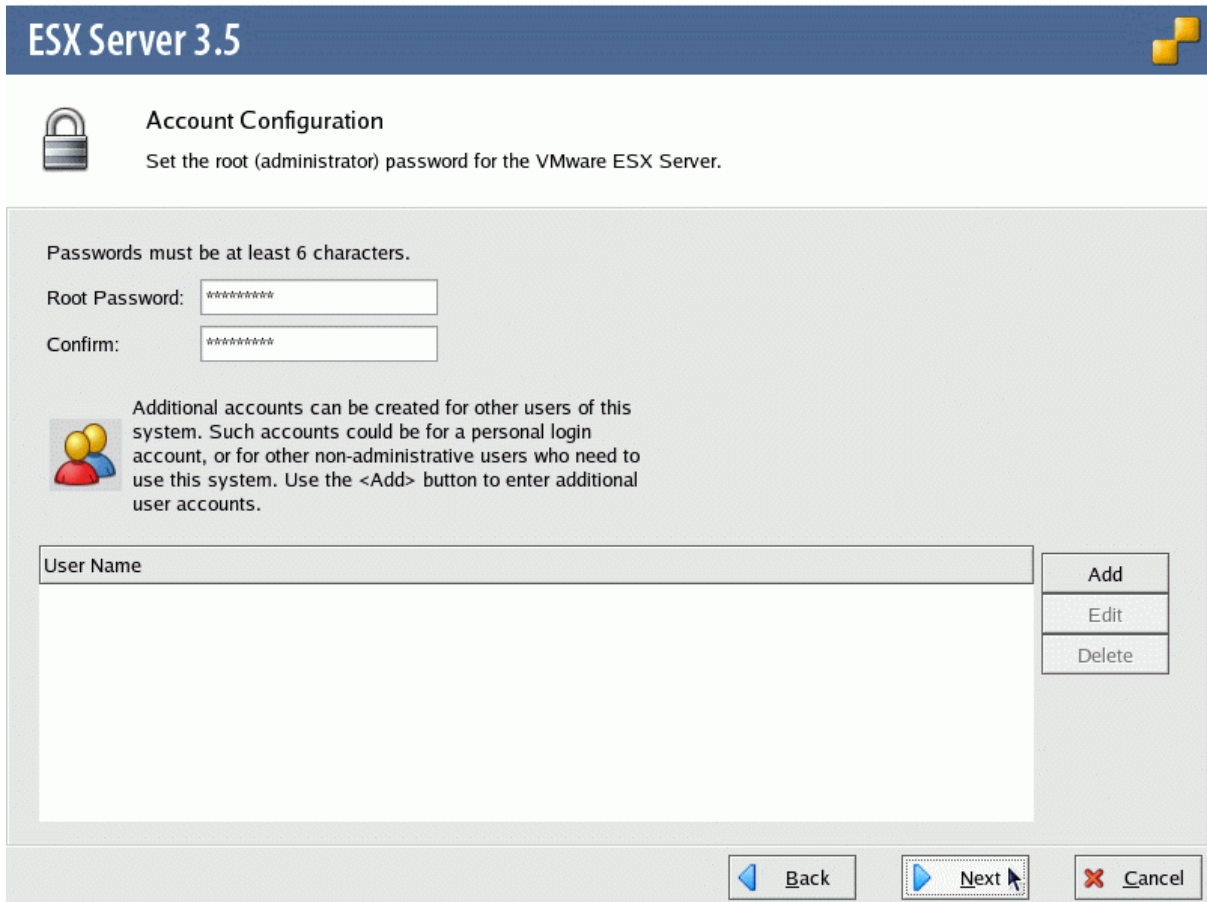
Press the **Next** button to continue.

Select the time zone.



Press the **Next** button to continue.

Set the root password for the ESX Server.




**ESX Server 3.5**

**Account Configuration**  
Set the root (administrator) password for the VMware ESX Server.

Passwords must be at least 6 characters.

Root Password:

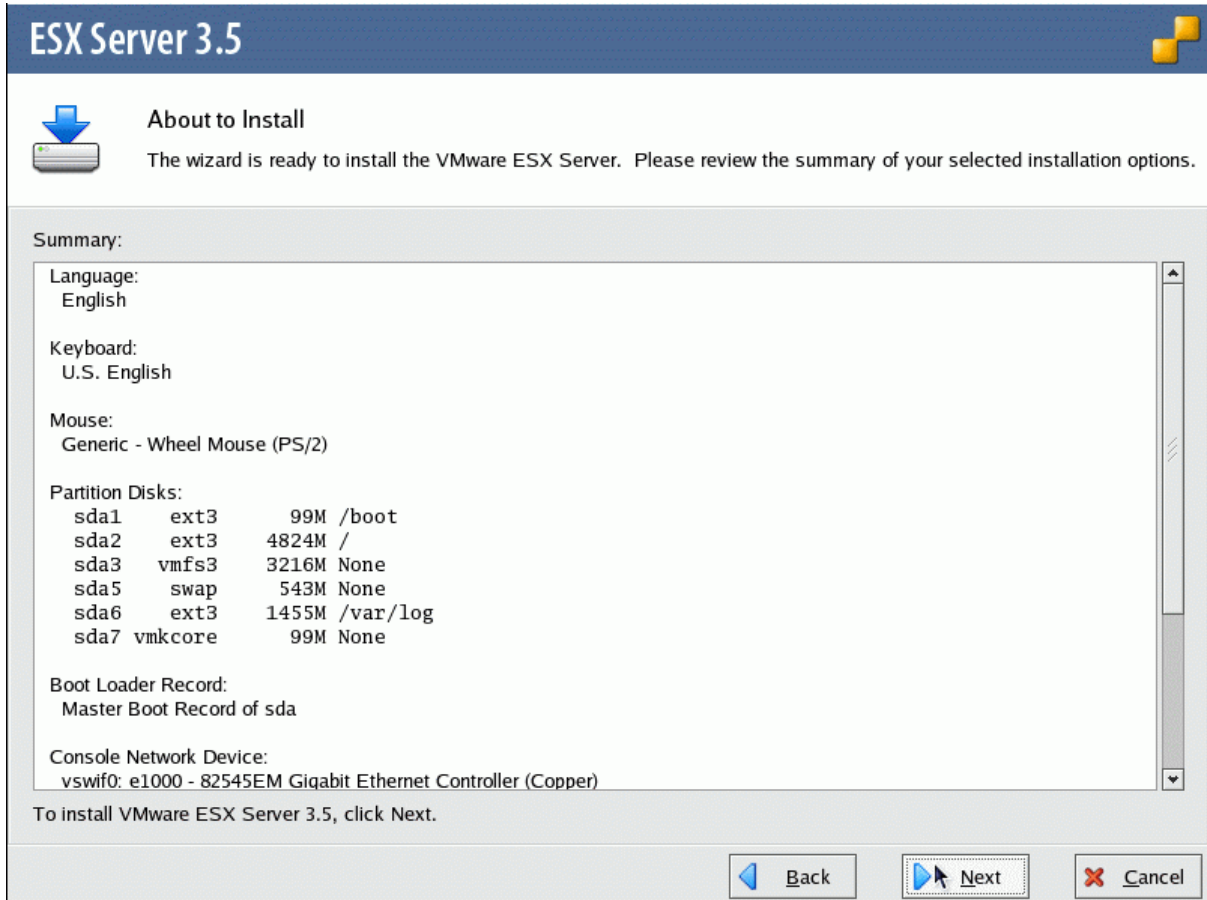
Confirm:

 Additional accounts can be created for other users of this system. Such accounts could be for a personal login account, or for other non-administrative users who need to use this system. Use the <Add> button to enter additional user accounts.

User Name	Add
	Edit
	Delete

Press the **Next** button to continue.

Check that all of the parameters are correct. Press the **Back** button if changes are required.



Press the **Next** button to begin installation.

After the installation process you will see a window confirming the installation is finished.



The installation is complete. After rebooting you can download and install Virtual Infrastructure Client and configure the ESX Server.

## **Configuring StarWind Server**

The StarWind configuration is detailed in this section. Before you start please ensure that StarWind is installed on the host that is providing storage services to the VMware ESX Server.

VMware's ESX Server needs a disk to store the settings of the virtual machine and a virtual hard drive to install a guest OS. With StarWind you can share the virtual disk for storing virtual machines.

## Storage Info

### Image File device

The **Image File** device creates a virtual iSCSI drive using the space of a physical hard disk on the machine where it is created. The resulting iSCSI storage will have the same structure as a physical hard disk.

When the **Image File** device is mounted (using an iSCSI Initiator), it will appear as standard hard disk to the computer on which it is mounted. All standard disk operations such as formatting, using a custom file system, copy data to/from it and install applications, etc. are fully supported.

There are some limitations for the **Image File** device usage:

As a virtual hard disk uses the space of your physical hard disk, the available volume is limited by the free space on that hard drive. If the size of the image file is close to the remaining free space of the hard disk on which it is store, you will not be able to store additional files on that disk.

You cannot change the volume of the image file whilst it is online (users are connected to it). However, you can extend the volume.

## Preparing Storage

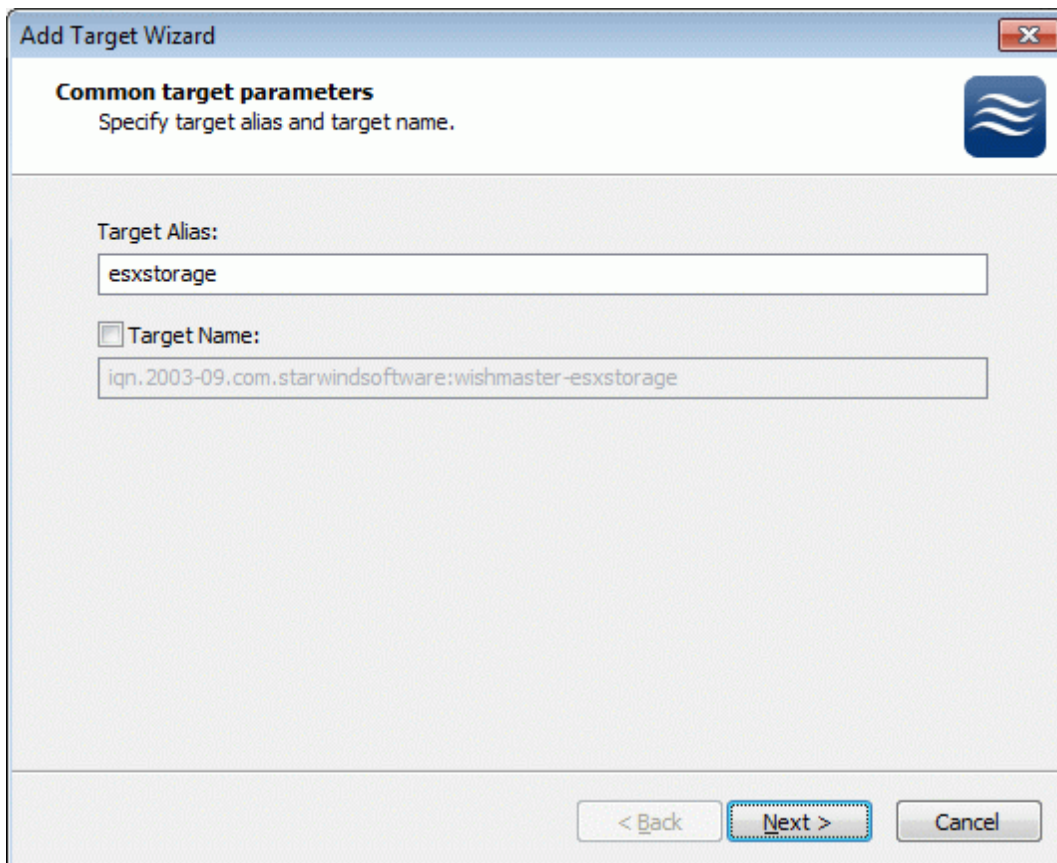
Launch the StarWind console **Start -> All Programs -> StarWind Software -> StarWind -> StarWind**. Whenever the **StarWind Console** is running, its icon will appear in the system tray.

The **StarWind Console** may be accessed by either double clicking the icon using the left mouse button or single click with the right mouse button and selecting the StartManagement menu item from the pop-up menu.

From the **Connections** tree select the computer you want to provision the iSCSI target device on. Press **Connect** button to continue. You will be prompted to enter the login and password. Default ones are: root, starwind. You can always change them later.

Press **Add Target** button to continue.

In the Wizard that appears, specify a target name. The name must be a unique name by which the device will be declared to the iSCSI initiators connecting to StarWind over an IP network.

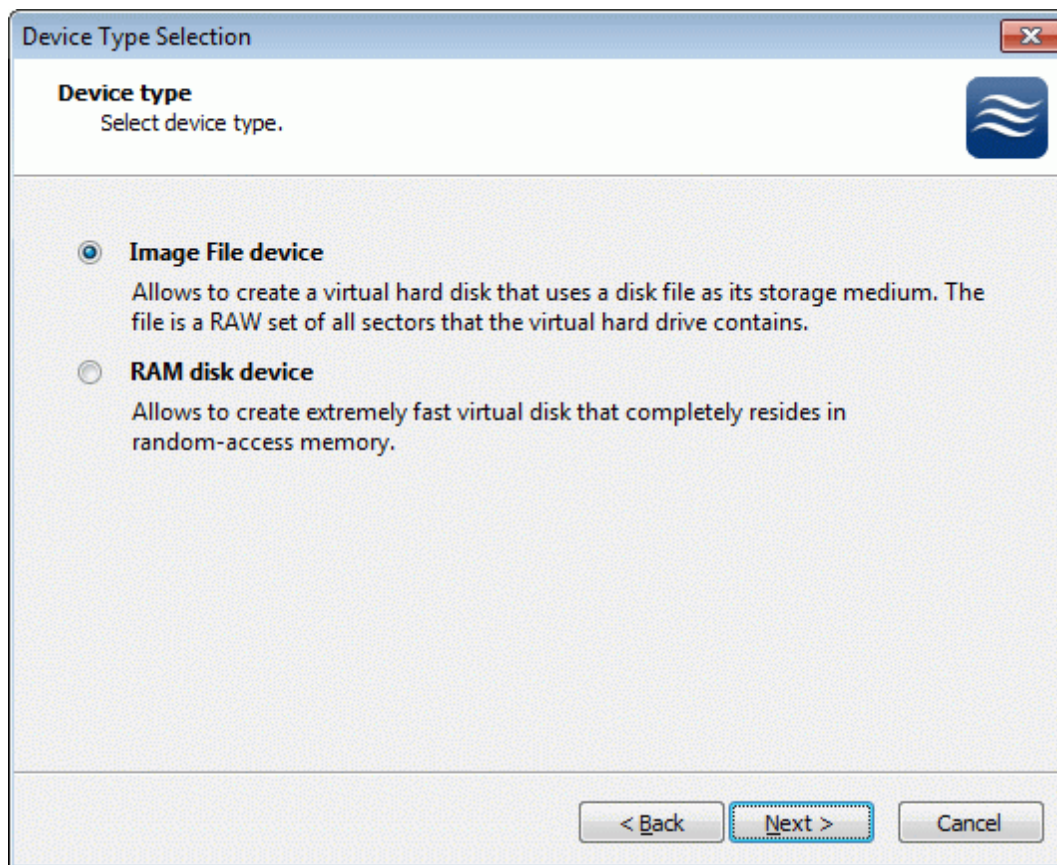


Press the **Next** button to continue.



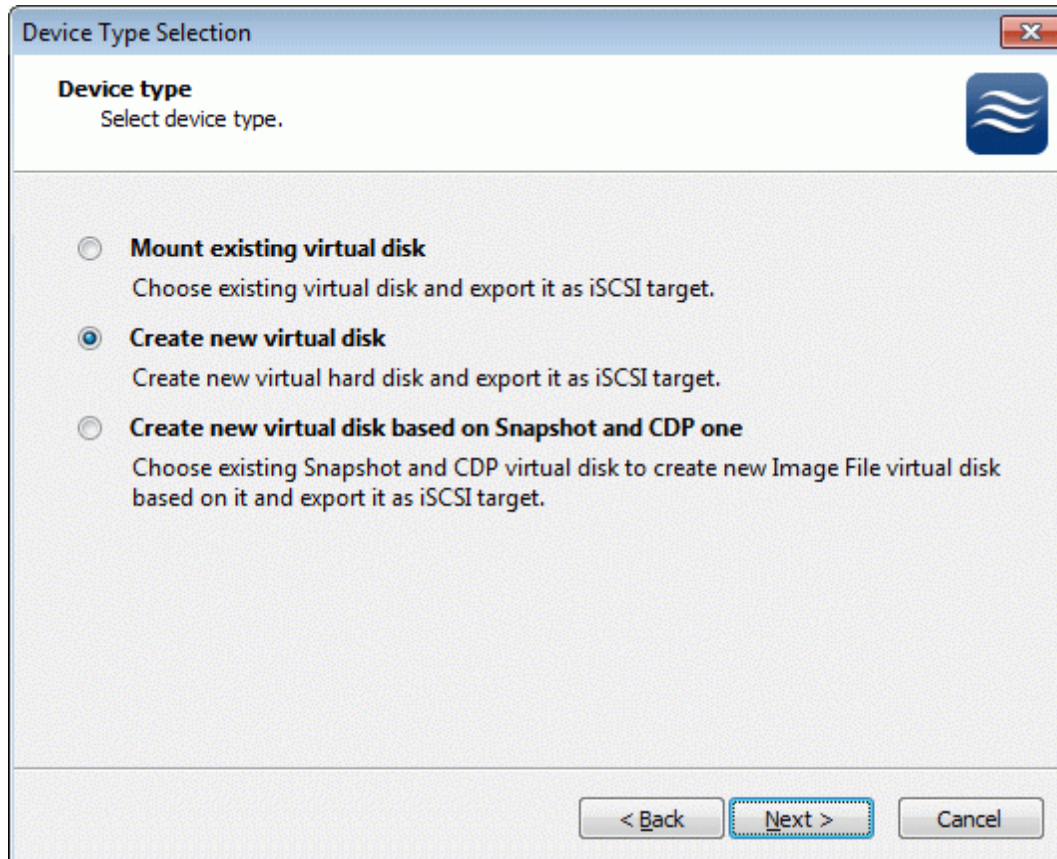


Select **Image File device**.



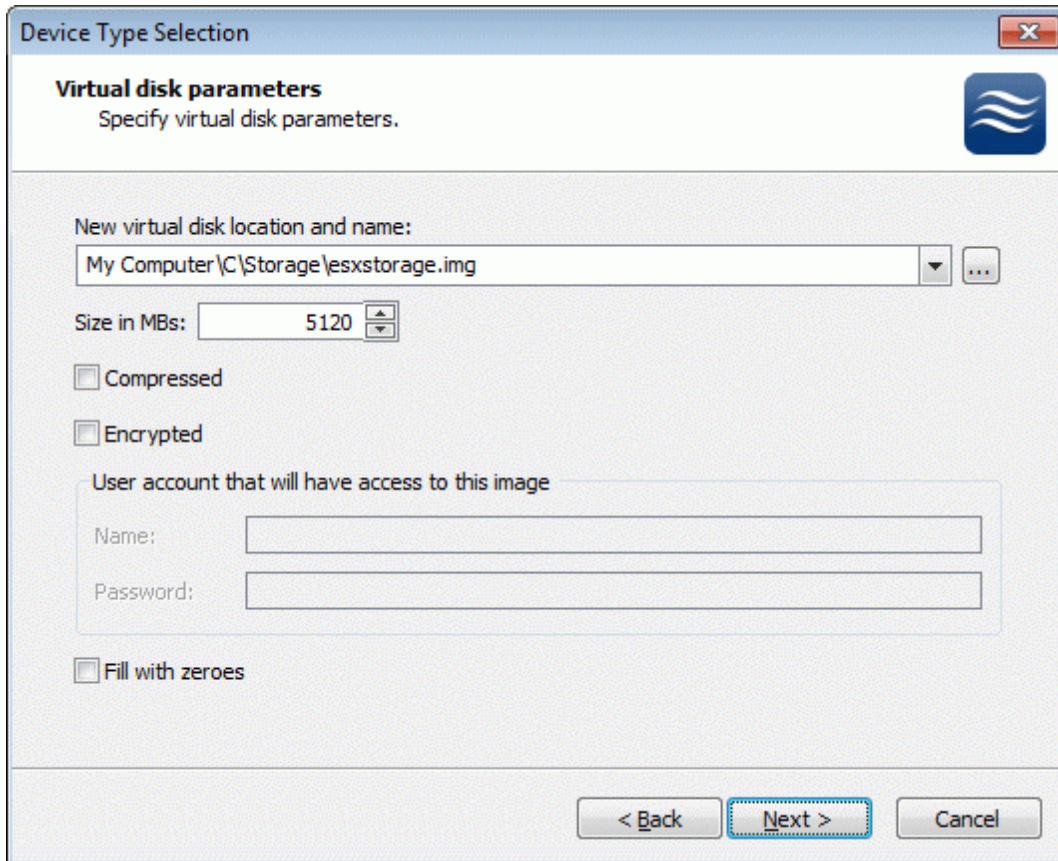
Press the **Next** button to continue.

Select **Create new virtual disk** to create a new hard disk image or **Mount existing virtual disk** to mount an existing image that you've prepared before.



Press the **Next** button to continue.

If you have decided to create a new virtual disk, specify the location and the name of the virtual disk you want to be created. The virtual disk size is specified in megabytes. Refer to the online help for details regarding additional parameters (**Fill with zeroes**, **Compressed** and **Encrypted**).

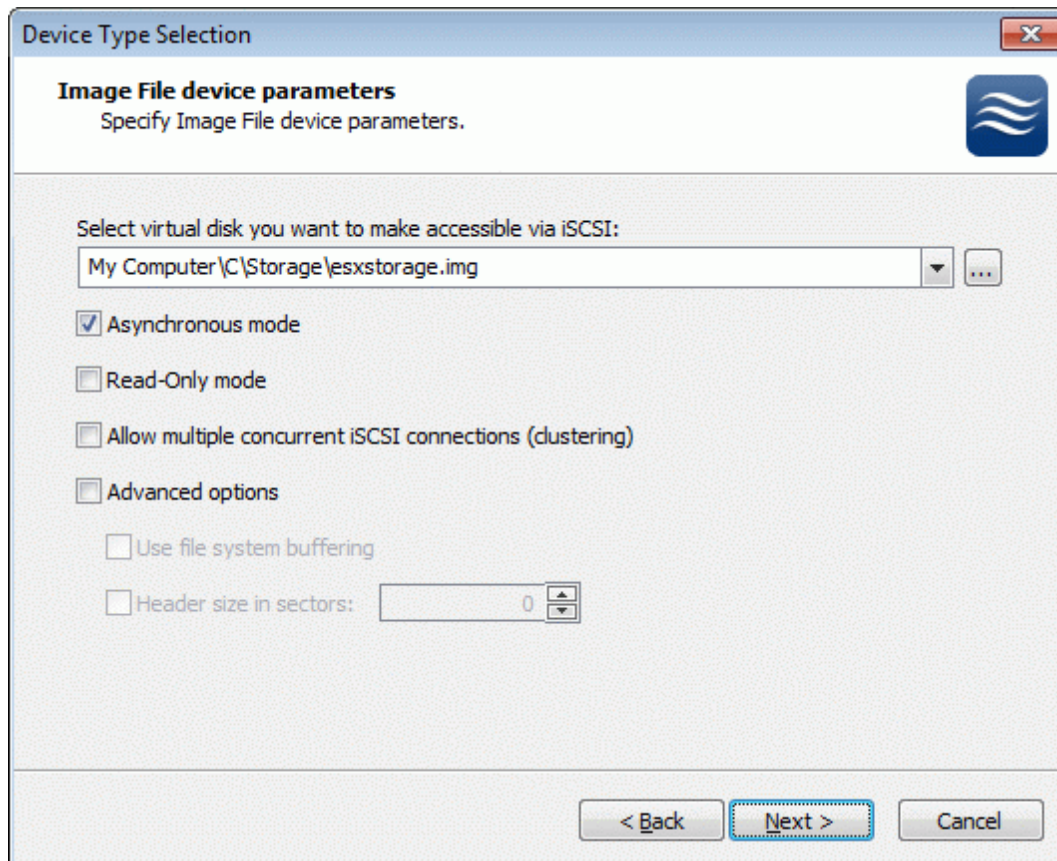


The screenshot shows a dialog box titled "Device Type Selection" with a close button (X) in the top right corner. The main heading is "Virtual disk parameters" with a sub-heading "Specify virtual disk parameters." and the StarWind logo. The dialog contains the following fields and options:

- "New virtual disk location and name:" with a text box containing "My Computer\C\Storage\esxstorage.img" and a browse button (...).
- "Size in MBs:" with a spin box set to "5120".
- Two unchecked checkboxes: "Compressed" and "Encrypted".
- A section titled "User account that will have access to this image" containing "Name:" and "Password:" text boxes.
- An unchecked checkbox: "Fill with zeroes".
- Navigation buttons at the bottom: "< Back", "Next >" (highlighted with a blue dashed border), and "Cancel".

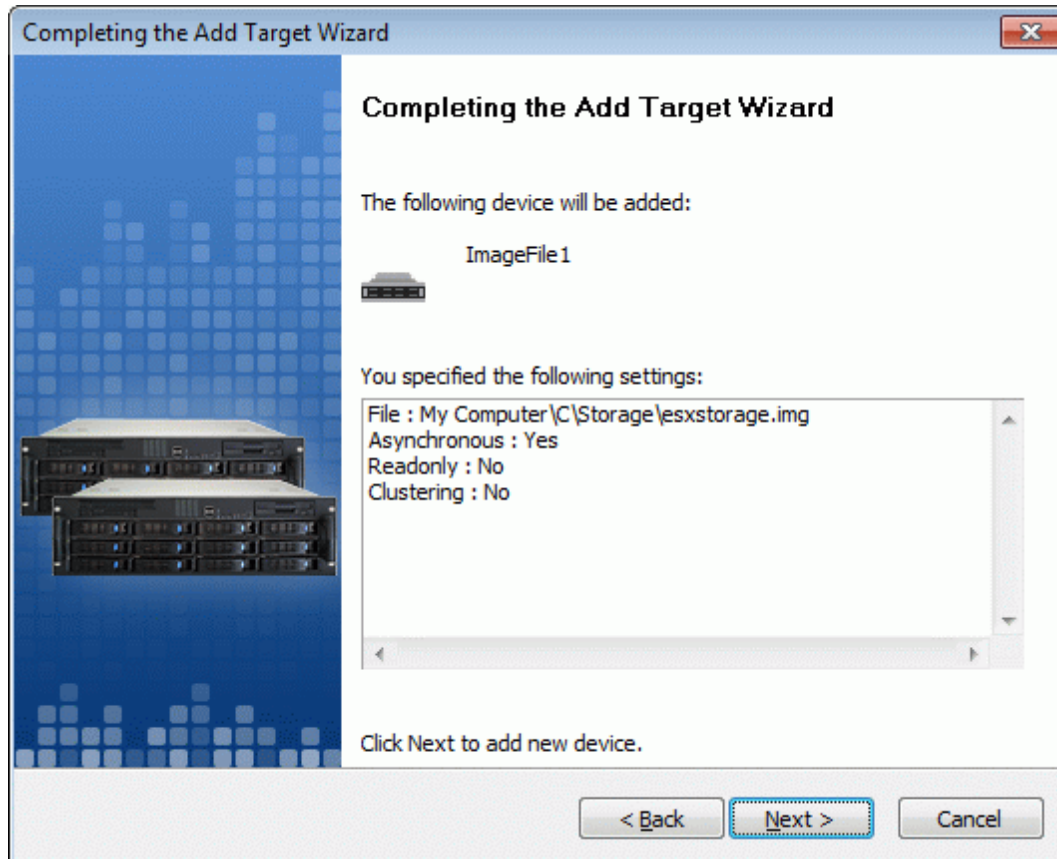
Press the **Next** button to continue.

An Image File device can have additional parameters. Refer to the online help for details regarding the additional parameters (**Asynchronous mode**, **Allow multiple connections (clustering)**, **Read-only mode** and **Specify advanced options**).



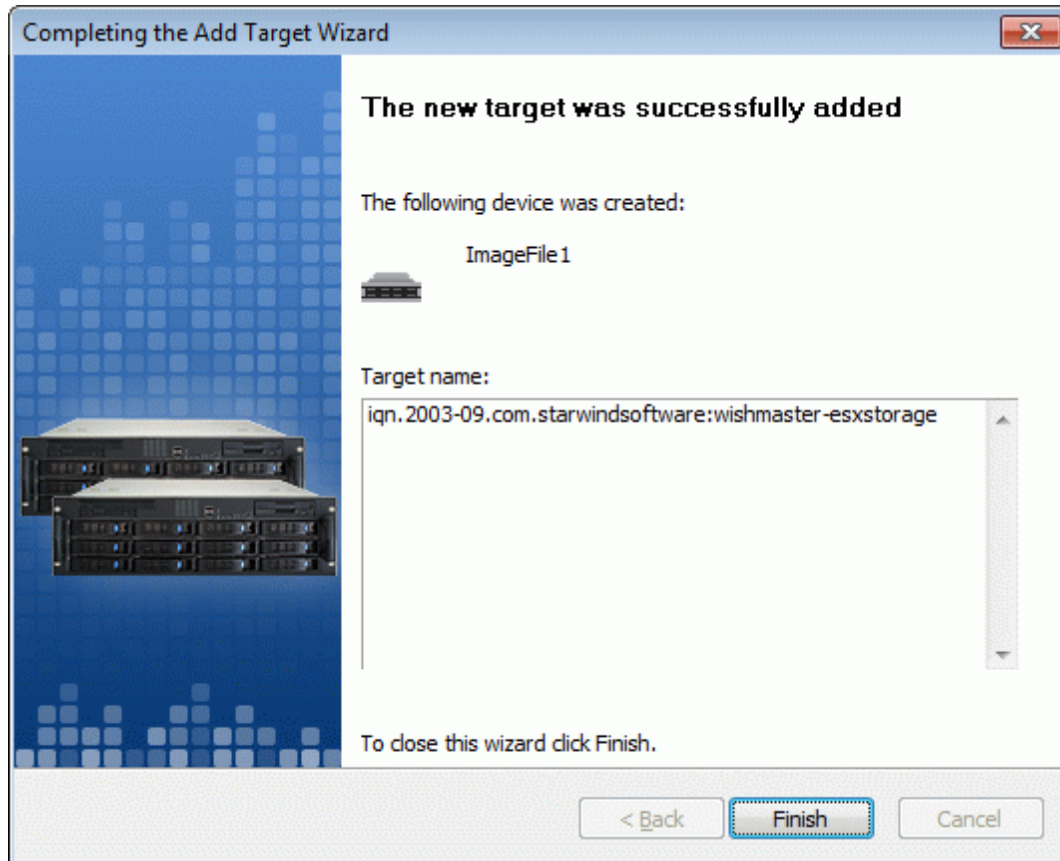
Press the **Next** button to continue.

Check the device parameters are correct. Press the **Back** button should any changes be required.



Press the **Next** button to continue.

A summary of the created device is displayed on the last wizard page (see image below).



Press the **Finish** button to close the wizard.

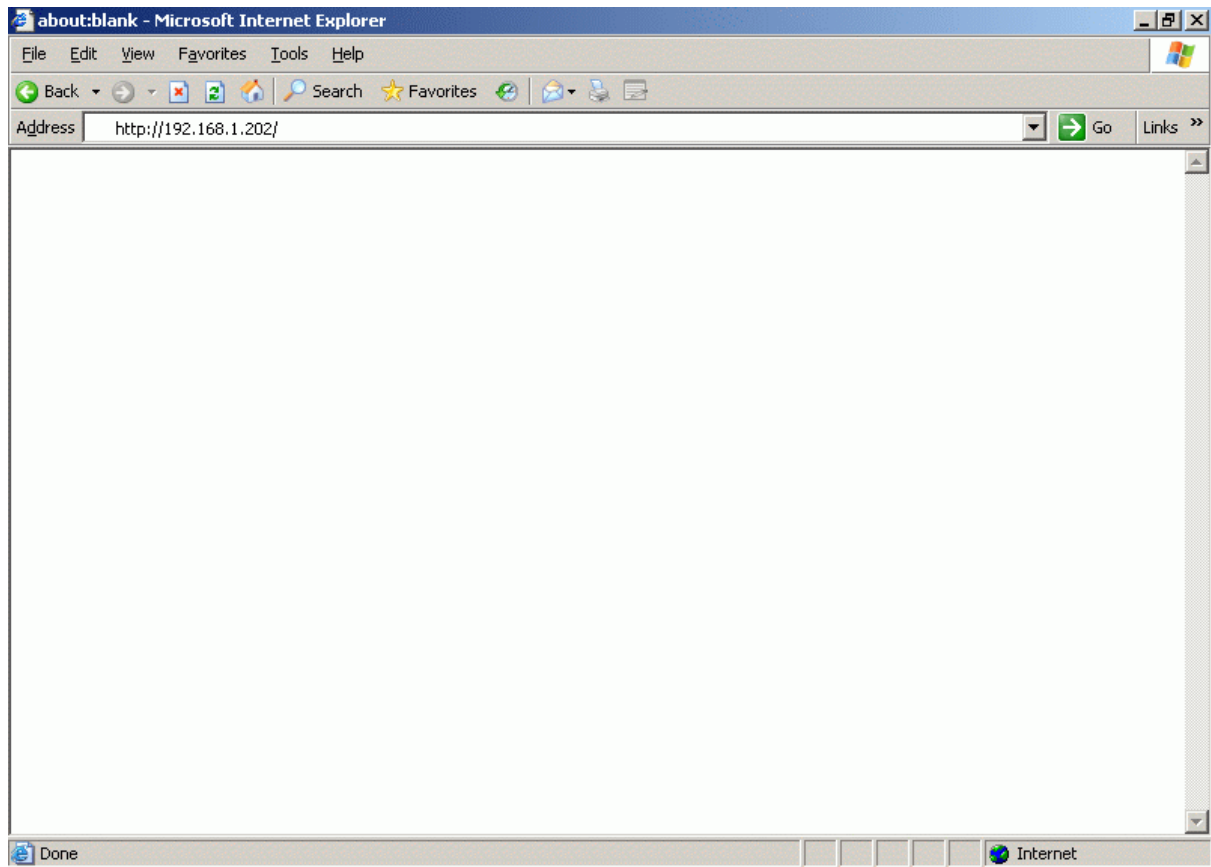
## **Configure Virtual Infrastructure**

This section describes the operations you need to complete to create and format the datastore in the way that ESX Servers can create and install virtual machines on it.



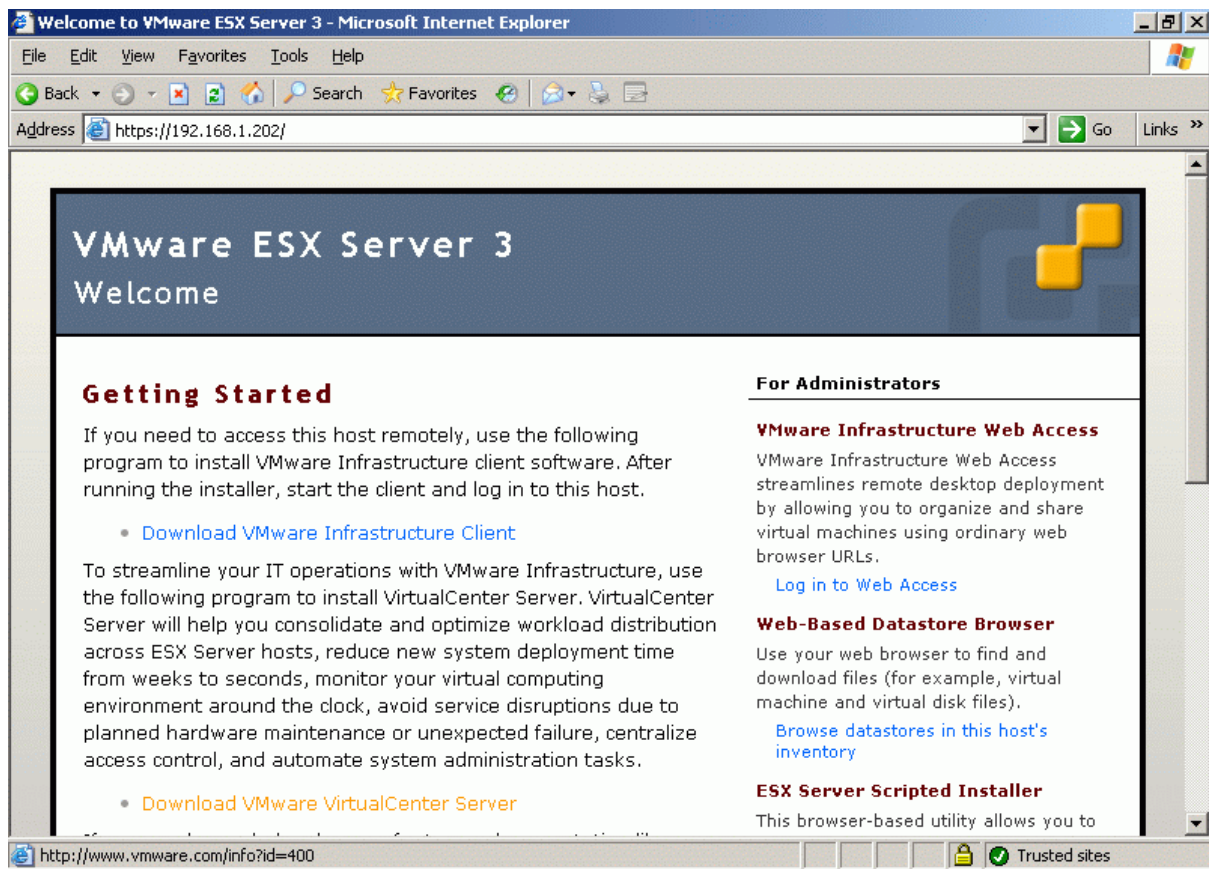
## Virtual Infrastructure Client Install

Type the IP address of the ESX Server host in the browser address panel.



Hit **Enter** to continue.

VMware ESX Server 3 Welcome page appears.



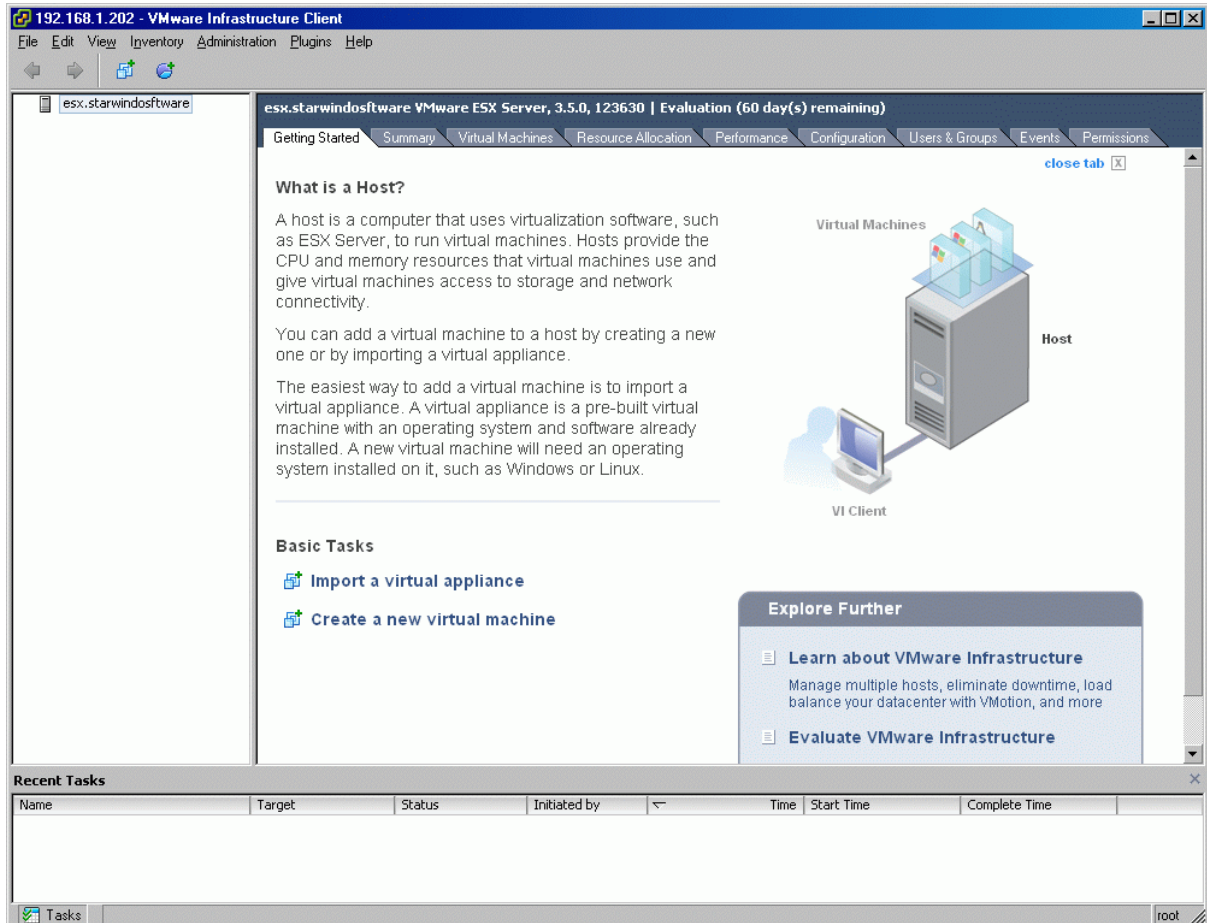
Click the **Download the VMware Infrastructure Client** link and save the executable file to disk. Run the file to install the Virtual Infrastructure Client.

Launch the Virtual Infrastructure Client application. Specify the name of the **ESX Server** to connect to and provide the **Username** and **Password** as configured previously.



Press the **Log In** button to connect to the ESX Server.

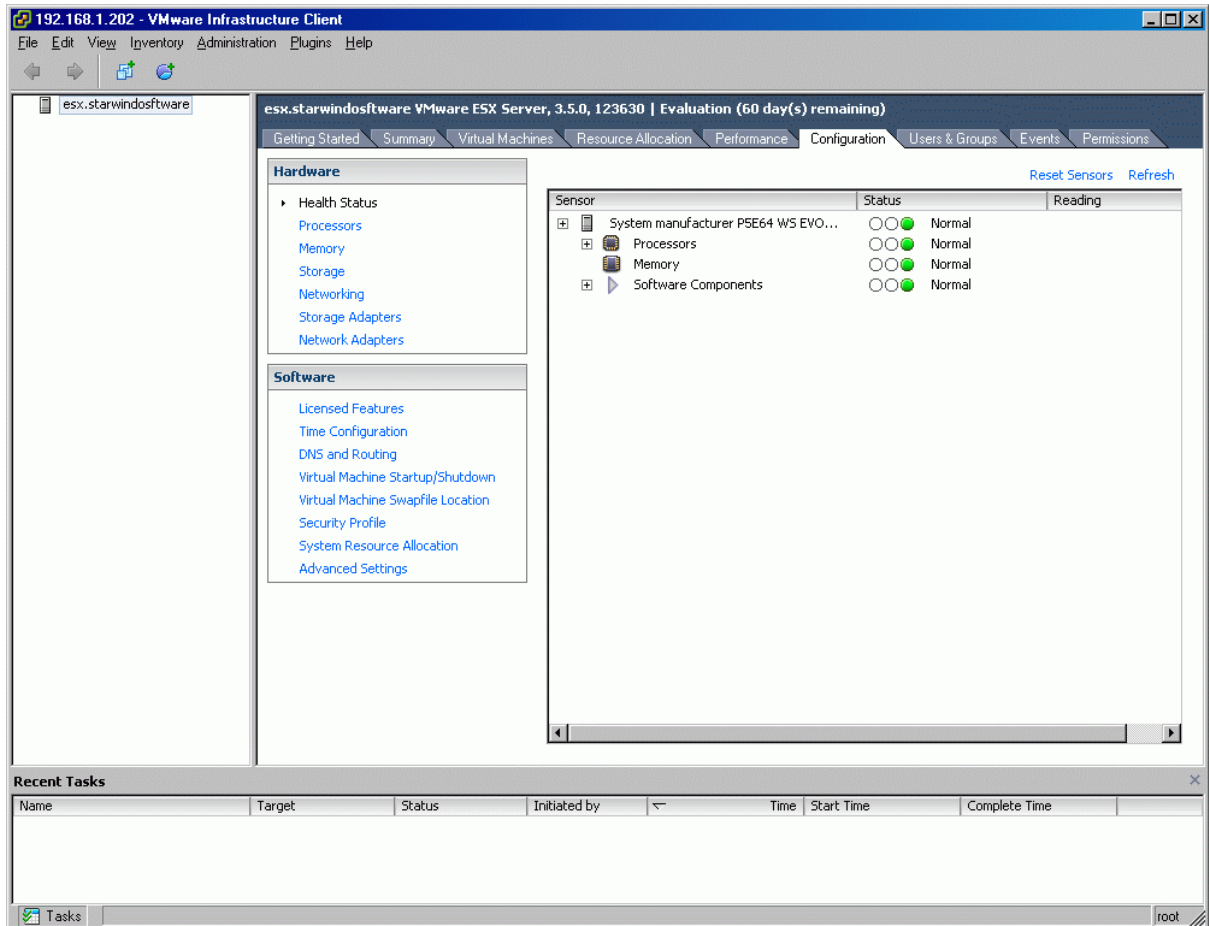
If successful, the **Virtual Infrastructure Client** window should look like the sample picture provided below.



## Configuring ESX Server to work with iSCSI connections

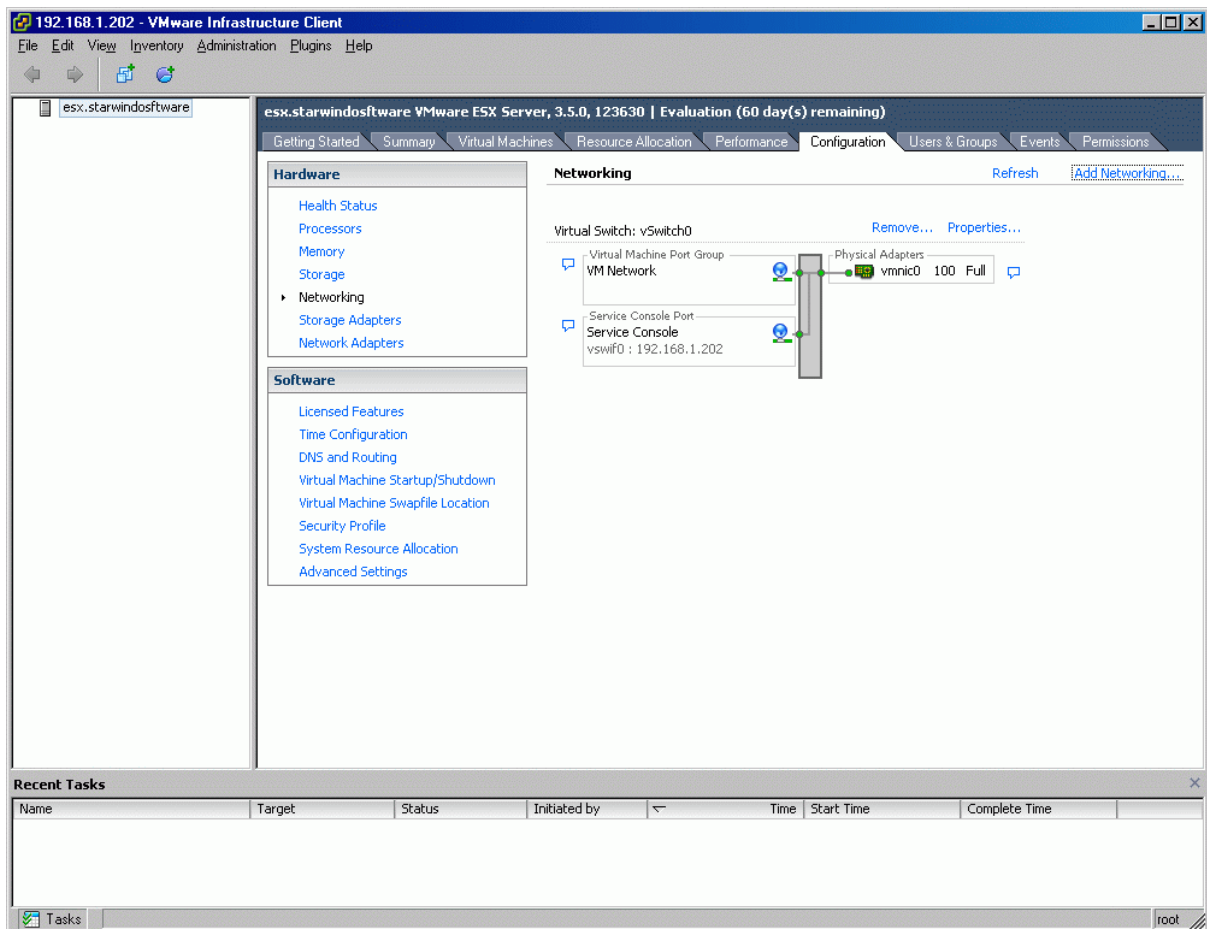
### Configure the VMkernel TCP/IP Networking Stack

Click the **Configuration** tab.



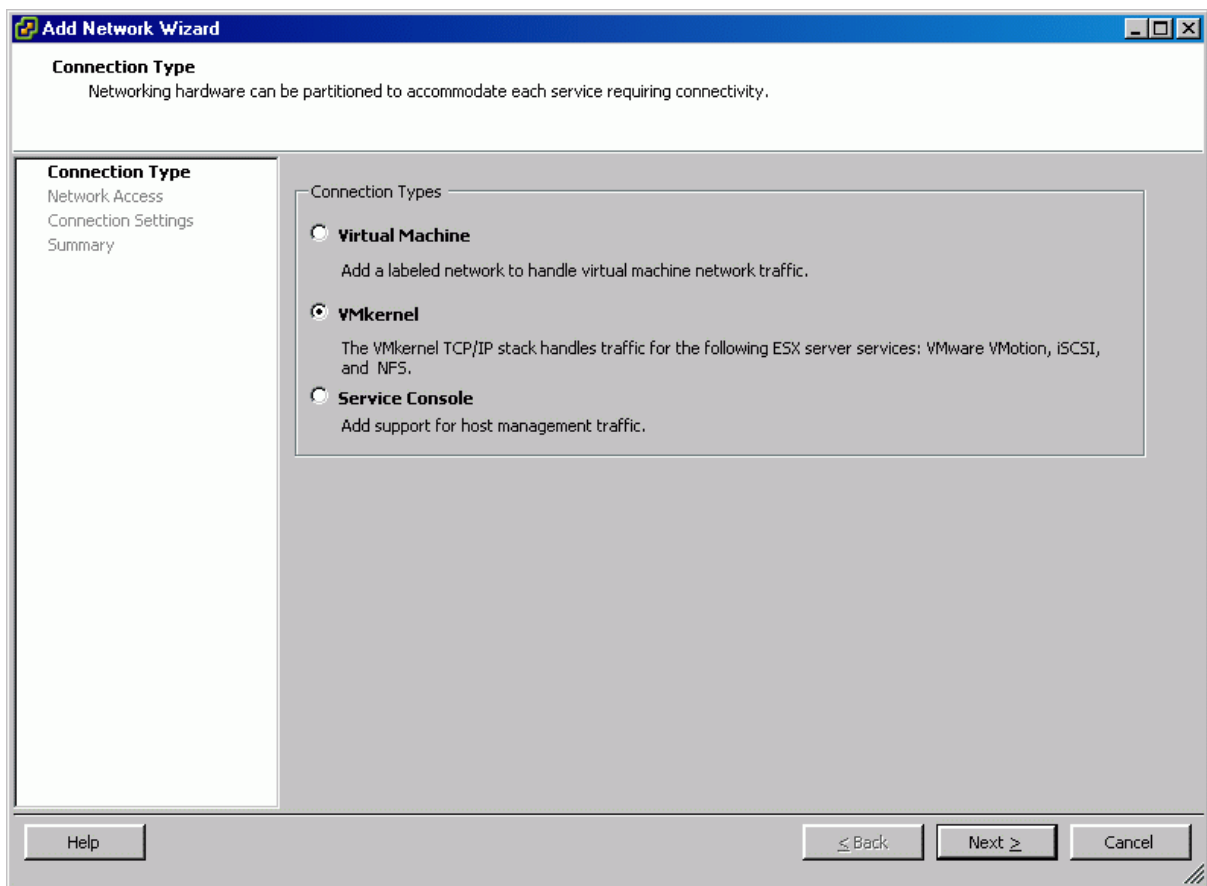
Then click **Networking**.

The current Network configuration appears.



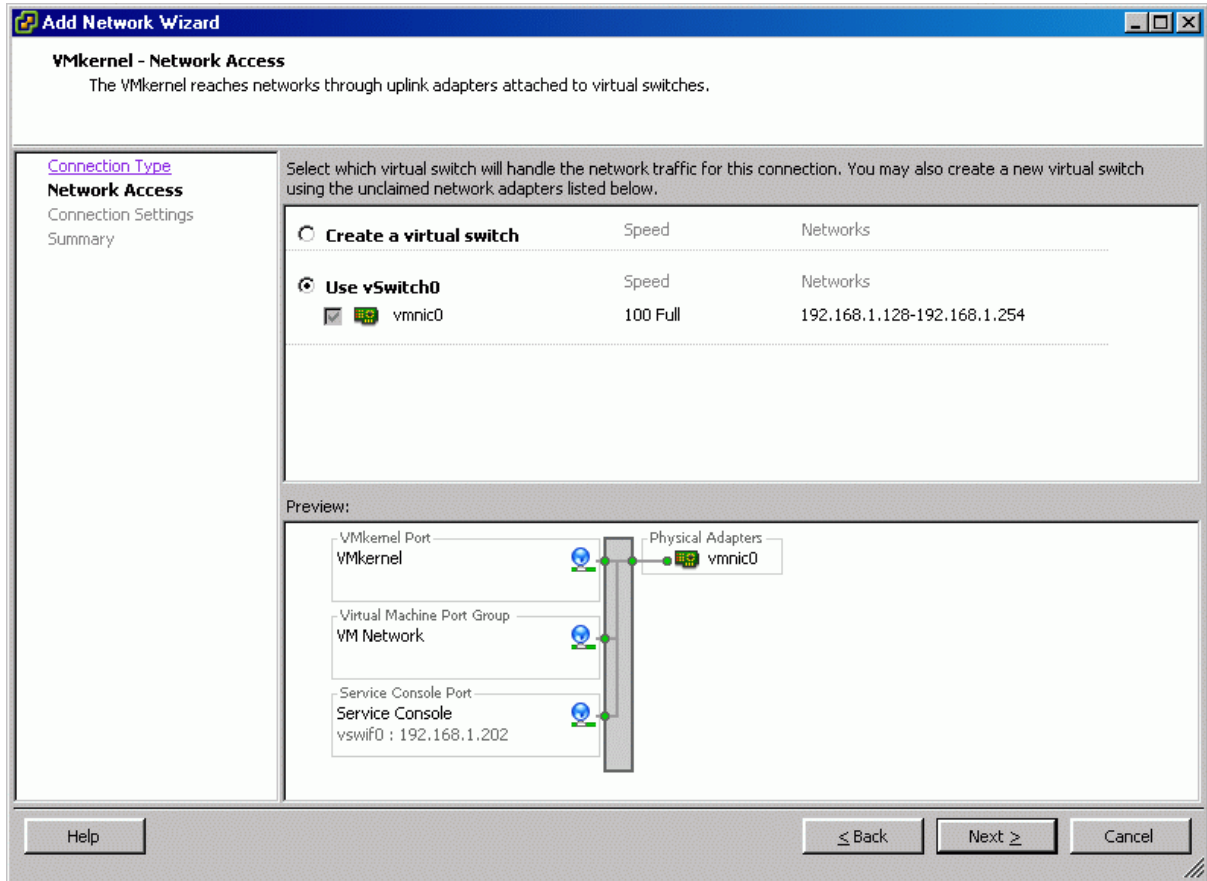
Click the **Add Networking** link.

Select the **VMkernel** option.



Press the **Next** button to continue.

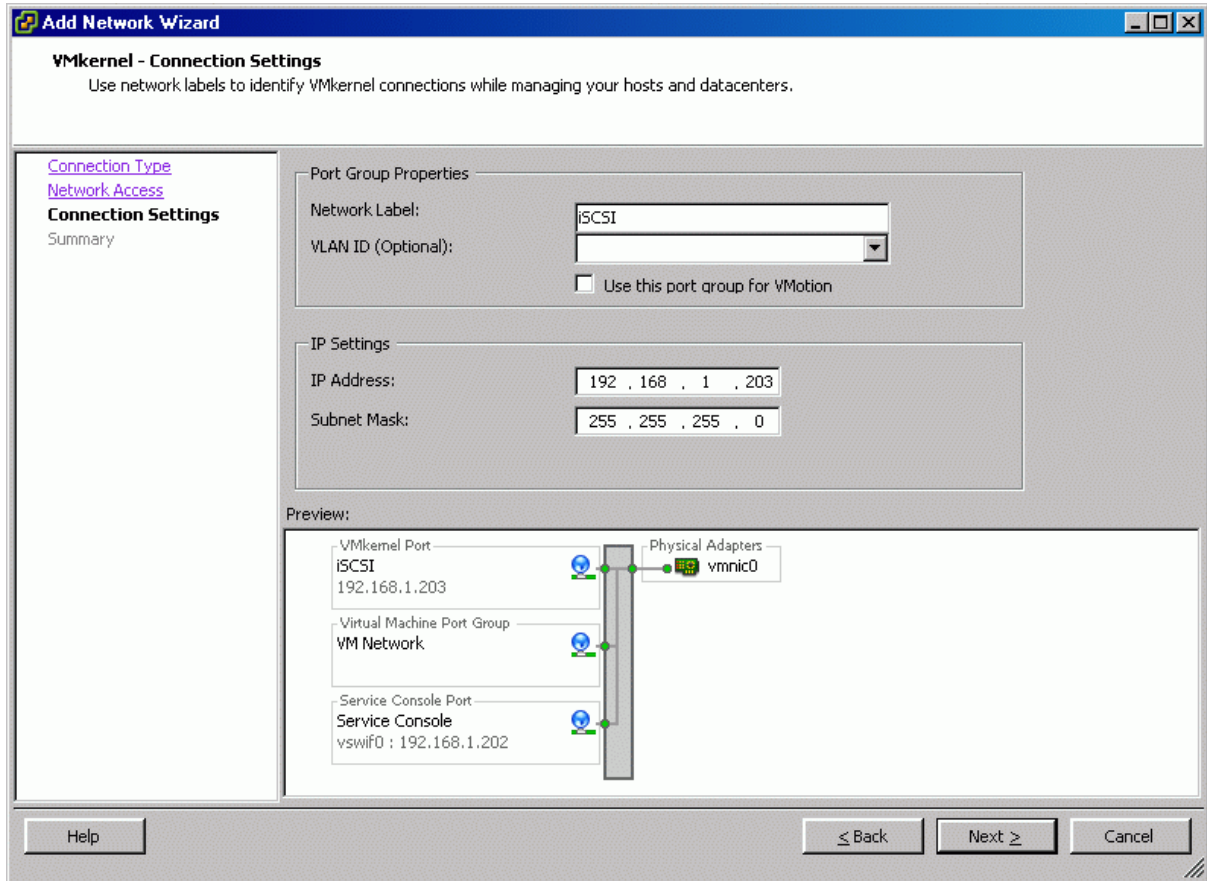
Select the vSwitch you to use or select the **Create a virtual switch** option to create new virtual switch.



Press the **Next** button to continue.

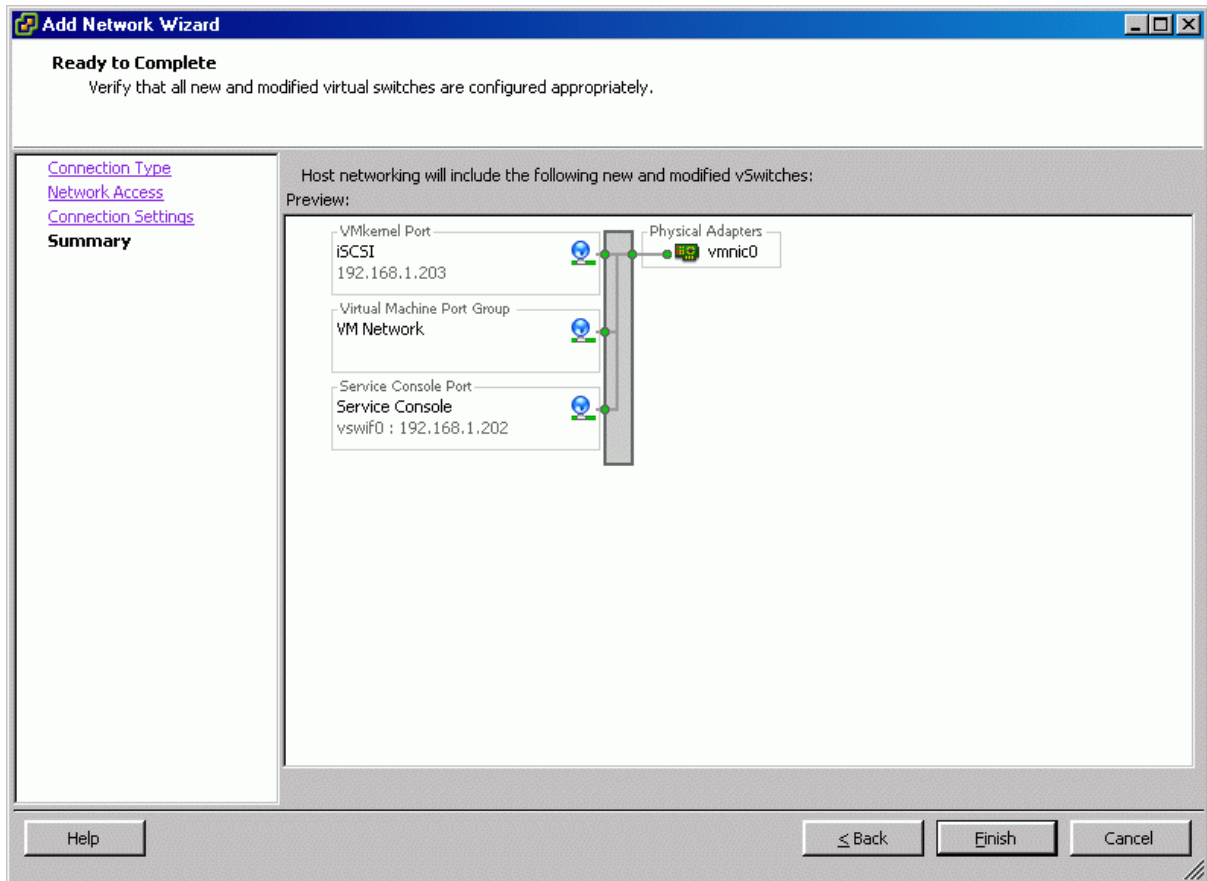


Specify the Network label. Also type the IP address and subnet mask. Optionally check **Use this port for VMotion** item.



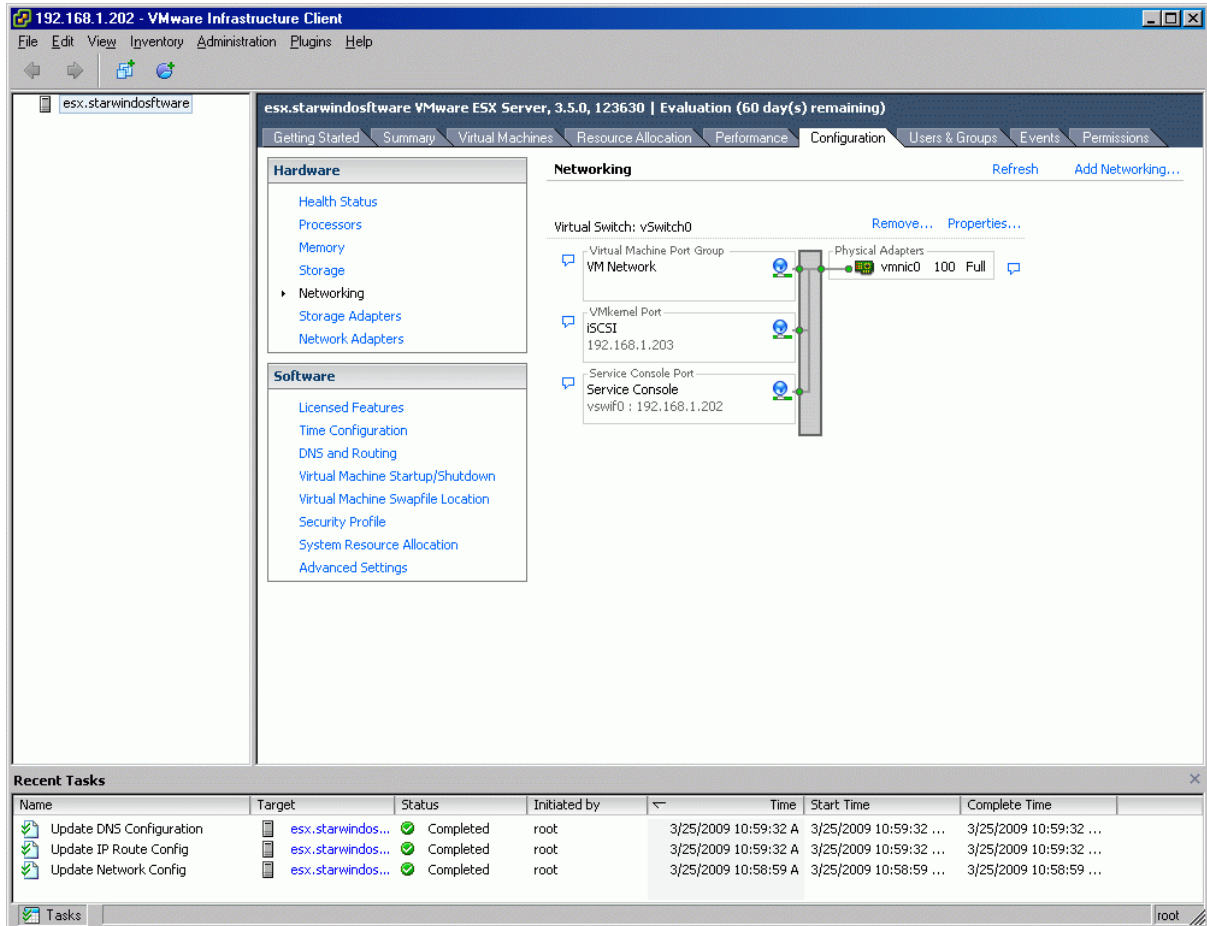
Press the **Next** button to continue.

Check if all of the parameters are correct. Press the **Back** button should any changes be required.



Press the **Finish** button to close the wizard.

If successful, the **VI Client** window should look like the sample picture provided below.

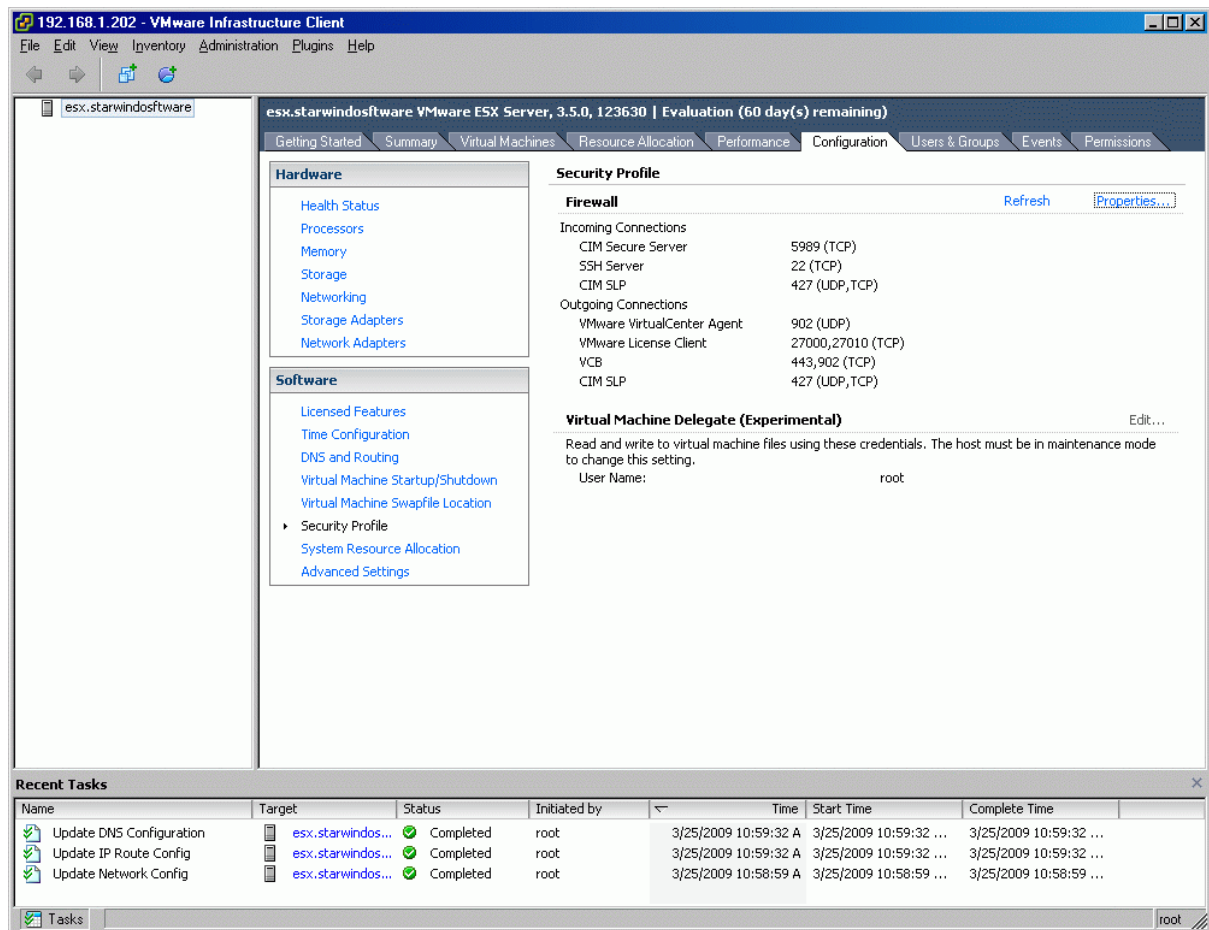


## Configuring Firewall

For working with iSCSI connectios you need to permit them in the firewall settings.

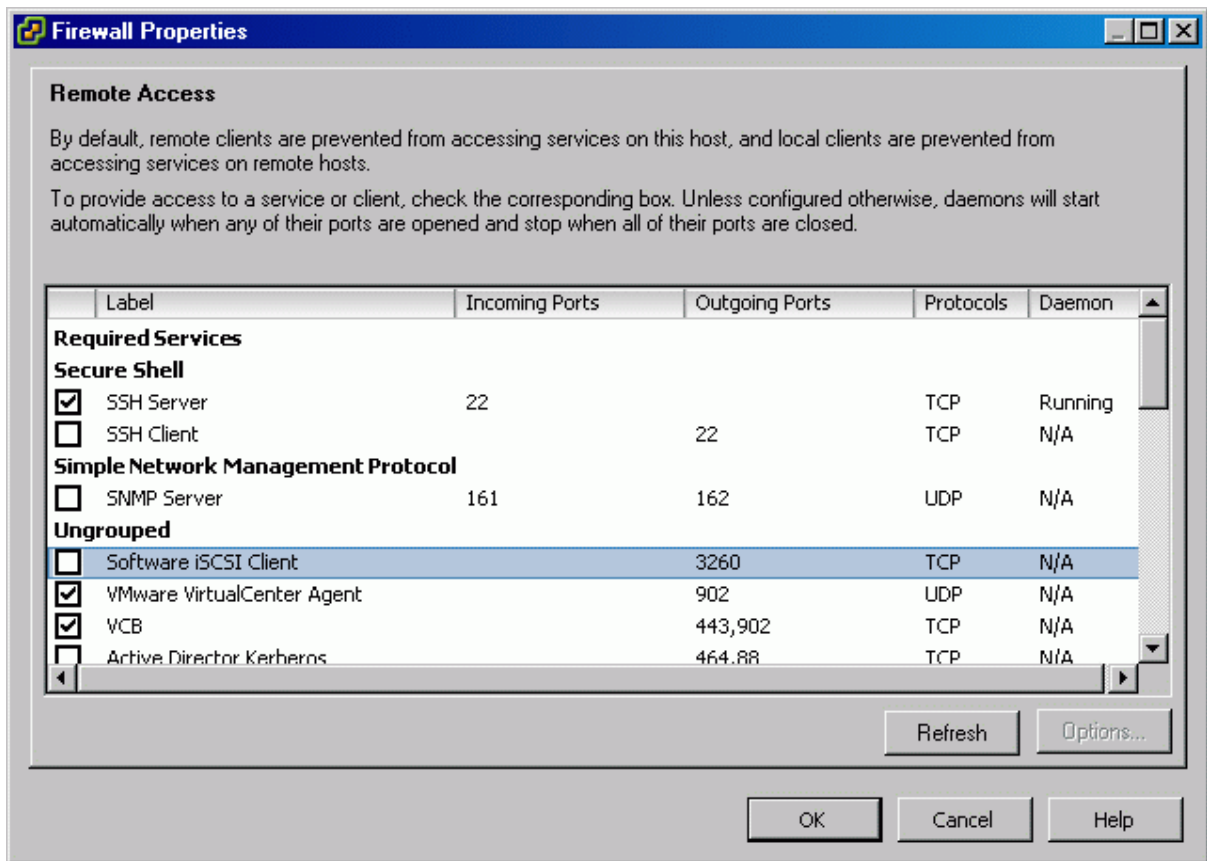
Click the **Configuration** tab. Then click **Security Profile**.

The **Virtual Infrastructure Client** displays a list of currently active incoming and outgoing connections with the corresponding firewall ports.



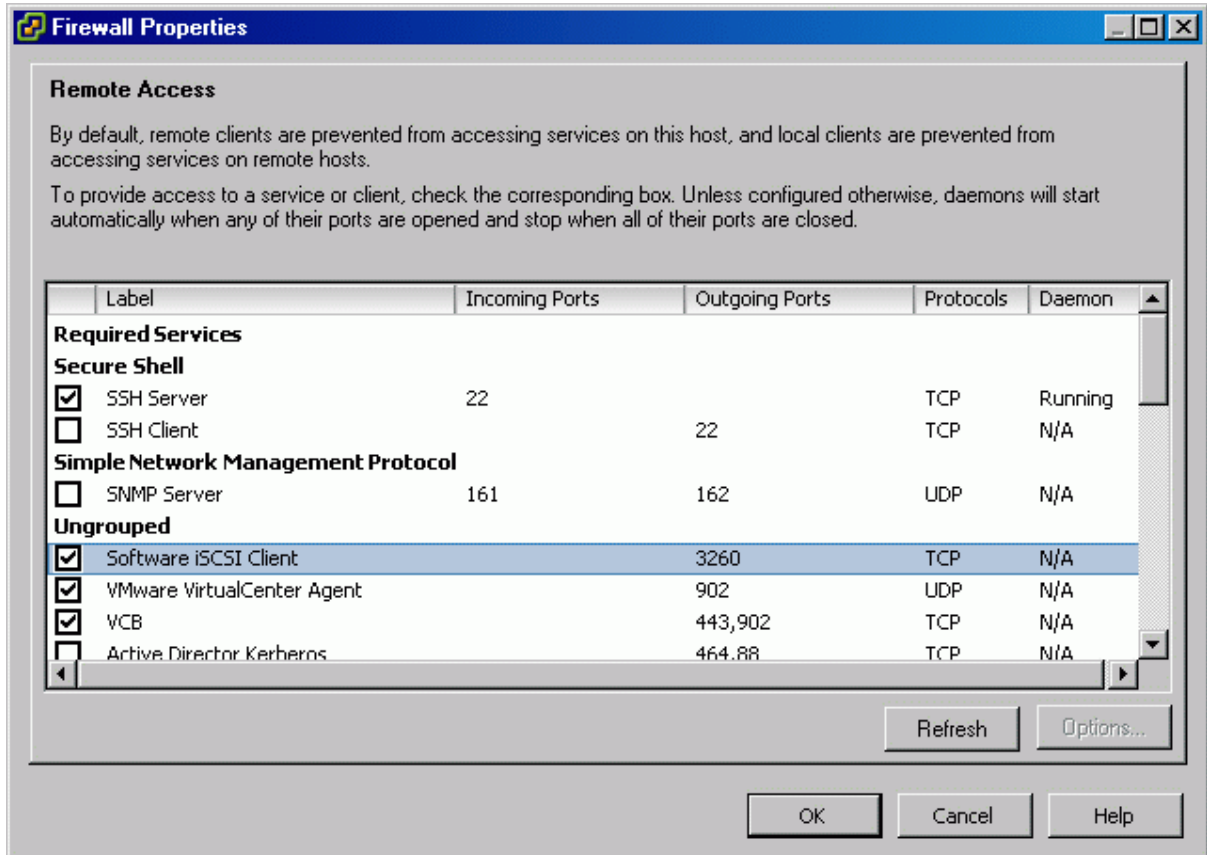
Click the **Properties** link.

The **Firewall Properties** dialog box will appear.



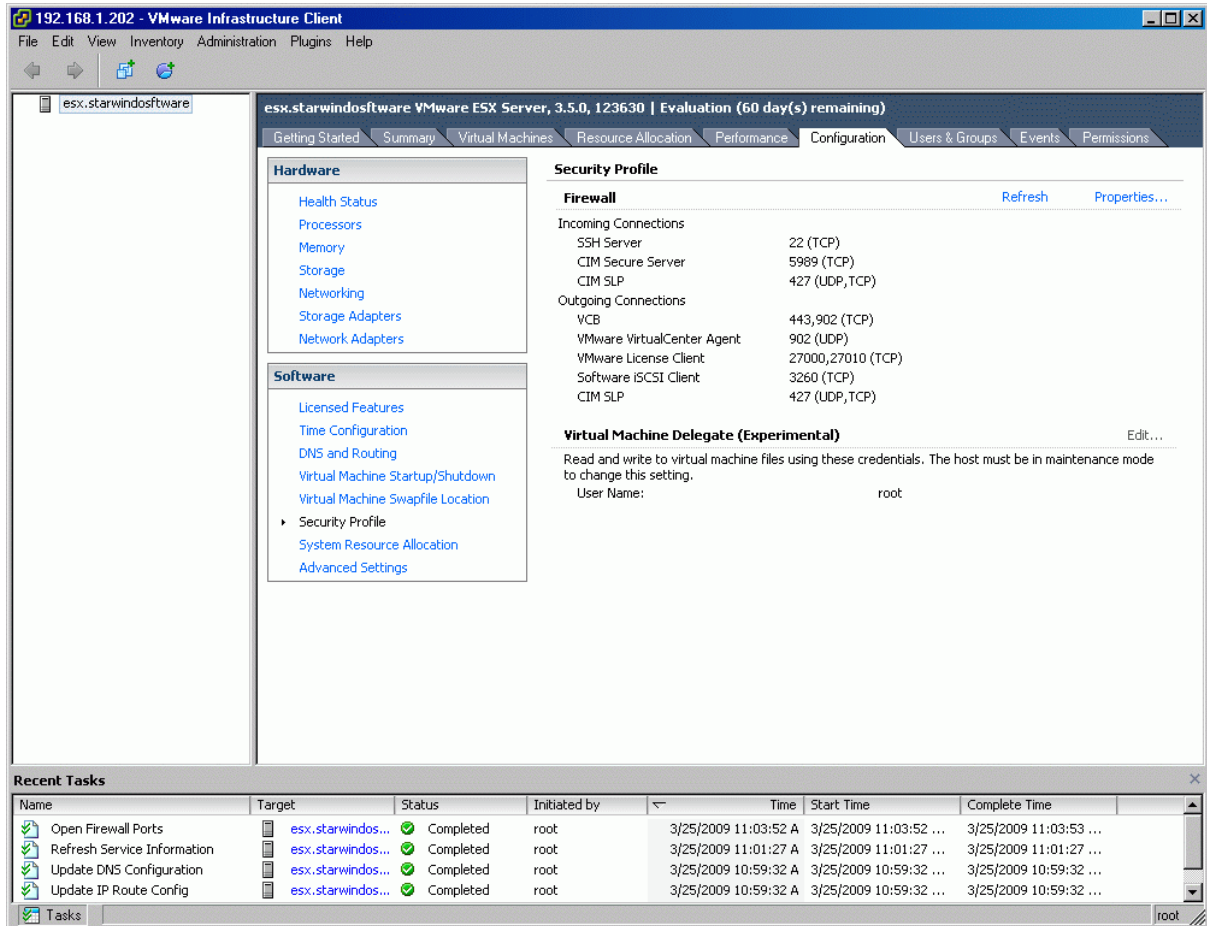
Find **Software iSCSI Client** in the list

Tick the option (set checkbox) to allow outgoing connection on the port shown (3260).



Press the **OK** button to continue.

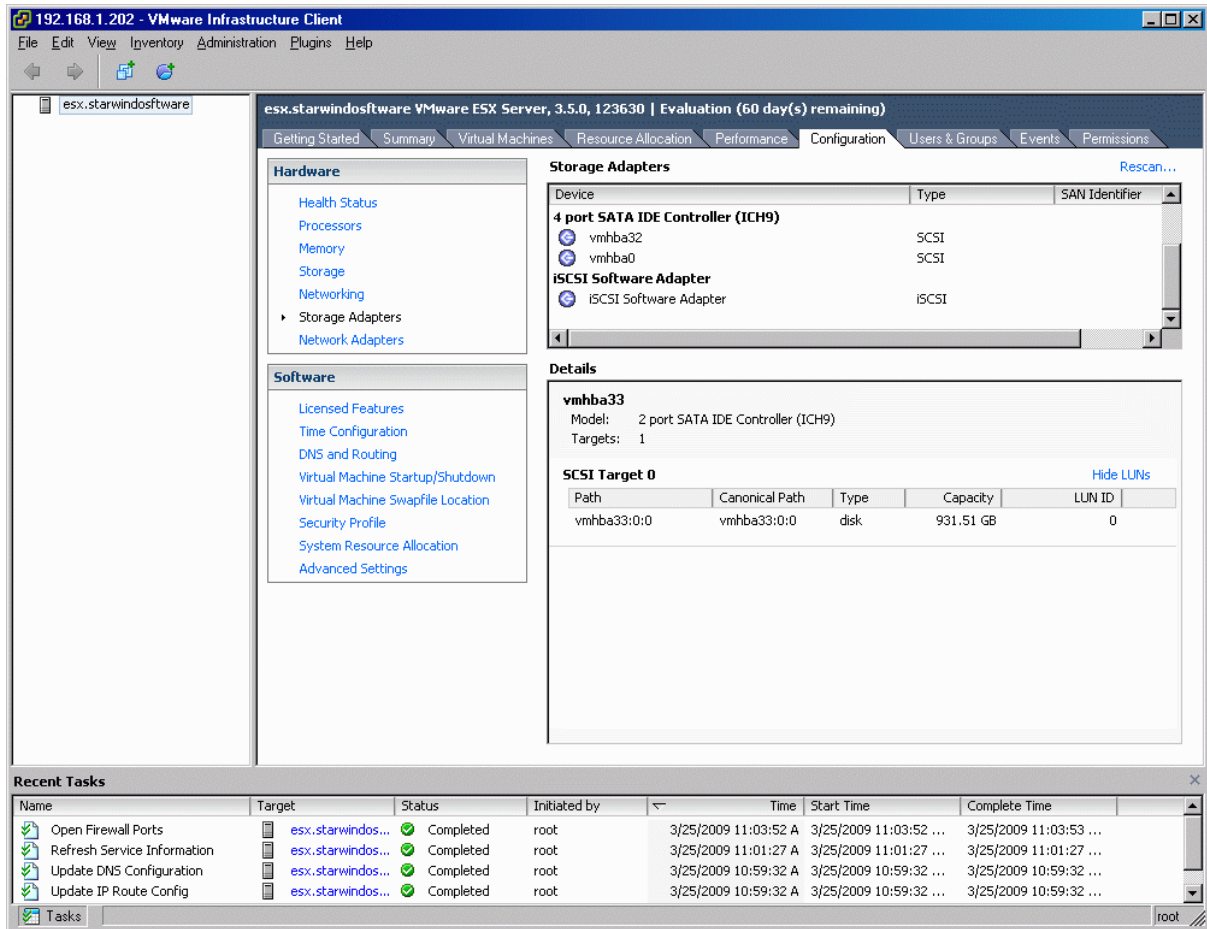
If successful, the **Virtual Infrastructure Client** window should look like the sample picture provided below.



## Configure the iSCSI Software Initiator

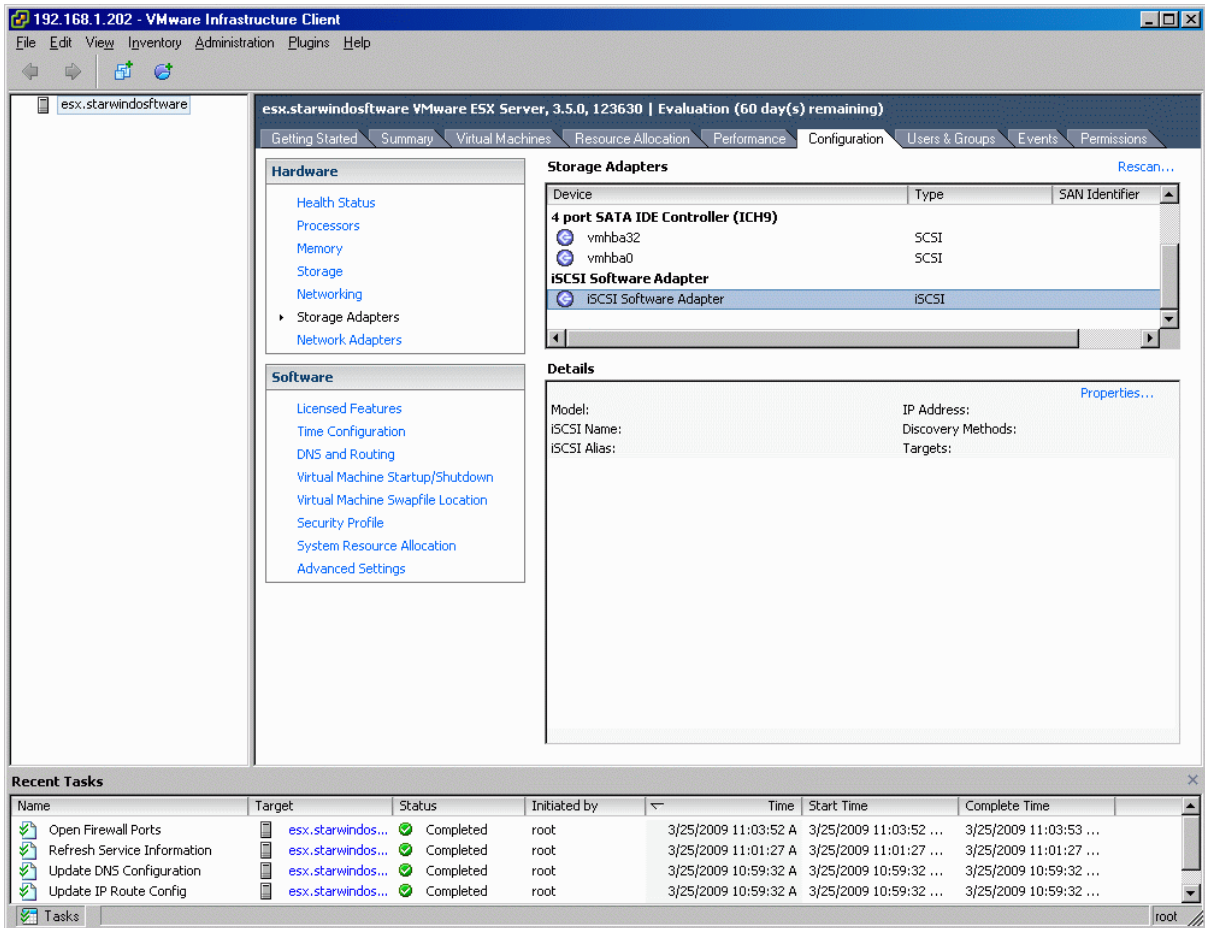
### Enabling iSCSI Software Initiator.

Click the **Configuration** tab. Then click **Storage Adapters**. The list of available storage adapters appears.



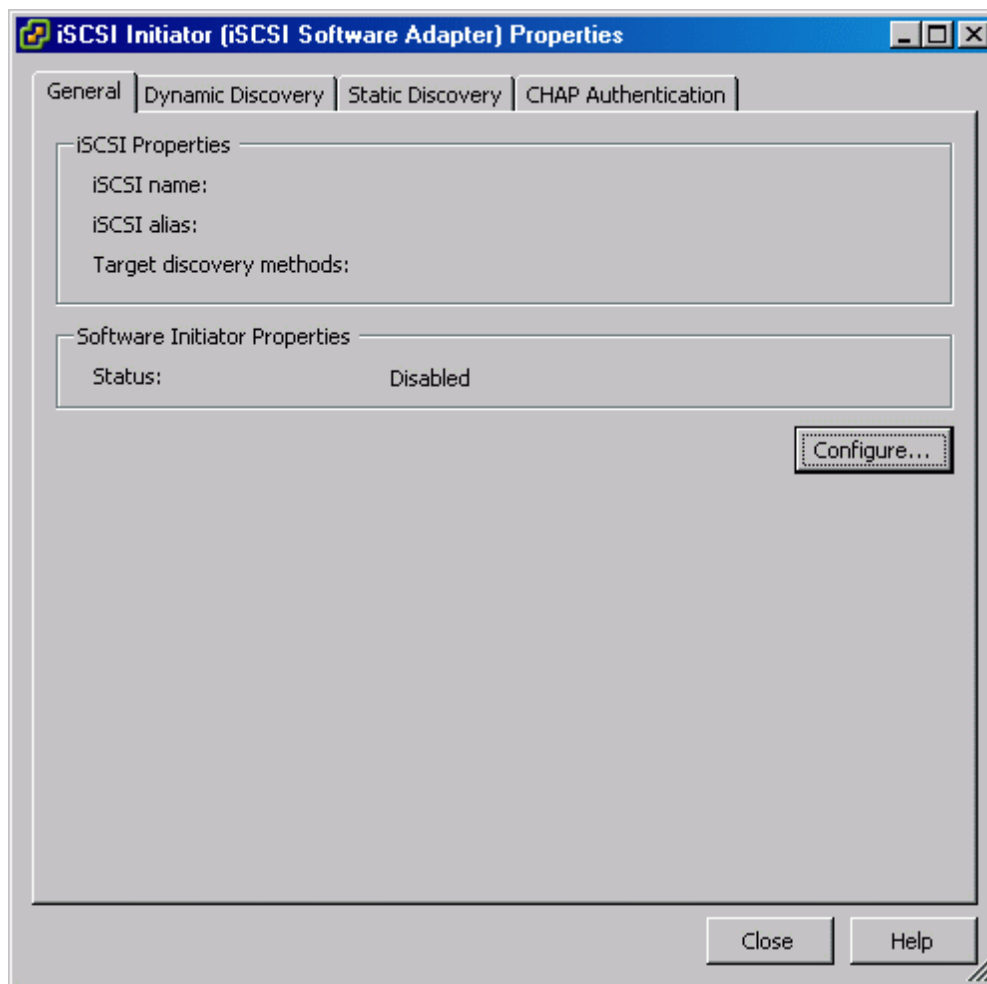


### Select iSCSI Software Adapter.



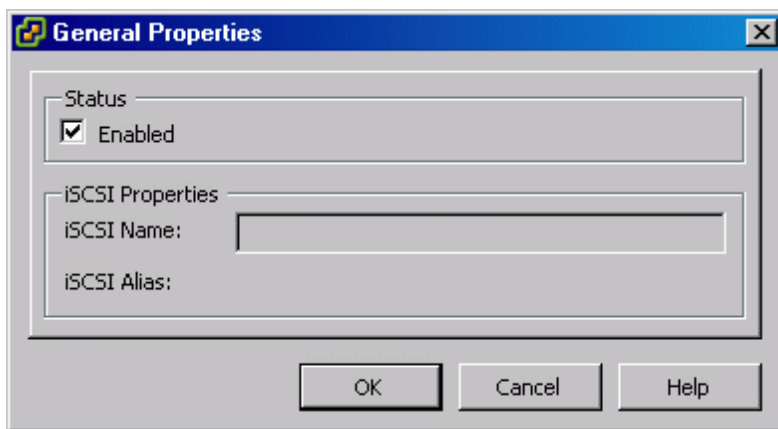
### Click Properties.

**iSCSI Initiator Properties** dialog appears.



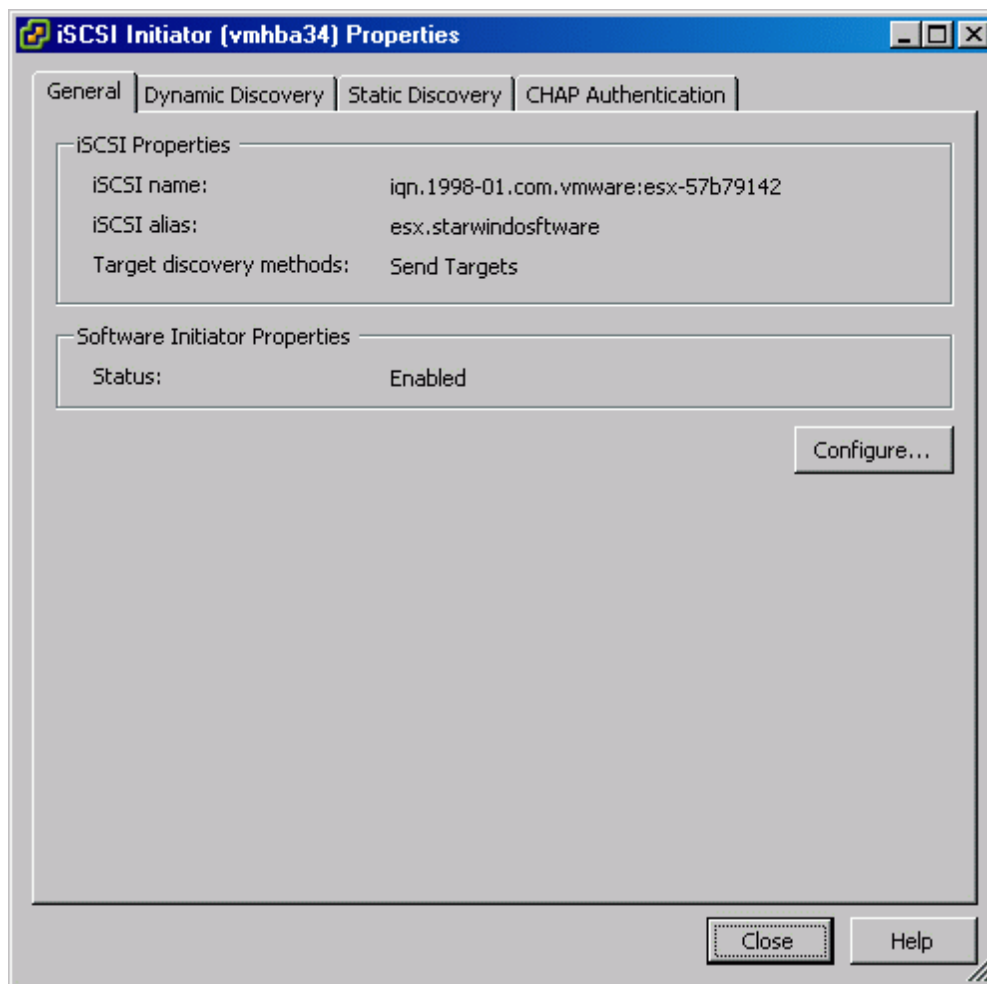
Press the **Configure** button.

To enable the initiator check the **Enabled** check box.

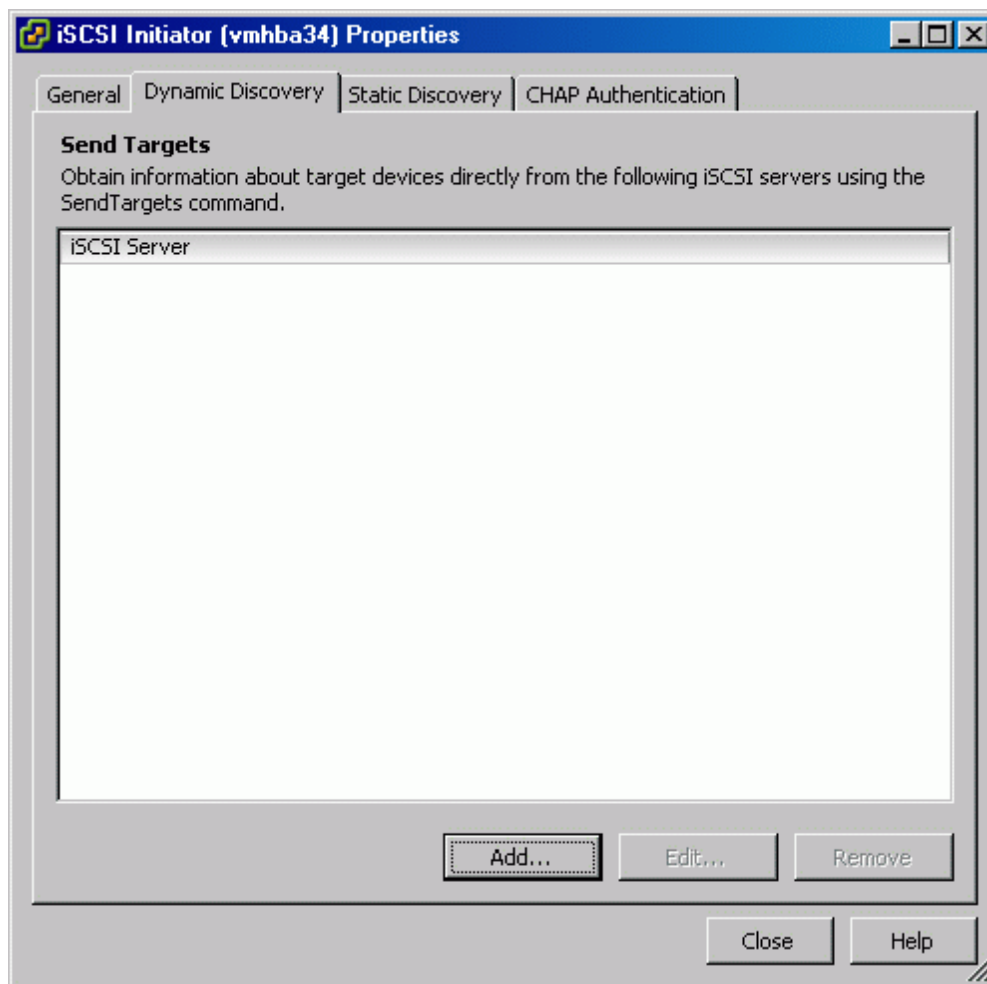


Press the **OK** button to close the **General Properties** dialog and return to the **iSCSI Initiator** properties dialog.

The dialog will now show the initiator's status, default name, and alias.

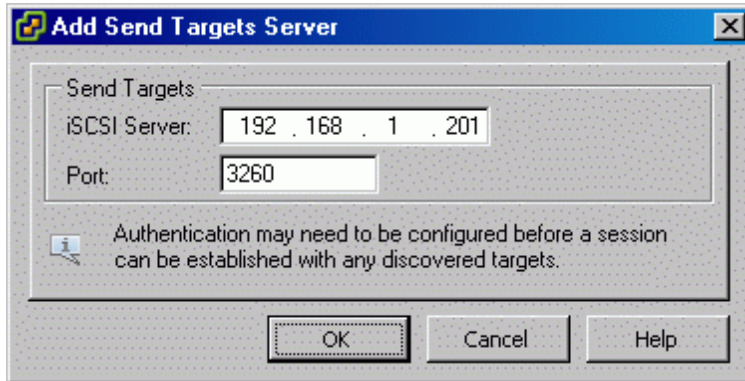


Switch to the **Dynamic Discovery** tab.



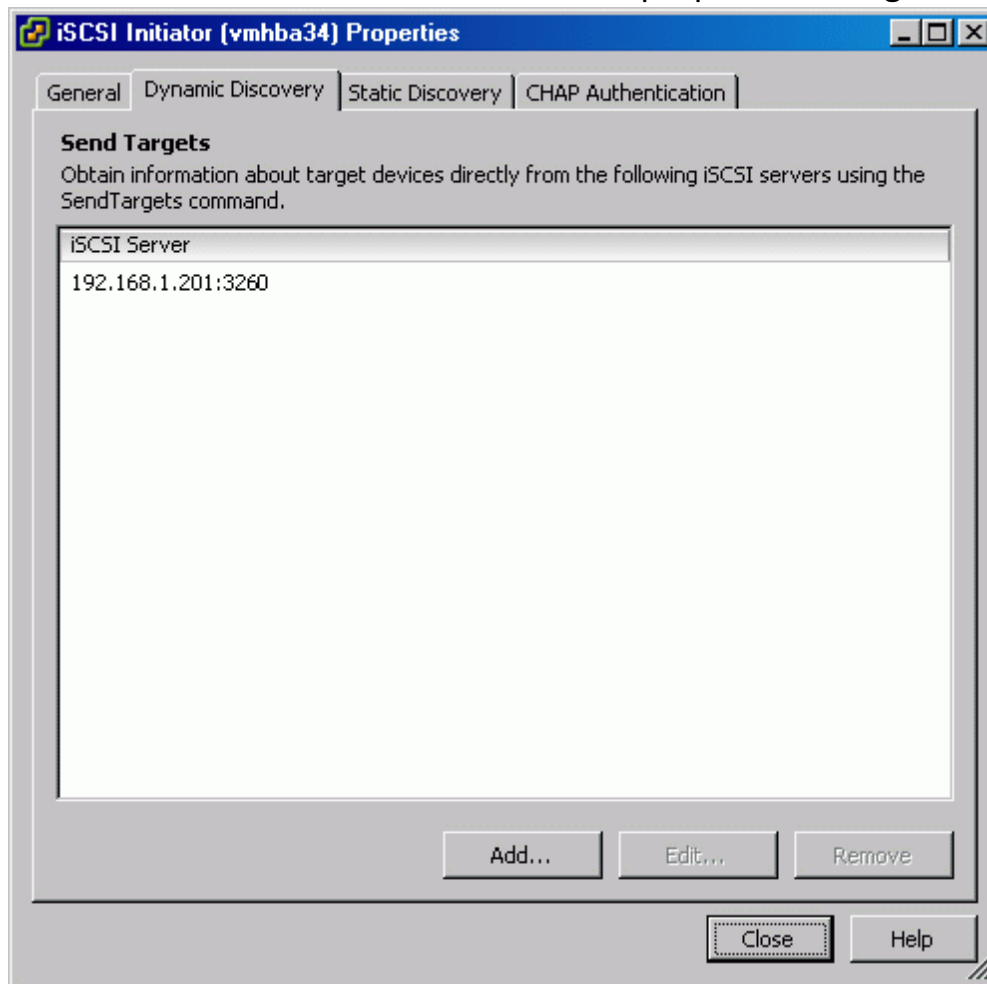
Press the **Add...** button

The **Add Send Targets Server** dialog is shown. Specify the IP address of the **StarWind** iSCSI target server.



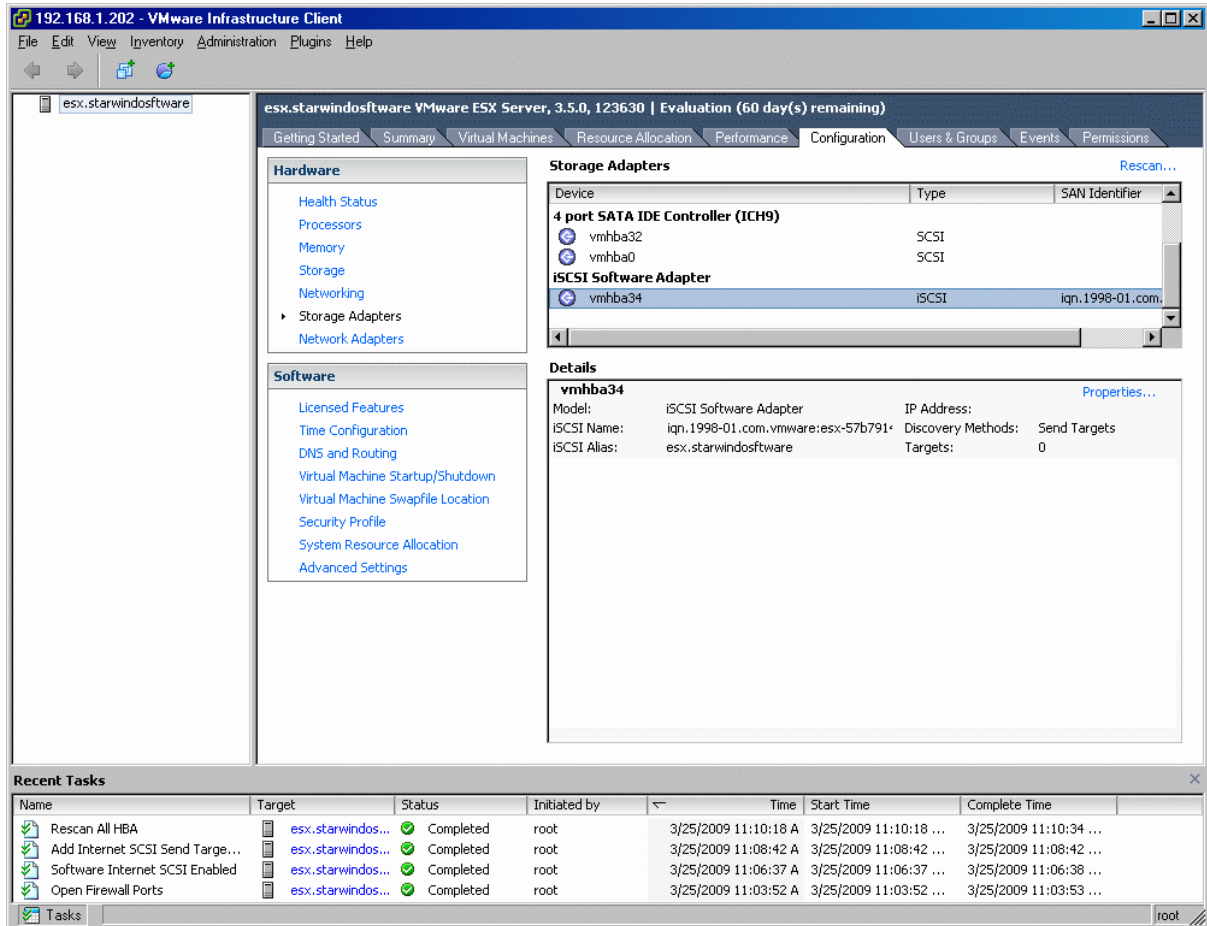
Press the **OK** button.

You will be returned to the **iSCSI Initiator** properties dialog.



Press the **Close** button.

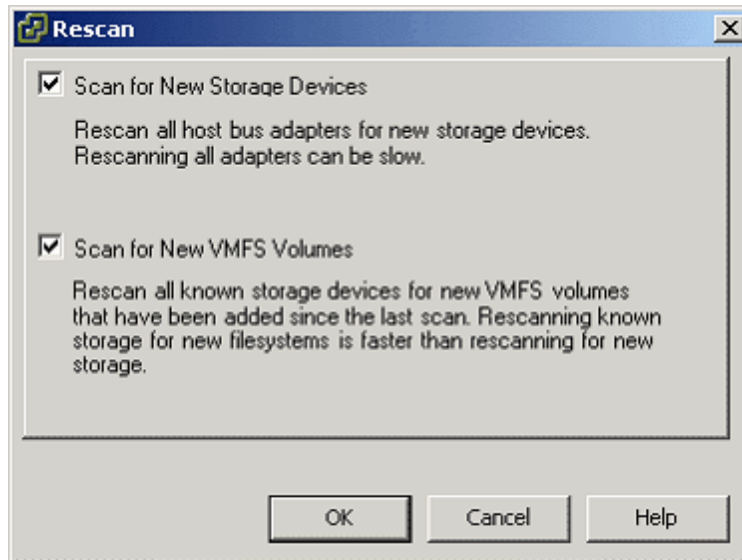
The **Virtual Infrastructure Client** window should look like the sample picture provided below.



Infrastructure client will prompt you to rescan for new iSCSI LUNs. If not - press **Rescan...** button.



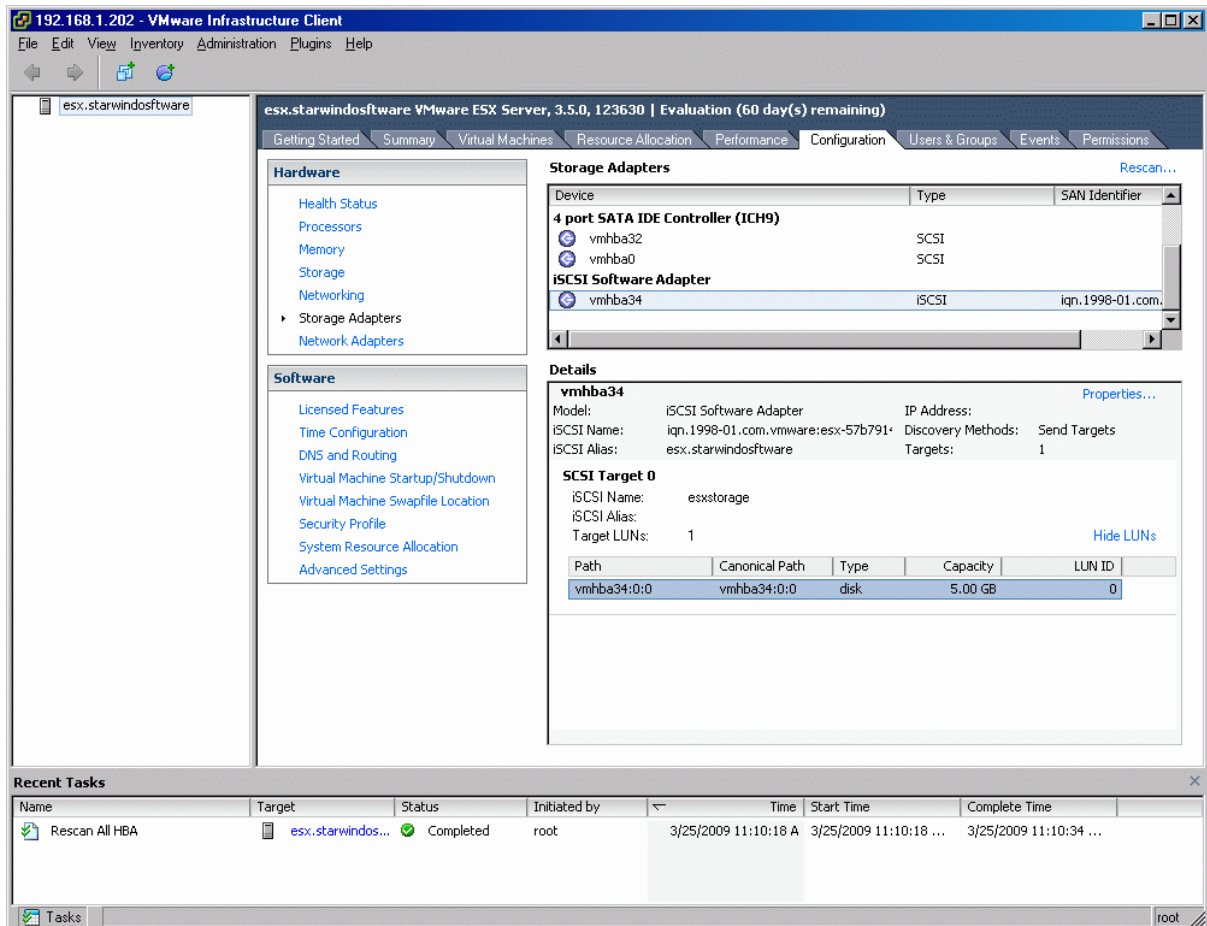
Rescan dialog appears.



Leave the default values and press the **OK** button.

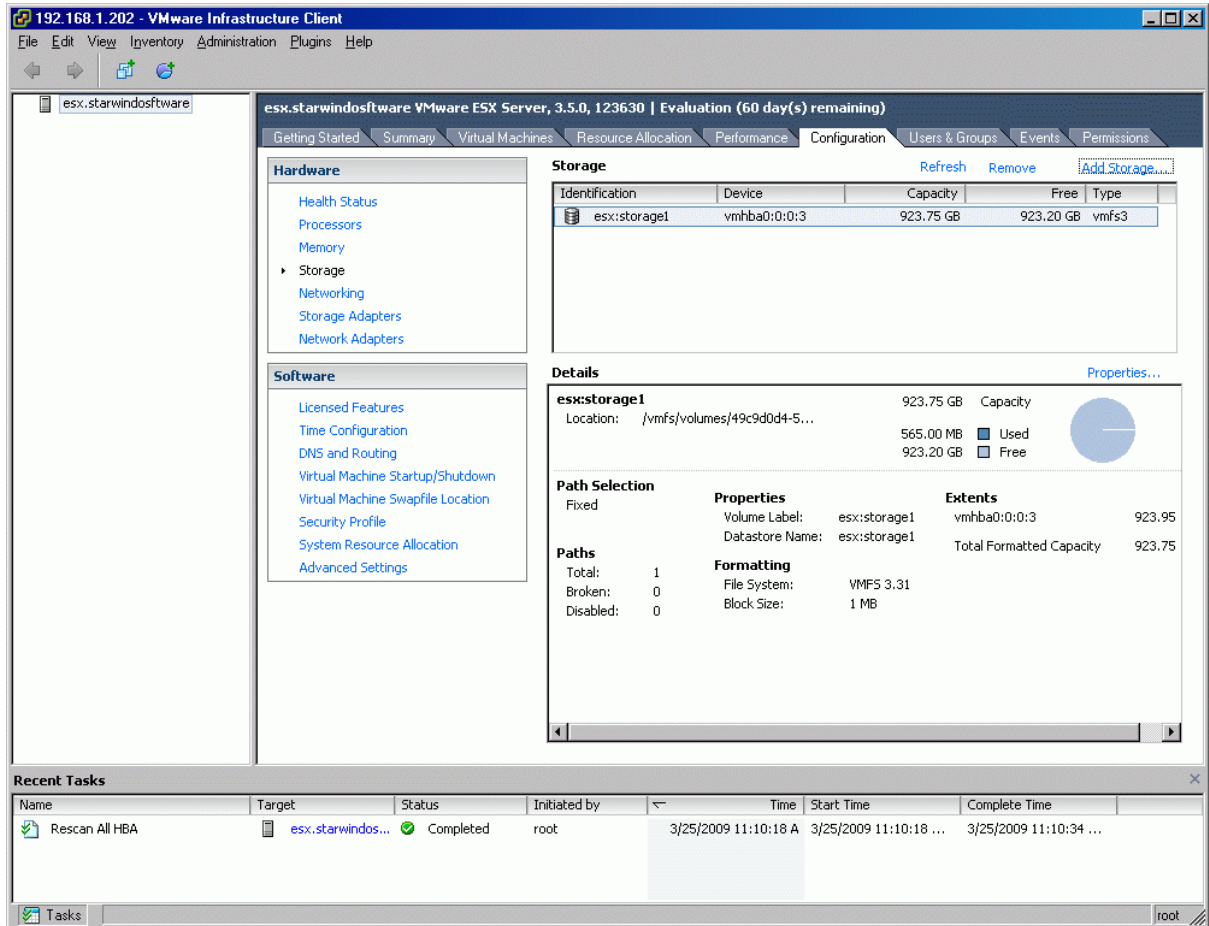
If successful, the **Virtual Infrastructure Client** window should look like the sample picture provided below.

Note that the **StarWind** target “**SCSI Target 0**” is now shown.



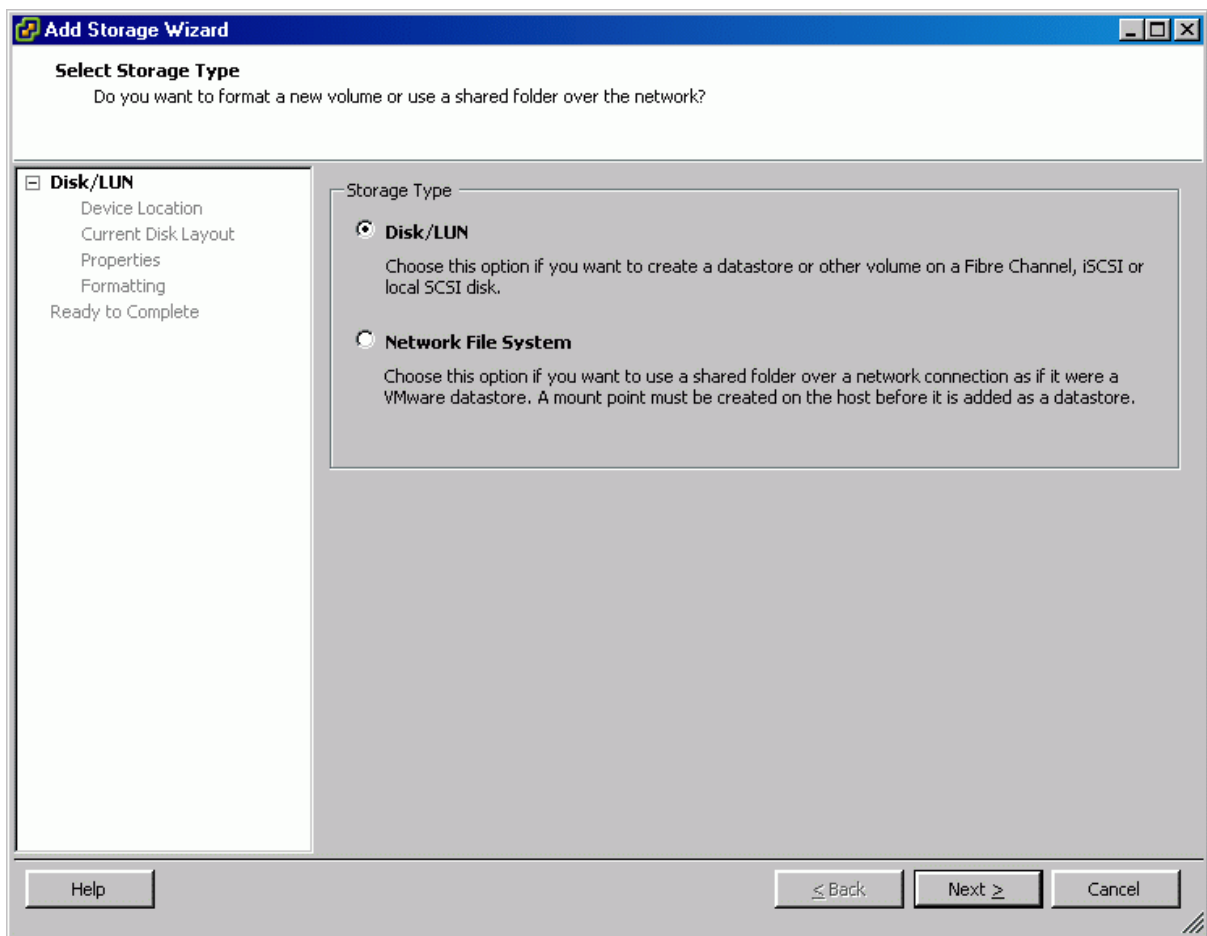
## Set Up the Datastore

Click the Configuration tab. Then click Storage (SCSI, SAN, and NFS).



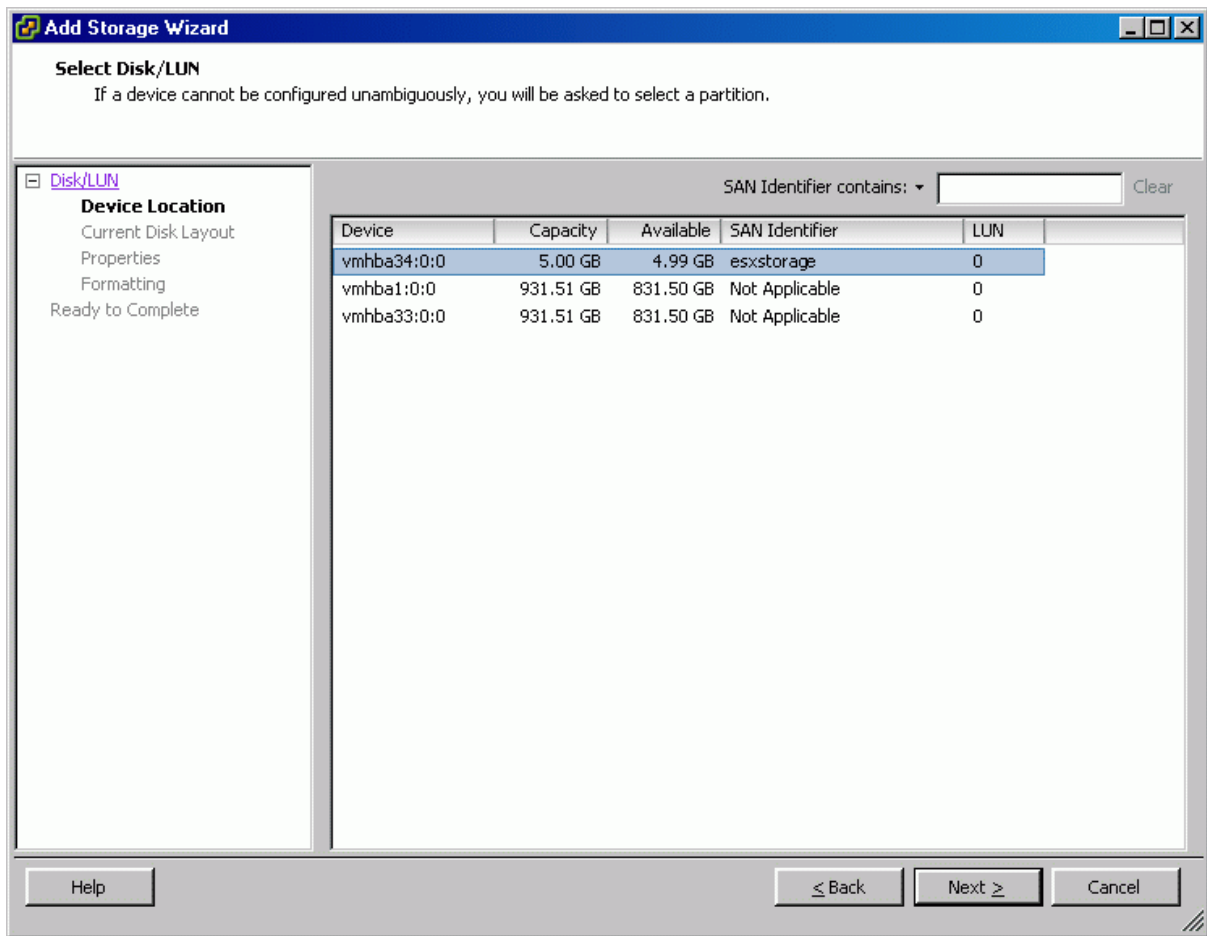
Press the **Add Storage...** link.

Add Storage dialog appears. Select **Disk/LUN** storage type.



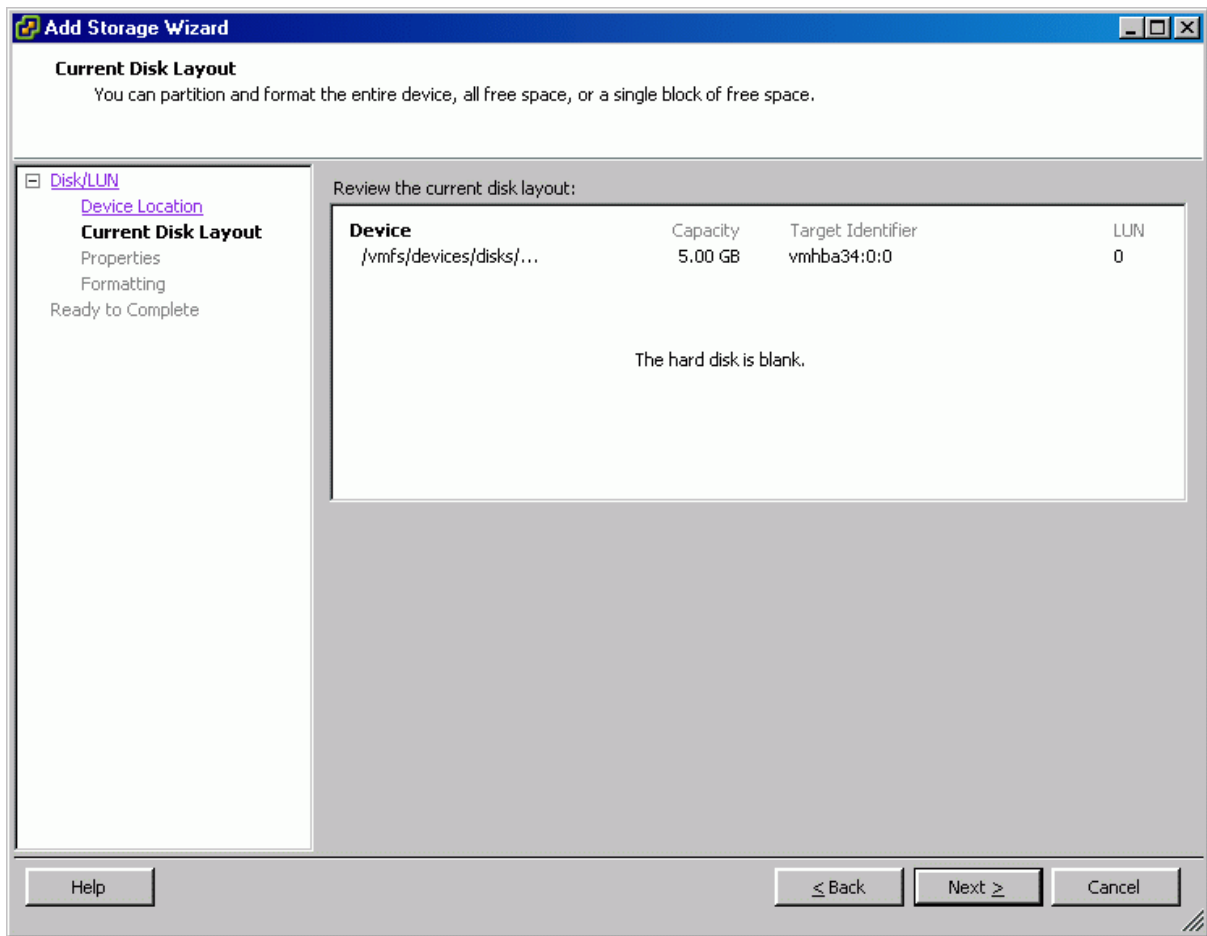
Press the **Next** button to continue.

Select the device.



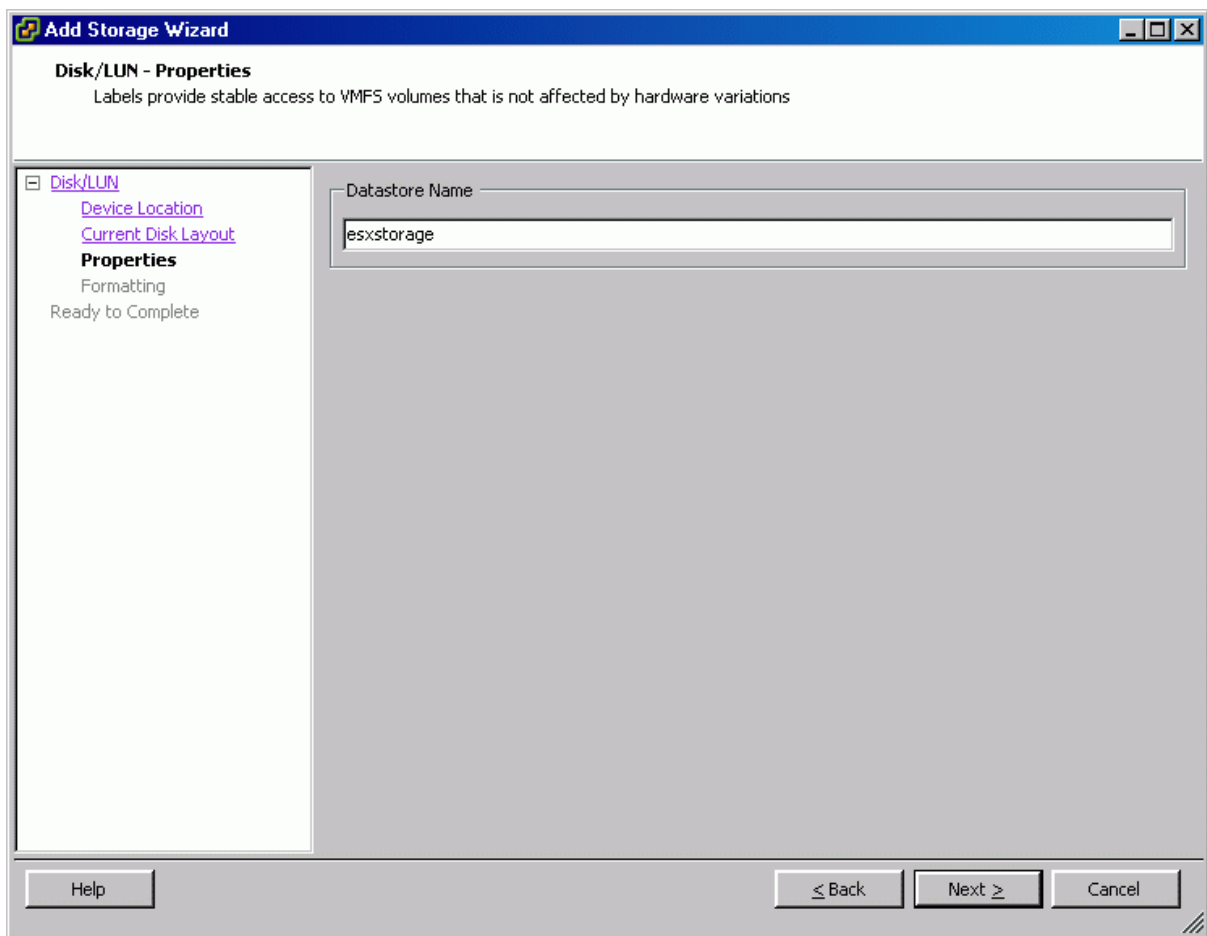
Press the **Next** button to continue.

Review the disk layout.



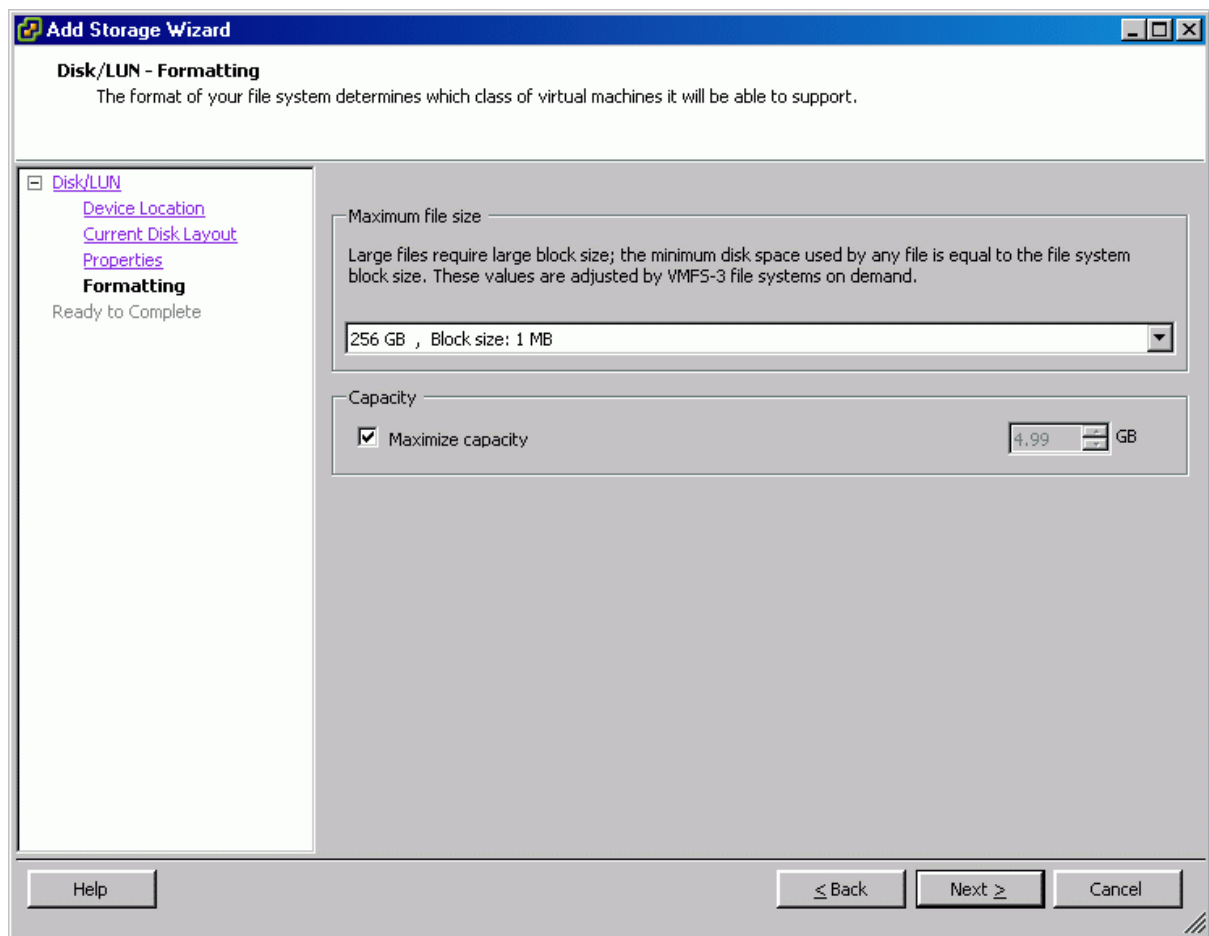
Press the **Next** button to continue.

Specify the Datastore Name.



Press the **Next** button to continue.

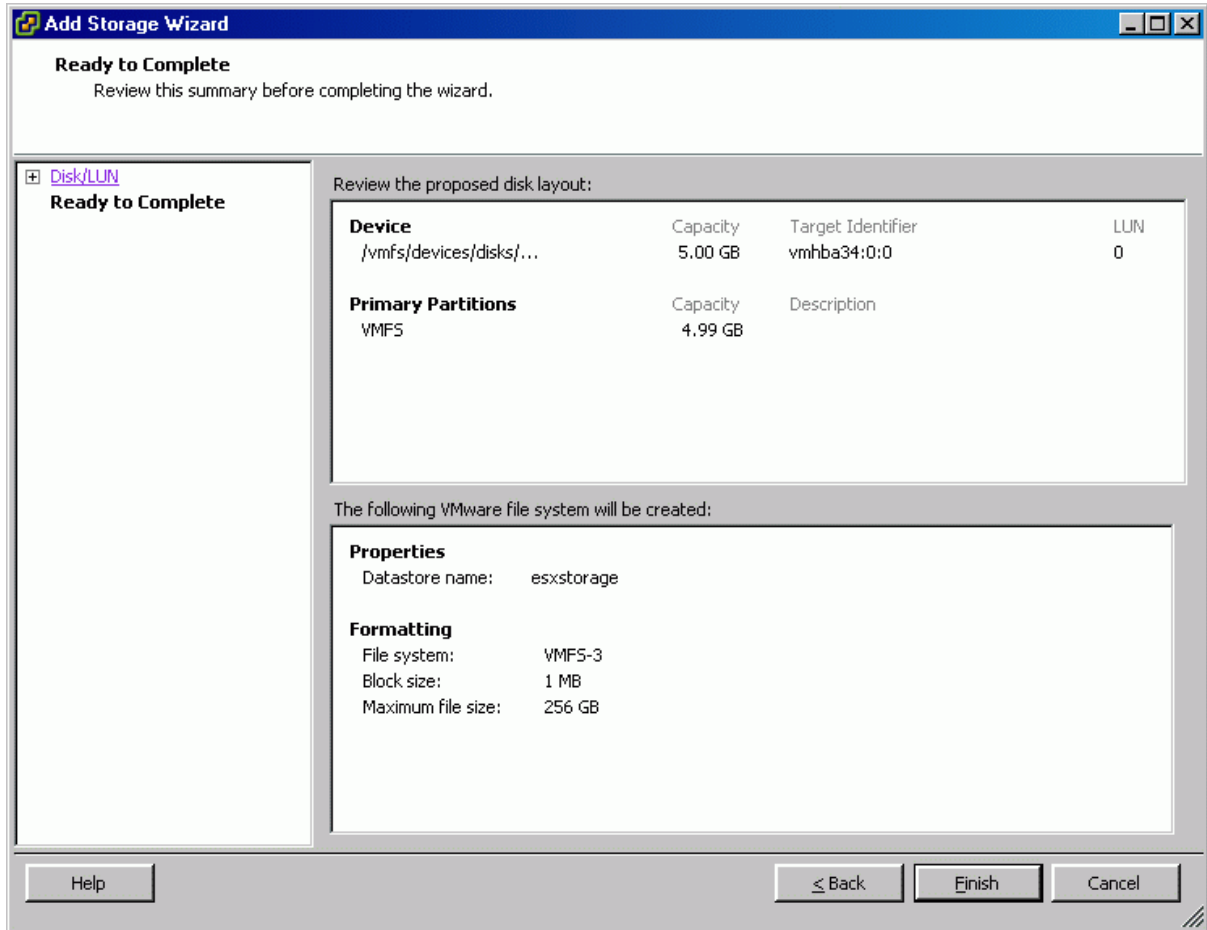
Specify the Disk/LUN formatting options.



Press the **Next** button to continue.

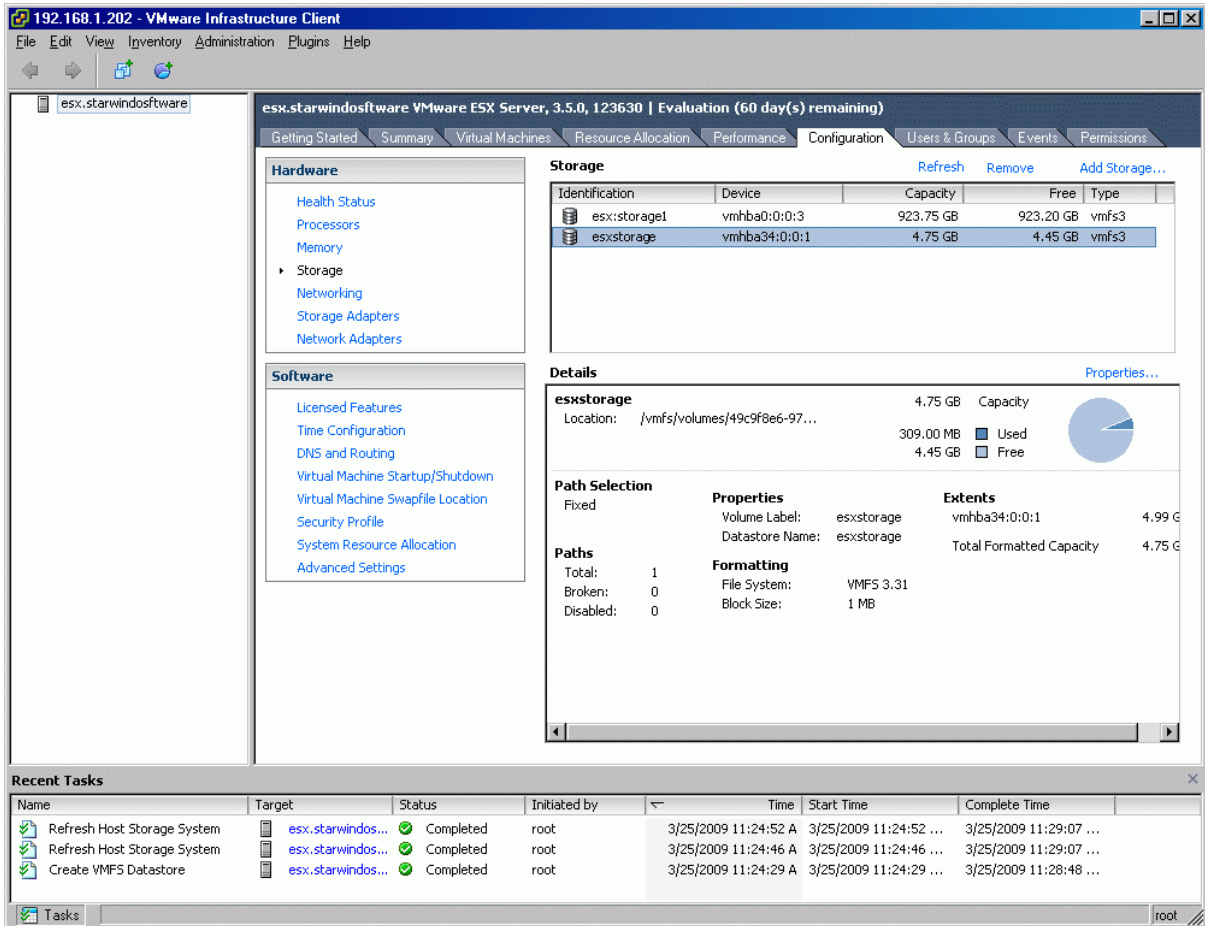


Confirm that the device parameters are correct and press the **Back** button should any changes be required.



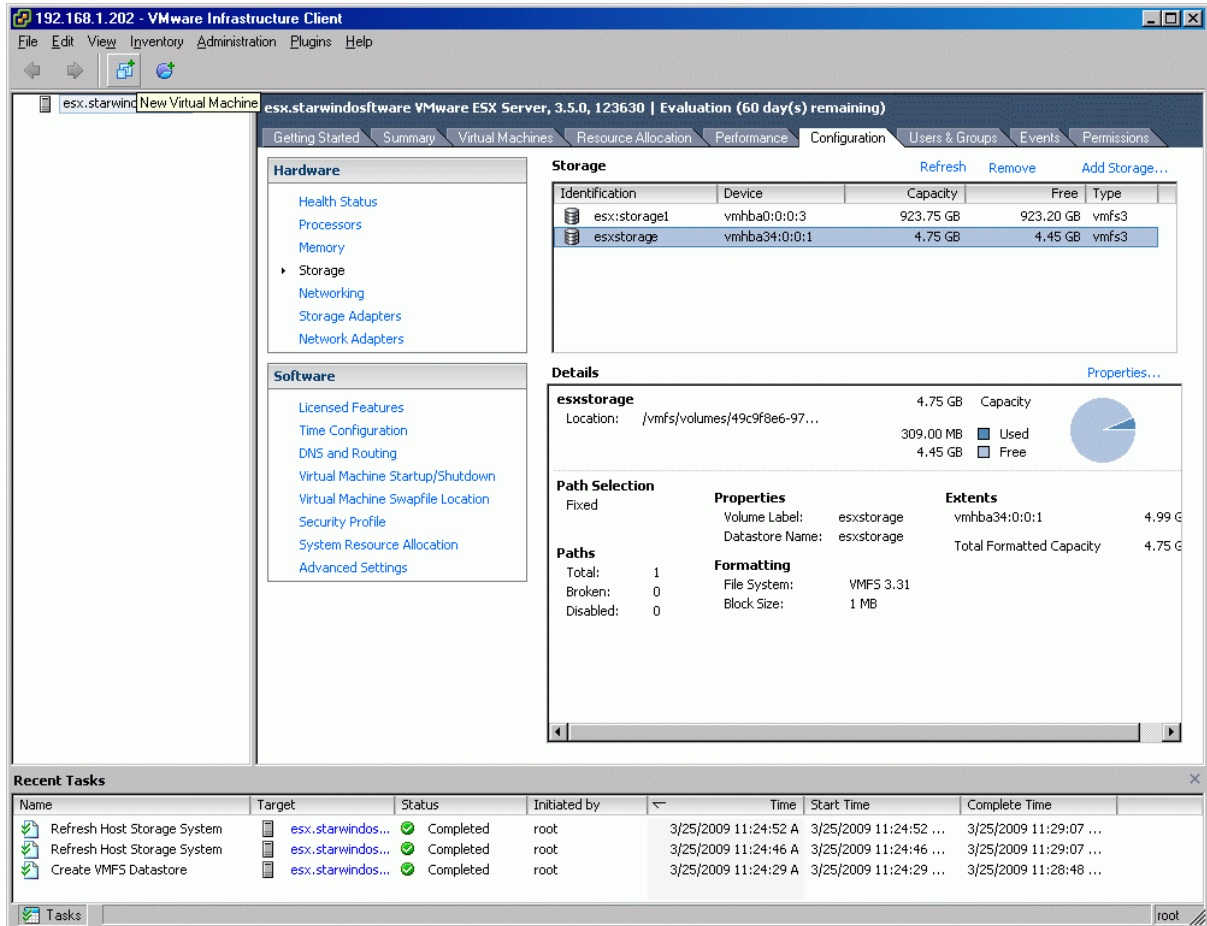
Press the **Finish** button to close the wizard.

If everything went fine, the **Virtual Infrastructure Client** window should look like the sample picture provided below.



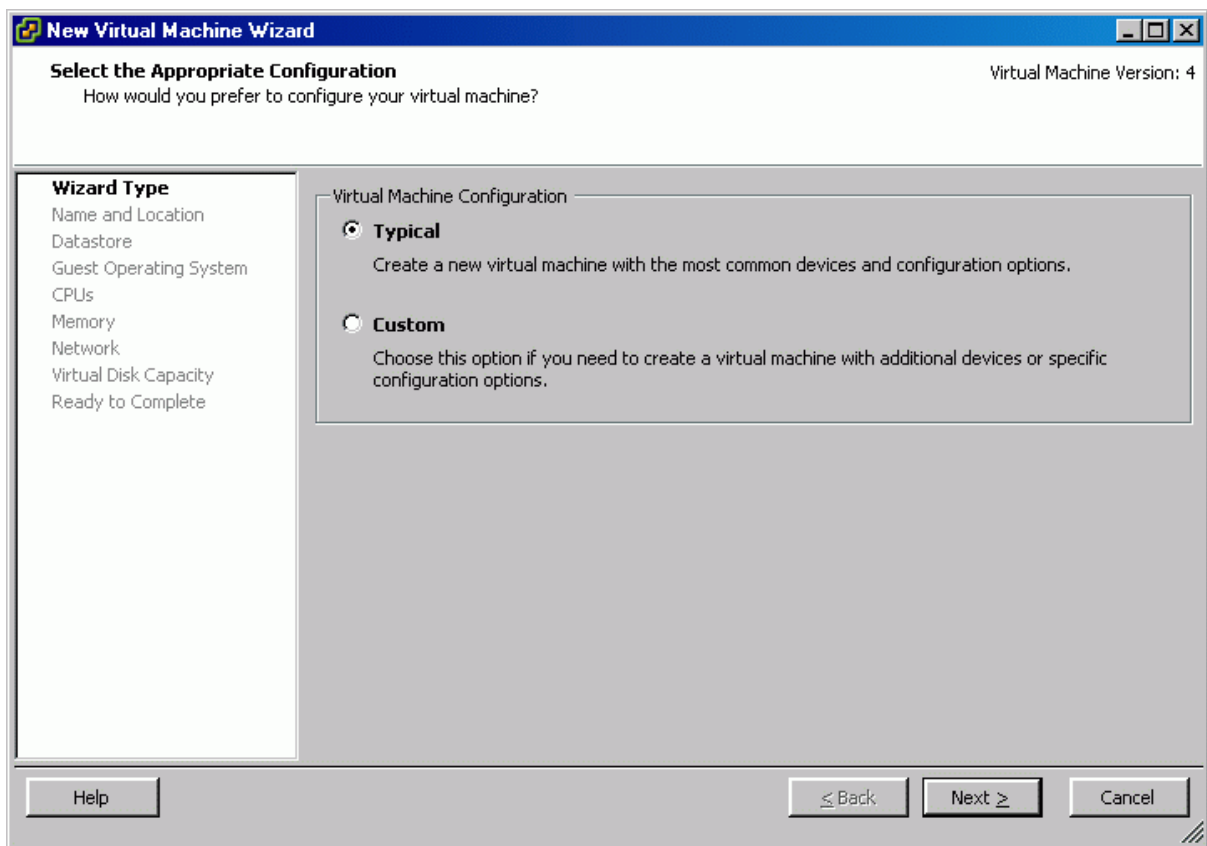
## Create a New Virtual Machine

Press the right mouse button over the server and select **New Virtual Machine**.

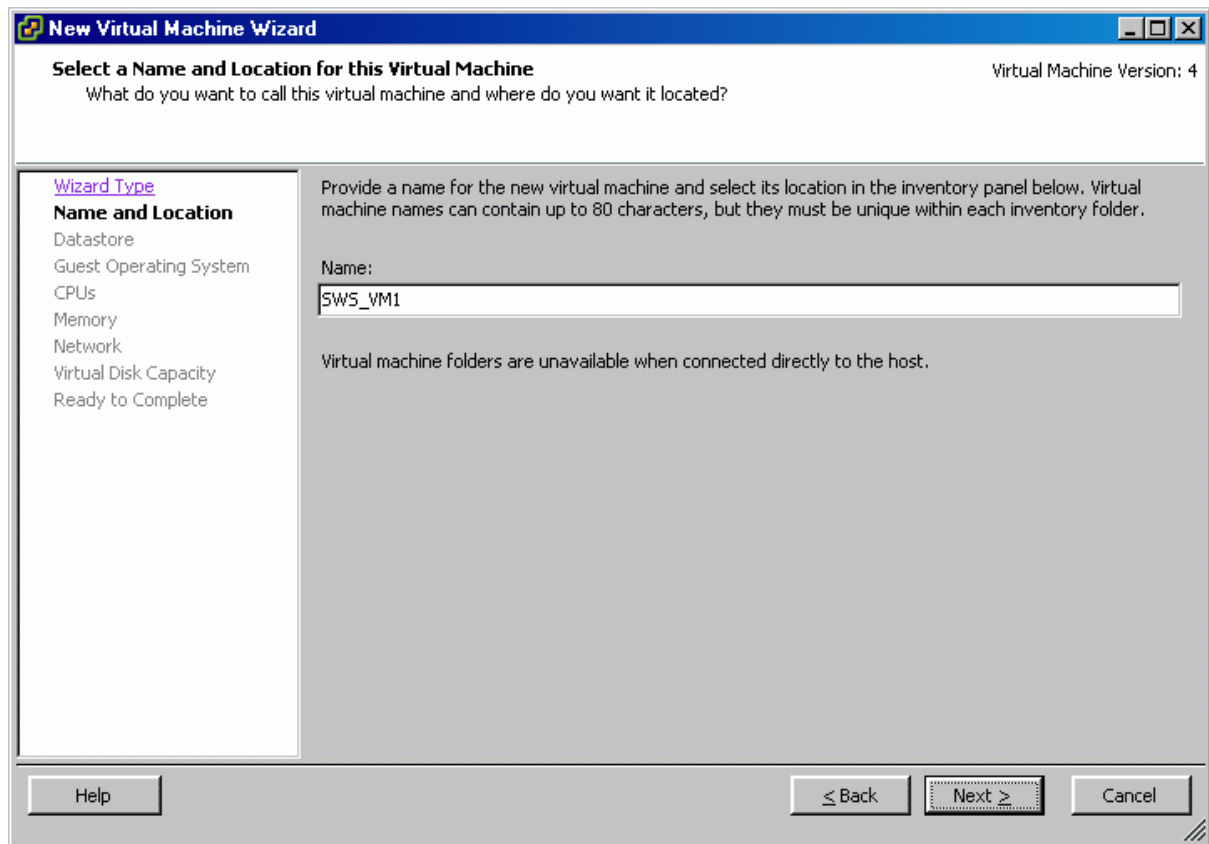


Alternatively you can press **Ctrl+N** combination.

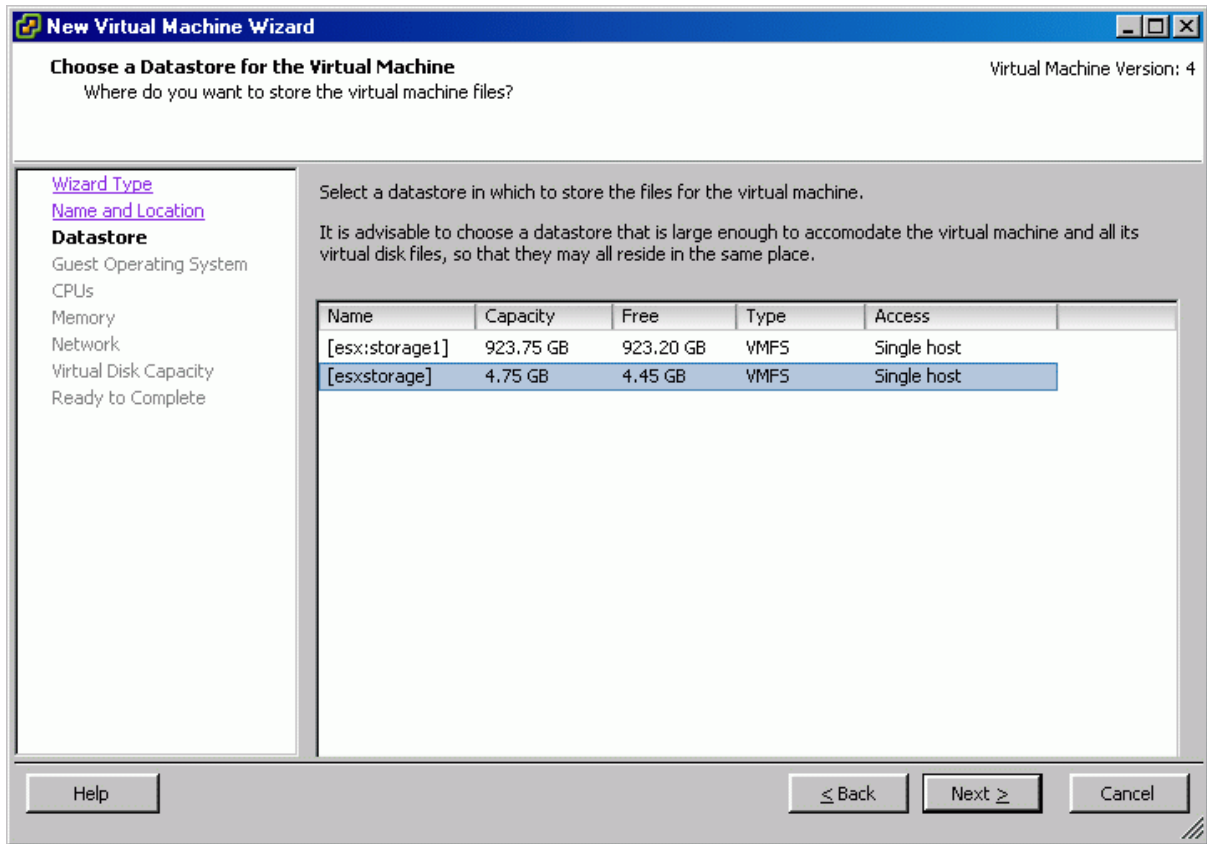
**New Virtual Machine Wizard** appears.



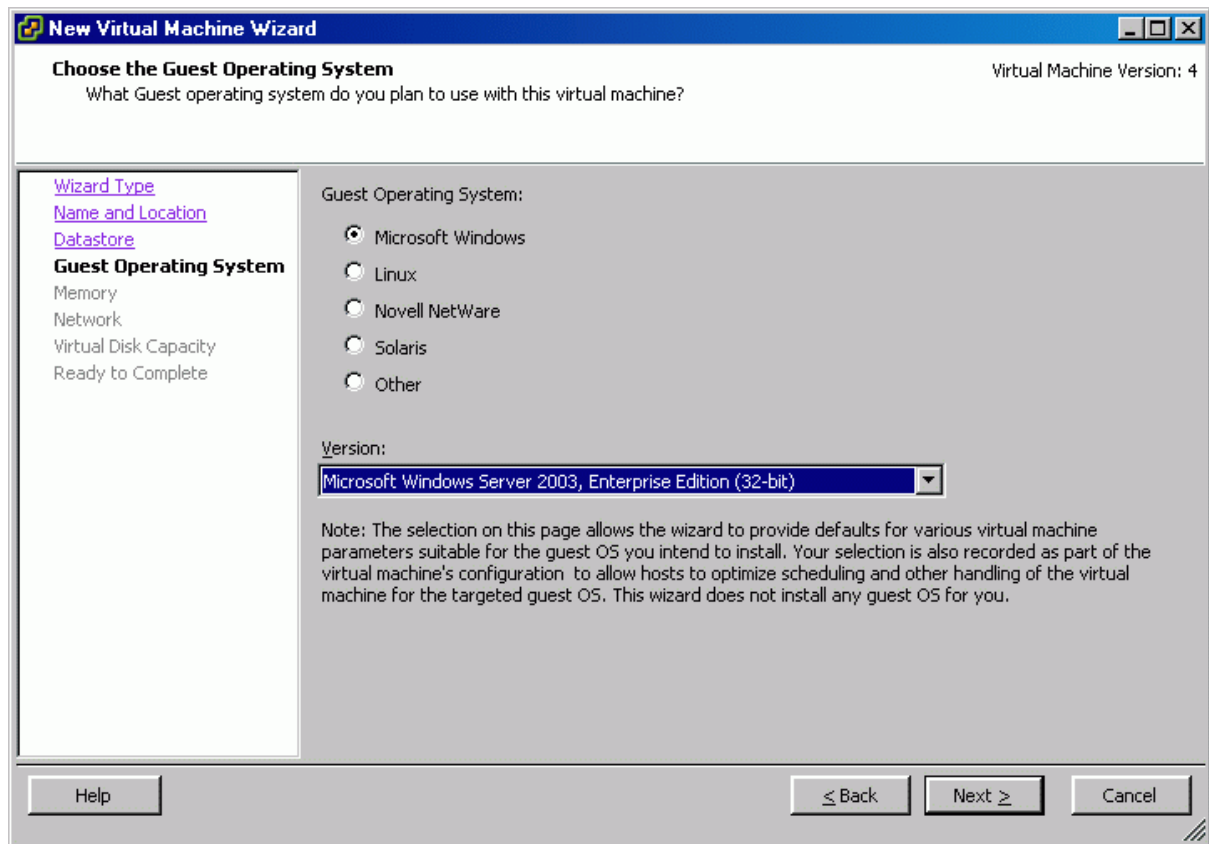
Press the **Next** button to continue.



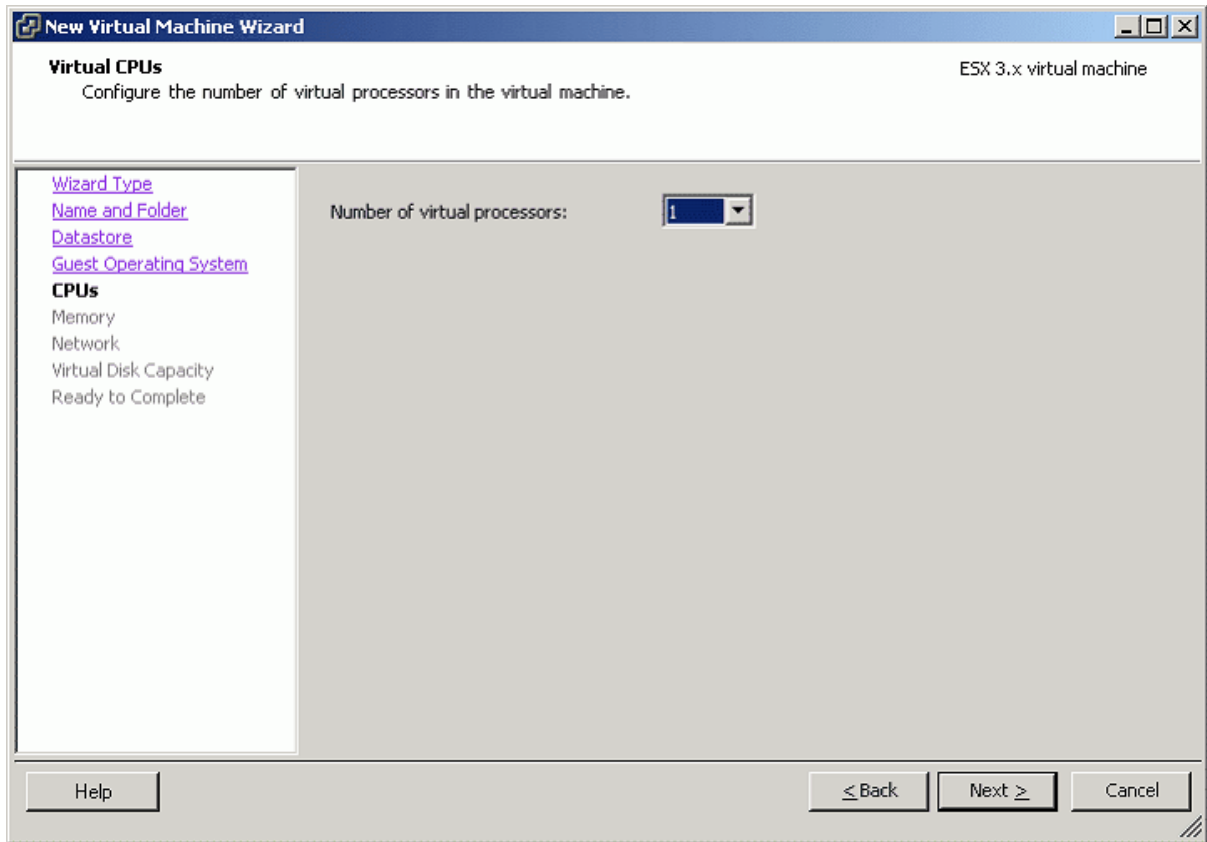
Press the **Next** button to continue.



Press the **Next** button to continue.

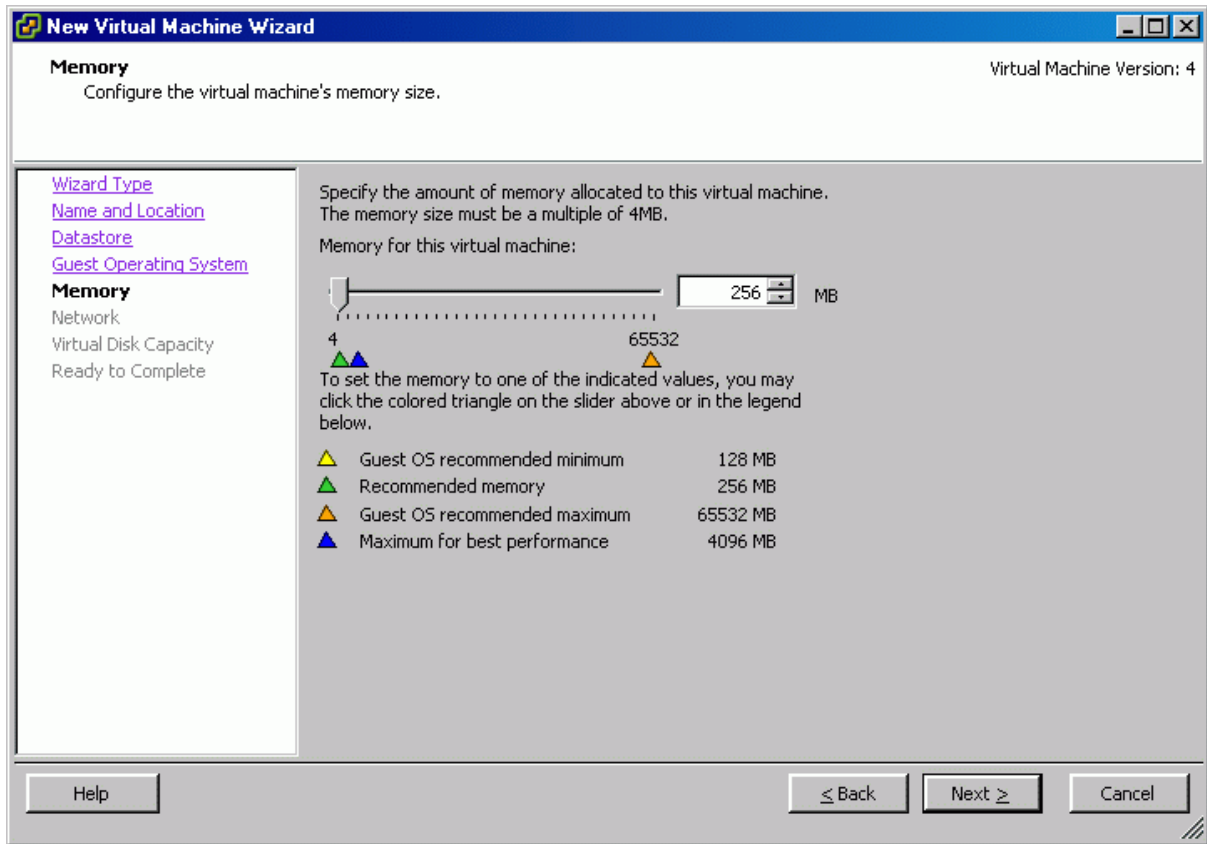


Press the **Next** button to continue.

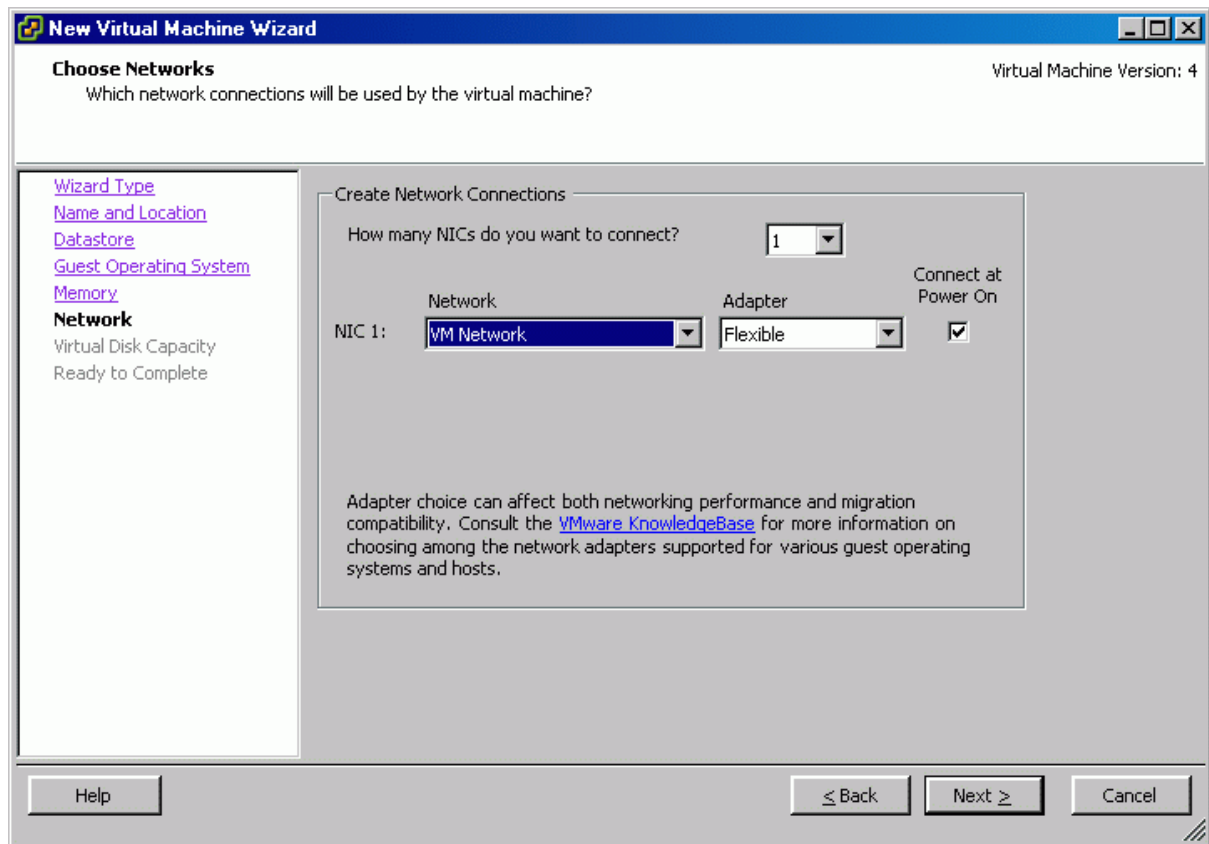


Press the **Next** button to continue.

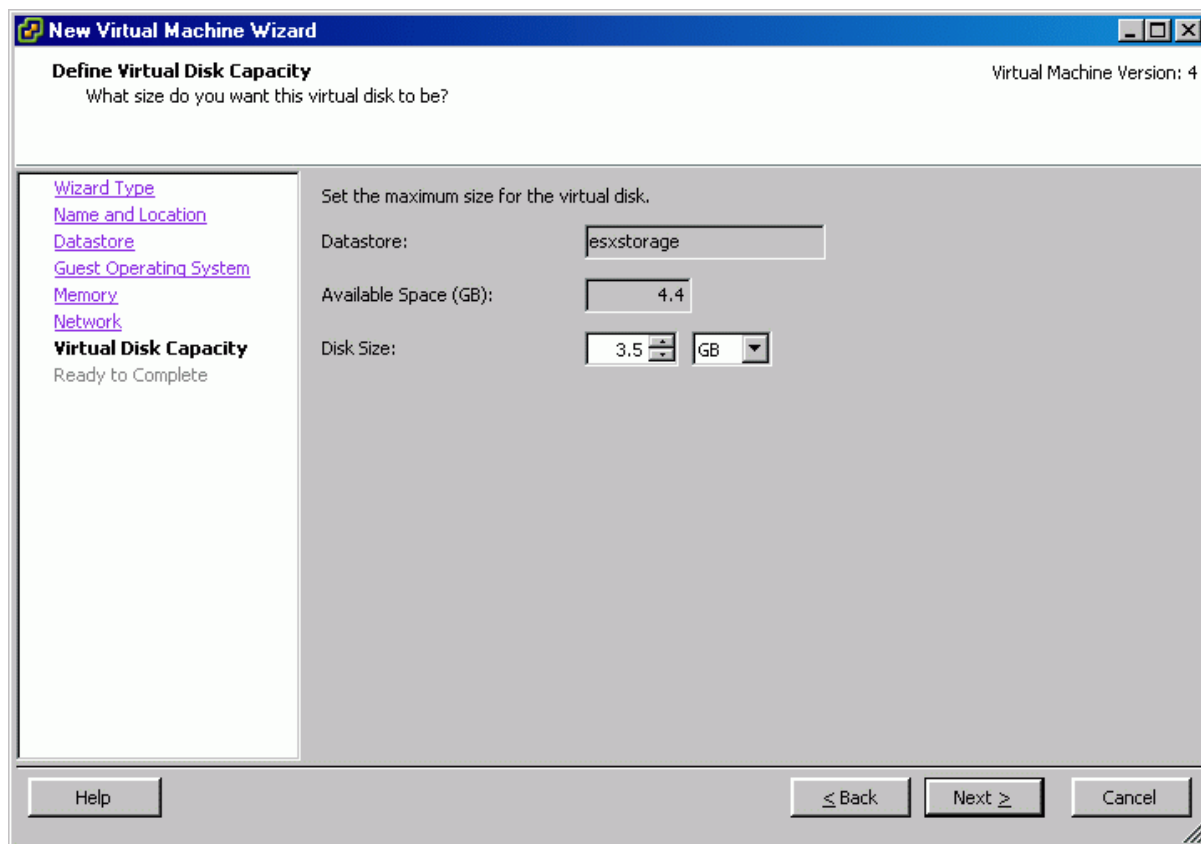




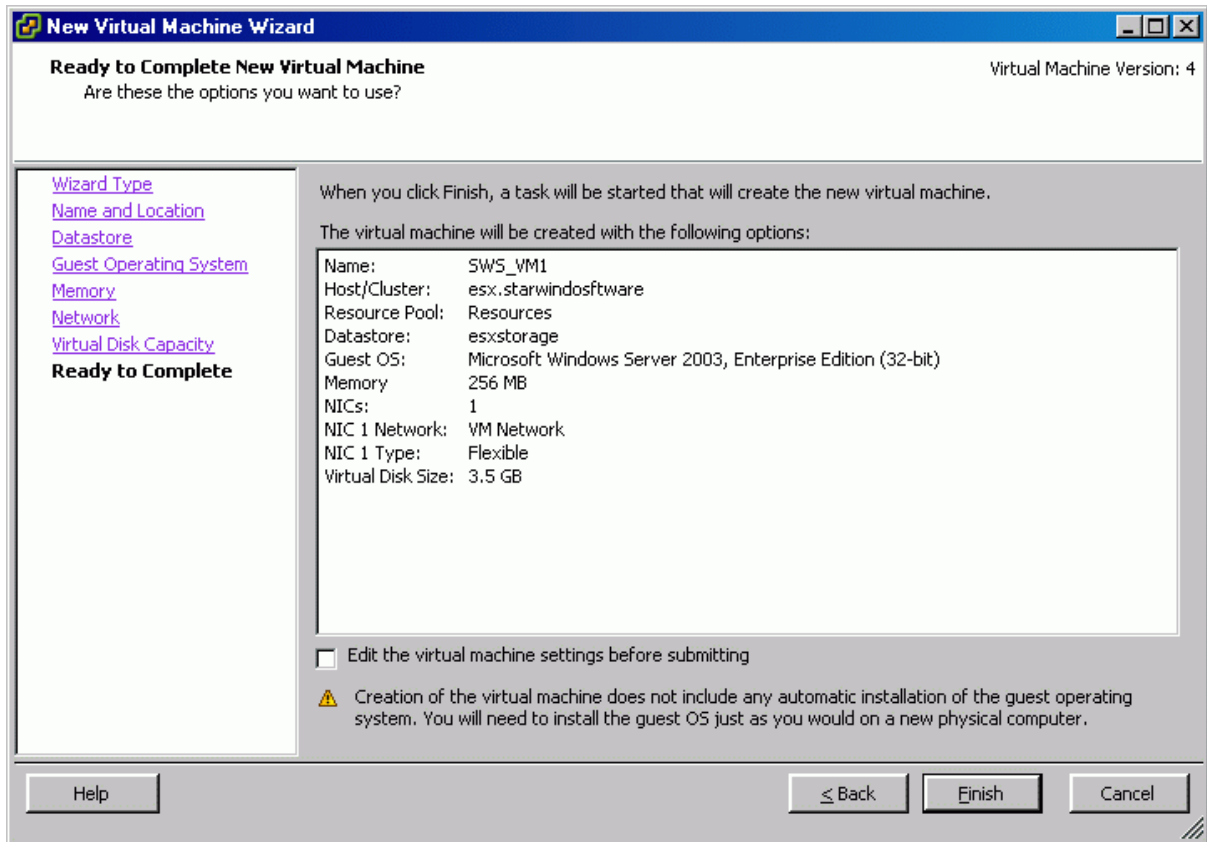
Press the **Next** button to continue.



Press the **Next** button to continue.

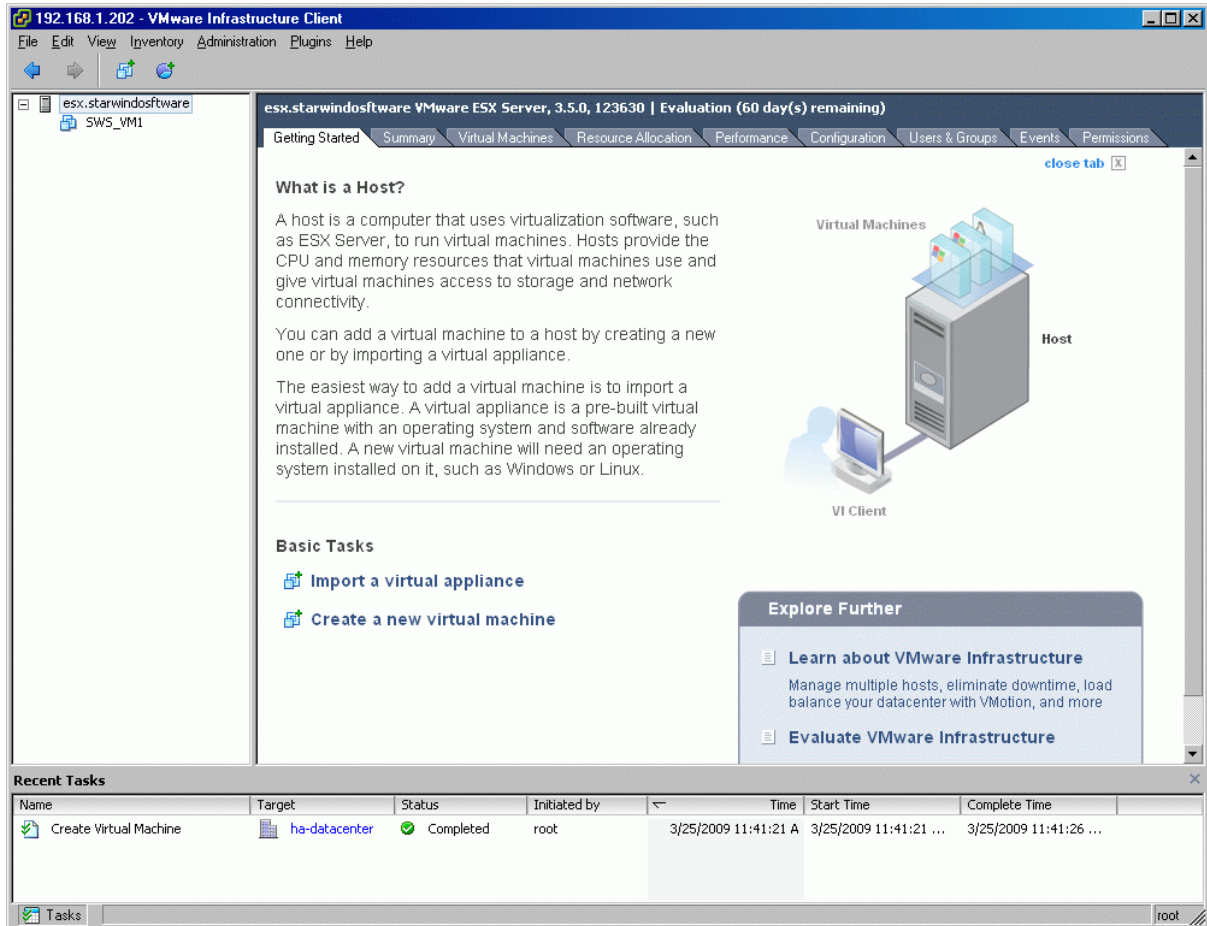


Press the **Next** button to continue.

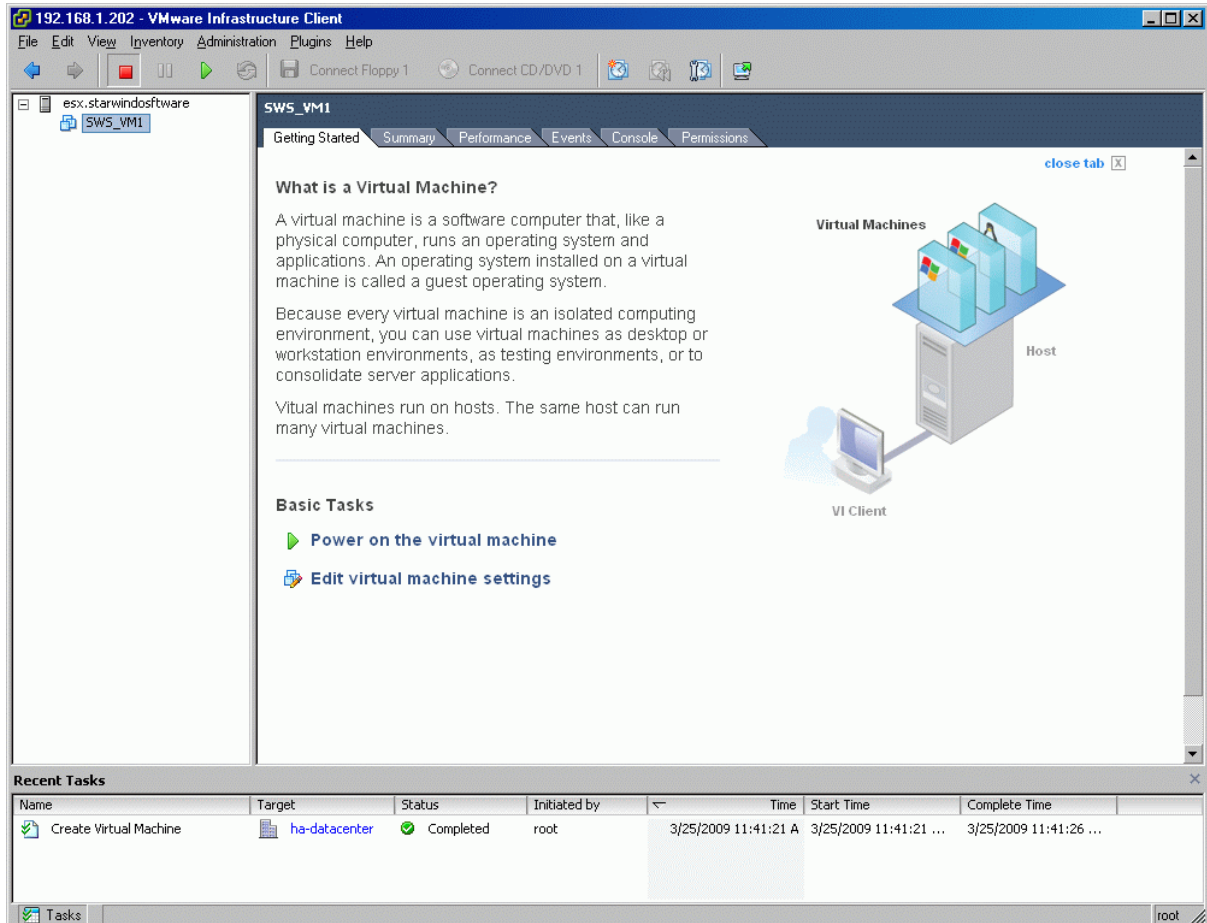


Press the **Finish** button to close the wizard.

If successful, the **Virtual Infrastructure Client** window should look like the sample picture provided below.

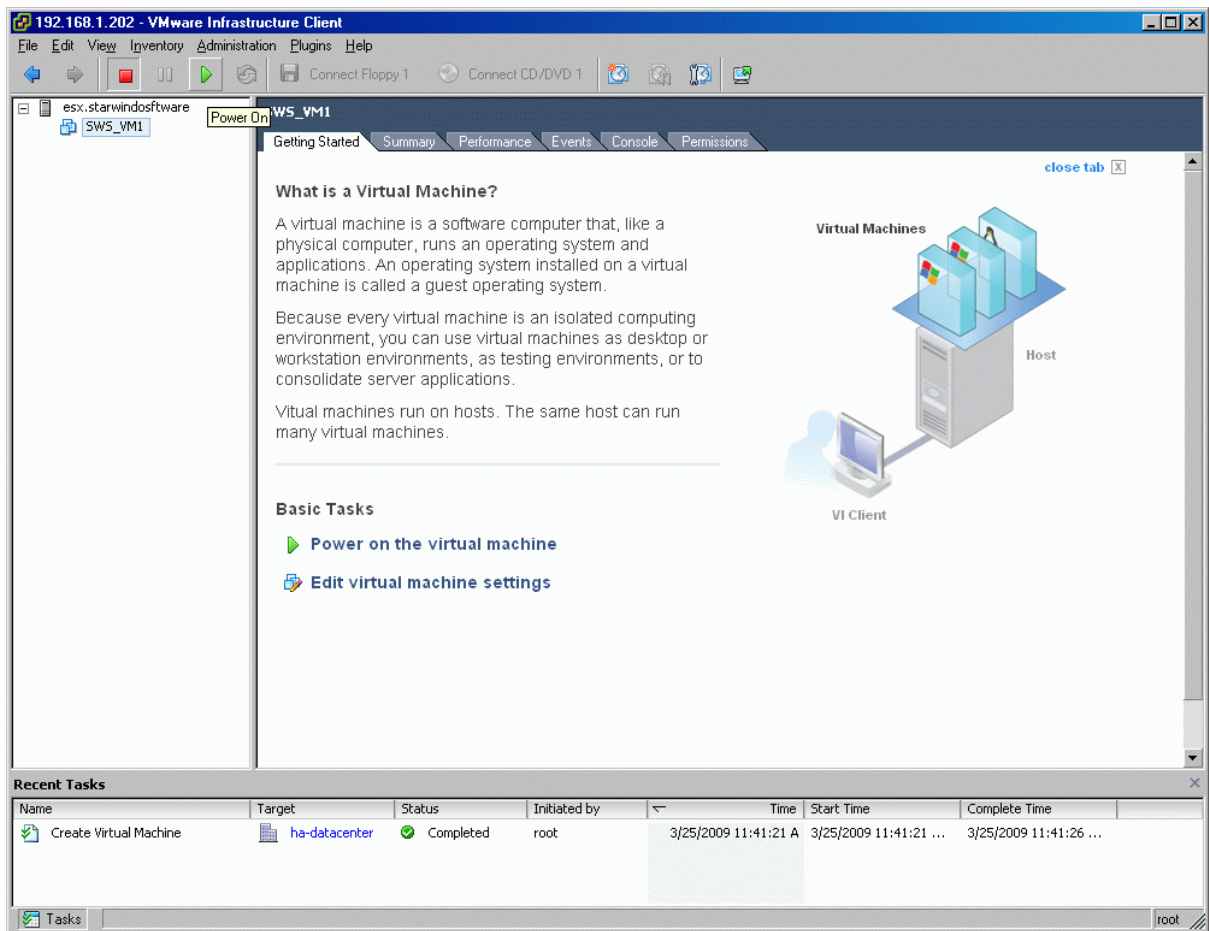


Click over the recently created virtual machine name in the inventory panel to view the information (see picture below).



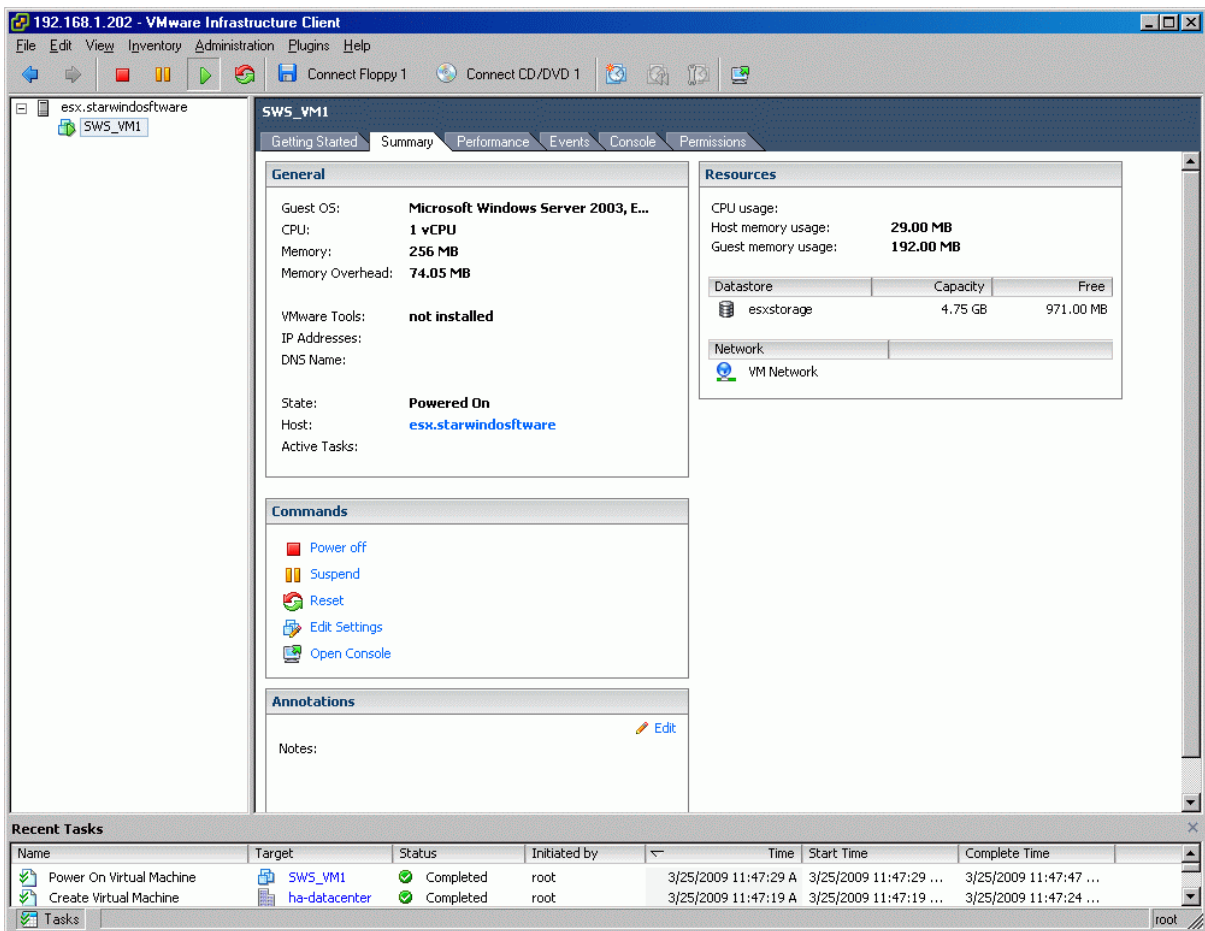
Before the virtual machine is powered on, check the **Licensed Features** on **Configuration** tab. You should specify **License Server** or provide **Host License File**.

Press the **Power On** button to start the virtual machine.



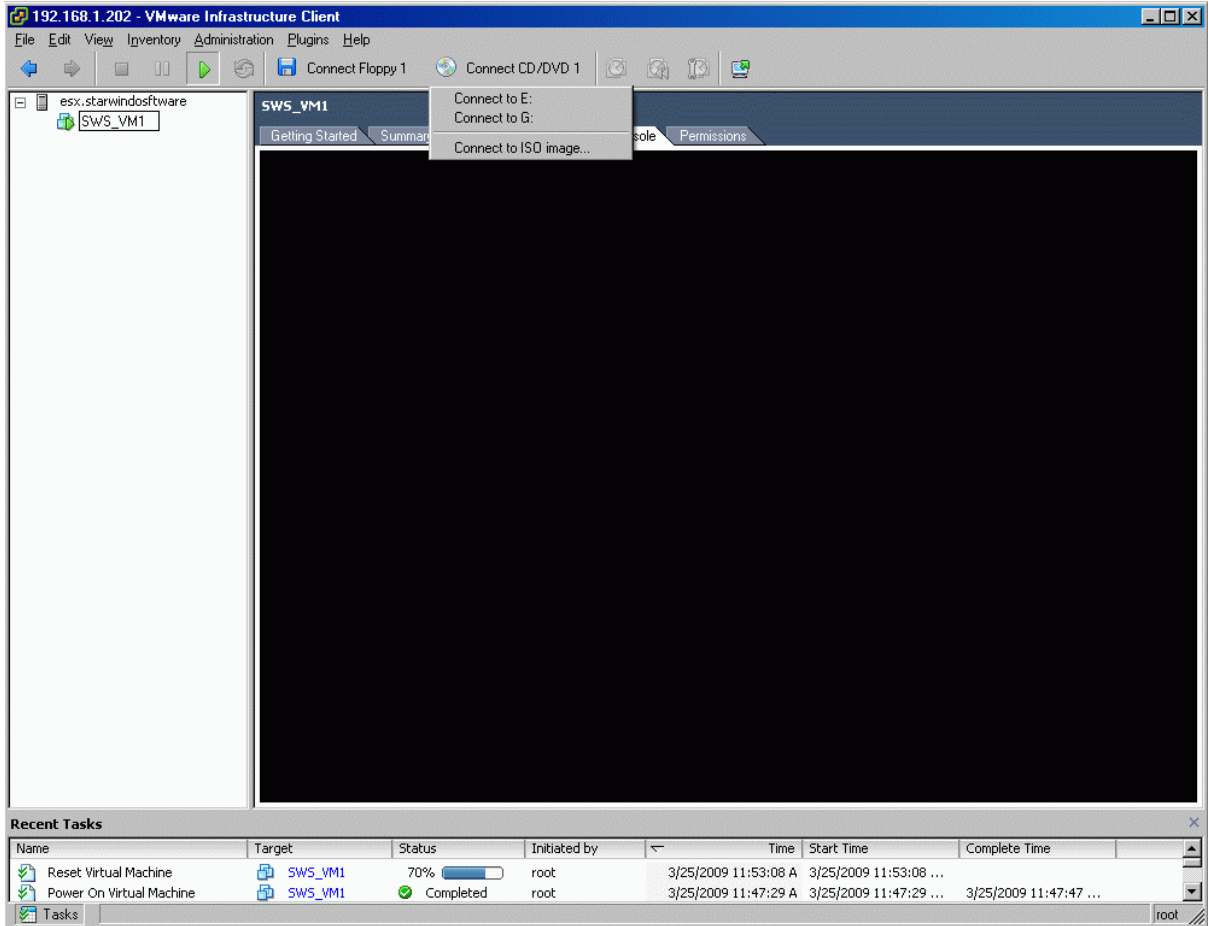
Optionally the virtual machine configuration may be editing by pressing the **Edit Settings** link.

Launch the console by pressing the **Open Console** button.

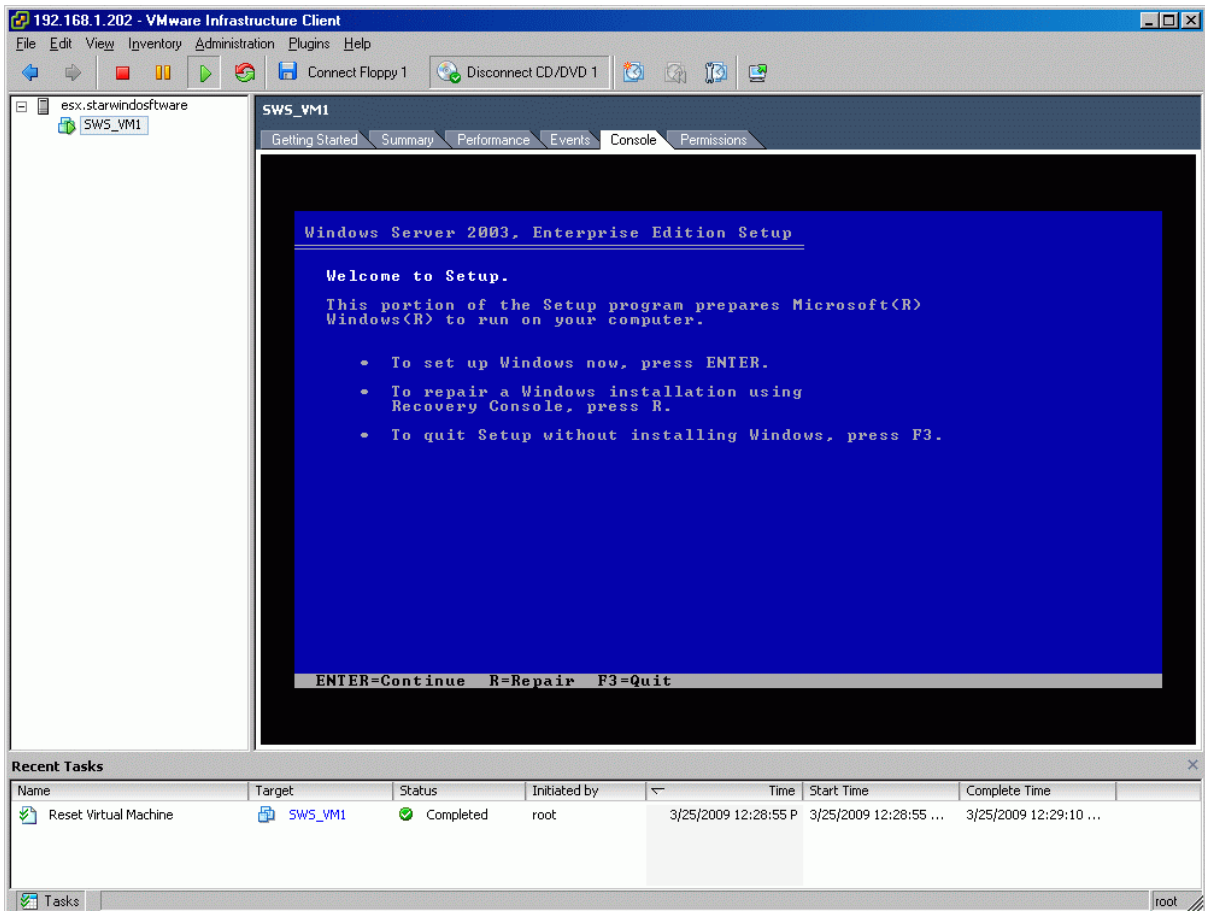


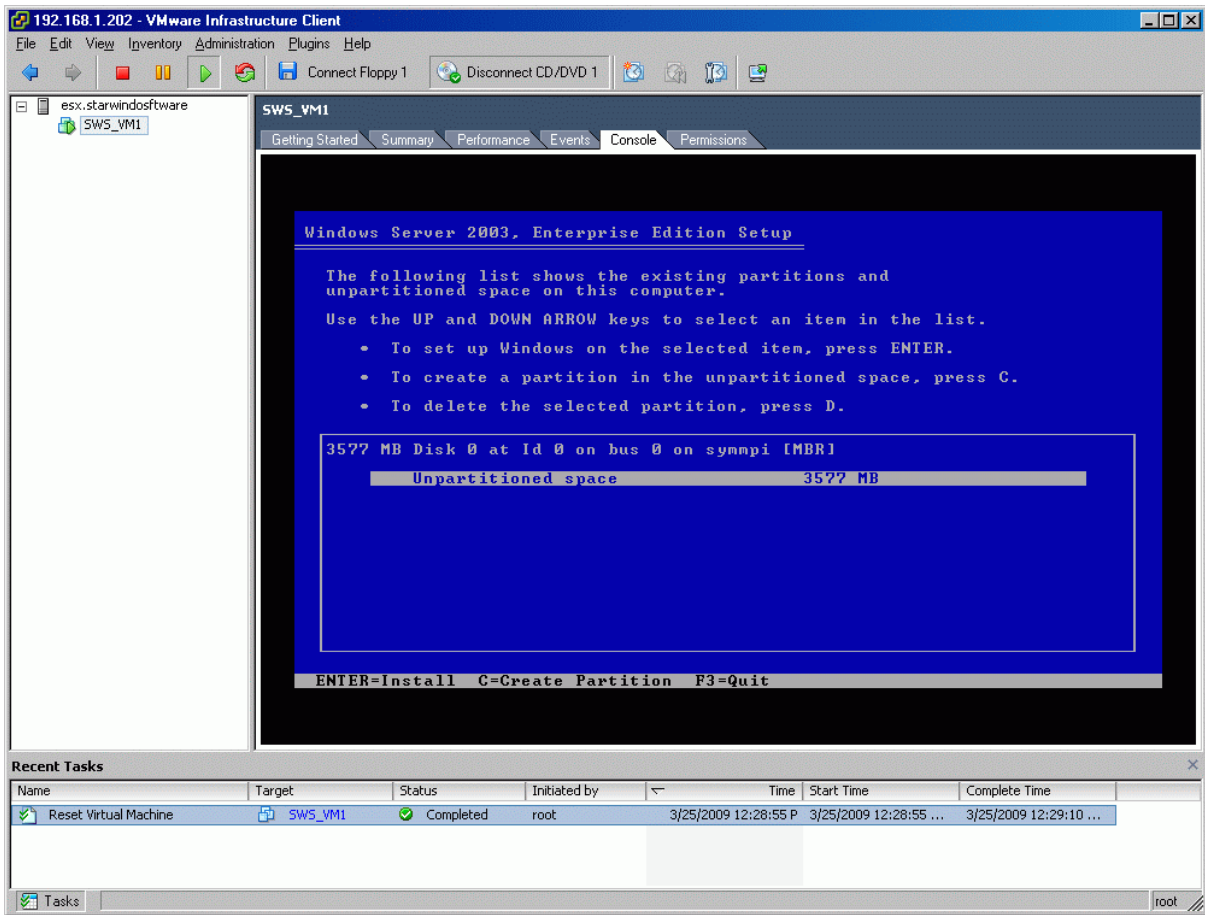


Specify path to the OS installation media or ISO.



The following screen captures show the installation of Microsoft's Windows 2003 Server operating system to an ESX Server managed through Virtual Infrastructure client using iSCSI for storage.





Install the OS in the usual way.

## Conclusion

## Contacts

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