

# **iStorage Server: iSCSI SAN for Windows Server 2008 Clustering**

Monday, January 07, 2010

KernSafe Technologies, Inc.

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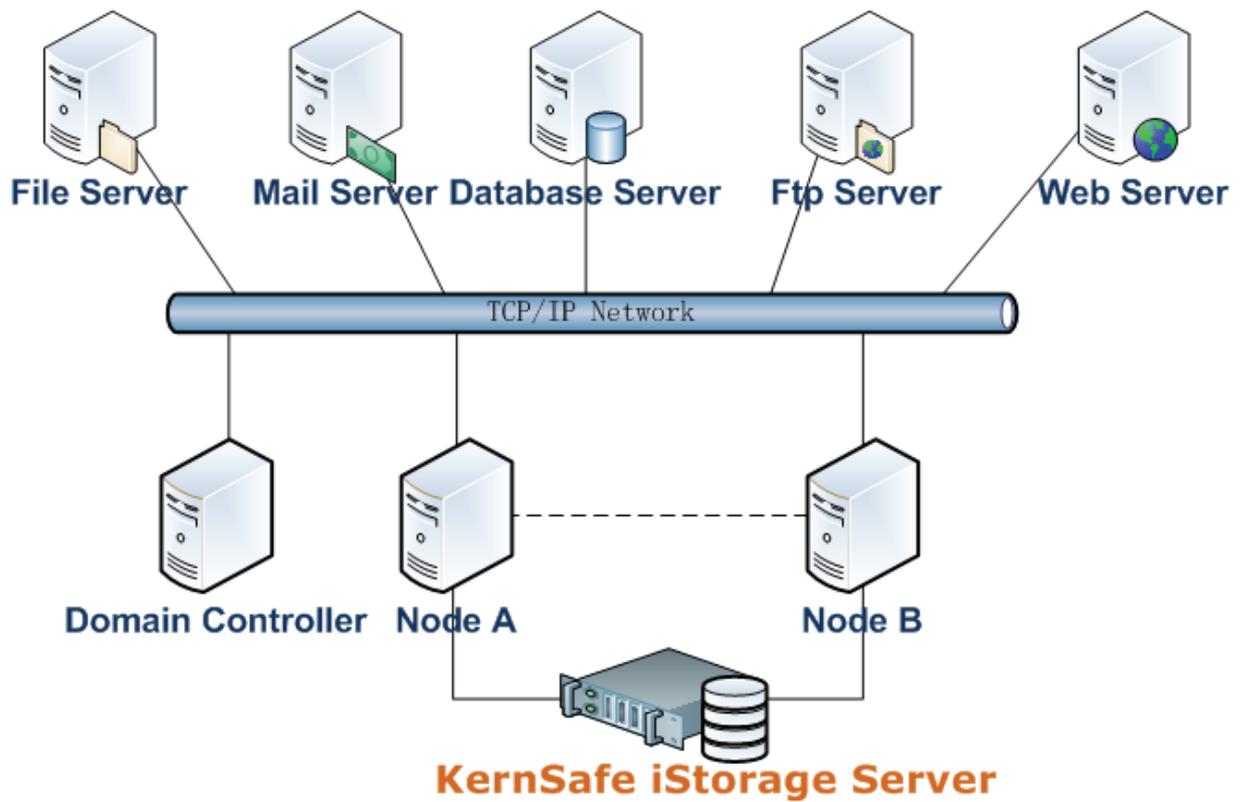
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## Overview

KernSafe iStorage Server is an advanced and powerful, full-featured software-only iSCSI Target that fully conforms to the latest iSCSI Standard 1.0 (former Draft 20). It is an IP SAN solution allowing you to quickly export existing storages such as disk images, VHD files, physical disks, partitions, CD/DVD-ROMs, tapes or any other type of SCSI based devices and even a variety of popular CD/DVD images to the client machines. The software thus delivers immediate benefits, as it allows storage to be consolidated, virtualized and centrally managed. iStorage Server also provides RAID-1 (mirror) feature enabling you to create two iSCSI devices for mirror backup.

High-availability clusters (also known as HA Clusters or Failover Clusters) are computer clusters that are implemented primarily for the purpose of providing high availability of services which the cluster provides. They operate by having redundant computers or nodes which are then used to provide service when system components fail. Normally, if a server with a particular application crashes, the application will be unavailable until someone fixes the crashed server. HA clustering remedies this situation by detecting hardware/software faults, and immediately restarting the application on another system without requiring administrative intervention, a process known as Failover. As part of this process, clustering software may configure the node before starting the application on it. For example, appropriate file systems may need to be imported and mounted, network hardware may have to be configured, and some supporting applications may need to be running as well.



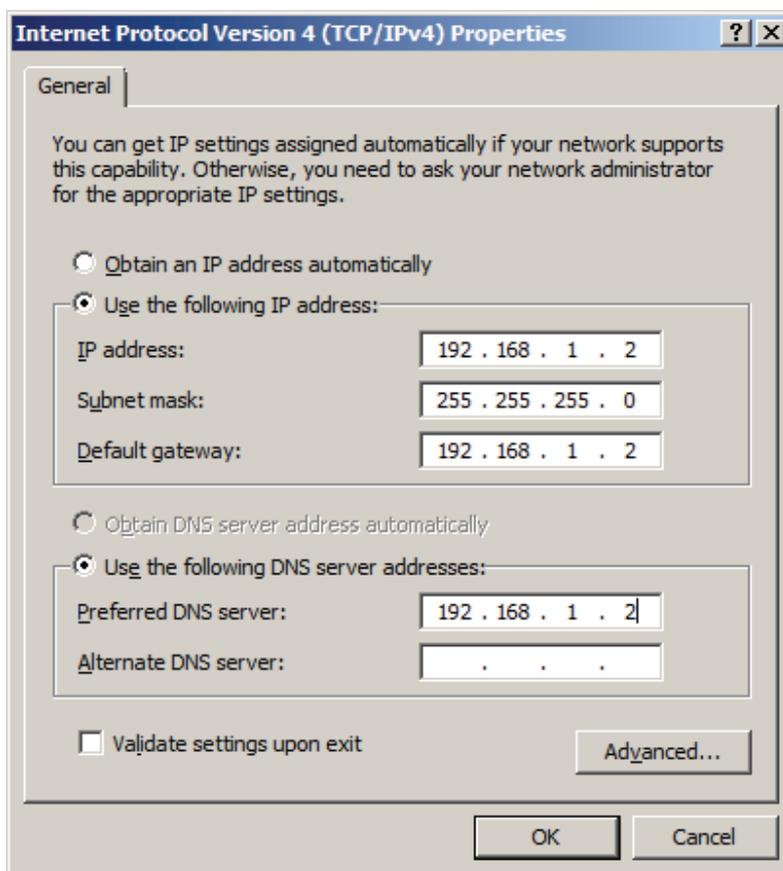
This document gives you detailed step-by-step instructions on KernSafe iStorage Server configuring for Windows Server 2008 or Windows Server 2008 R2 failover clusters. Before to do so, prepare the following three computers or virtual machine in Hyper-v:

Name	IP Address	Detail
08DC	192.168.1.2	Domain Controller
08Node1	192.168.1.101	Failover Node 1
08Node2	192.168.1.102	Failover Node 2
KernStorage	192.168.0.2	iStorage Server

# Configuring on Domain Controller

## Network Adapter

For working in clustering environment, the network adapter must be assigned a static IP address. Select the **Internet Protocol Version 4(TCP/IPv4)** and then press the **Properties** button, the **Internet Protocol Version 4 (TCP/IPv4)** dialog is shown. As Active Directory requires DNS, an address must be provided, in this case we can specify itself IP address. DNS will be installed later after installed Active Directory.

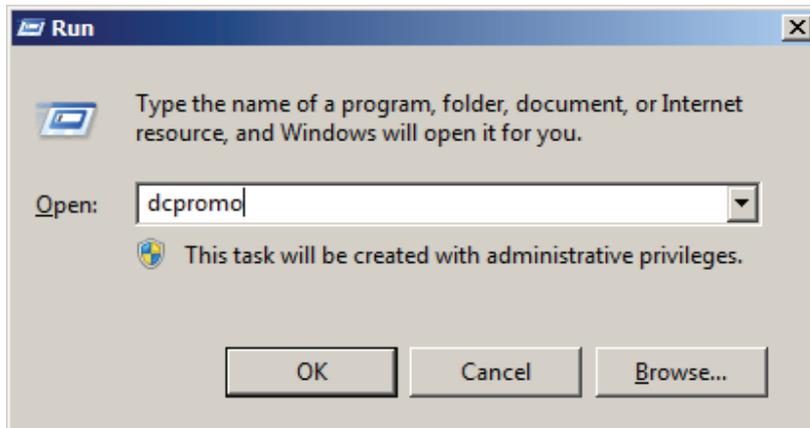


Type the IP address and DNS server address.

Press the OK button to continue.

# Install Active Directory

Select **Start->Run** and type **dcpromo** in the **Open** input box.



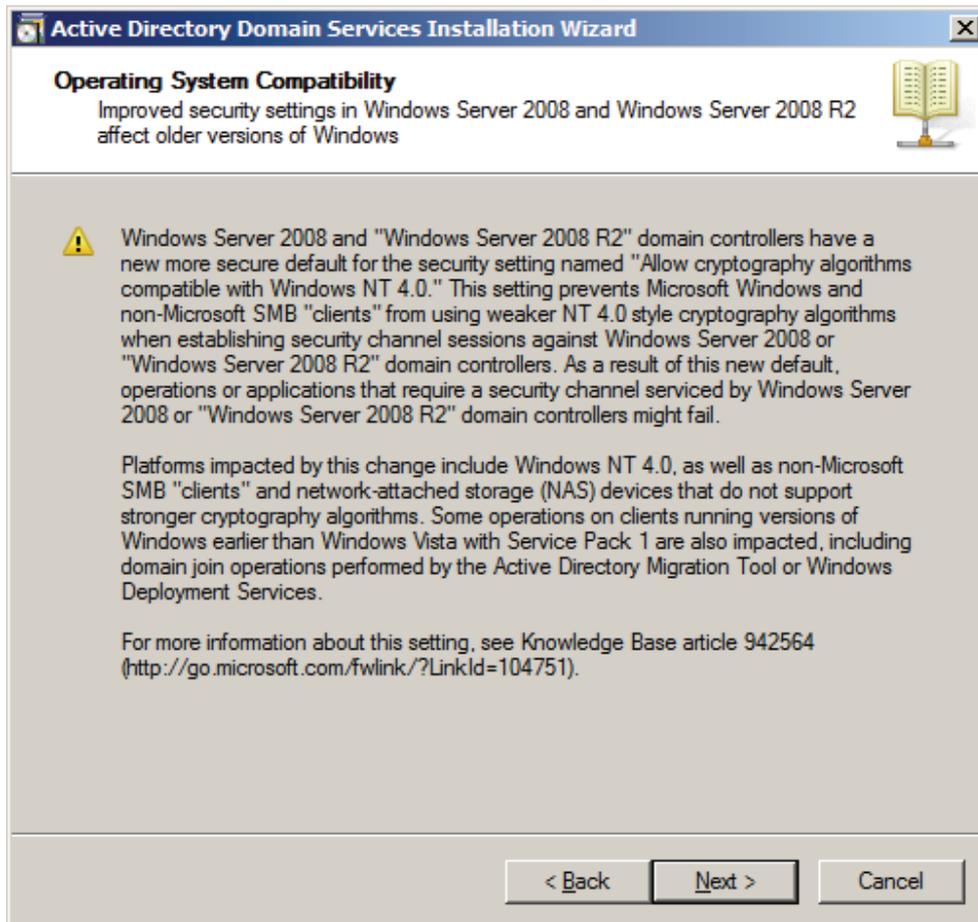
Press the OK button to continue.

The **Active Directory Domain Services Installation Wizard** is shown.



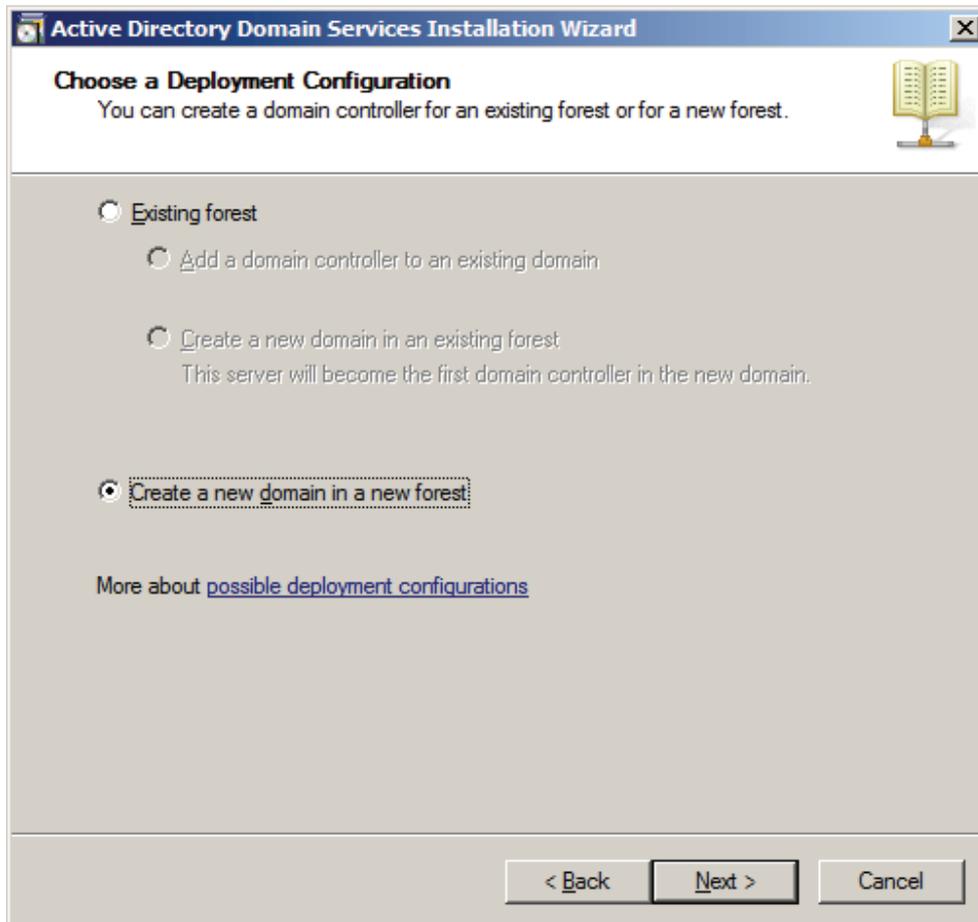
Press the **Next** button to continue.

The **Active Directory Domain Services Installation Wizard** is shown, before to do next, please read the introducing instructions carefully.



Press the **Next** button to continue.

Because we are creating Active Directory, Select the **Create a new domain in a new forest** option.



Press the **Next** button to continue.

Specify the name of Forest Root Domain.

**Active Directory Domain Services Installation Wizard**

**Name the Forest Root Domain**  
The first domain in the forest is the forest root domain. Its name is also the name of the forest.

Type the fully qualified domain name (FQDN) of the new forest root domain.

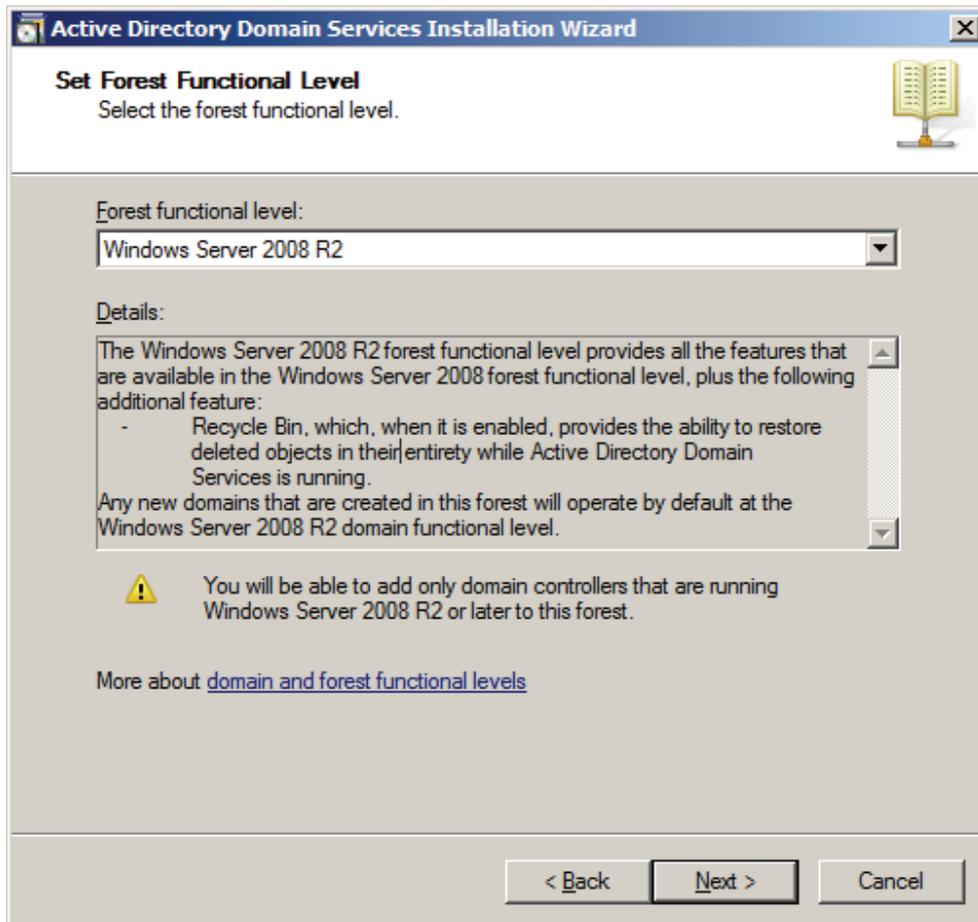
FQDN of the forest root domain:

Example: corp.contoso.com

< Back   Next >   Cancel

Press the **Next** button to continue.

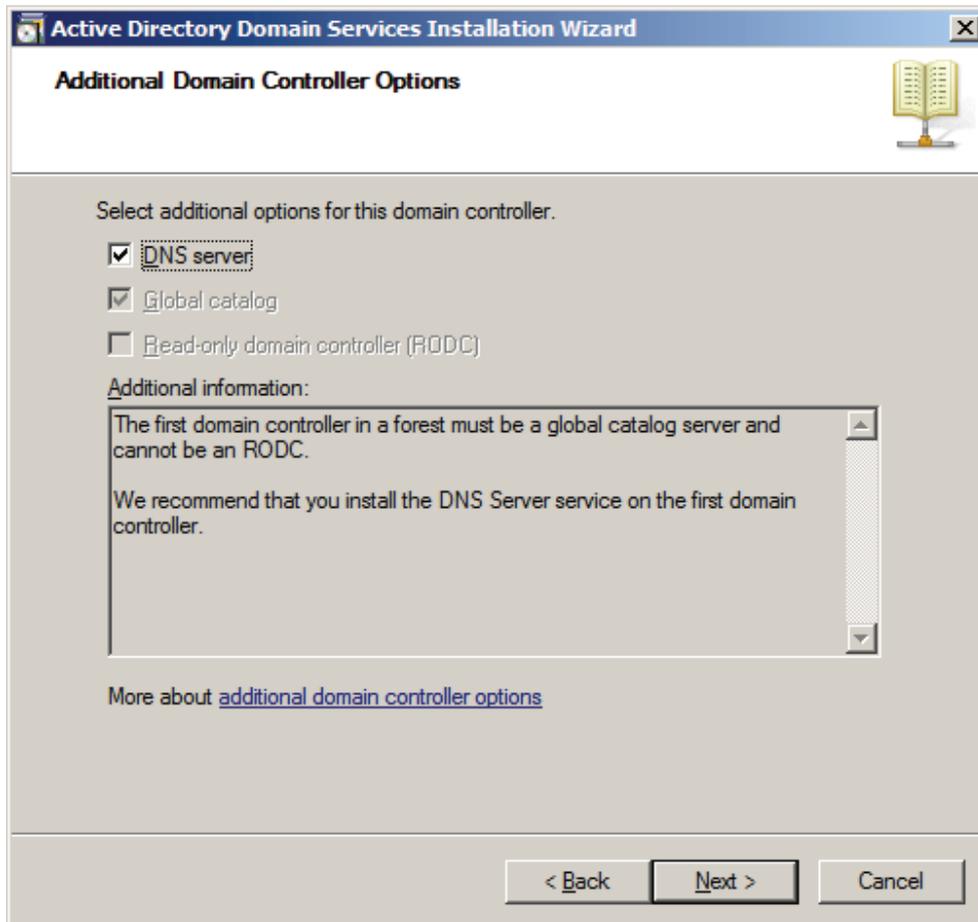
Select the Forest functional level.



Select Windows Server 2008 or Windows Server 2008 R2 if building Windows Server 2008 R2 clustering.

Press the **Next** button to continue.

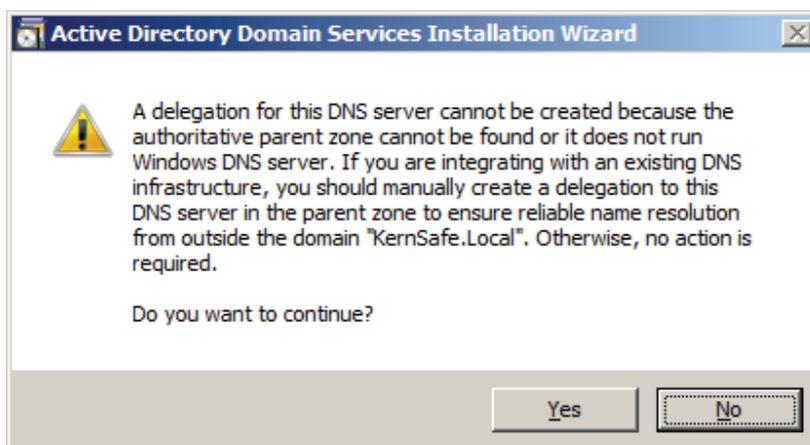
Select the additional options for this domain controller.



Keep the selection of the **DNS Server**.

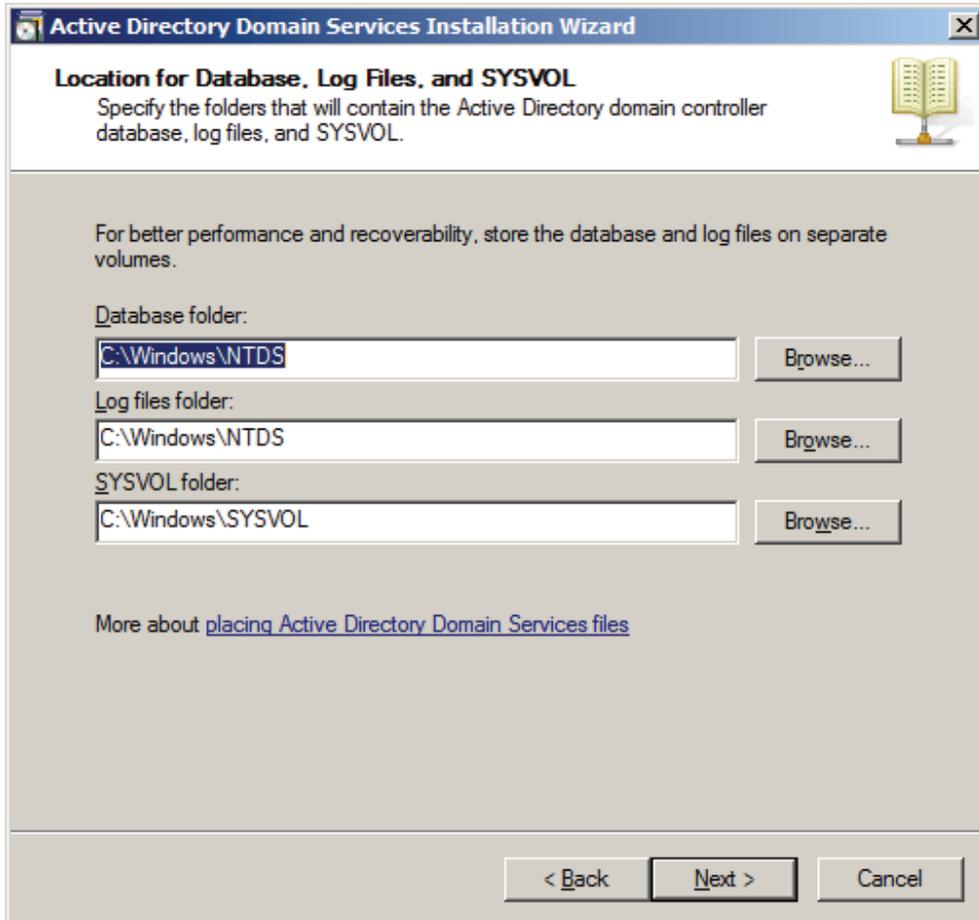
Press the **Next** button to continue.

The **Active Directory Domain Services Installation Wizard** is shown.



Press the **Yes** button to continue.

Customize the directories for Database folder, Log files folder and SYSVOL folder.



The screenshot shows the 'Active Directory Domain Services Installation Wizard' window. The title bar reads 'Active Directory Domain Services Installation Wizard'. The main heading is 'Location for Database, Log Files, and SYSVOL'. Below the heading, it says 'Specify the folders that will contain the Active Directory domain controller database, log files, and SYSVOL.' There is a small icon of an open book to the right. The main area contains the text: 'For better performance and recoverability, store the database and log files on separate volumes.' Below this, there are three rows of input fields, each with a 'Browse...' button to its right. The first row is labeled 'Database folder:' and contains the text 'C:\Windows\NTDS'. The second row is labeled 'Log files folder:' and contains the text 'C:\Windows\NTDS'. The third row is labeled 'SYSVOL folder:' and contains the text 'C:\Windows\SYSVOL'. At the bottom of the window, there are three buttons: '< Back', 'Next >', and 'Cancel'.

Press the **Next** button to continue.

Specify the **Directory Services Restore Mode Administrator Password**.

**Active Directory Domain Services Installation Wizard**

**Directory Services Restore Mode Administrator Password**

The Directory Services Restore Mode Administrator account is different from the domain Administrator account.

Assign a password for the Administrator account that will be used when this domain controller is started in Directory Services Restore Mode. We recommend that you choose a strong password.

Password:

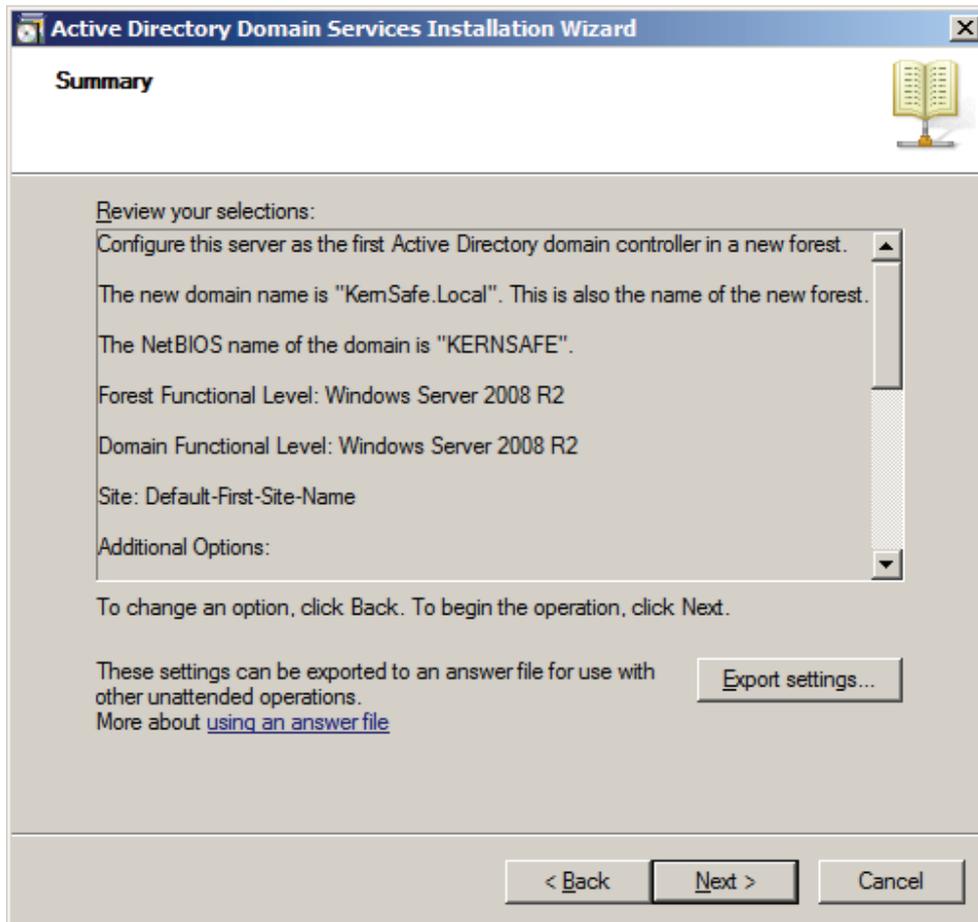
Confirm password:

More about [Directory Services Restore Mode password](#)

< Back   Next >   Cancel

Press the **Next** button to continue.

Check all of the parameters are correct; press the **Back** button is any change is required.



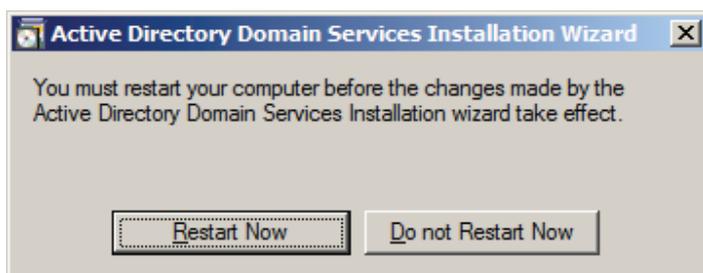
Press the **Next** button to continue.

After a while, Active Directory Domain Services Installation is completed.



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

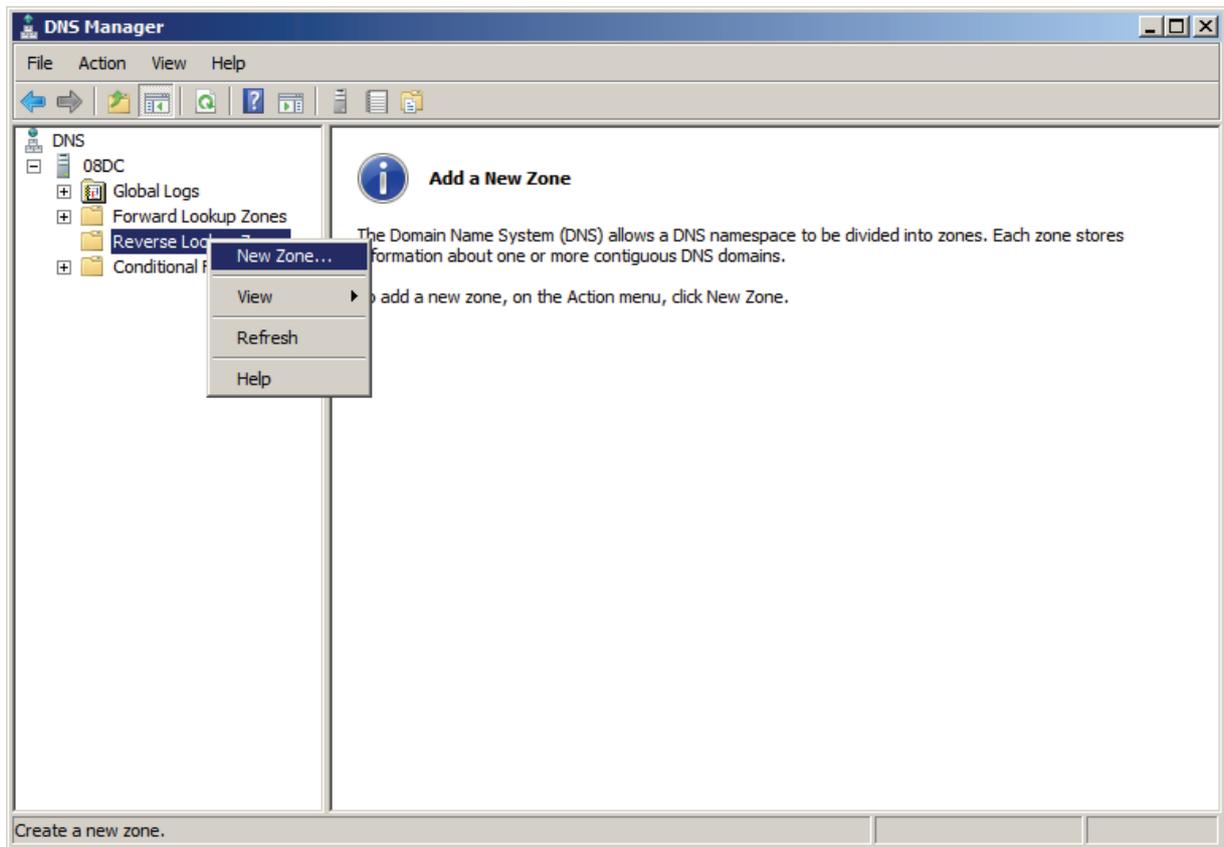
Restart is required.



Press the **Restart Now** button to restart the computer.

## Install DNS

Use administrator role to log on to the Domain controller machine and launch the **DNS Manager**.



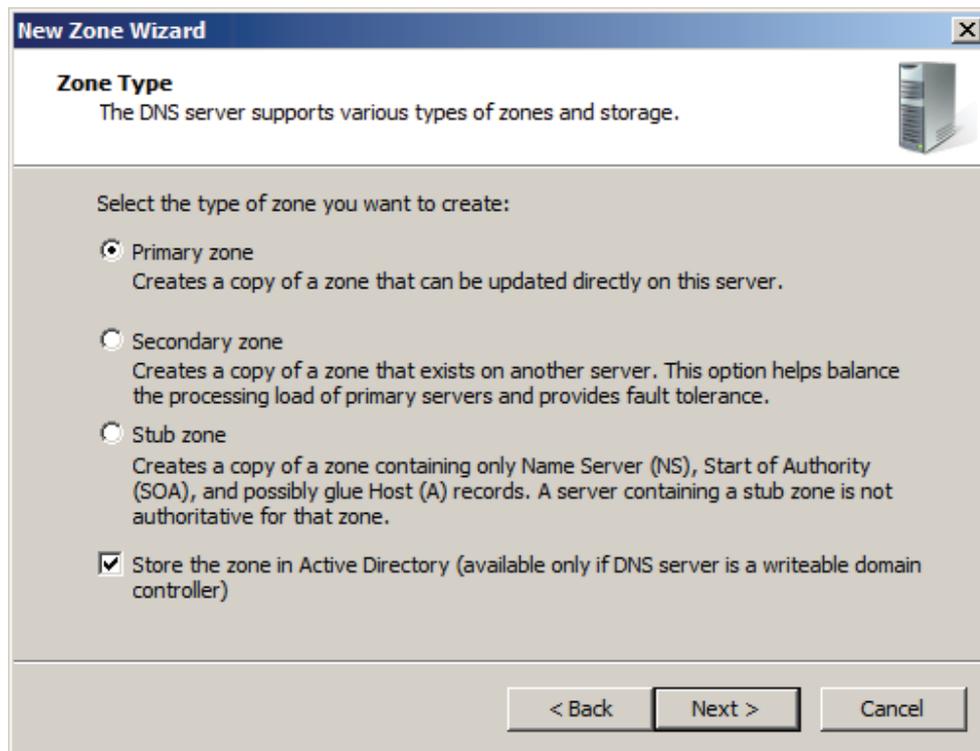
Right click on the **Reverse Lookup Zone** in the left tree view and then select **New Zone...** menu item.

The **New Zone Wizard** is shown.



Press the **Next** button to continue.

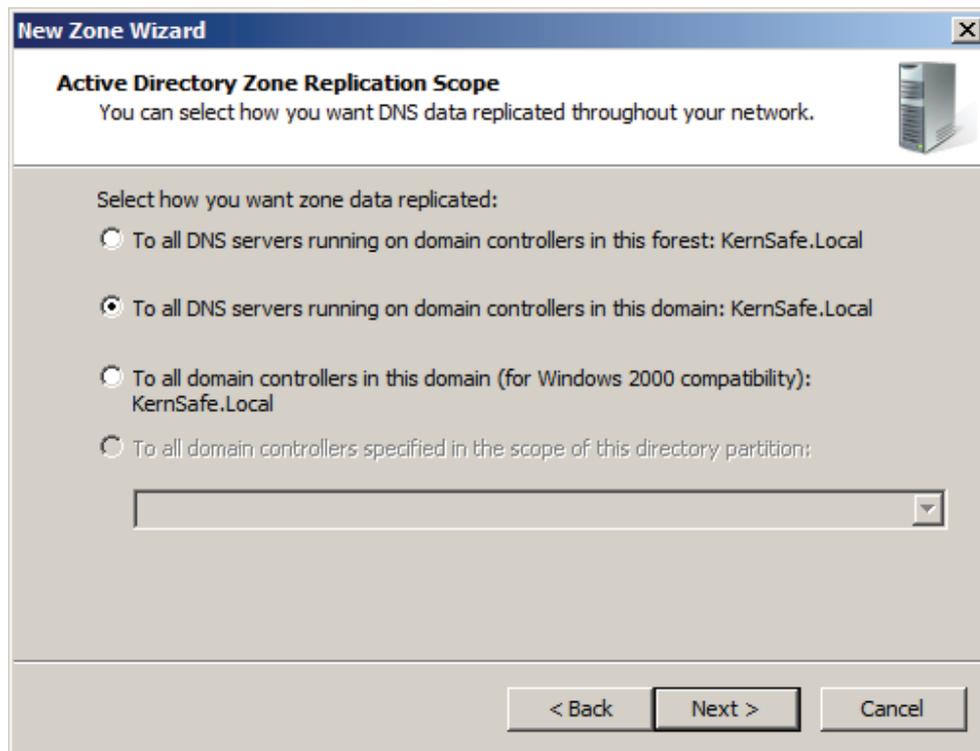
Select zone type.



Select the **Primary zone** and keep the selection of **Store the zone in Active Directory**.

Press the **Next** button to continue.

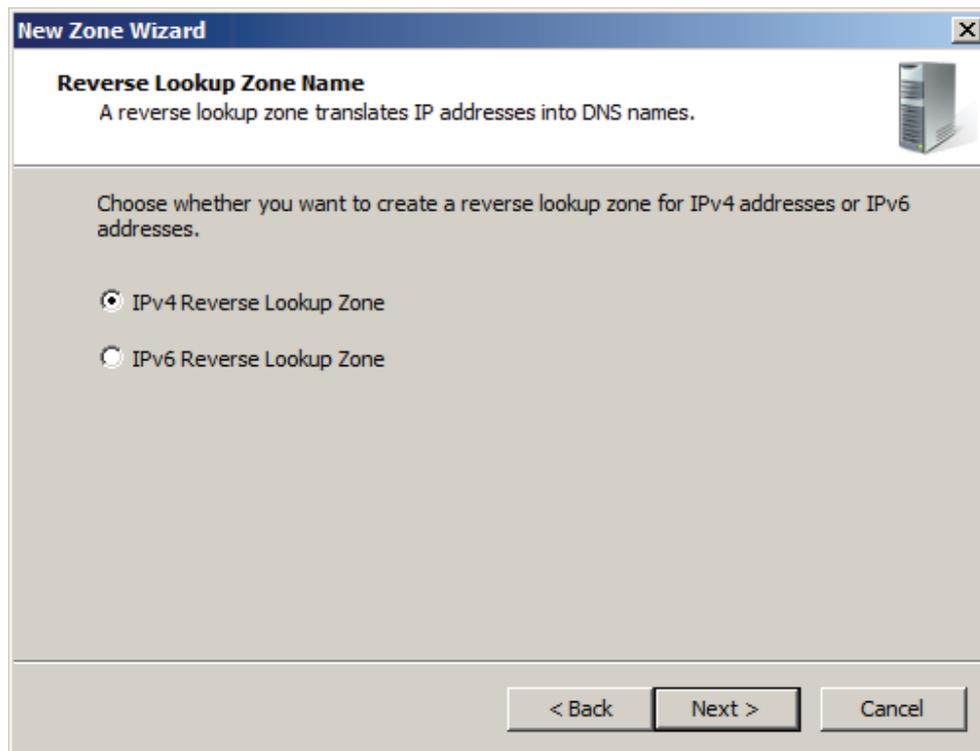
Select zone replication scope.



Keep the default selection.

Press the **Next** button to continue.

Choose reverse lookup zone name.



Select **IPv4 Reverse Lookup Zone**.

Press the **Next** button to continue.

Type the network ID or zone name.

The screenshot shows a Windows-style dialog box titled "New Zone Wizard" with a close button in the top right corner. The main heading is "Reverse Lookup Zone Name" with a sub-description: "A reverse lookup zone translates IP addresses into DNS names." To the right of this text is a small icon of a server tower. Below the heading, there is a paragraph: "To identify the reverse lookup zone, type the network ID or the name of the zone." There are two radio button options. The first is "Network ID:", which is selected. Below it is a text box containing "192 .168 .1" followed by a cursor. Below the text box is a paragraph explaining that the network ID is the portion of the IP address that belongs to the zone and should be entered in normal order. Below this is another paragraph explaining that a zero in the network ID will appear in the zone name, with examples: "network ID 10 would create zone 10.in-addr.arpa, and network ID 10.0 would create zone 0.10.in-addr.arpa." The second radio button option is "Reverse lookup zone name:", which is not selected. Below it is a text box containing "1.168.192.in-addr.arpa". At the bottom of the dialog box are three buttons: "< Back", "Next >", and "Cancel".

Select the **Network ID** and then type IP address in the **Network ID**.

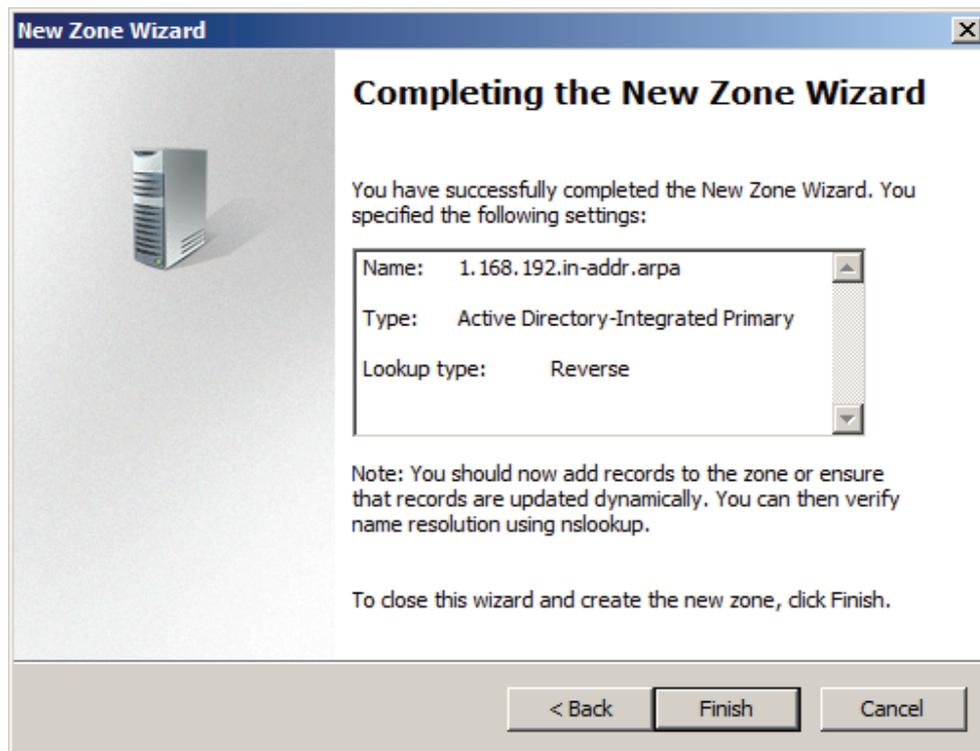
Press the **Next** button to continue.

Specify dynamic update options.



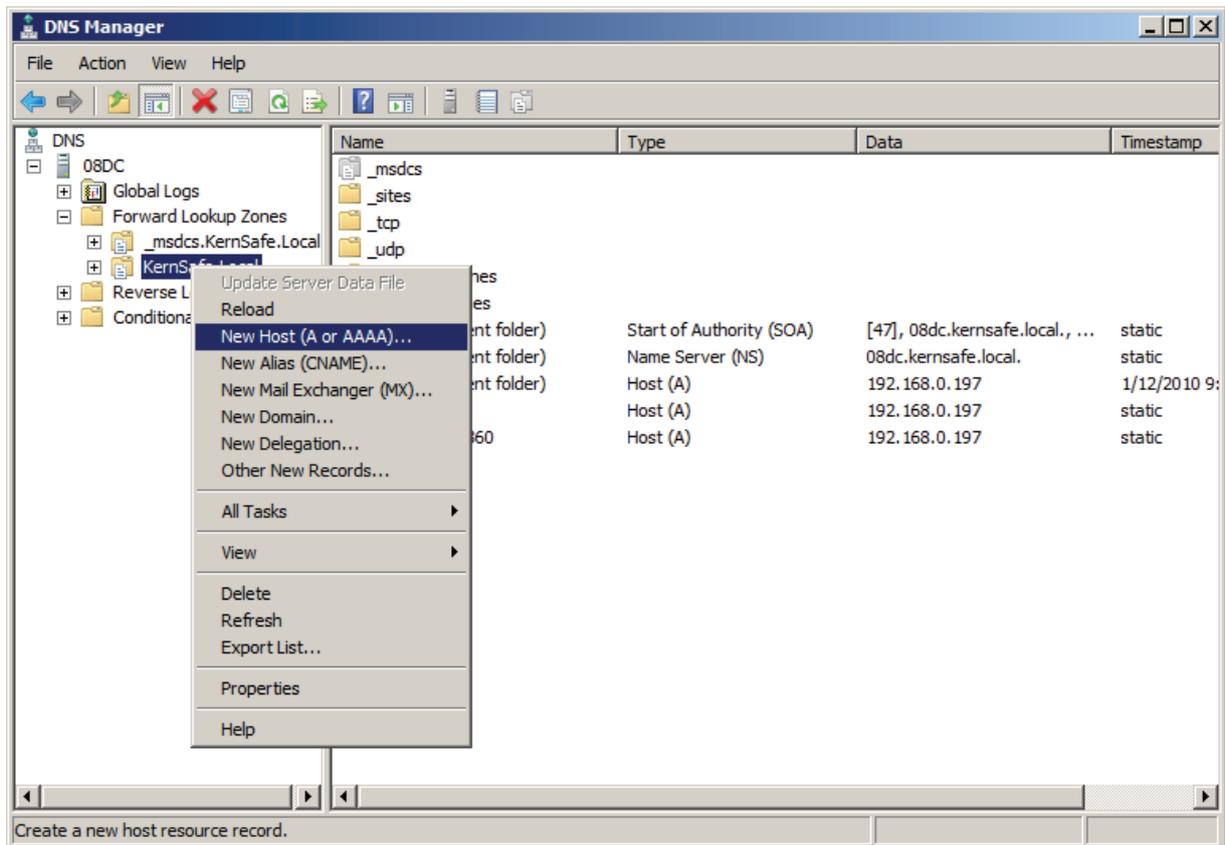
Press the **Next** button to continue.

Check all the parameters all required, press the **Back** button if any change is required.

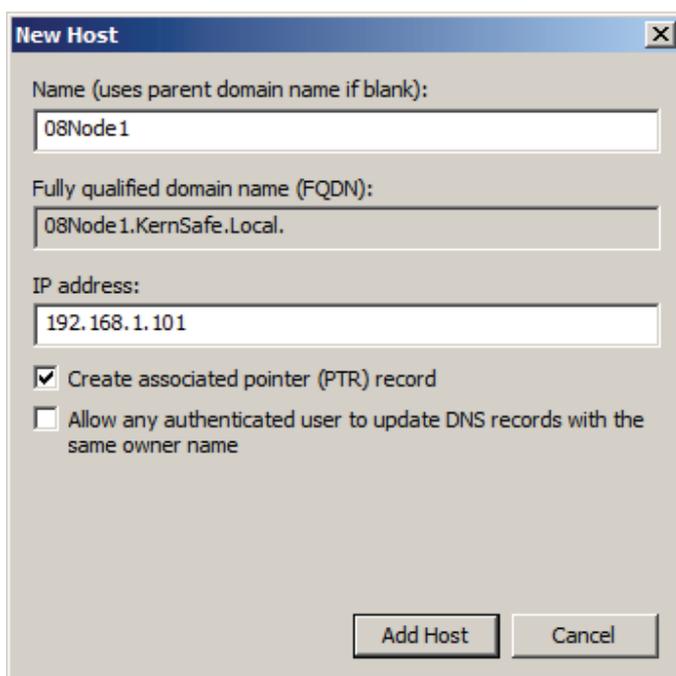


Press the **Finish** button to close the **New Zone Wizard**.

Right click on the **KernSafe.Local** in the left tree view of **DNS Manager**, then select **New Host (A or AAA)...** menu item.



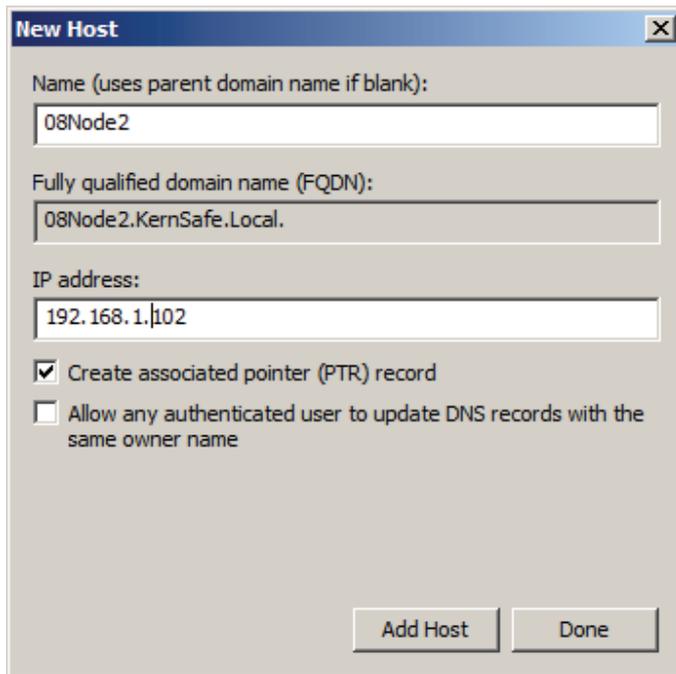
The **New Host** dialog is shown.



Type host name in the **Name** and IP address in the **IP address** field for the **08Node1** machine.

Check the **Create associated pointer (PTR) record** checkbox.

Press the **Add Host** button to add 08Node1 DNS record.



**New Host** [X]

Name (uses parent domain name if blank):  
08Node2

Fully qualified domain name (FQDN):  
08Node2.KernSafe.Local.

IP address:  
192.168.1.102

Create associated pointer (PTR) record

Allow any authenticated user to update DNS records with the same owner name

Add Host Done

Type host name in the **Name** and IP address in the **IP address** field for the **08Node2** machine.

Check the **Create associated pointer (PTR) record** checkbox.

Press the **Add Host** button to add 08Node2 DNS record.

Press the **Done** button to close **New Host** dialog.

Now we will see the two records in the **DNS Manager**.

**DNS Manager**

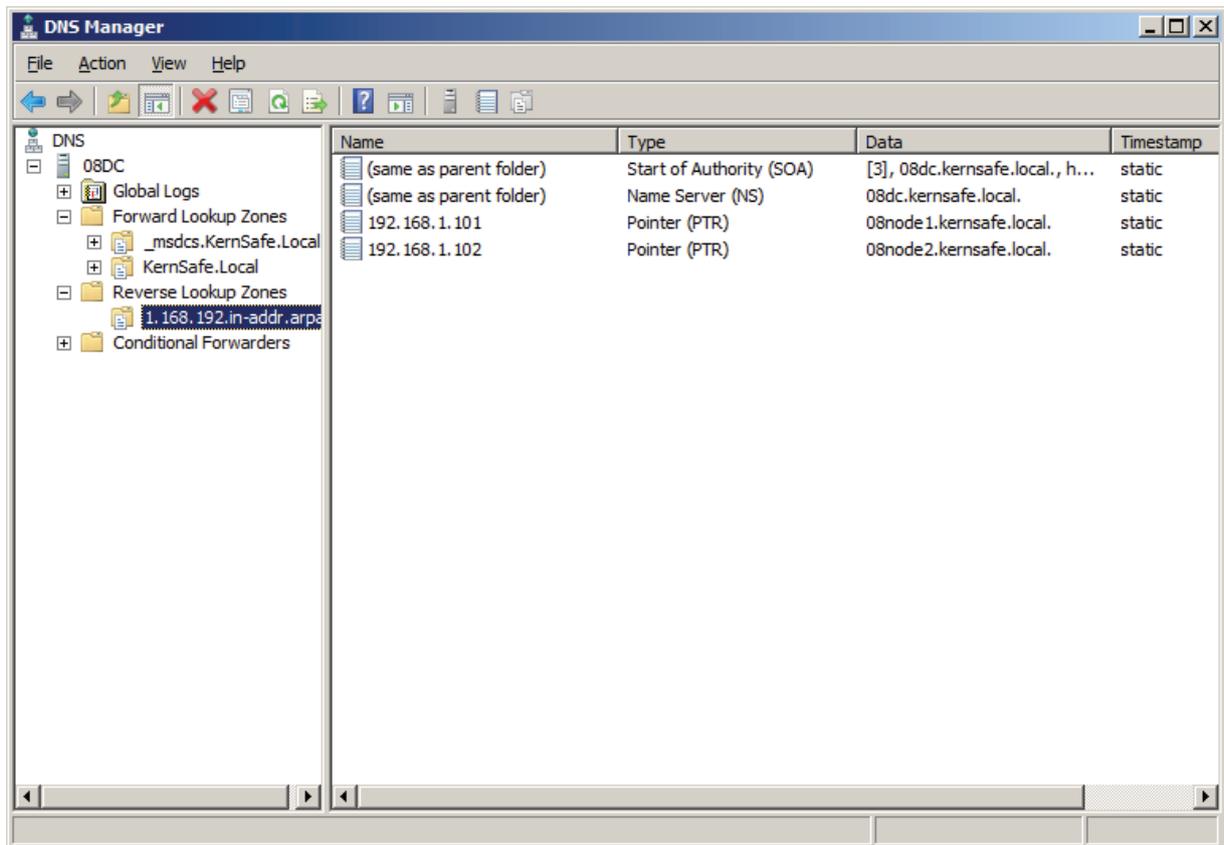
File Action View Help

← → ↻ ⌂ ? 📄 📄 📄

**DNS**

- 08DC
  - Global Logs
  - Forward Lookup Zones
    - \_msdcs.KernSafe.Local
    - KernSafe.Local**
  - Reverse Lookup Zones
  - Conditional Forwarders

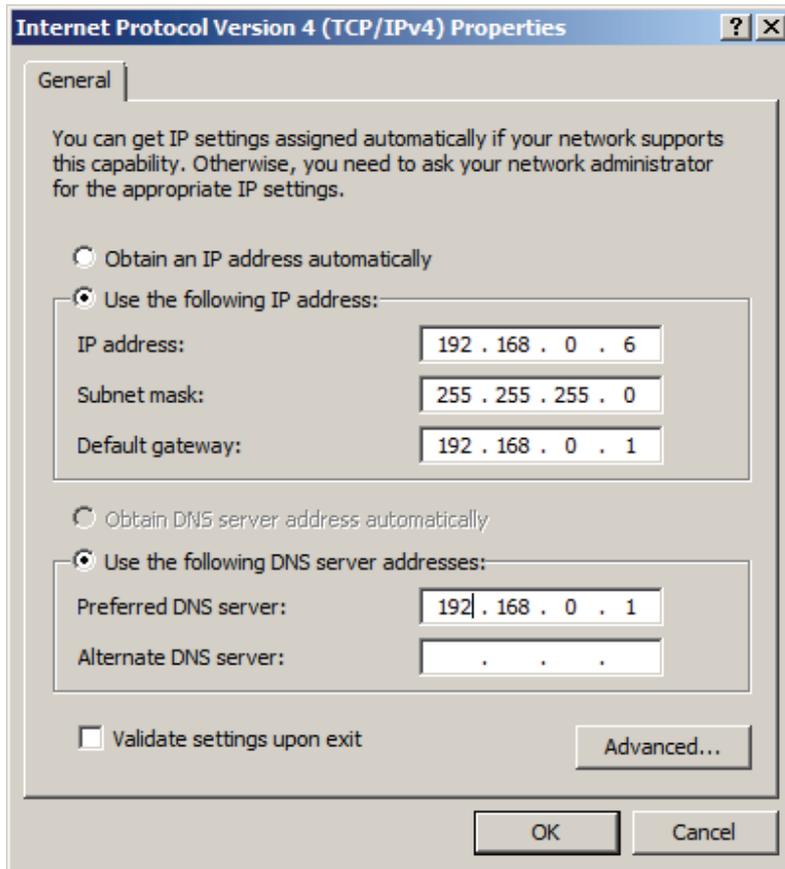
Name	Type	Data	Timestamp
_msdcs			
_sites			
_tcp			
_udp			
DomainDnsZones			
ForestDnsZones			
(same as parent folder)	Start of Authority (SOA)	[47], 08dc.kernsafe.local., ...	static
(same as parent folder)	Name Server (NS)	08dc.kernsafe.local.	static
(same as parent folder)	Host (A)	192.168.0.197	1/12/2010 9:
08dc	Host (A)	192.168.0.197	static
win-ak3i2gk1360	Host (A)	192.168.0.197	static
08Node1	Host (A)	192.168.1.101	
08Node2	Host (A)	192.168.1.102	



## Configuring on iStorage Server

### Network Adapter

For working in clustering environment, the network adapter must be assigned a static IP address. Select the **Internet Protocol Version 4(TCP/IPv4)** and then press the **Properties** button, the **Internet Protocol Version 4 (TCP/IPv4)** dialog is shown.

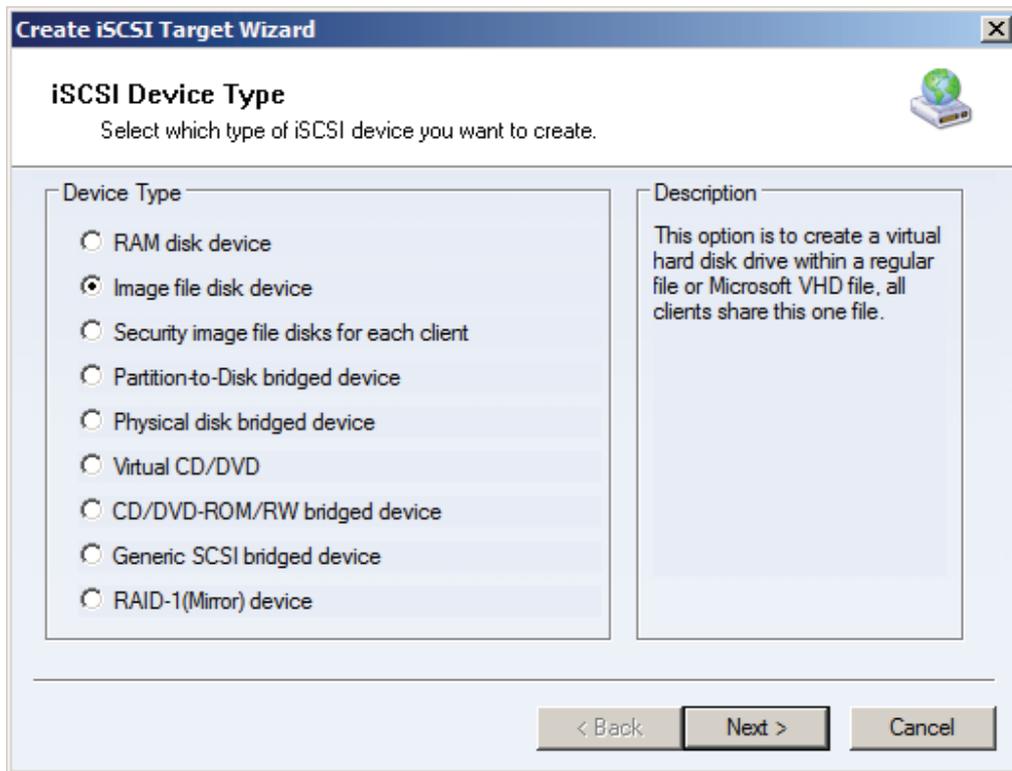


Set the second network adapter of Domain Controller as shown in the figure. IP address is set as 192.168.2.1 and Subnet mask is set as 255.255.255.0.

## Preparing Quorum Volume

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

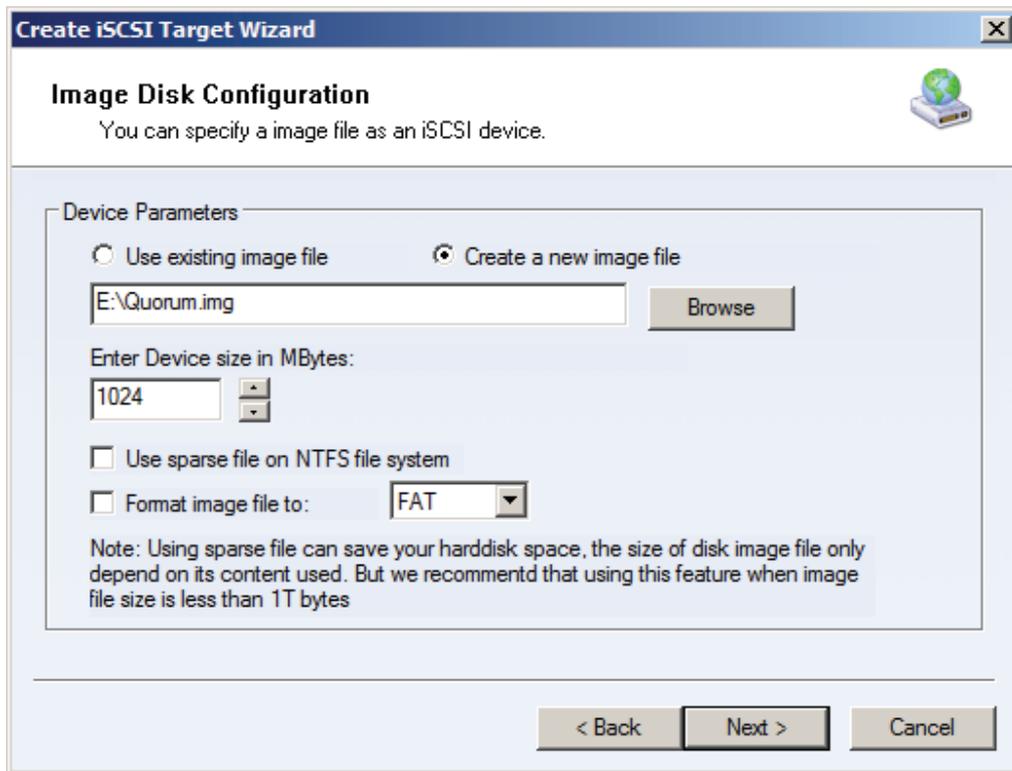
Select a device type



Choose **Image file disk device**.

Press the **Next** button to continue.

Specify image file path and size.

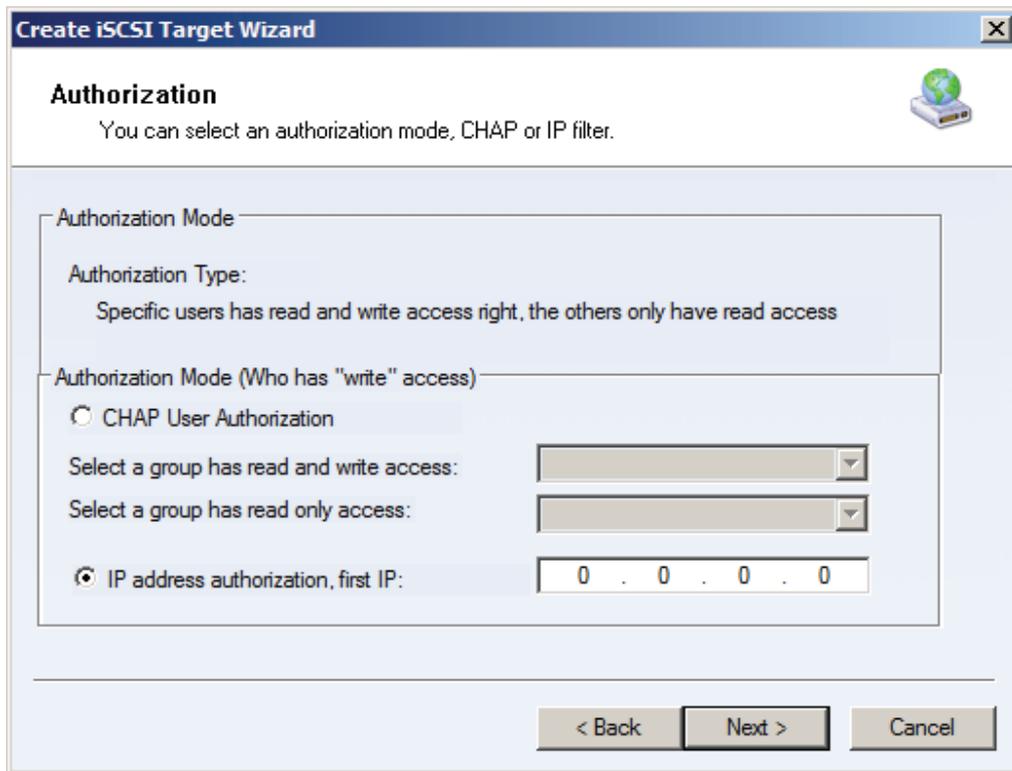


Select **Create a new image file** or **Use existing image file** if you already have a one.

Specify the device size.

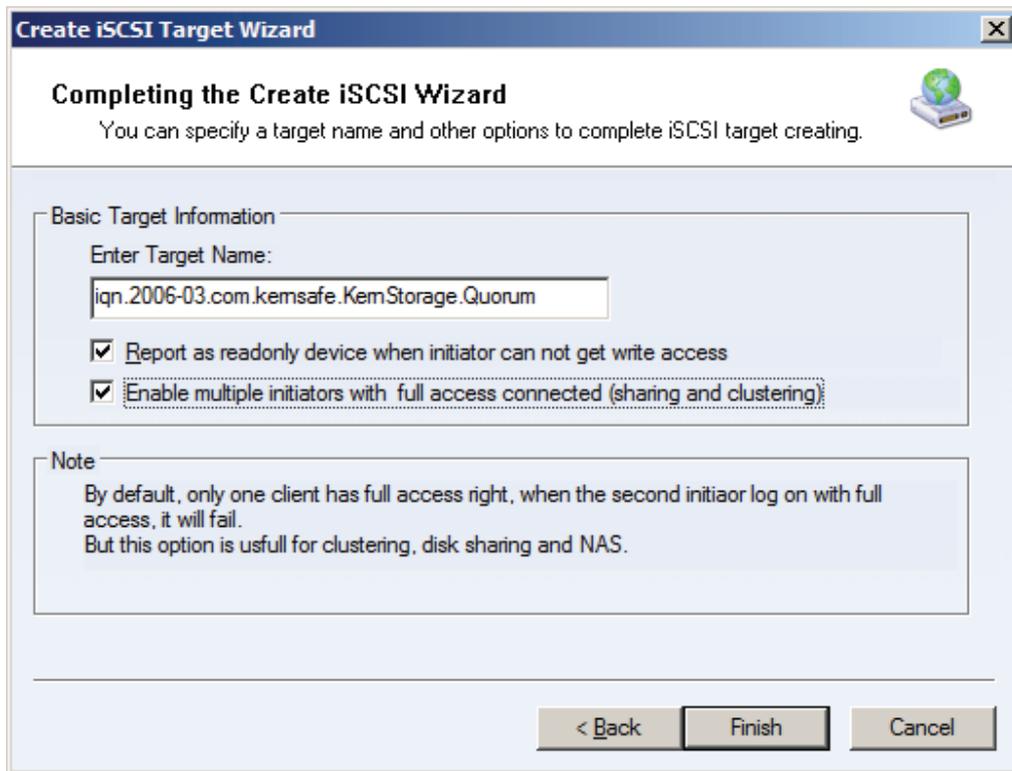
Press the **Next** button to continue.

Set authorization mode.



Press the **Next** button to continue.

Finish creating iSCSI Target



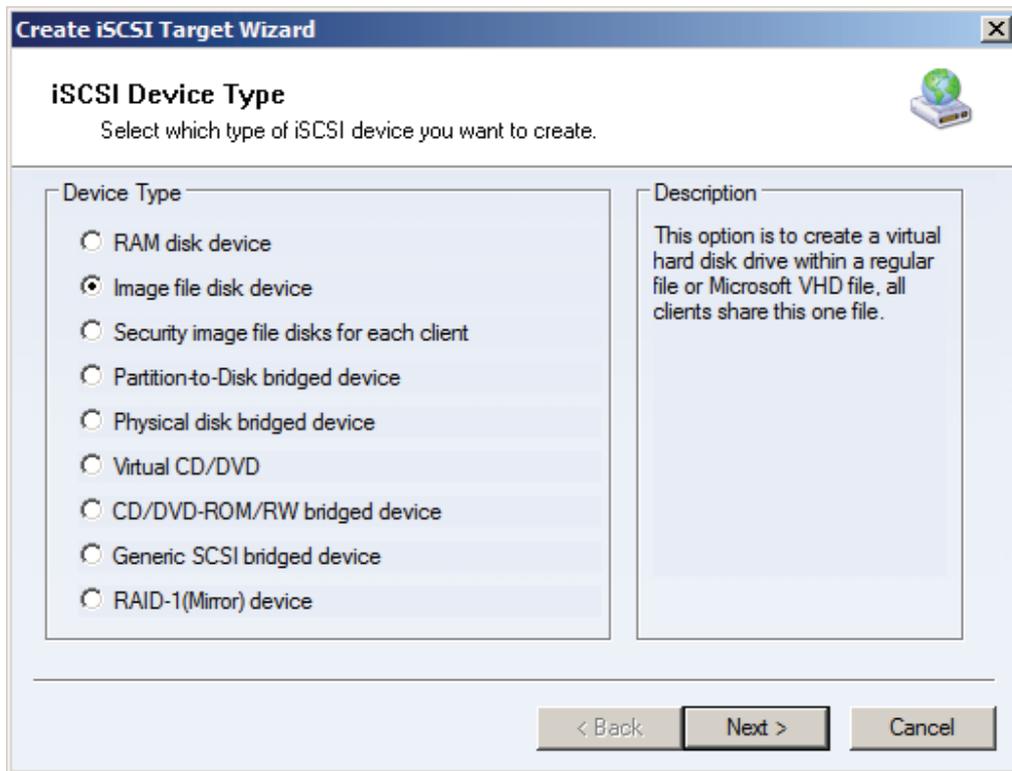
Type a target name in the Target Name field, or use the default.

Check the **multiple initiators with full access connected (sharing and clustering)** check box.

Press the **Finish** button to continue.

Make target writable. Press the **Client** button on the toolbar of **iStorage Server Management Console**, then change to **IP Filter** view.

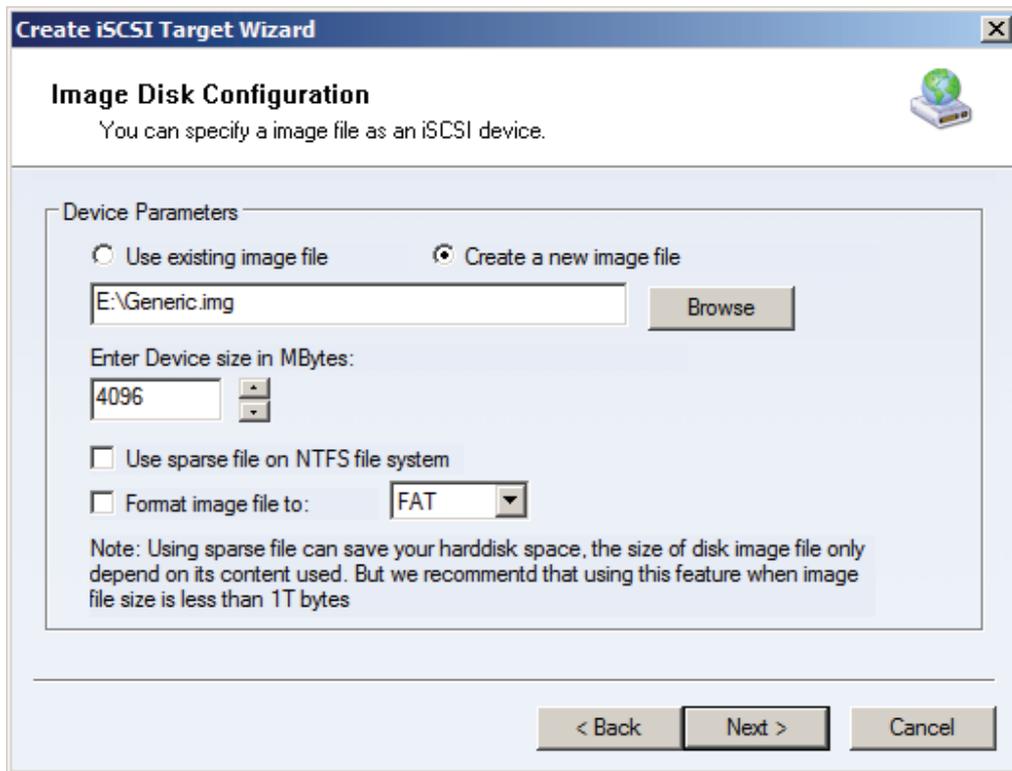




Choose **Image file disk device**.

Press the **Next** button to continue.

Specify image file path and size.

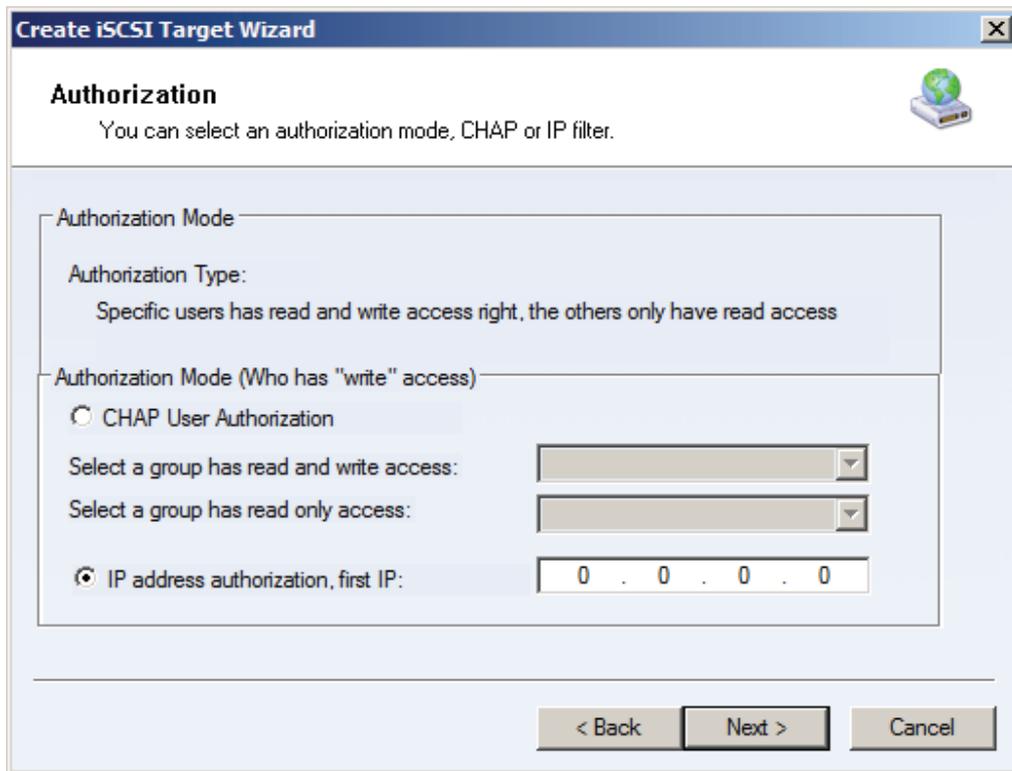


Select **Create a new image file** or **Use existing image file** if you already have a one.

Specify the device size.

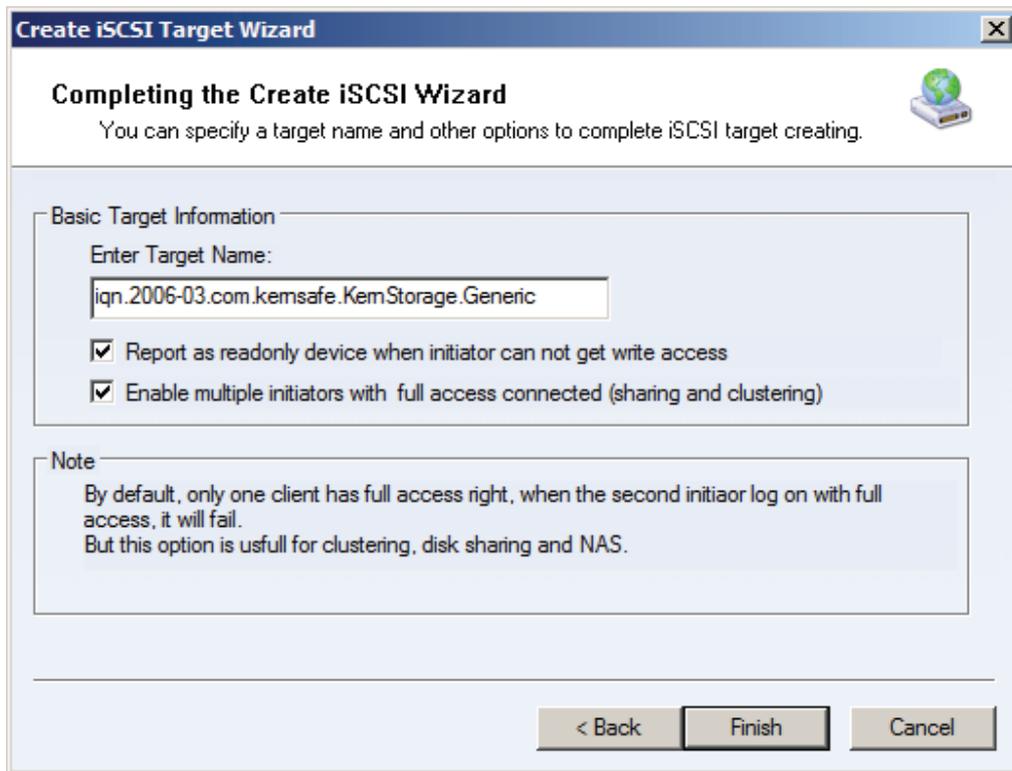
Press the **Next** button to continue.

Set authorization mode.



Press the **Next** button to continue.

Finish creating iSCSI Target



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

Check the **multiple initiators with full access connected (sharing and clustering)** check box.

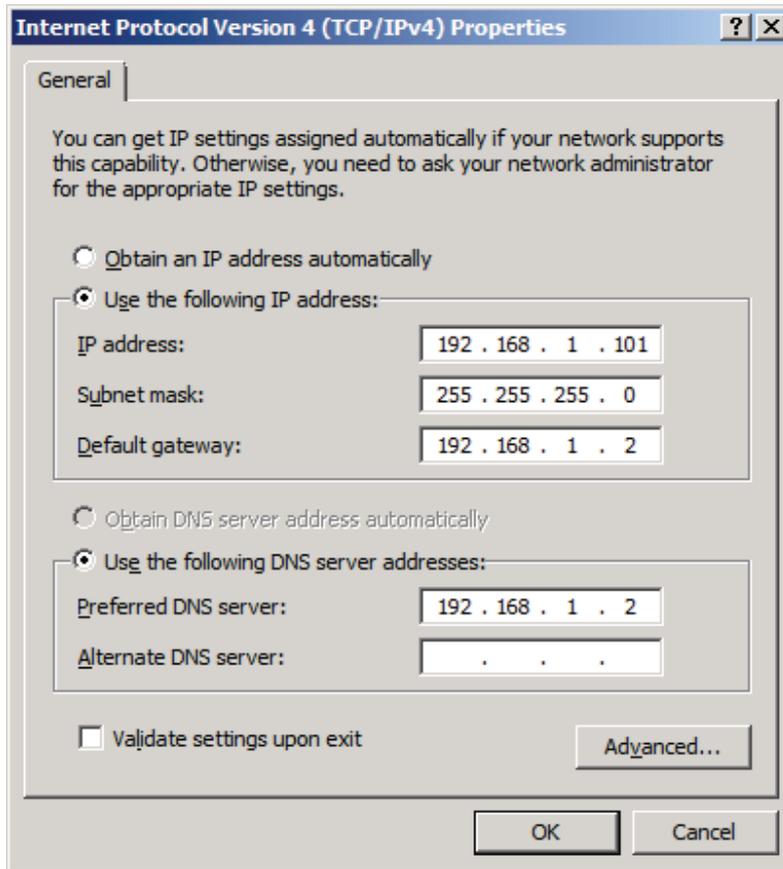
Press the **Finish** button.

Make target writable. Press the **Client** button on the toolbar of **iStorage Server Management Console**, then change to **IP Filter** view.



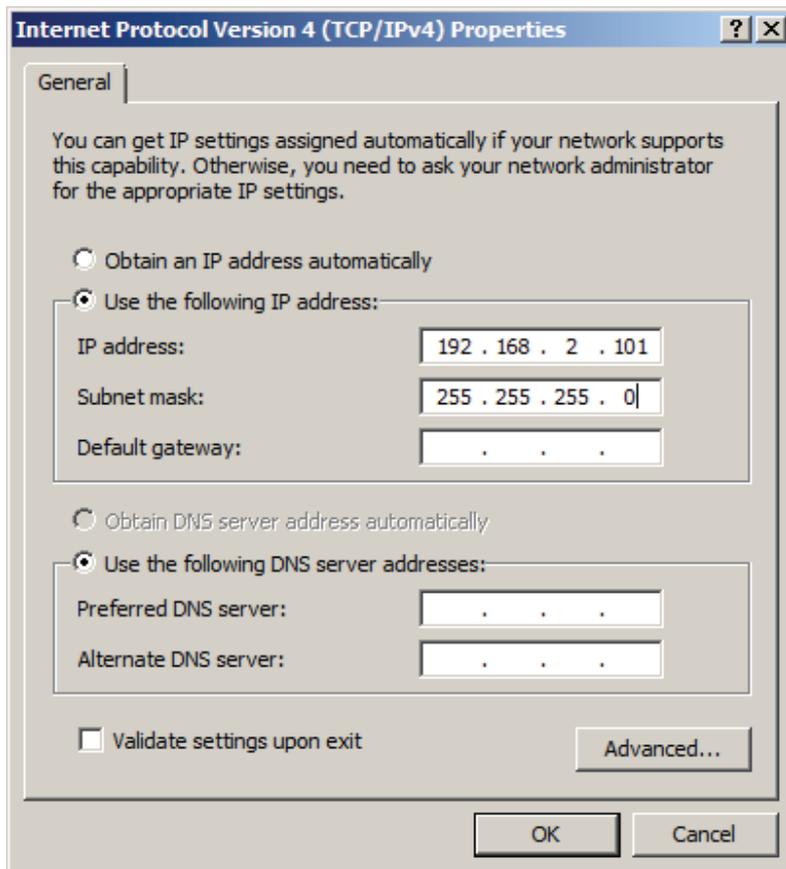


Version 4 (TCP/IPv4) dialog is shown.



Type in the **IP address**, **Subnet mask**, **Default gateway** and **Preferred NDS server**.

Set the second network adapter of 08Node.



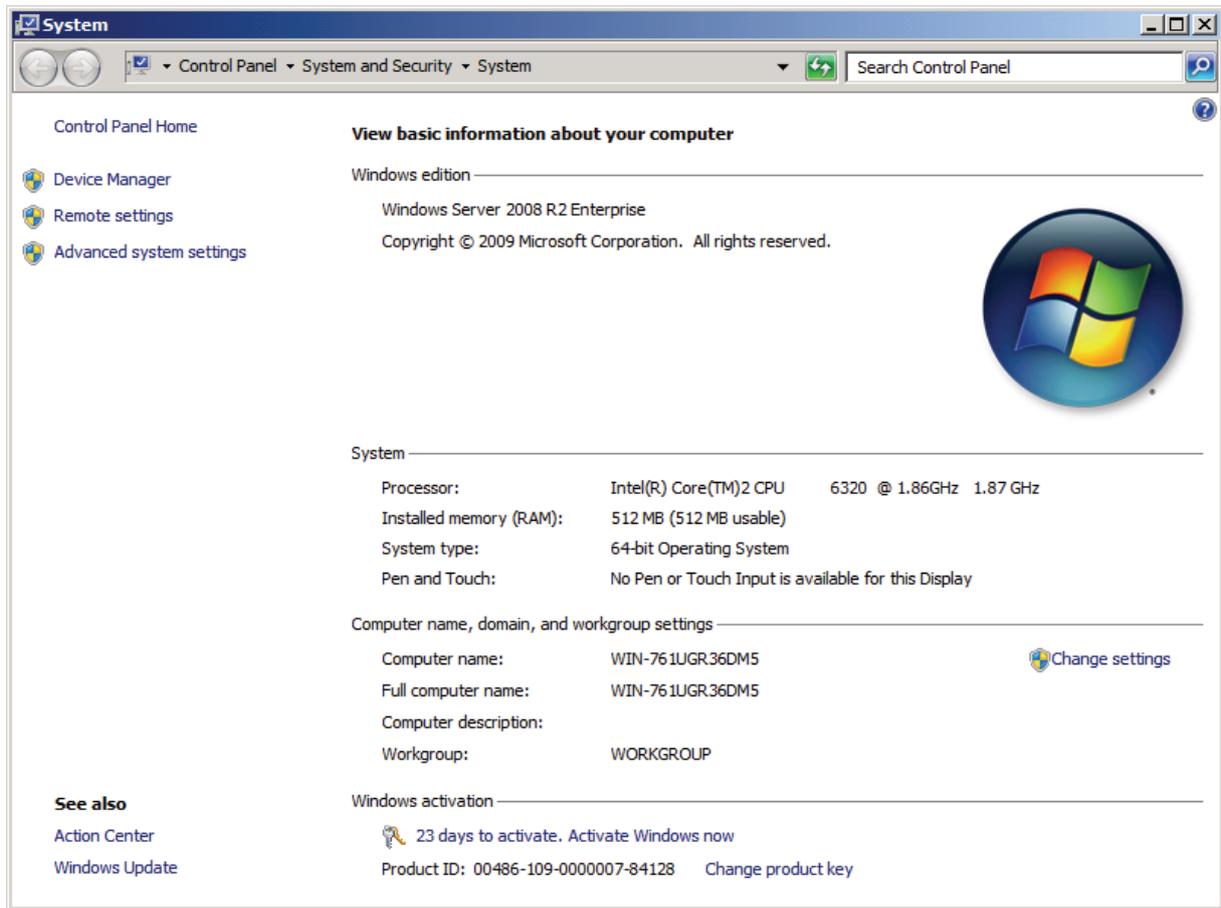
Type in the IP address and Subnet mask.

Press the **OK** button to change IP address.

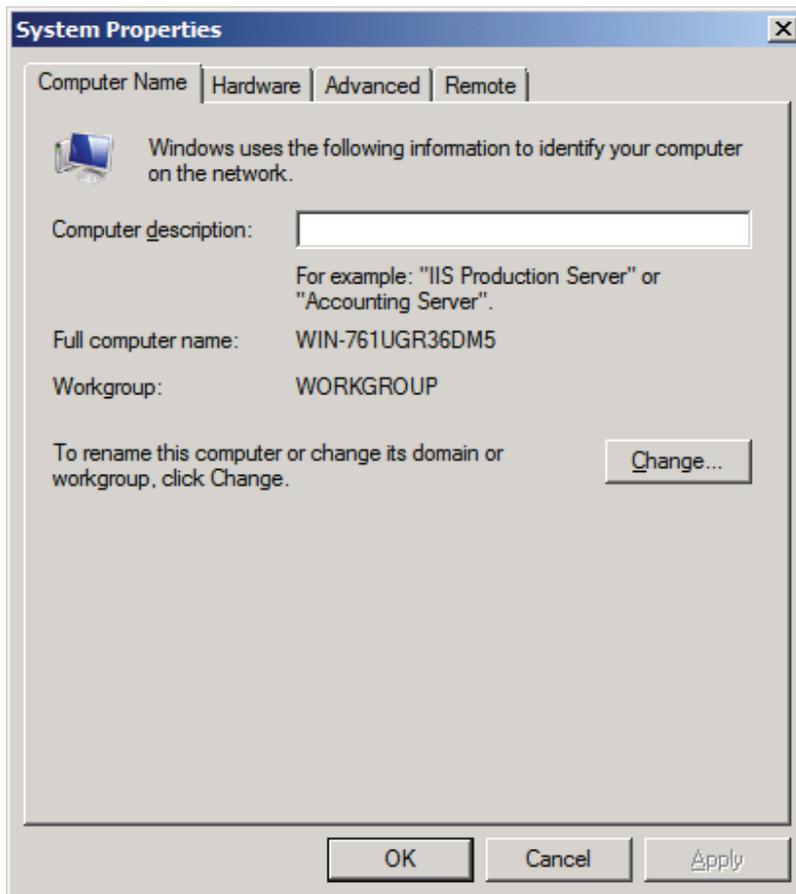
## Join to the domain

Press the **OK** button to change IP address.

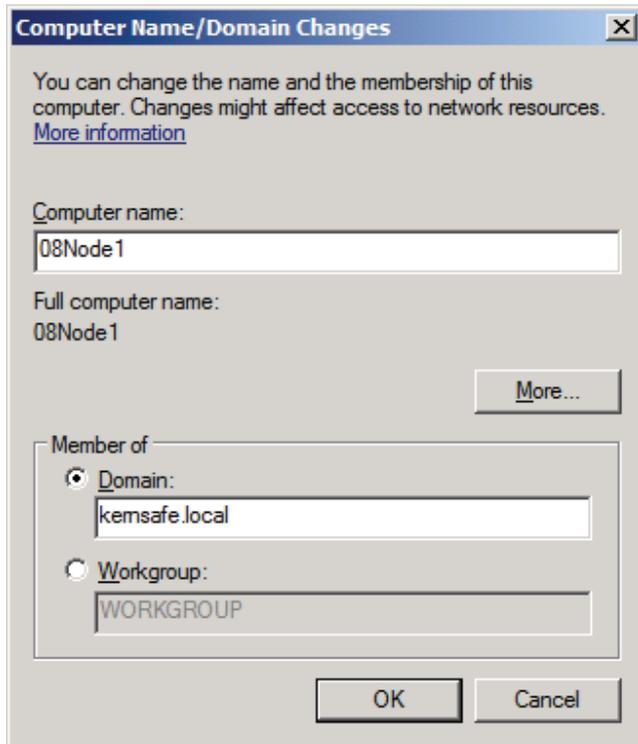
Open System Properties page.



Click on the **Change settings** link, the **System Properties** Dialog is shown.



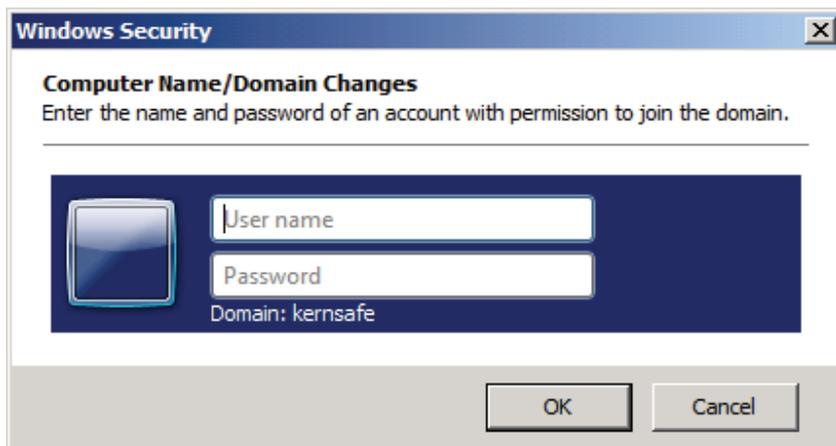
Press the **Change...** button.



Type 08Node1 in the **Computer name** and kernsafe.local in the **Domain**.

Press the **OK** button to change computer name and join the domain.

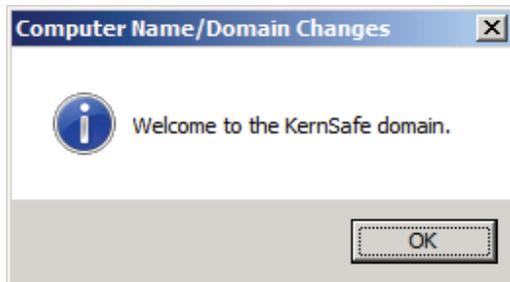
Domain controller account is required to join the domain.



Type your user name and password.

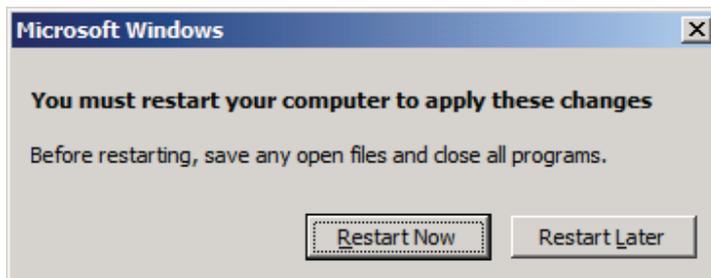
Press the OK button to continue.

If successful, the **Computer Name/Domain Changes** notification dialog is shown as below.



Press the **OK** button to continue.

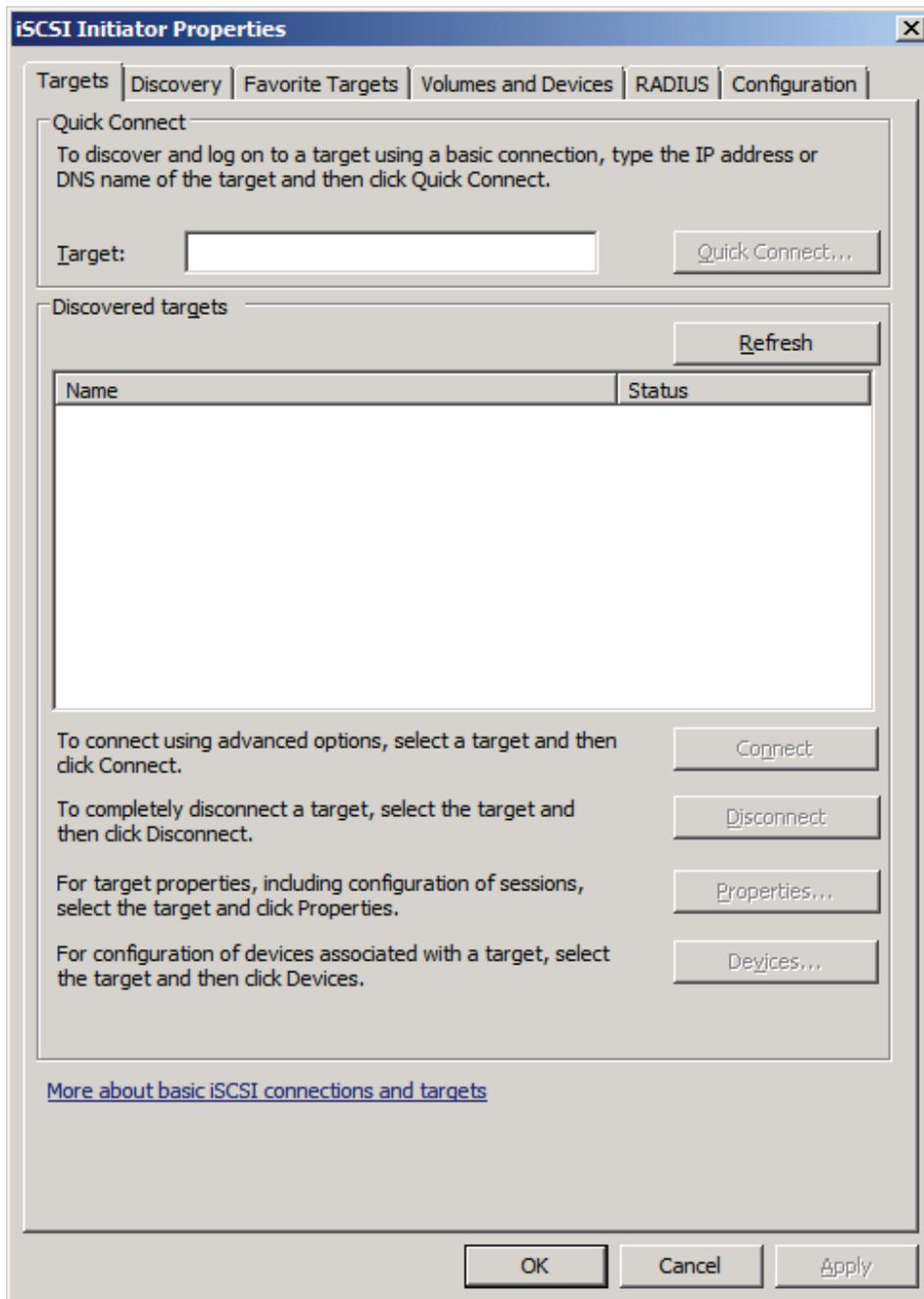
Restart is required.



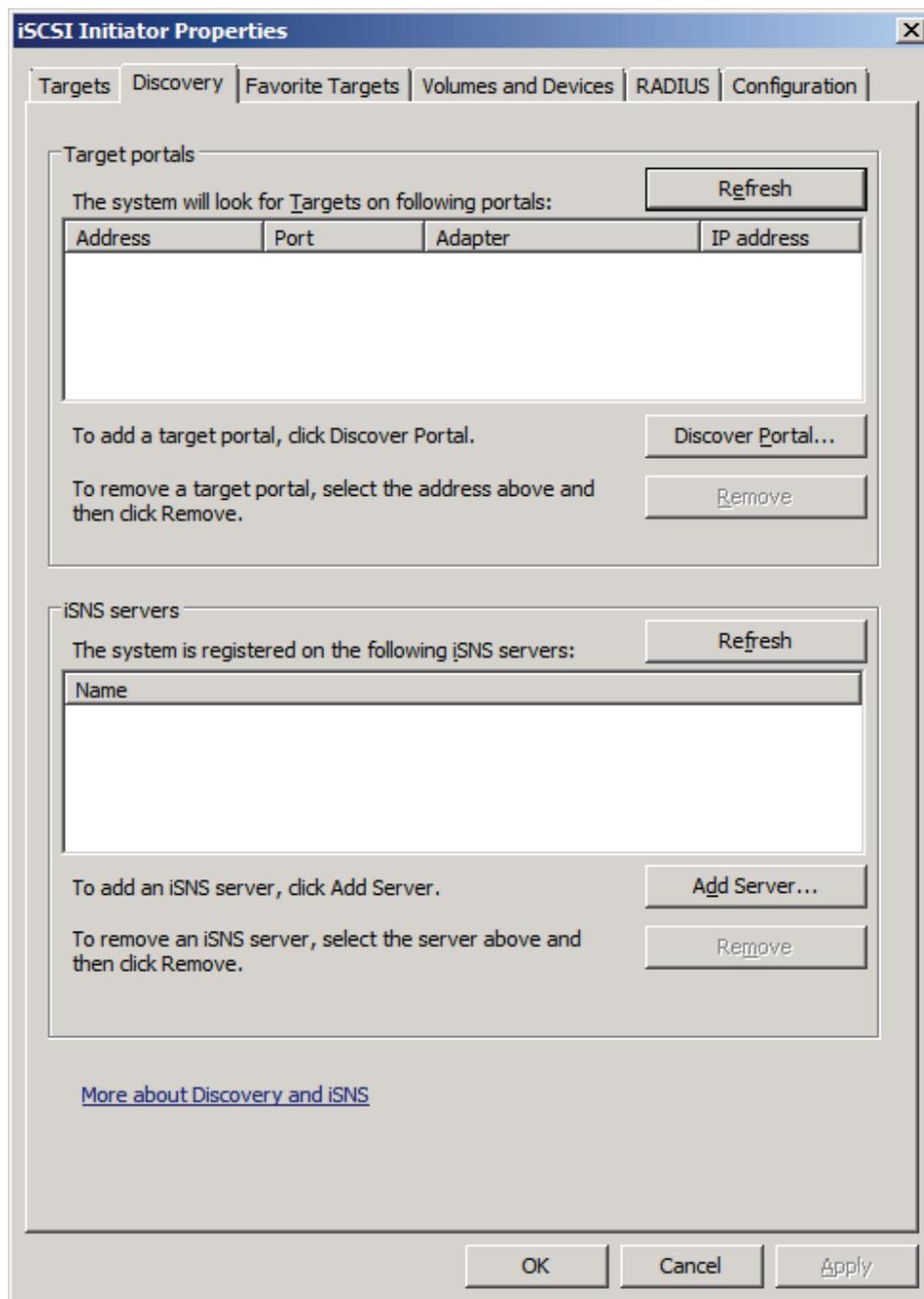
Press **the Restart Now** button to restart the computer.

## Log in to iSCSI disks

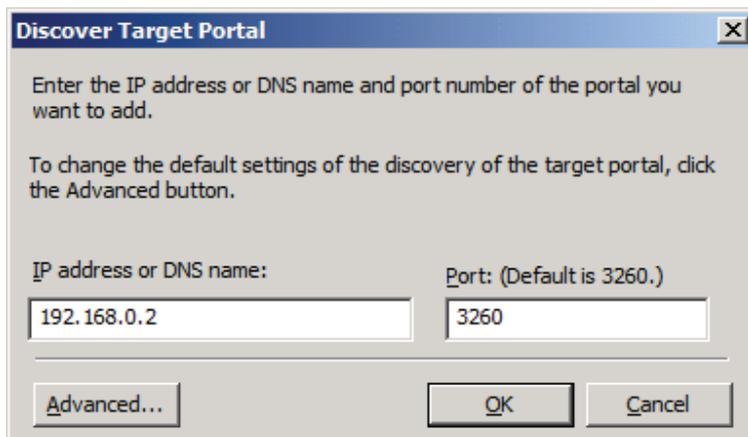
Lunch the Administrative Tools -> Microsoft iSCSI initiator.



Select the **Discovery** page.



Press the **Discovery Portal** button, the **Discovery Target Portal** dialog is shown.



The image shows a dialog box titled "Discover Target Portal" with a close button (X) in the top right corner. The dialog contains the following text and fields:

Enter the IP address or DNS name and port number of the portal you want to add.

To change the default settings of the discovery of the target portal, click the Advanced button.

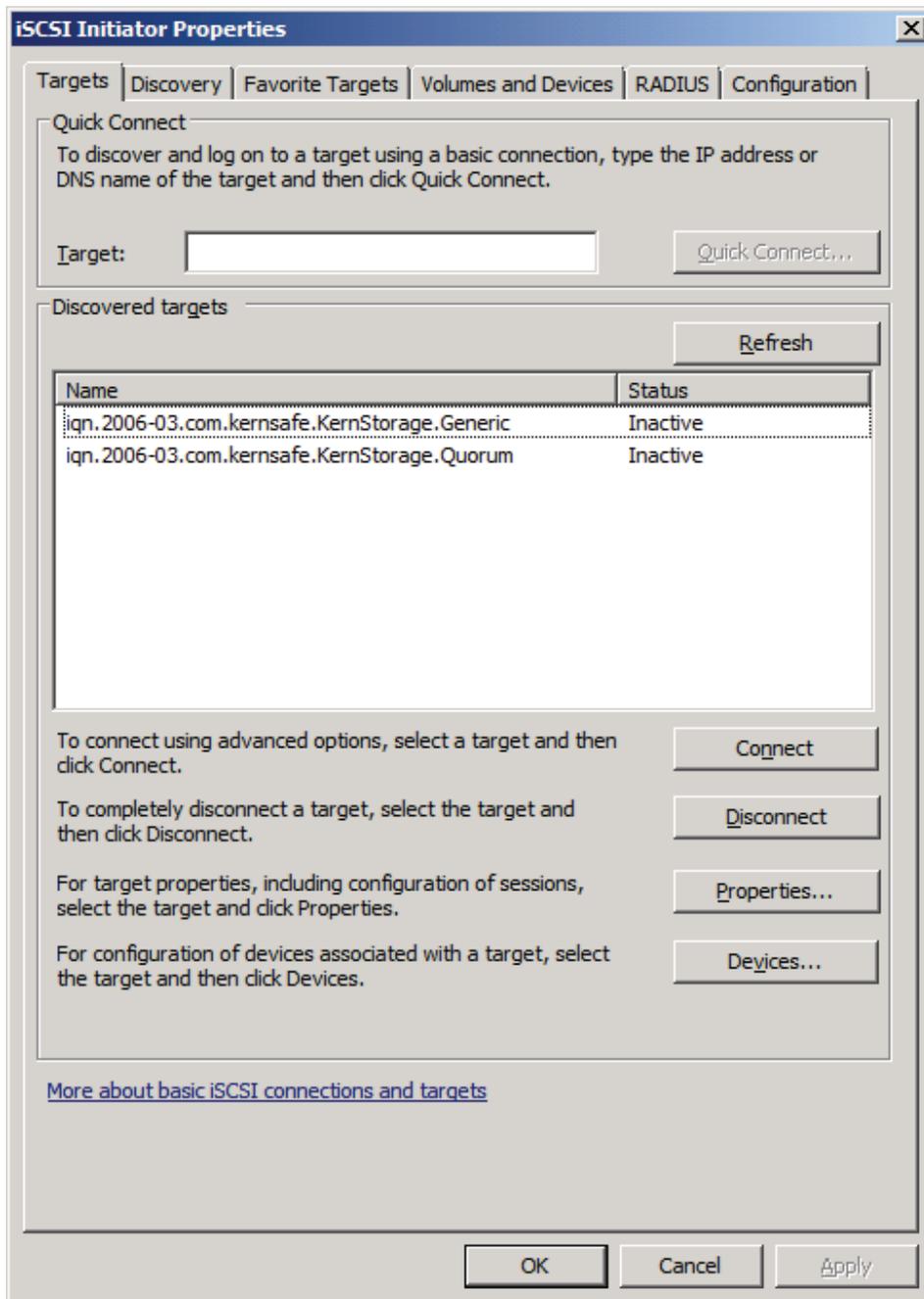
IP address or DNS name:  Port: (Default is 3260.)

Buttons:

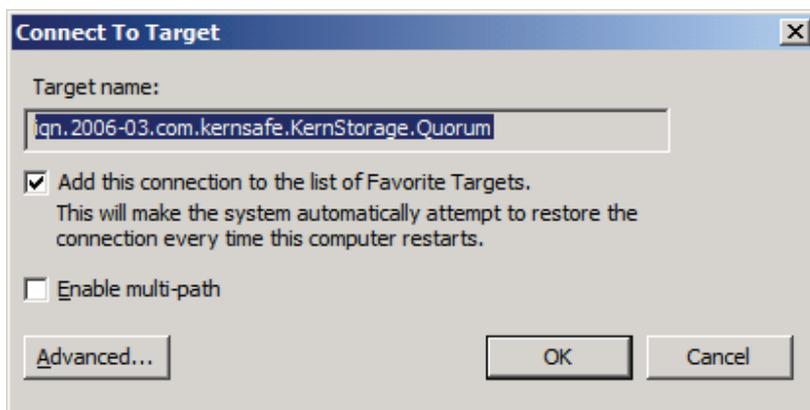
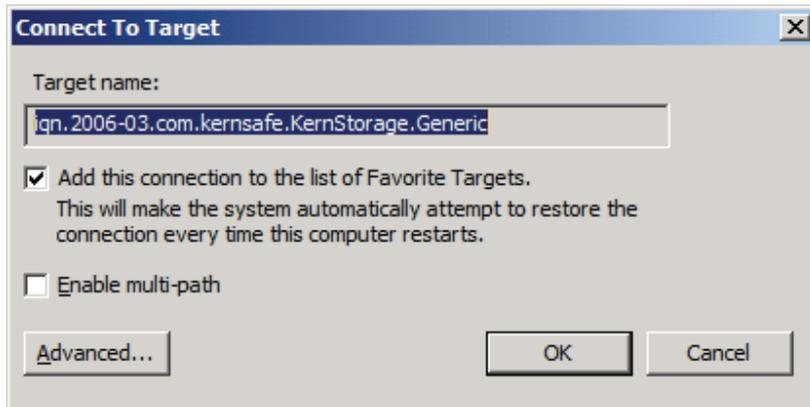
Type **IP address or NDS name** and **Port** of the iStorage Server in the required fields.

Press the **OK** button to add.

Select the **Targets** page.



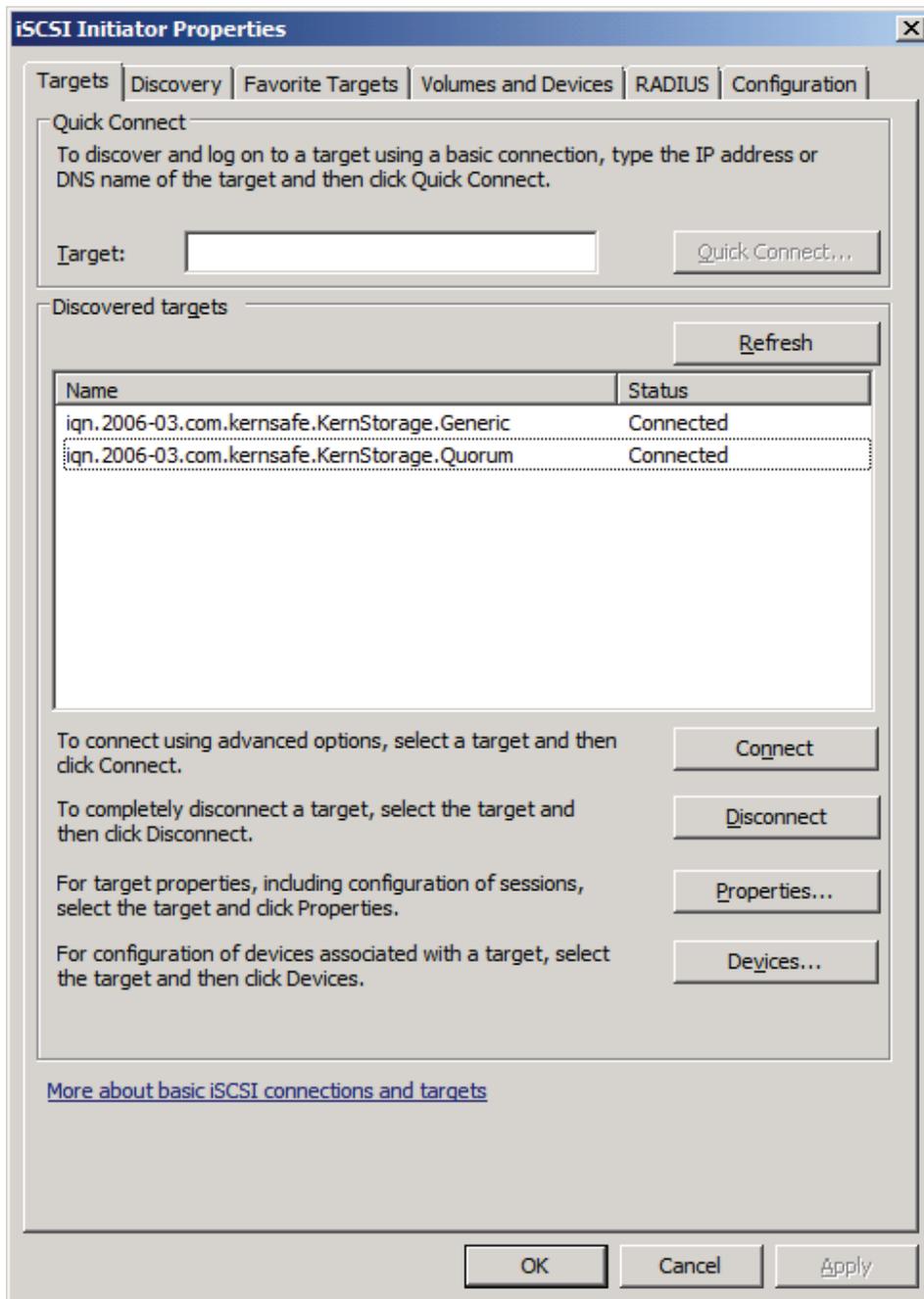
Select the targets just added and then press the **Connect** button.



Keep selection of **the Add this connection to the list of Favorite Targets.**

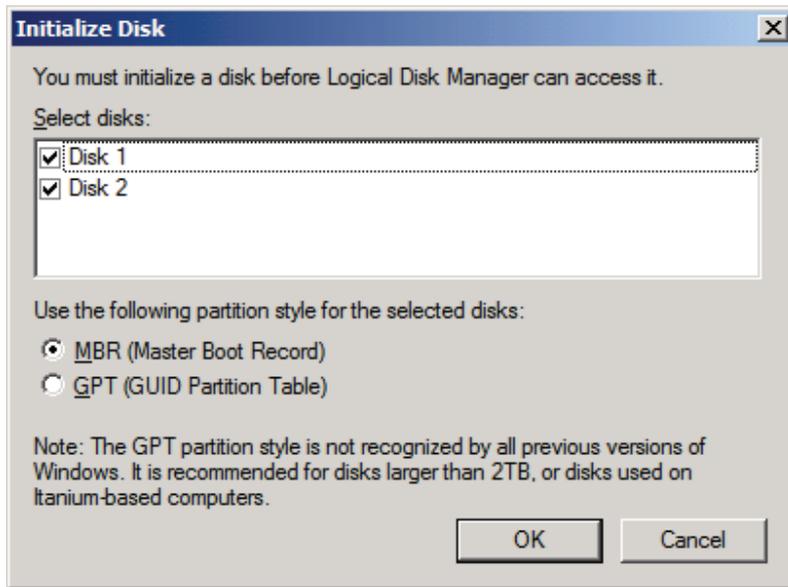
Press the **OK** button to continue.

If successful, the logged on targets are shown in the figure.



Launch the **Windows Computer Management Console**.

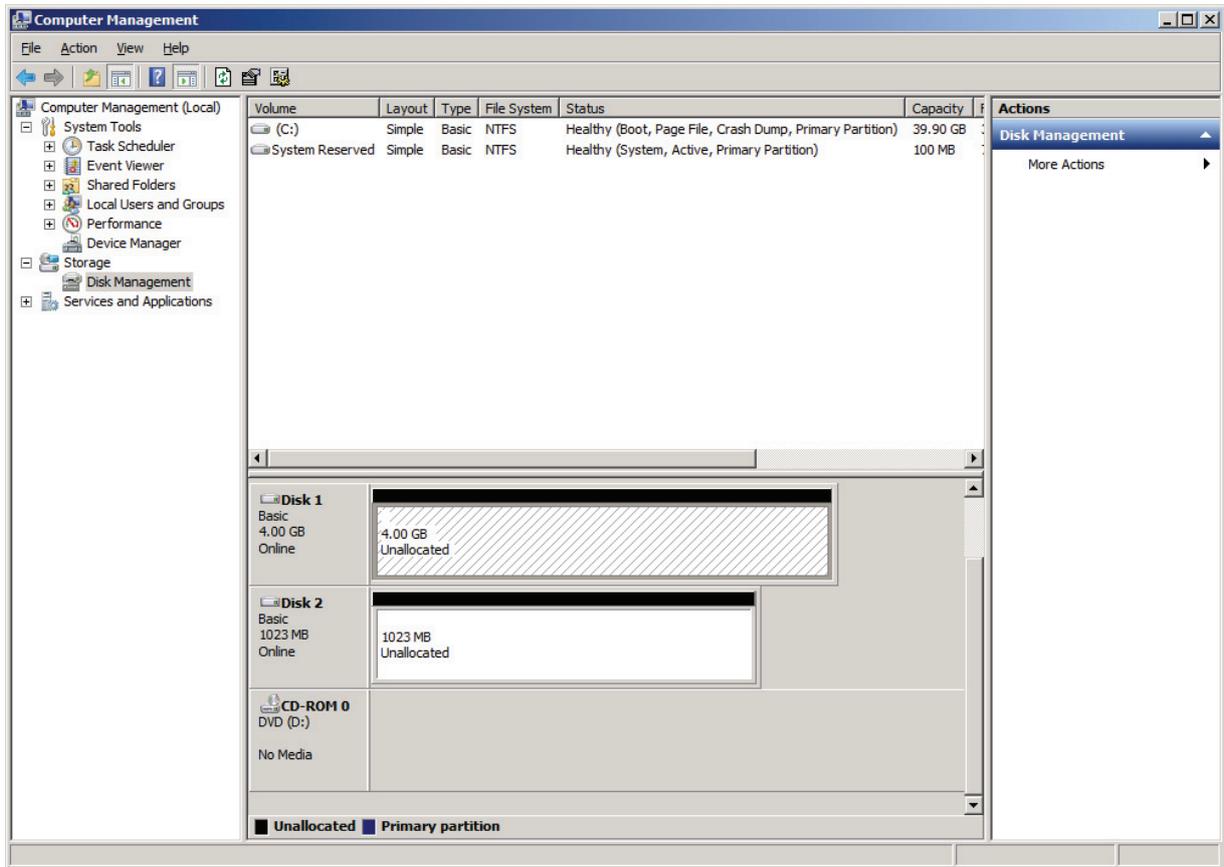
An **Initialize Disk** dialog is shown.



Keep the selection of the two disks.

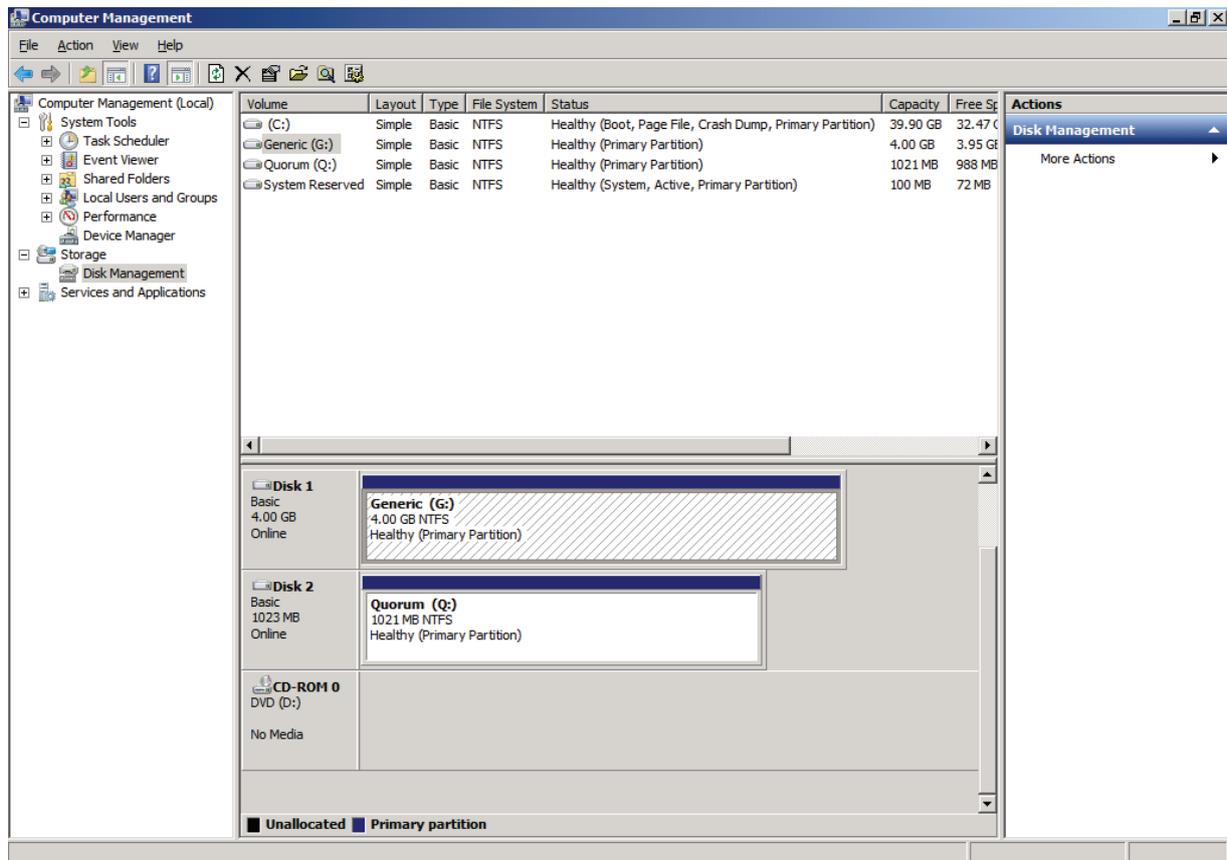
Select partition style for the selected disks.

Press the **OK** button to continue.



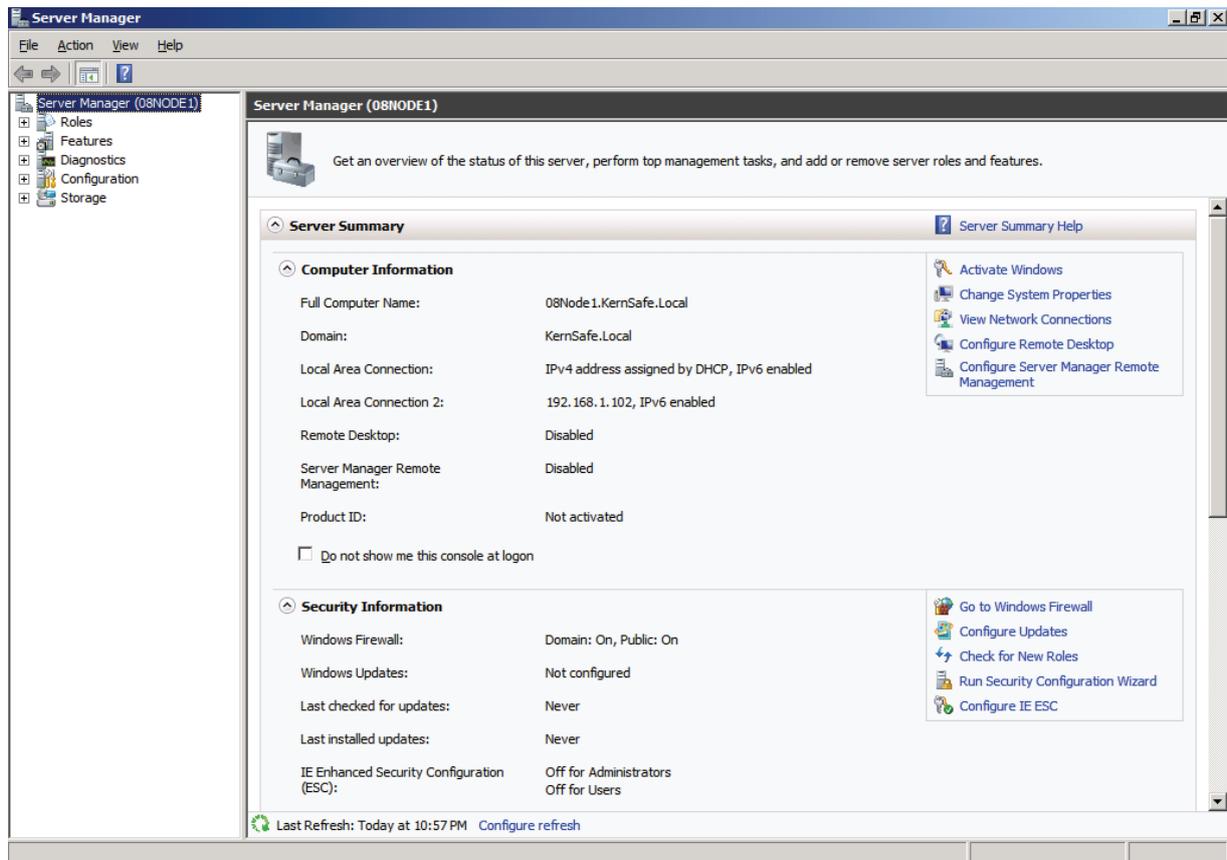
Right click on the Disks and then select New Simple Volume, partition and format the two disks followed by wizard.

If successful, the new volumes created are shown in the figure below.

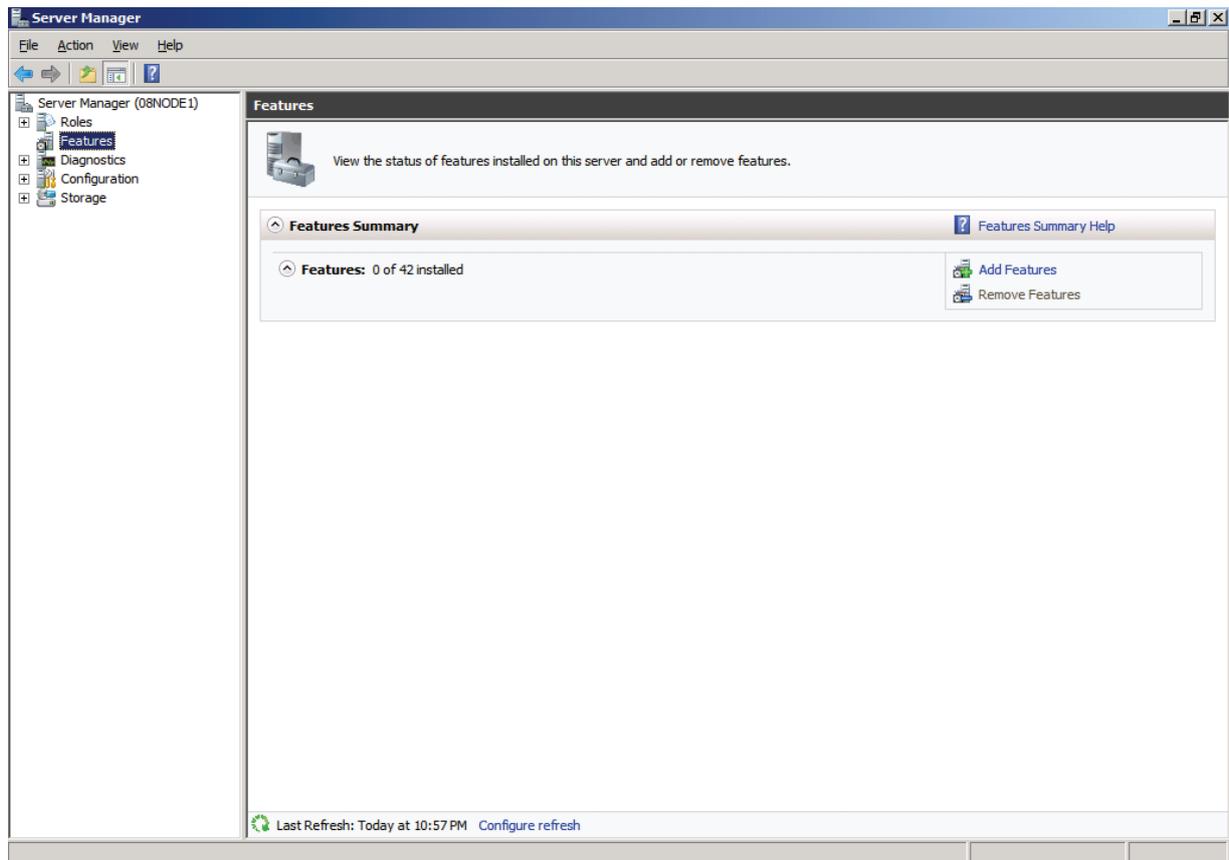


## Installing Failover Clustering Service

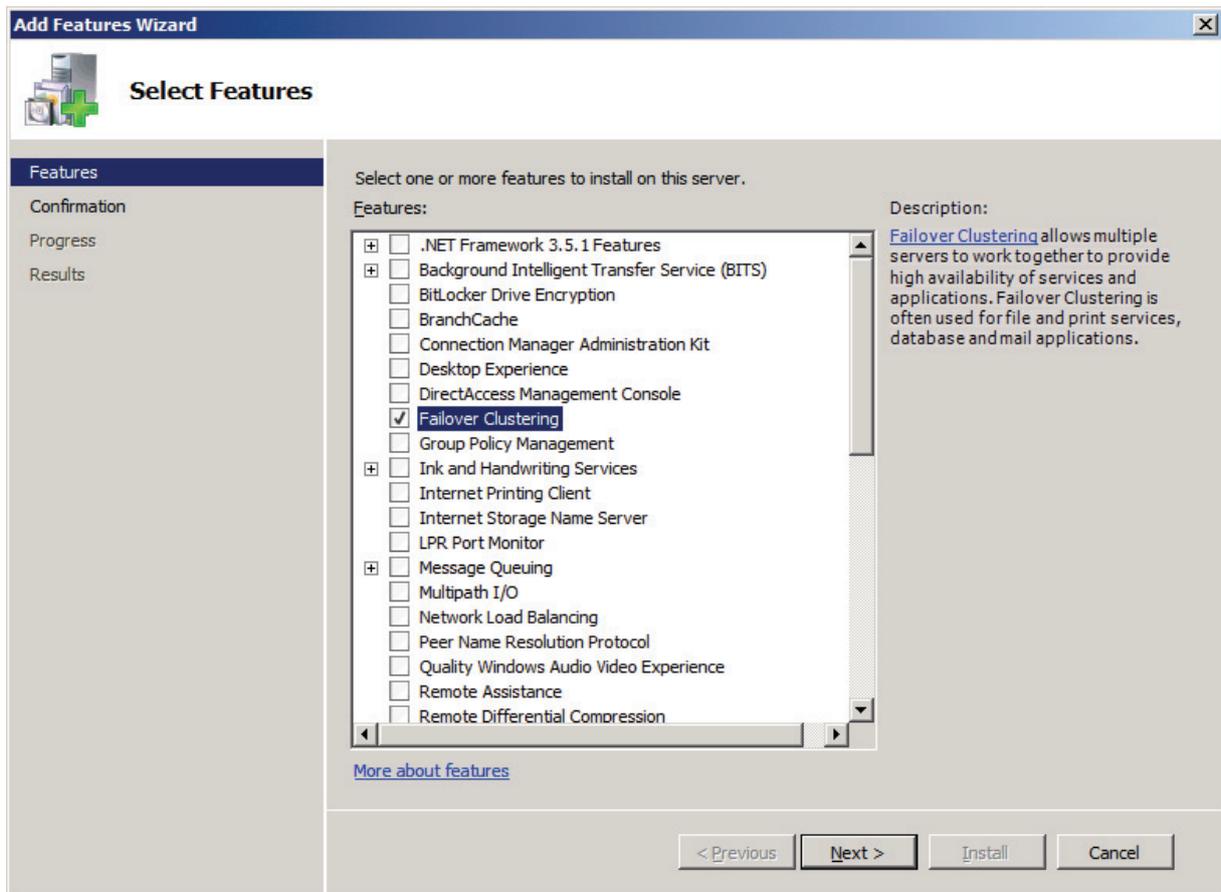
Launch the **Windows Server manager Console**.



Select the **Features** node from the left tree view.

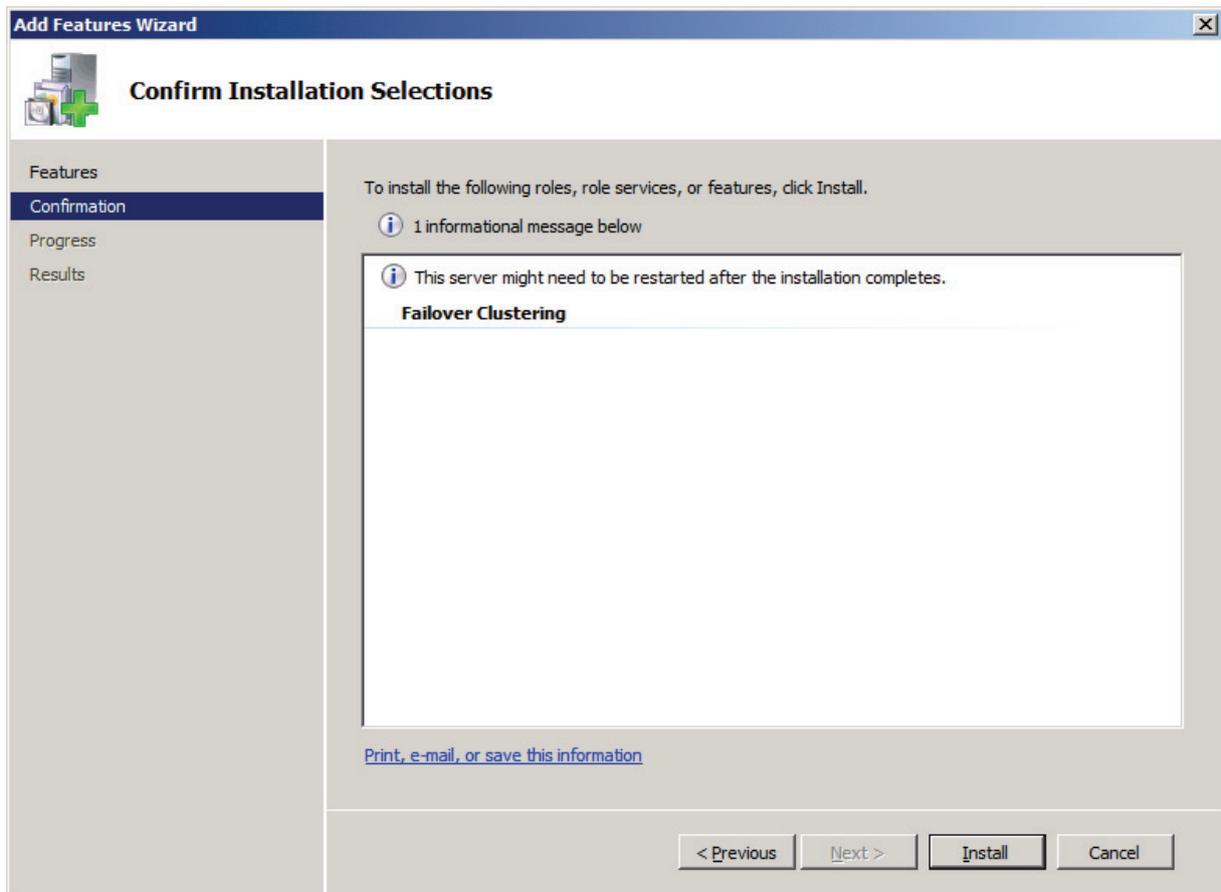


Click the **Add Features** link, the **Add Features Wizard** is shown.



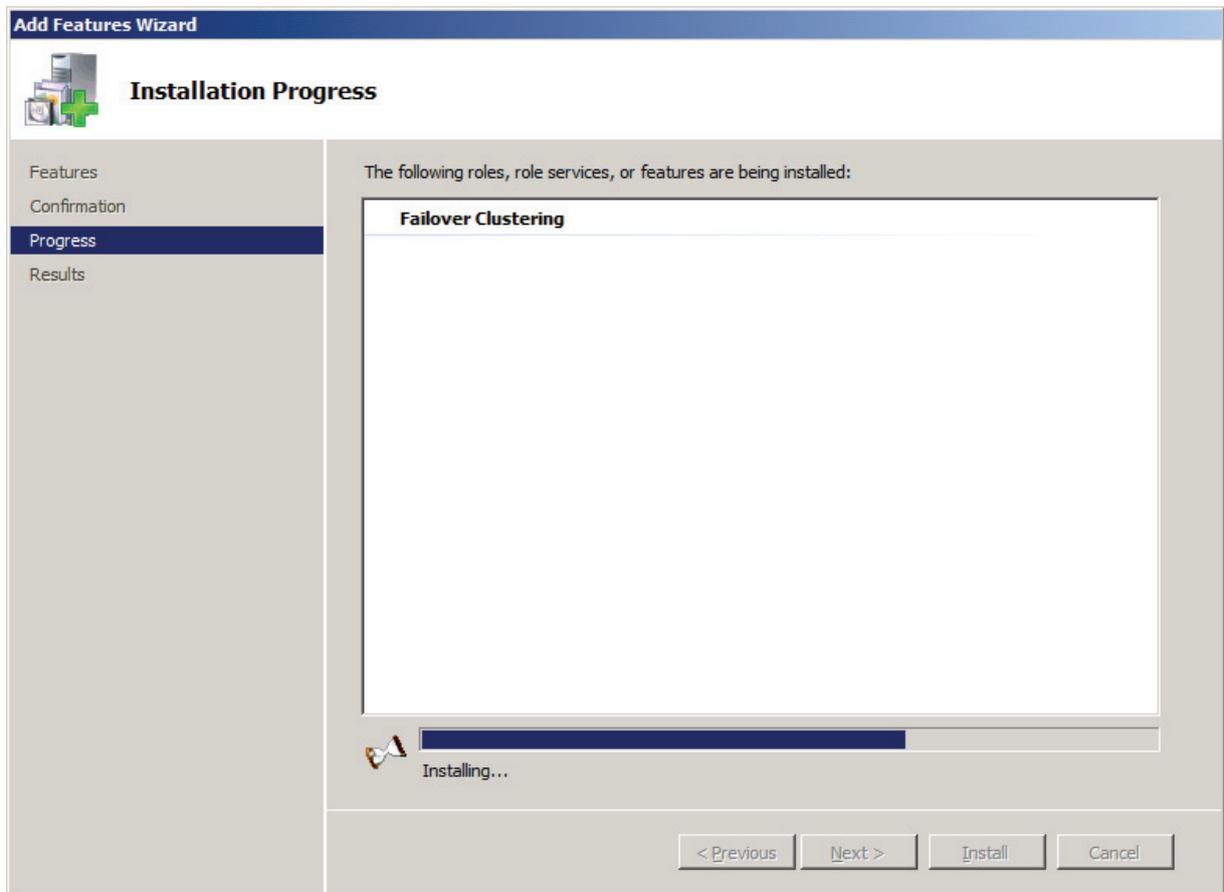
Select the **Failover Clustering**.

Press the **Next** button to continue.

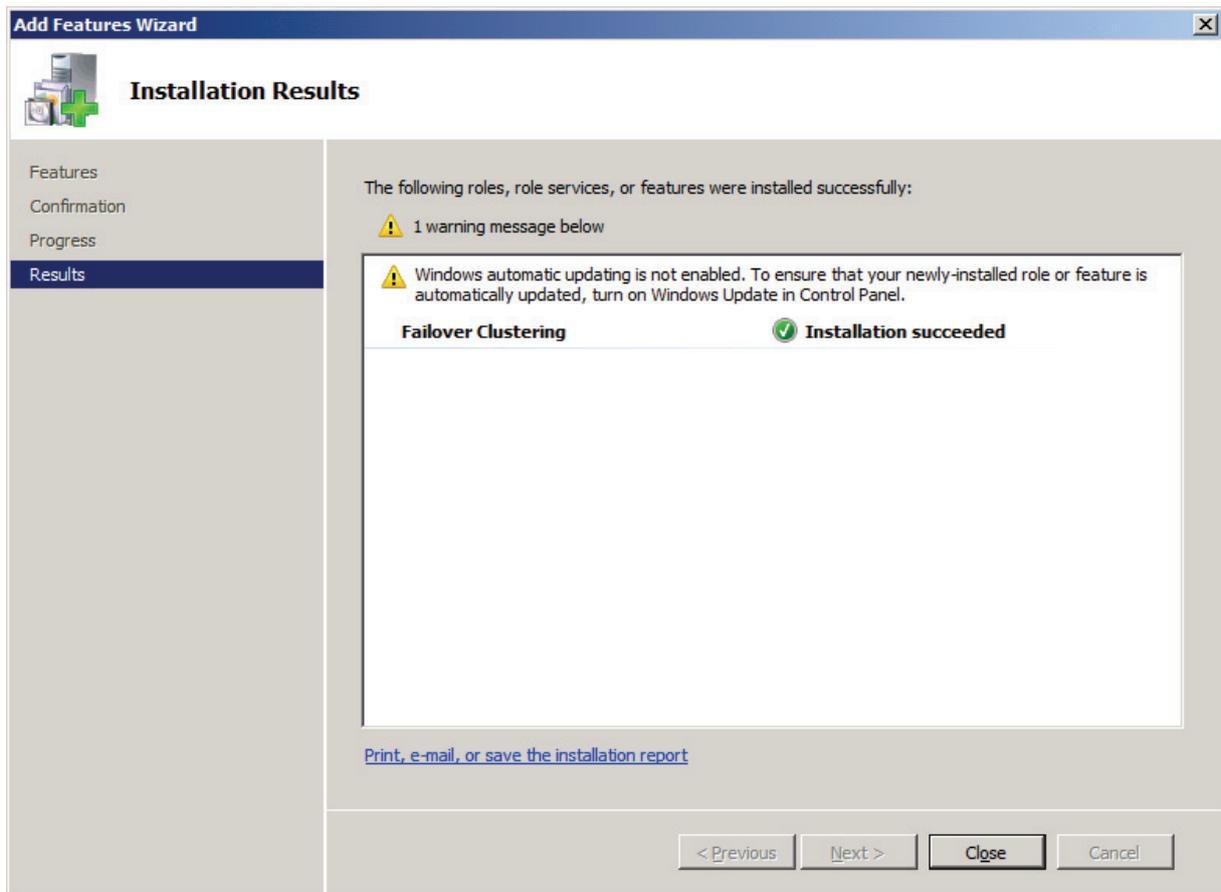


Press the **Install** button to install the **Failover Clustering** feature.

The installation of the Failover Clustering is going on.



If successful, the wizard will complete and show as the figure below.



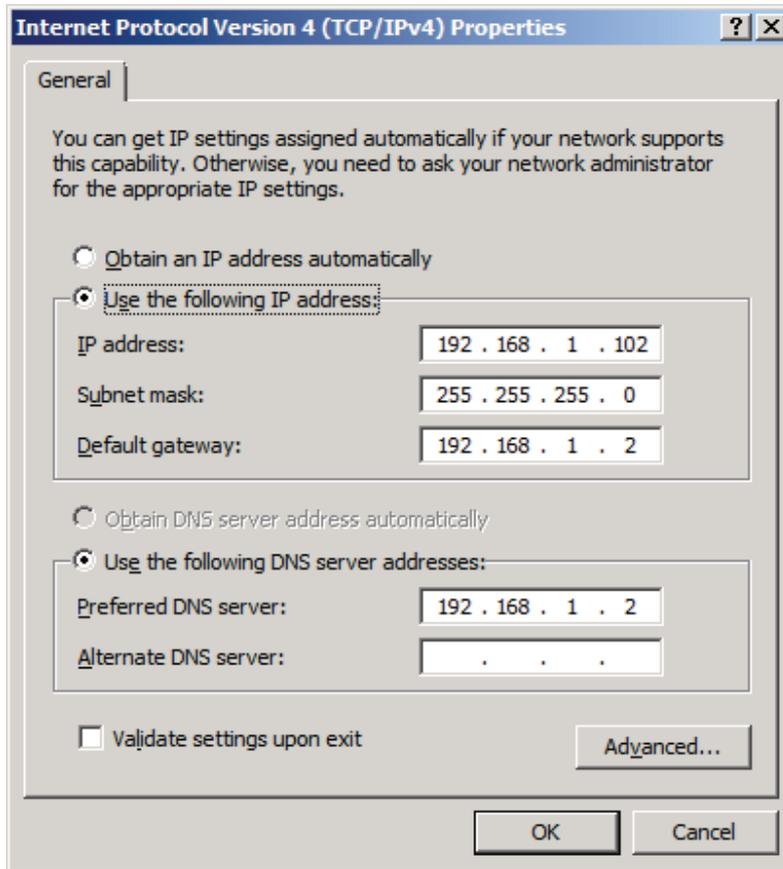
Press the **Close** button.

## Configuring on Cluster Node 2

### Network Adapter

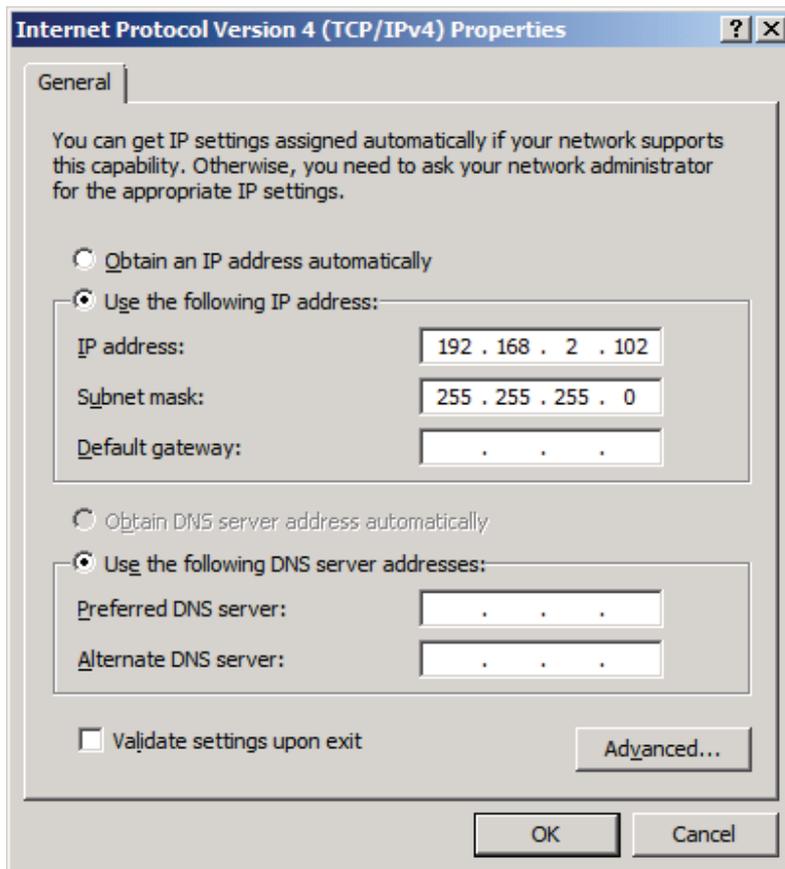
For working in clustering environment, the network adapter must be assigned a static IP address. Select the **Internet Protocol Version 4(TCP/IPv4)** and then press the **Properties** button, the **Internet Protocol**

Version 4 (TCP/IPv4) dialog is shown.



Type in the **IP address**, **Subnet mask**, **Default gateway** and **Preferred NDS server**.

Set the second network adapter of 08Node.



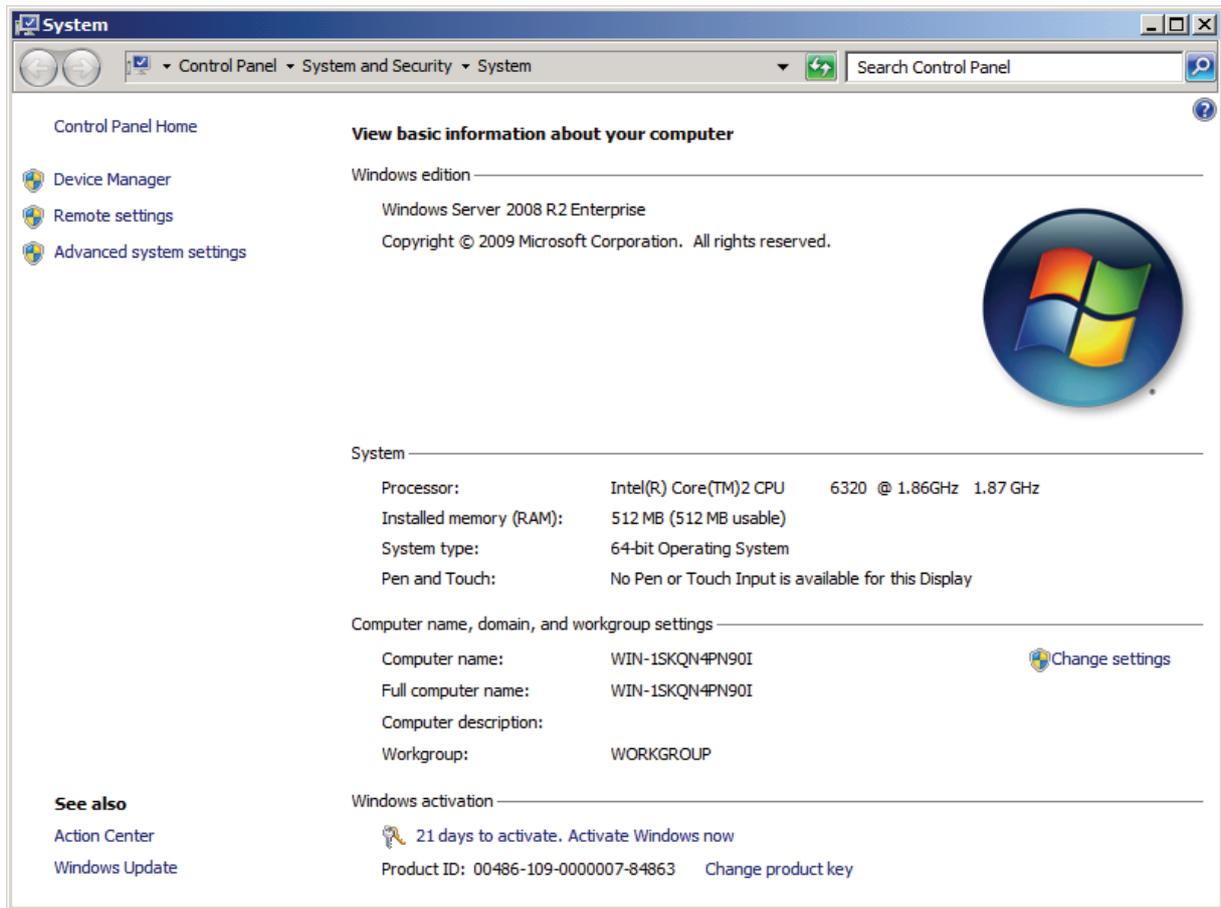
Type in the IP address and Subnet mask.

Press the **OK** button to change IP address.

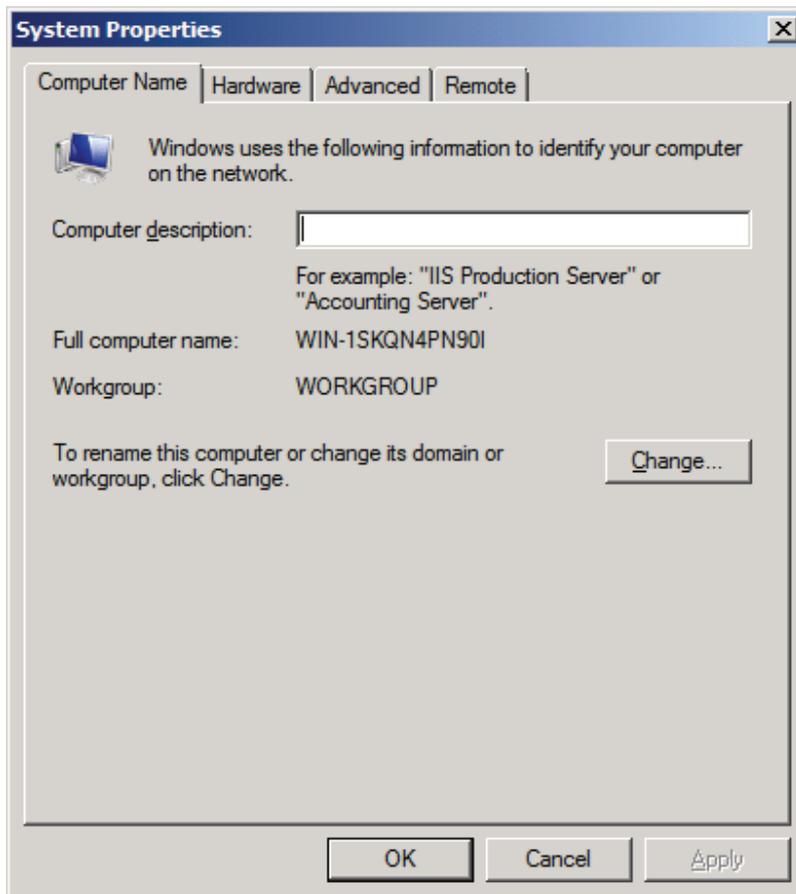
## Join to the domain

Press the **OK** button to change IP address.

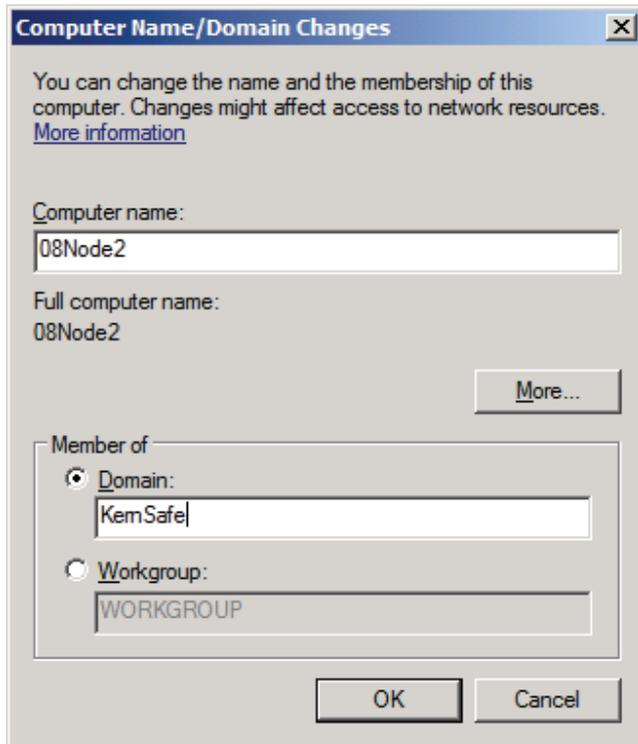
Open System Properties page.



Click on the **Change settings** link, the **System Properties** Dialog is shown.



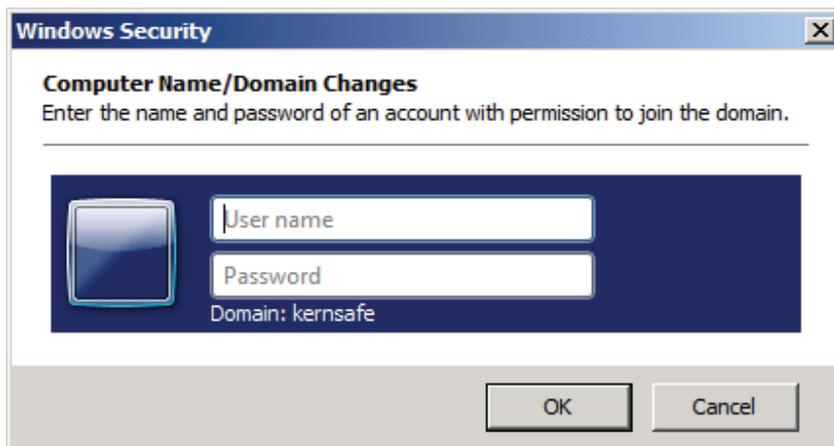
Press the **Change...** button.



Type 08Node2 in the **Computer name** and kernsafe.local in the **Domain**.

Press the **OK** button to change computer name and join the domain.

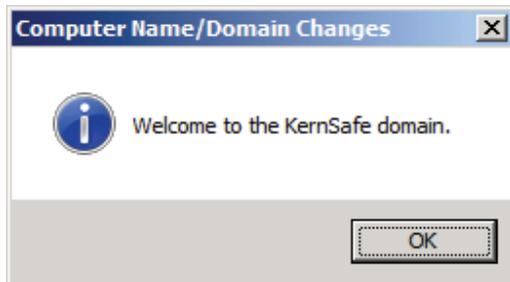
Domain controller account is required to join the domain.



Type your user name and password.

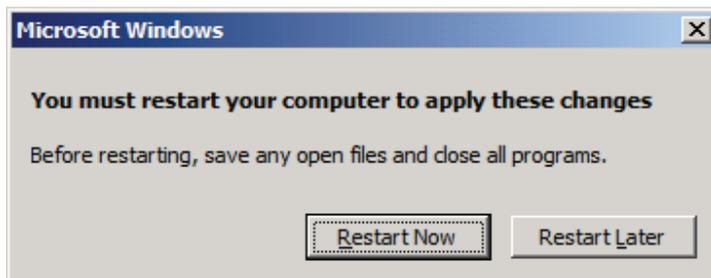
Press the OK button to continue.

If successful, the **Computer Name/Domain Changes** notification dialog is shown as below.



Press the **OK** button to continue.

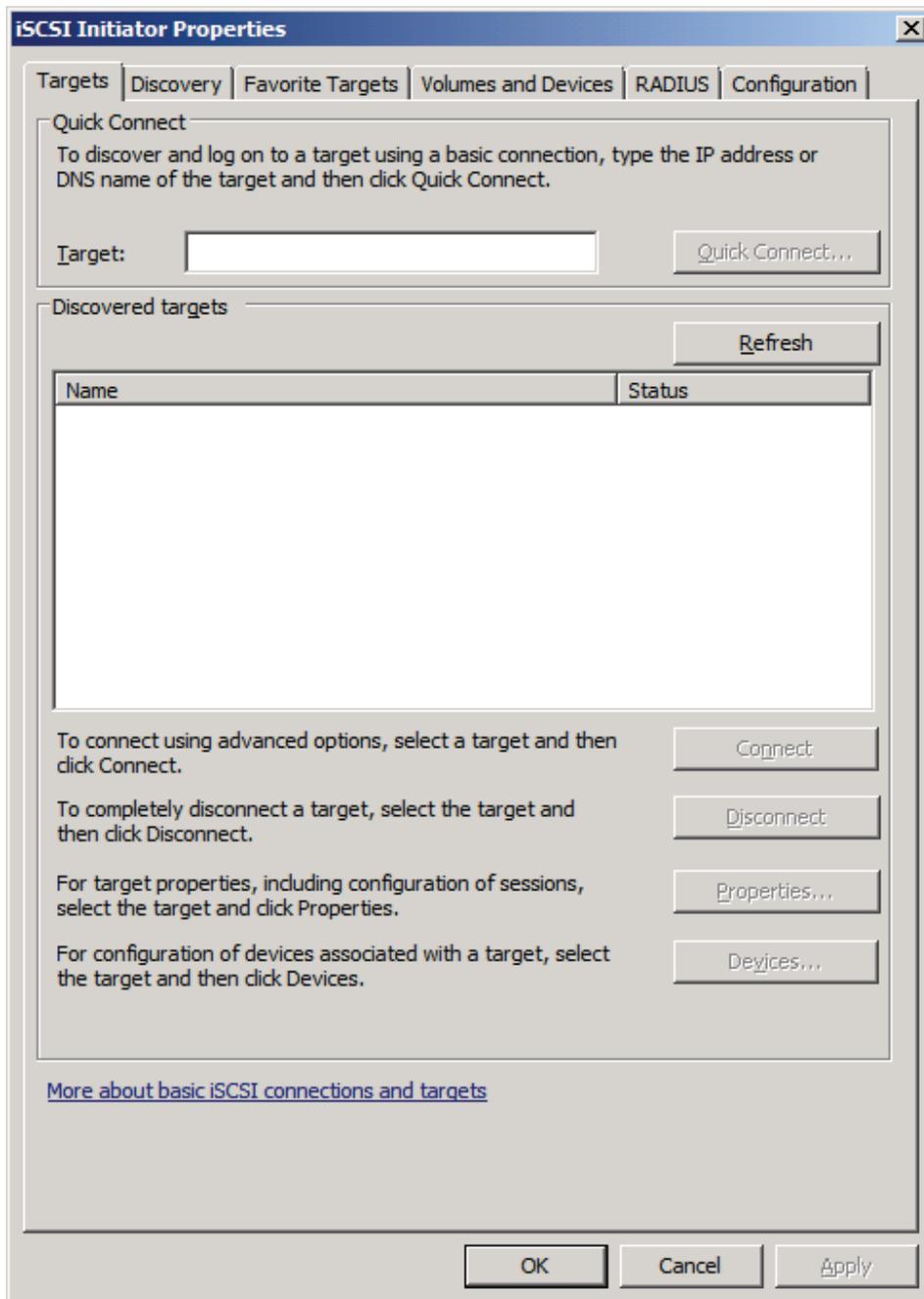
Restart is required.



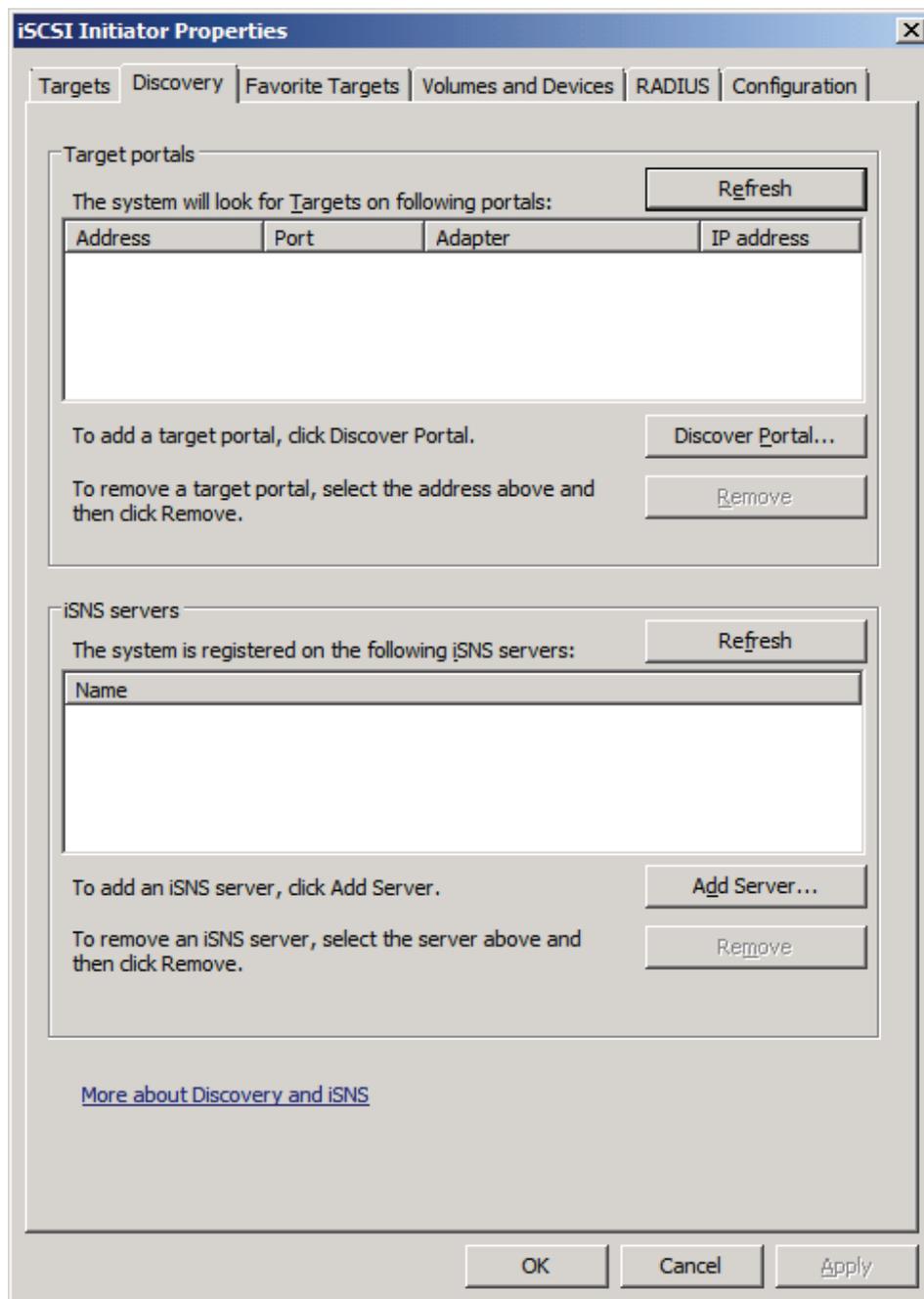
Press **the Restart Now** button to restart the computer.

## Log in to iSCSI disks

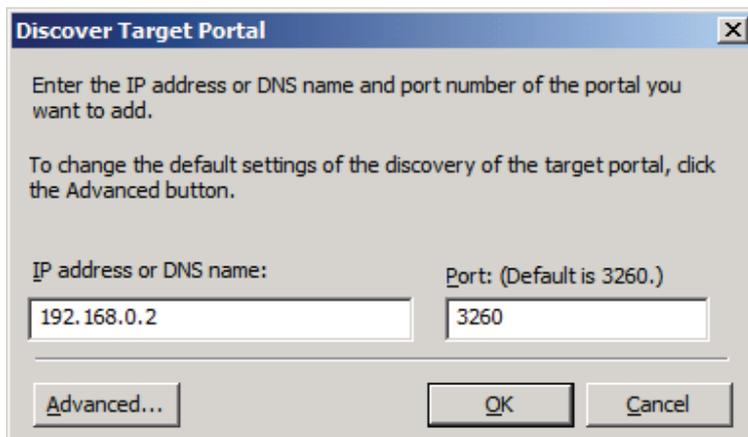
Lunch the Administrative Tools -> Microsoft iSCSI initiator.



Select the **Discovery** page.



Press the **Discovery Portal** button, the **Discovery Target Portal** dialog is shown.



The image shows a dialog box titled "Discover Target Portal" with a close button (X) in the top right corner. The dialog contains the following text and fields:

Enter the IP address or DNS name and port number of the portal you want to add.

To change the default settings of the discovery of the target portal, click the Advanced button.

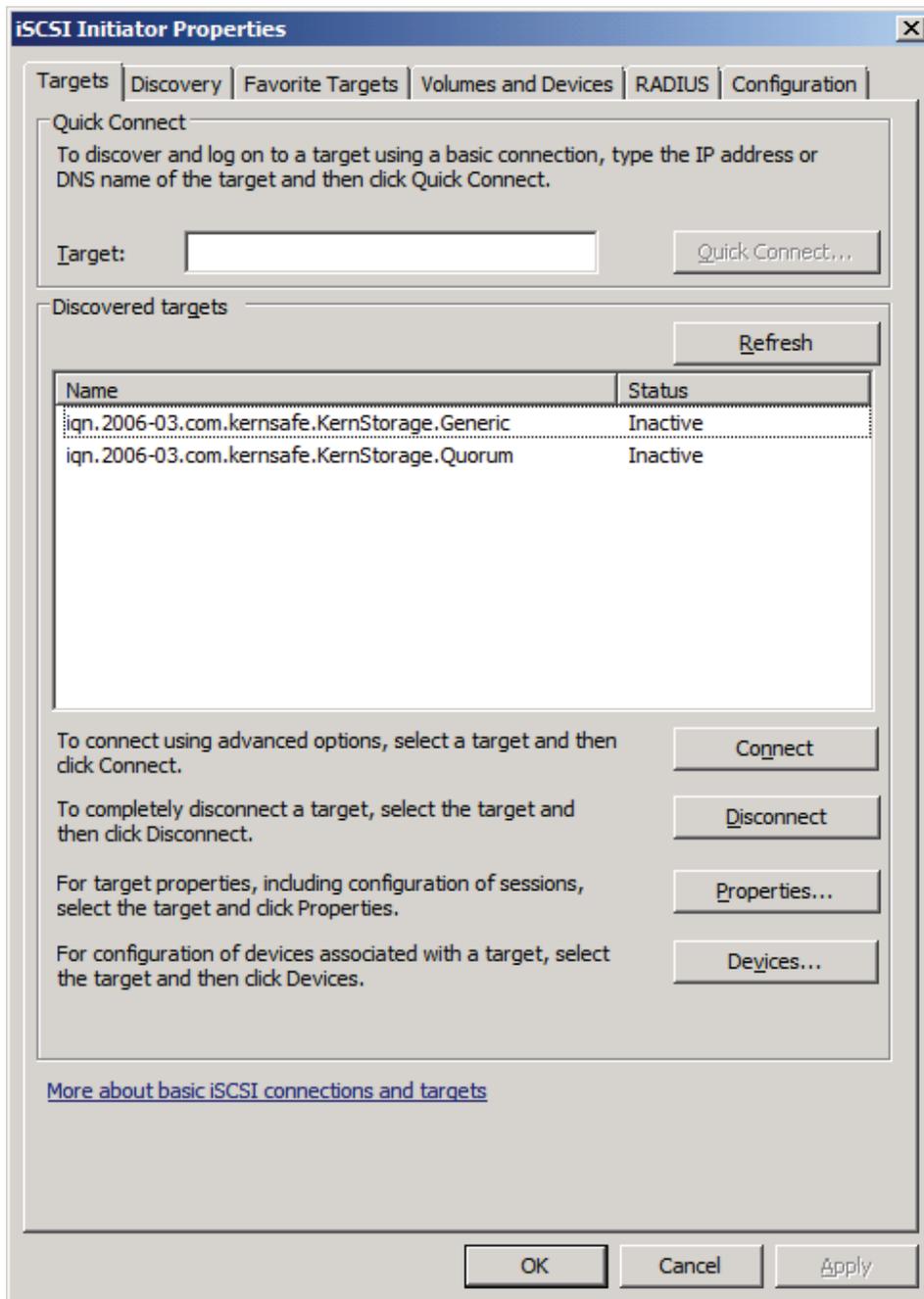
IP address or DNS name:  Port: (Default is 3260.)

Buttons:

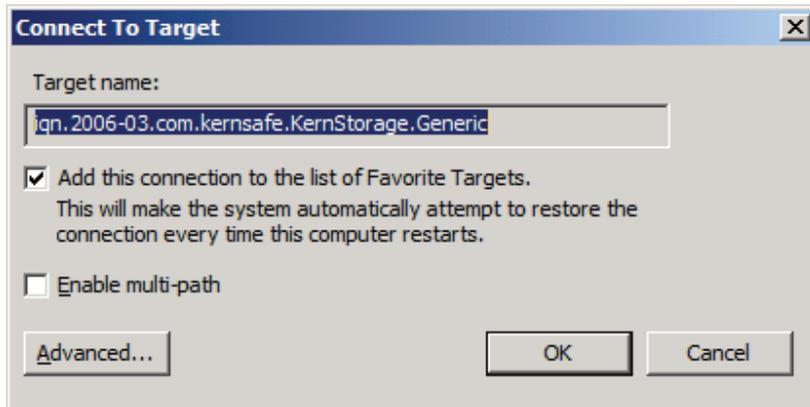
Type **IP address or NDS name** and **Port** of the iStorage Server in the required fields.

Press the **OK** button to add.

Select the **Targets** page.



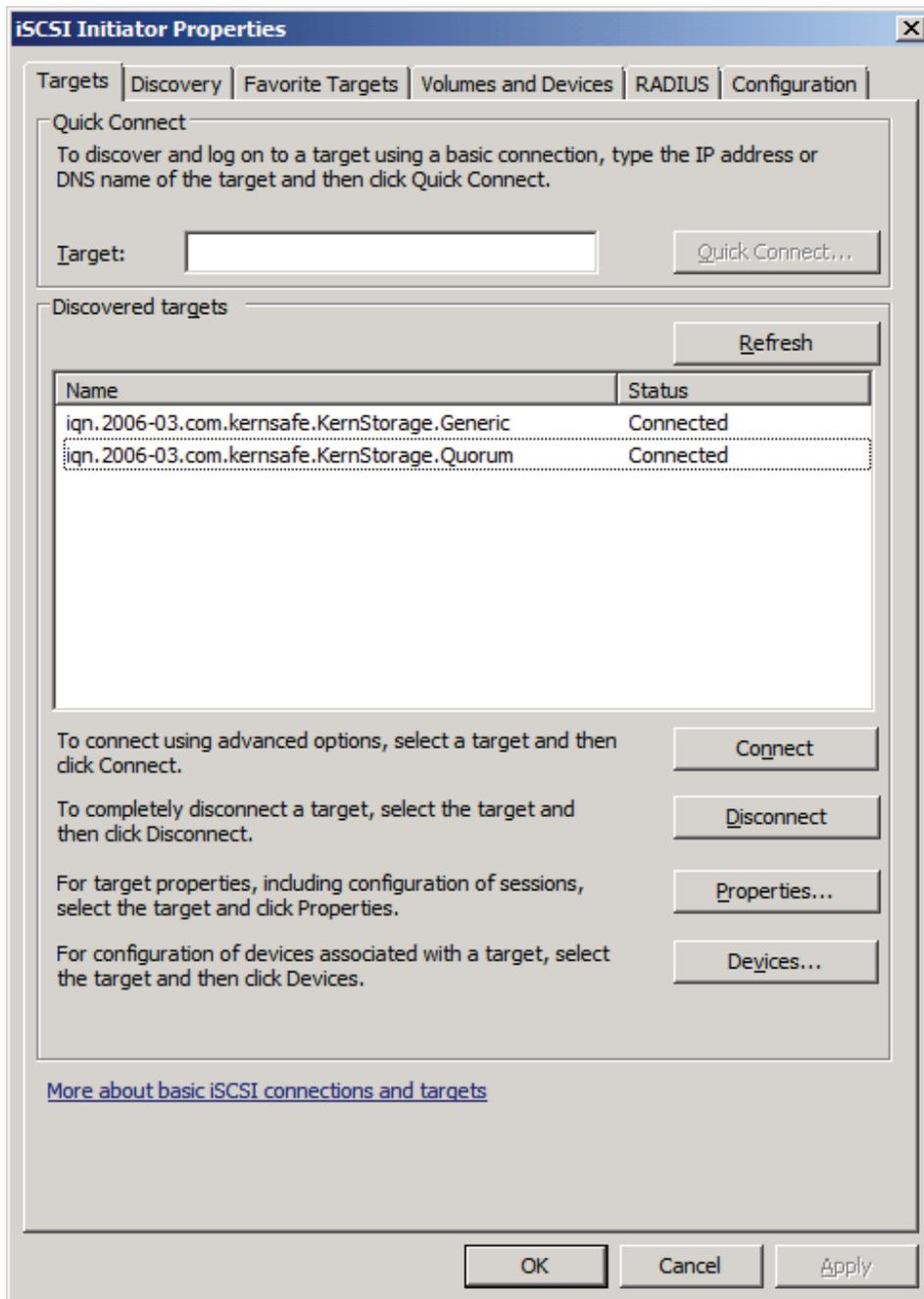
Select the targets just added and then press the **Connect** button.



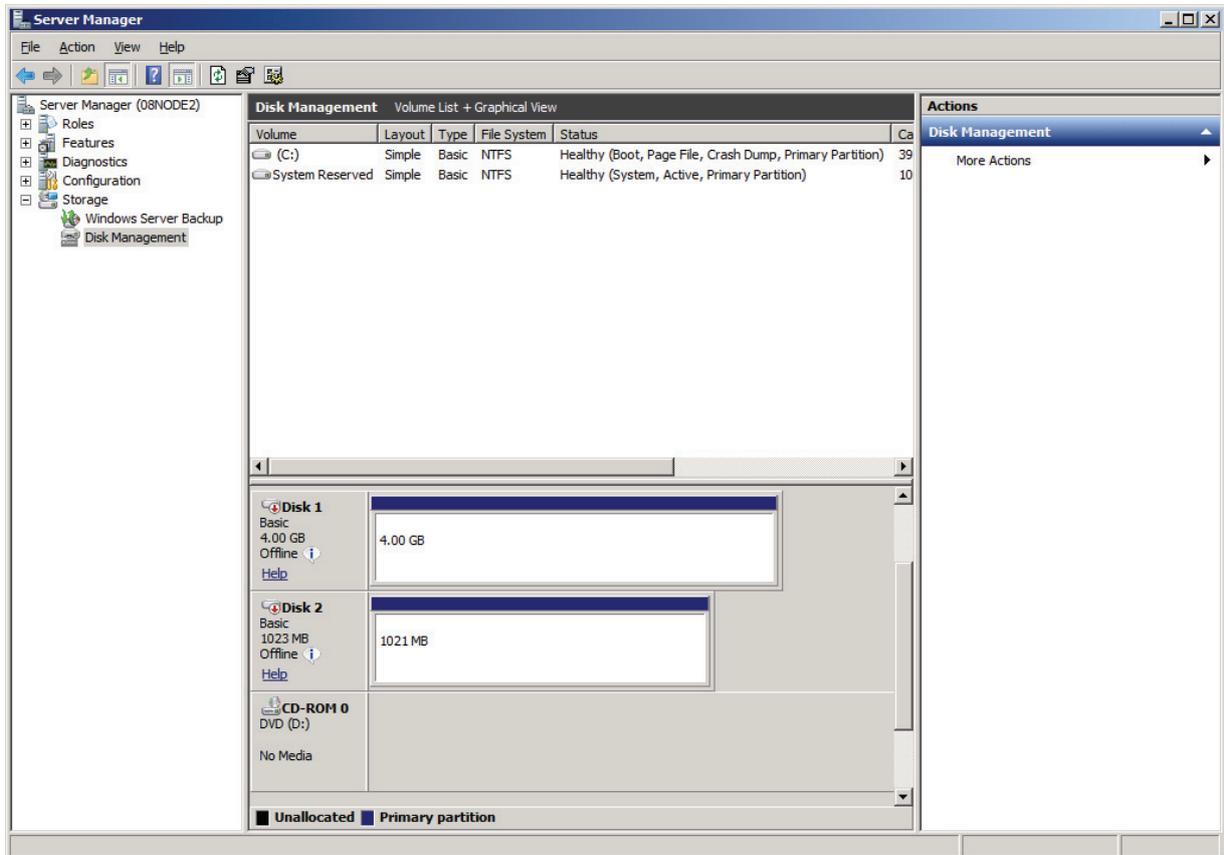
Keep selection of **the Add this connection to the list of Favorite Targets.**

Press the **OK** button to continue.

If successful, the logged on targets are shown in the figure.

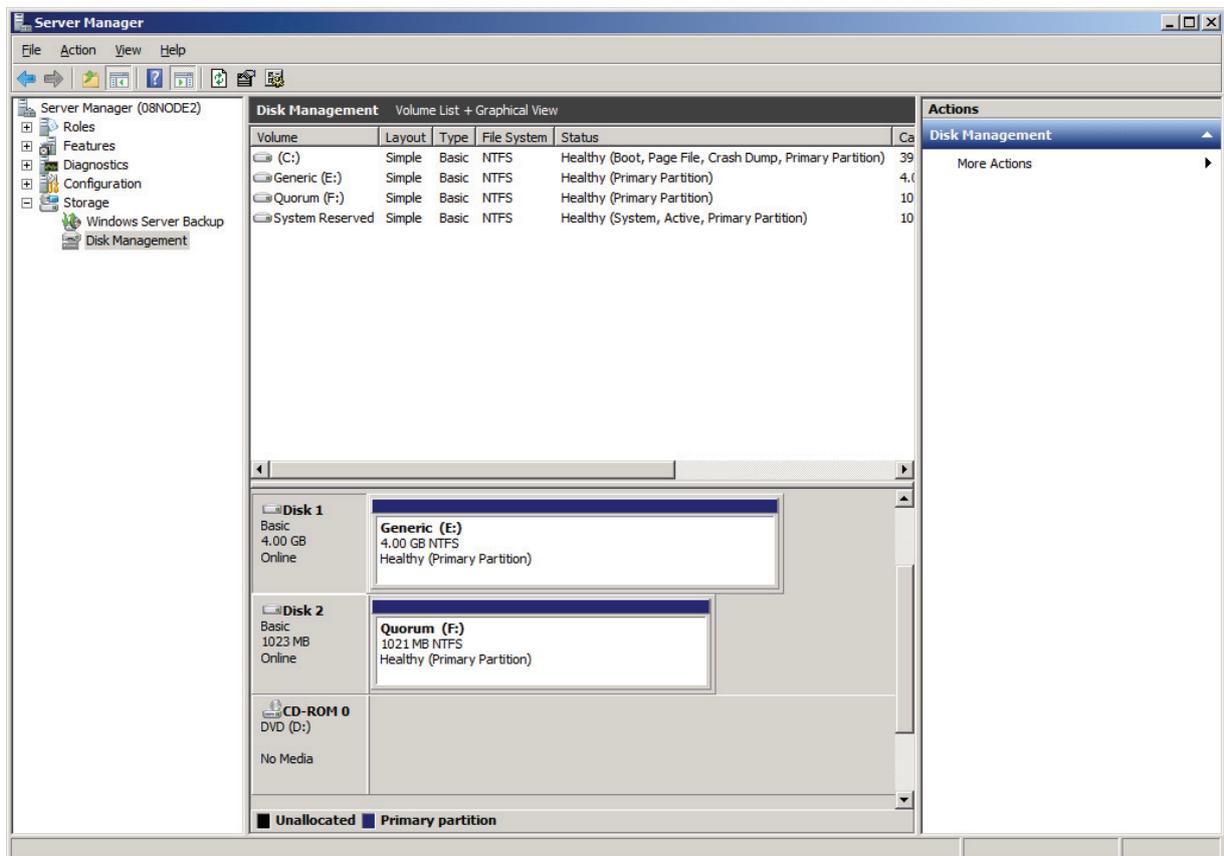


Launch the **Windows Computer Management Console**.



Right click on the **Disk1** and then select the **Online** menu item, bring **Disk1** online.

Right click on the **Disk2** and then select the **Online** menu item, brings **Disk2** online.

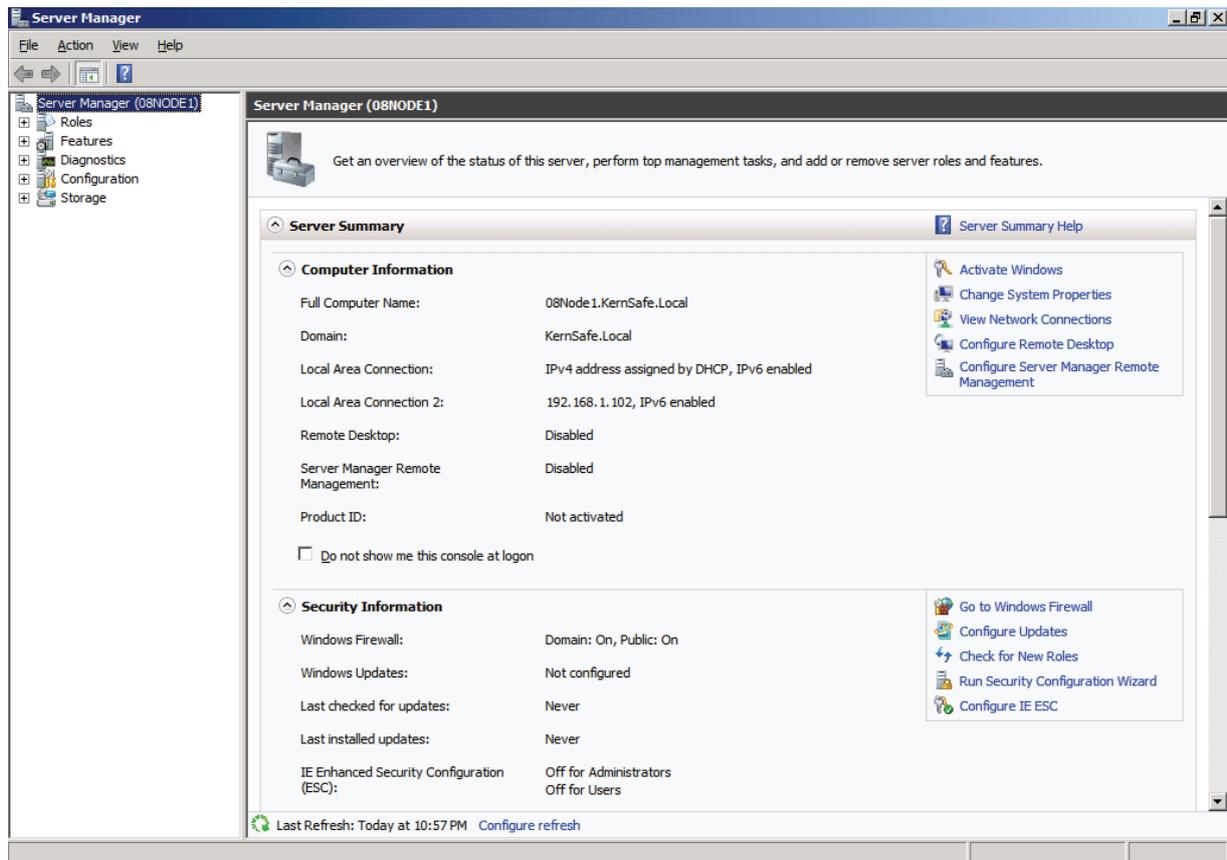


Right on the Disk1 and then select the **Change Driver Letter and Paths...** menu item, change the letter of Disk1 to **G:**.

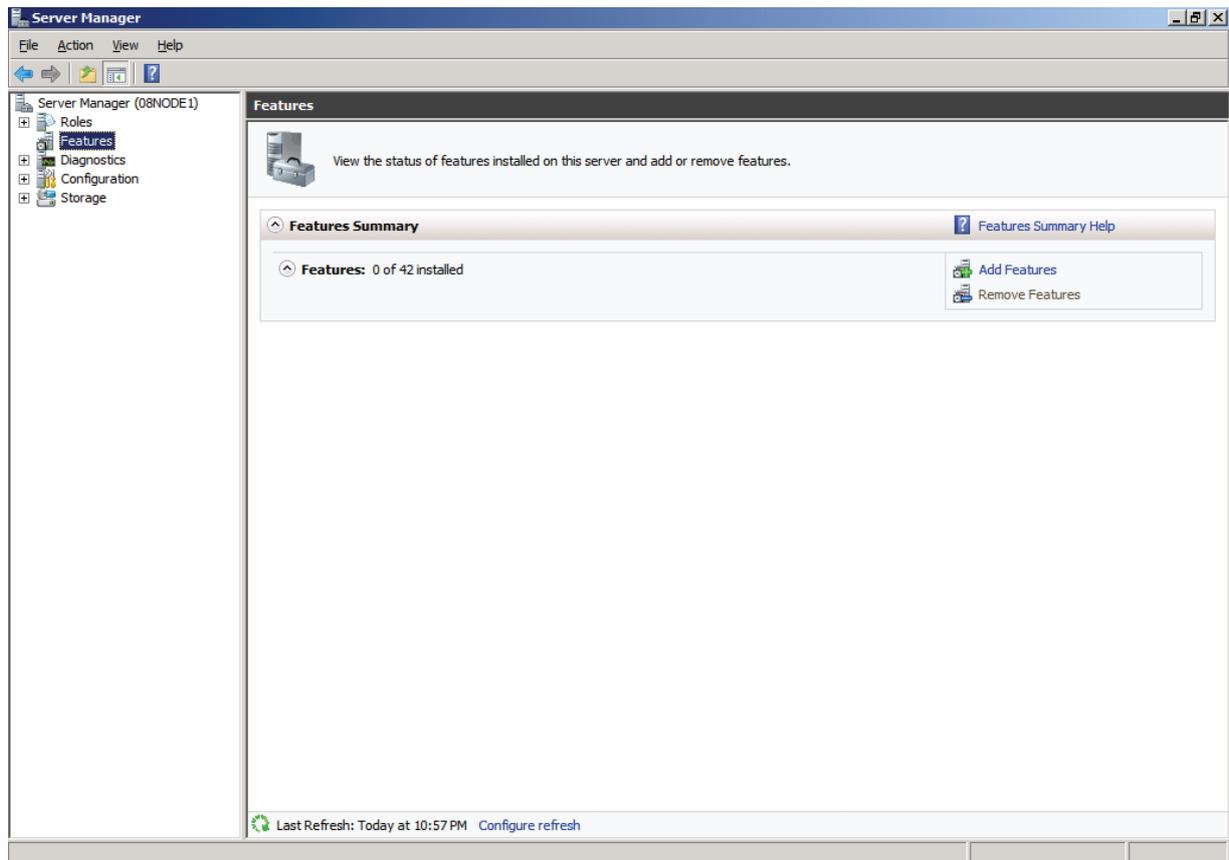
Right on the Disk2 and then select the **Change Driver Letter and Paths...** menu item, change the letter of Disk2 to **Q:**.

## Installing Failover Clustering Service

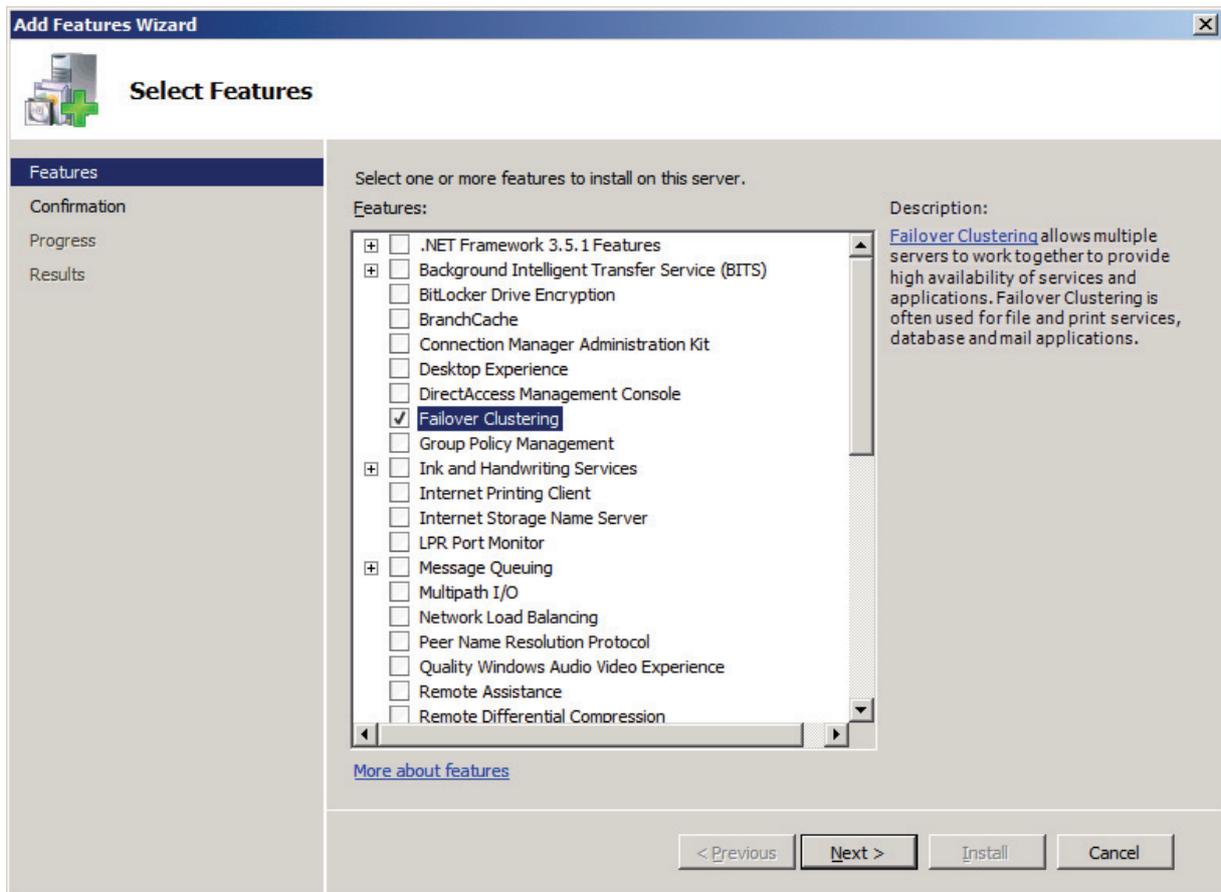
Launch the **Windows Server manager Console**.



Select the **Features** node from the left tree view.

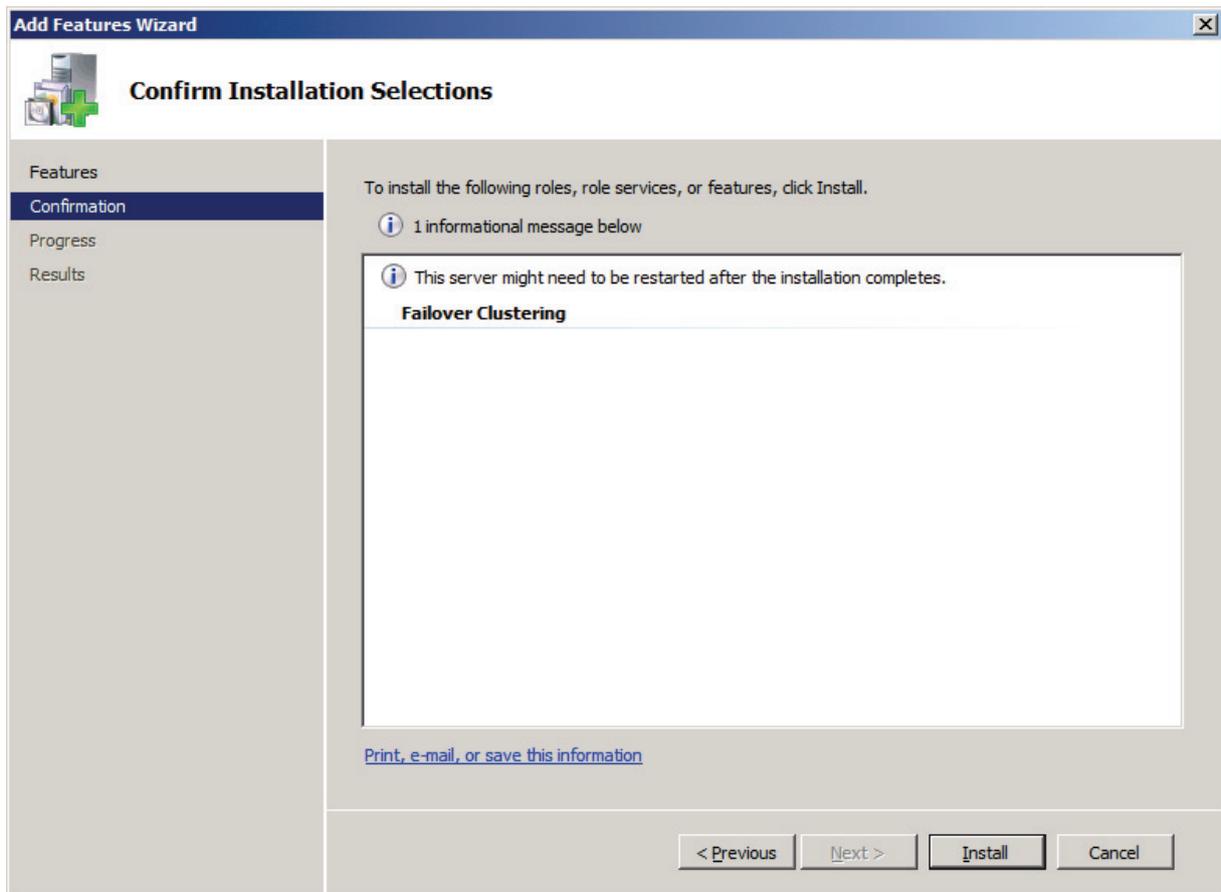


Click the **Add Features** link, the **Add Features Wizard** is shown.



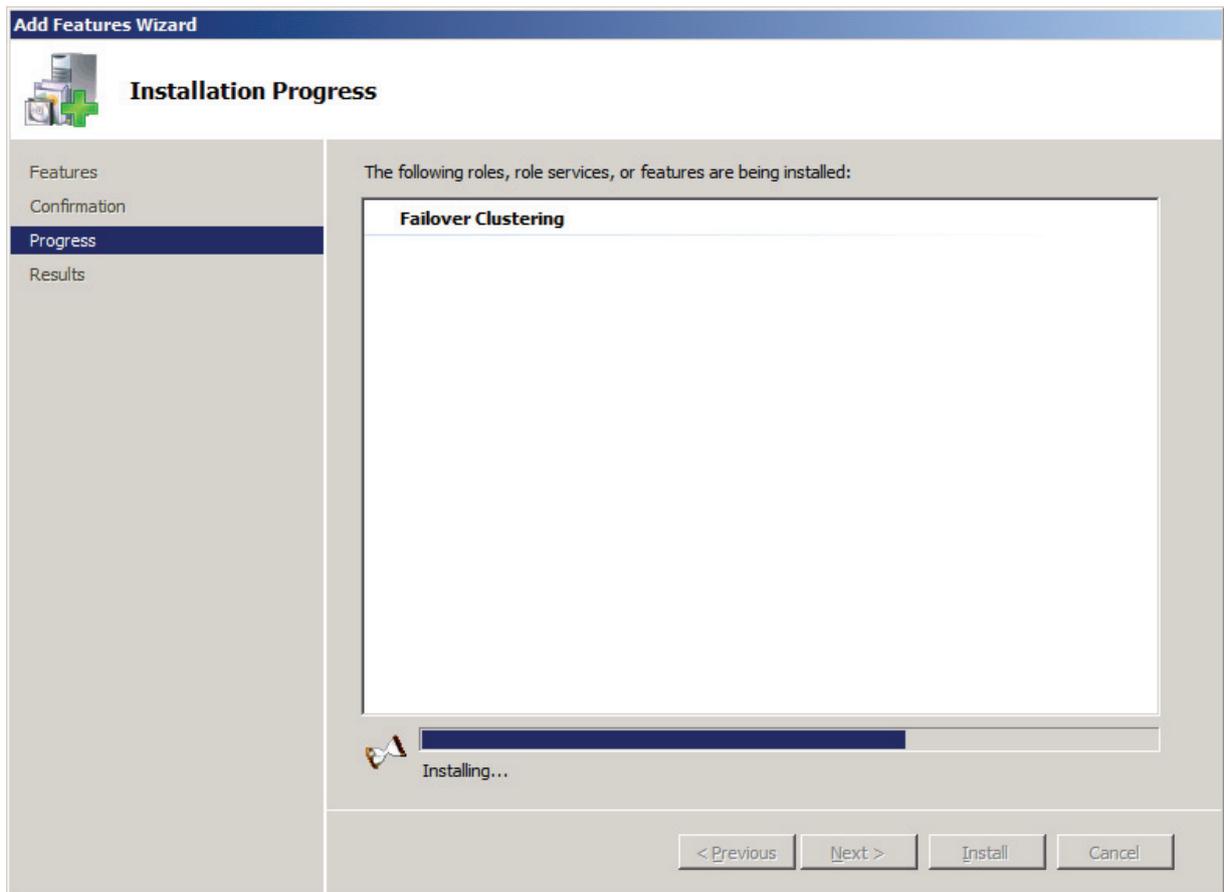
Select the **Failover Clustering**.

Press the **Next** button to continue.

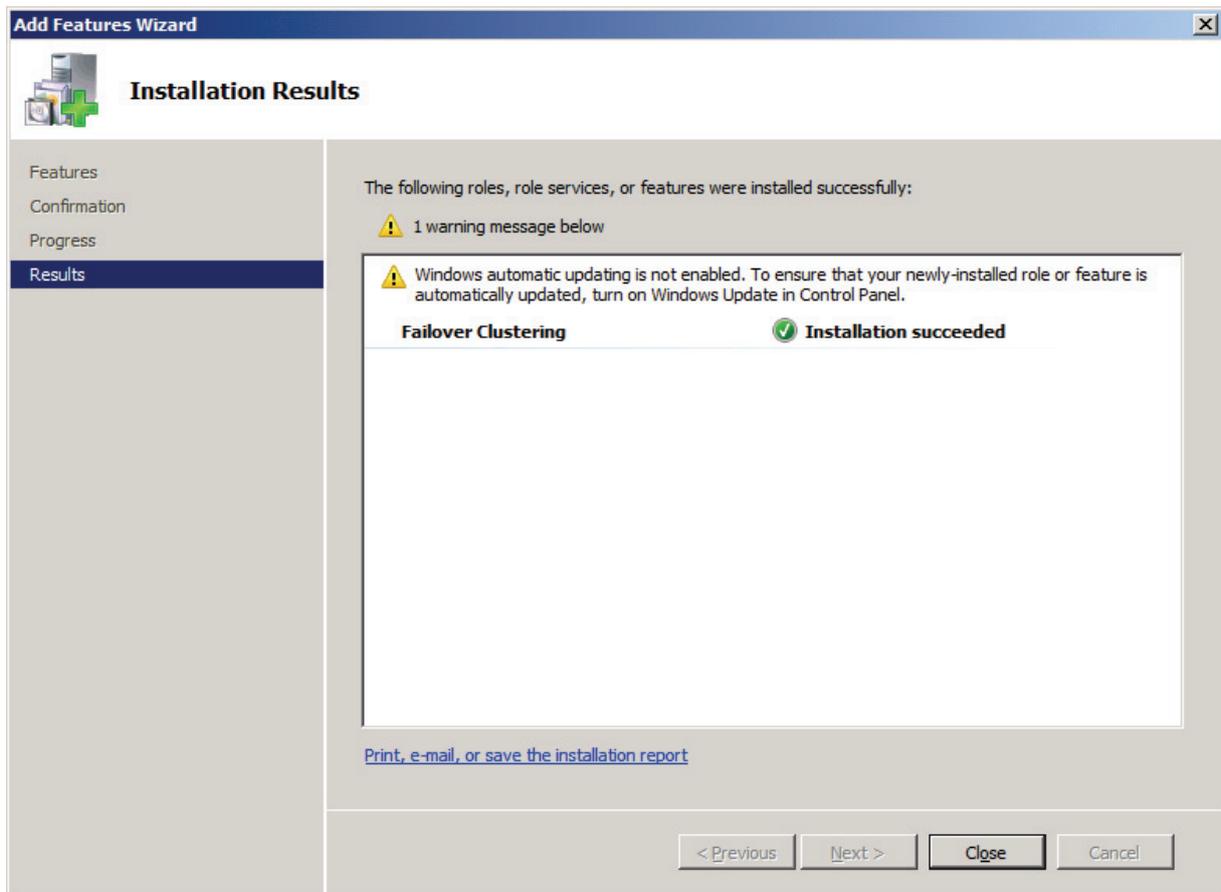


Press the **Install** button to install the **Failover Clustering** feature.

The installation of the Failover Clustering is going on.



If successful, the wizard will complete and show as the figure below.



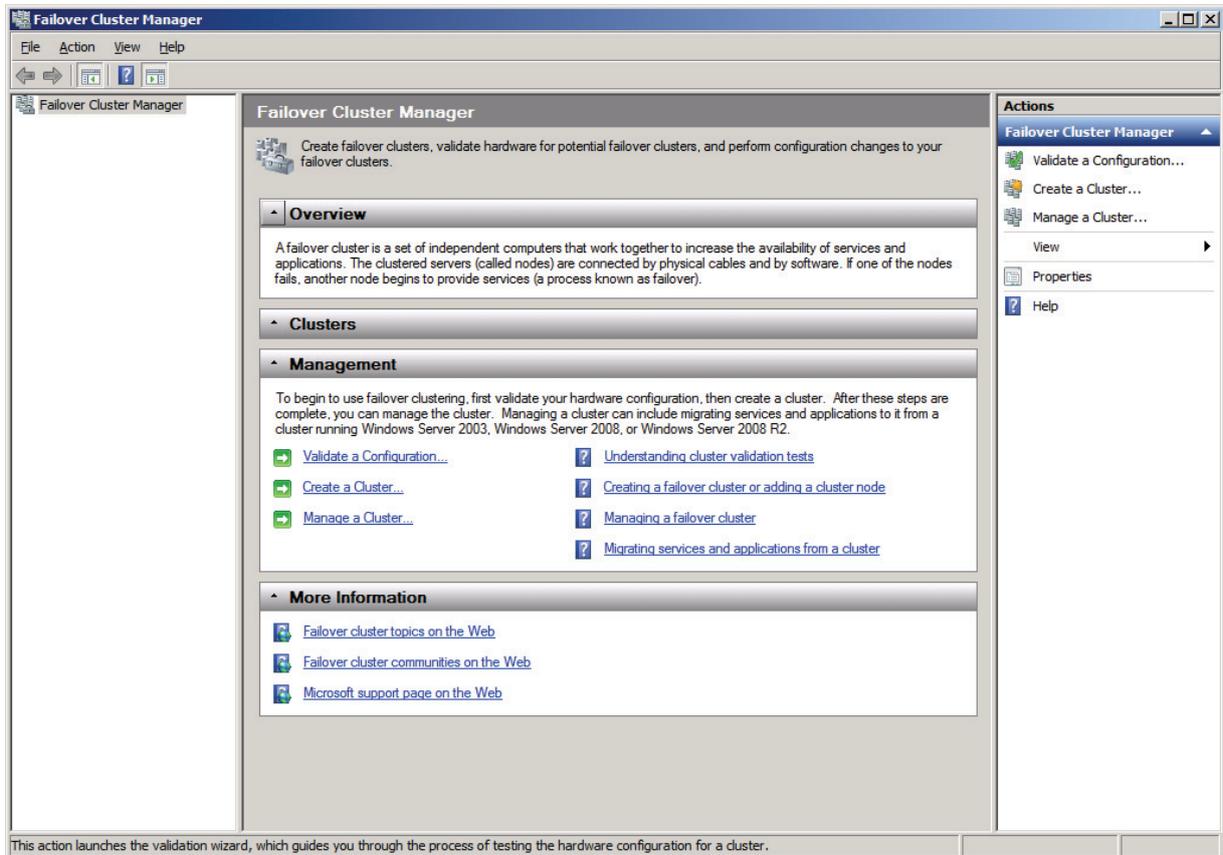
Press the **Close** button.

## Configuring Failover Clustering

### Validate a Configuration

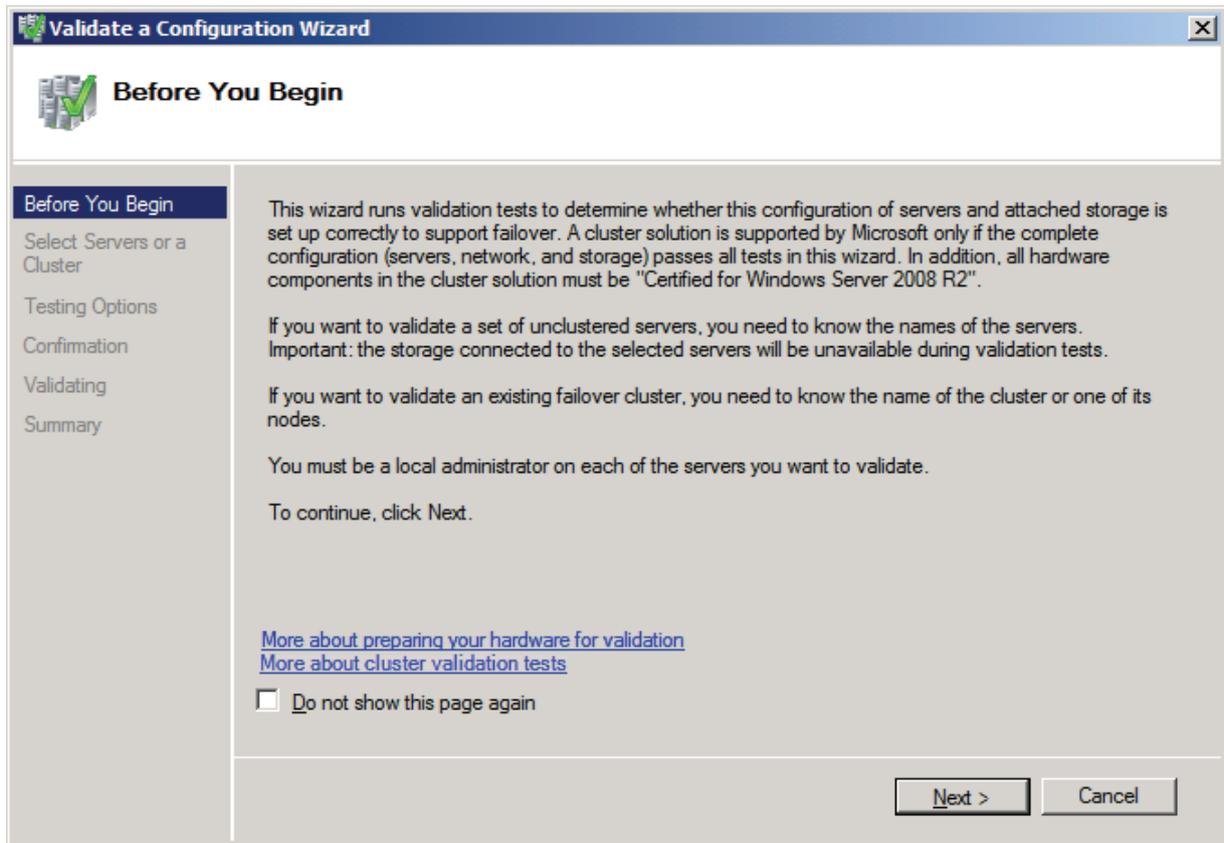
Note that this step is not necessary for creating a cluster, but it ensures that the configuration is suitable for failover clustering.

Launch to the **Windows Failover Cluster Manager** console in node 1 or node 2 machines.



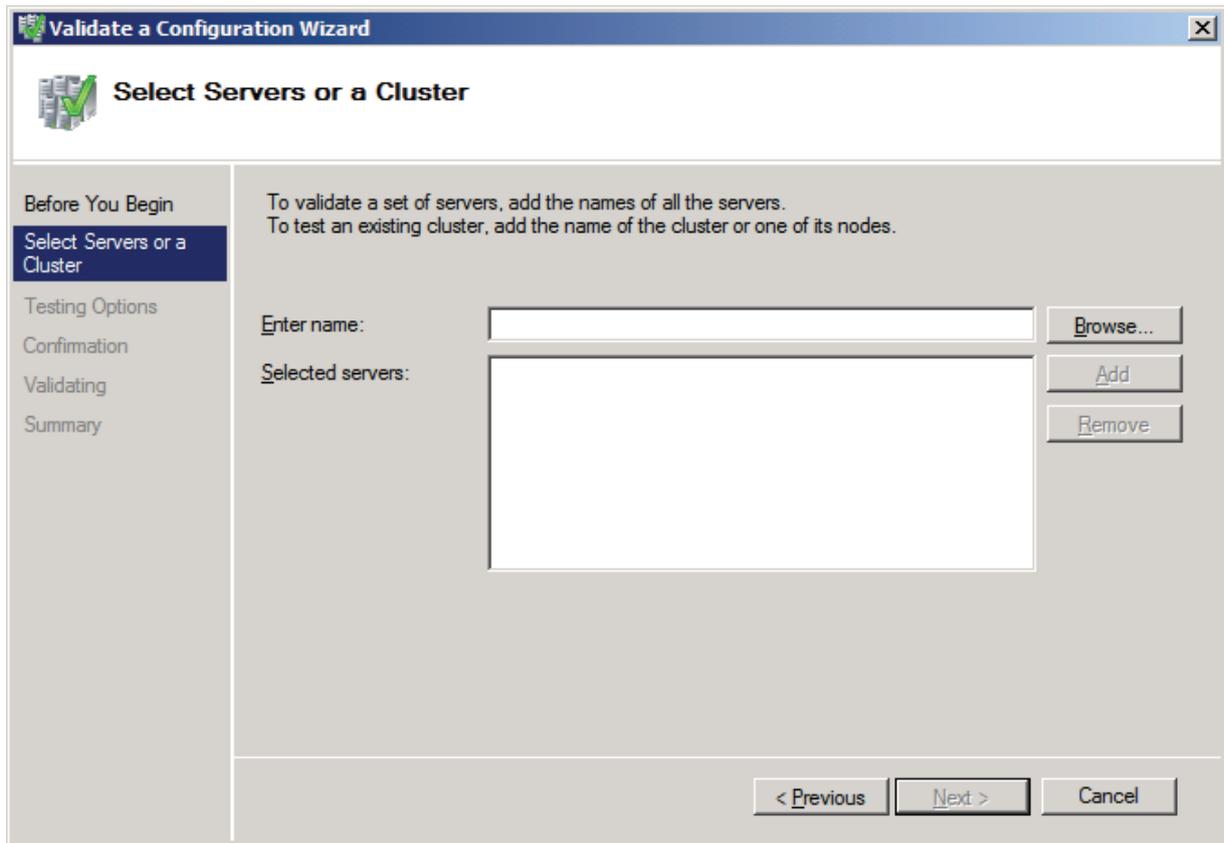
Click on the **Validate a Configuration...** link.

The **Validate a Configuration Wizard** is shown.

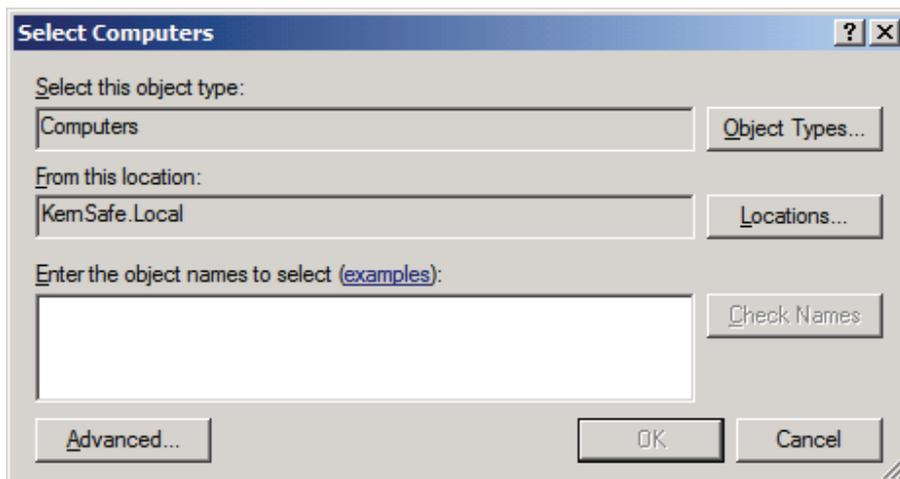


Press the **Next** button to continue.

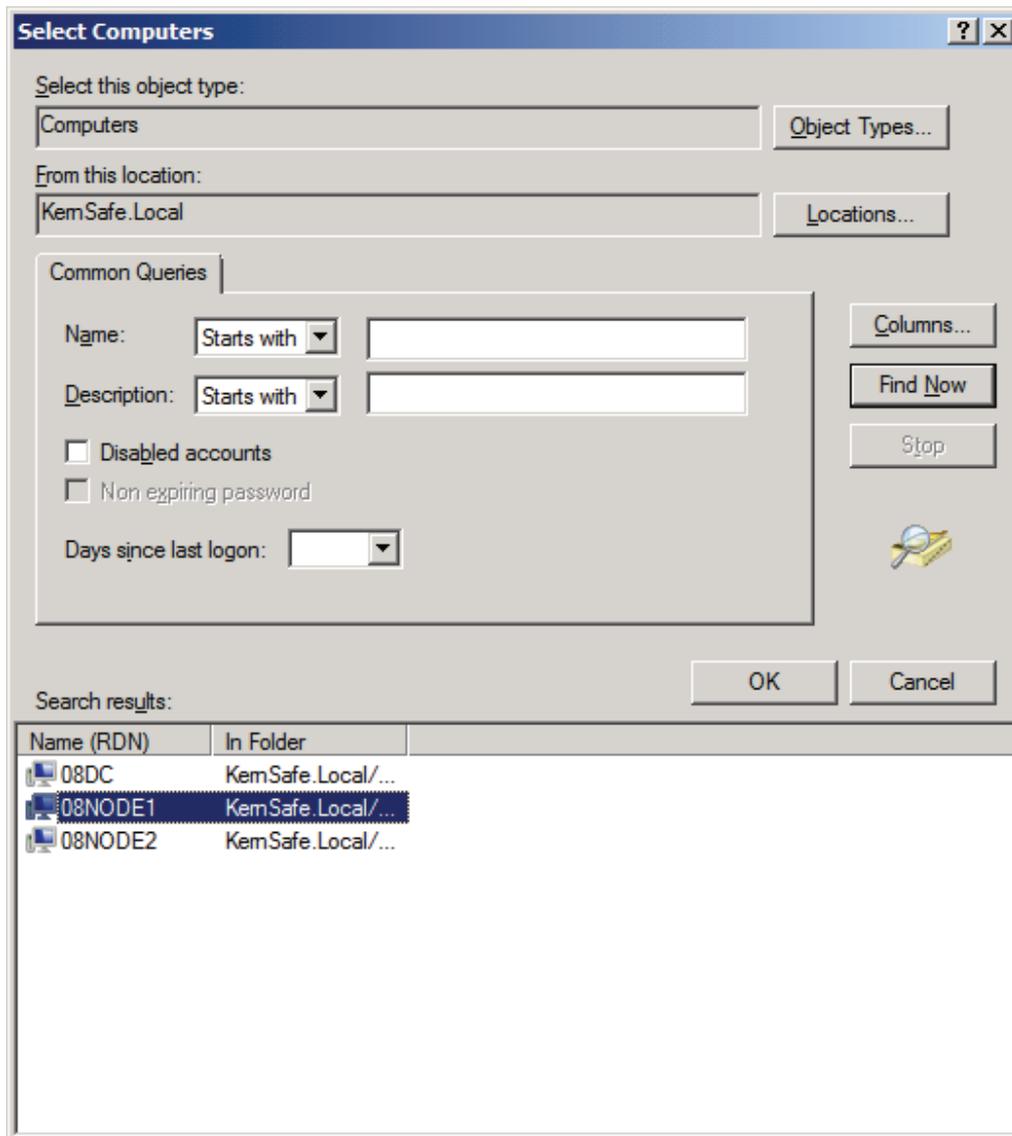
Add nodes to the cluster.



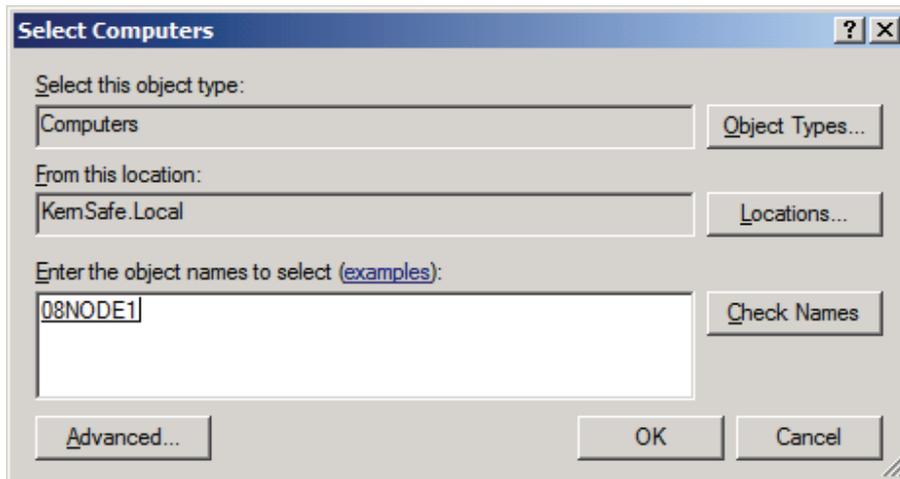
Press the **Browse** button, the Select **Computers** dialog is shown.



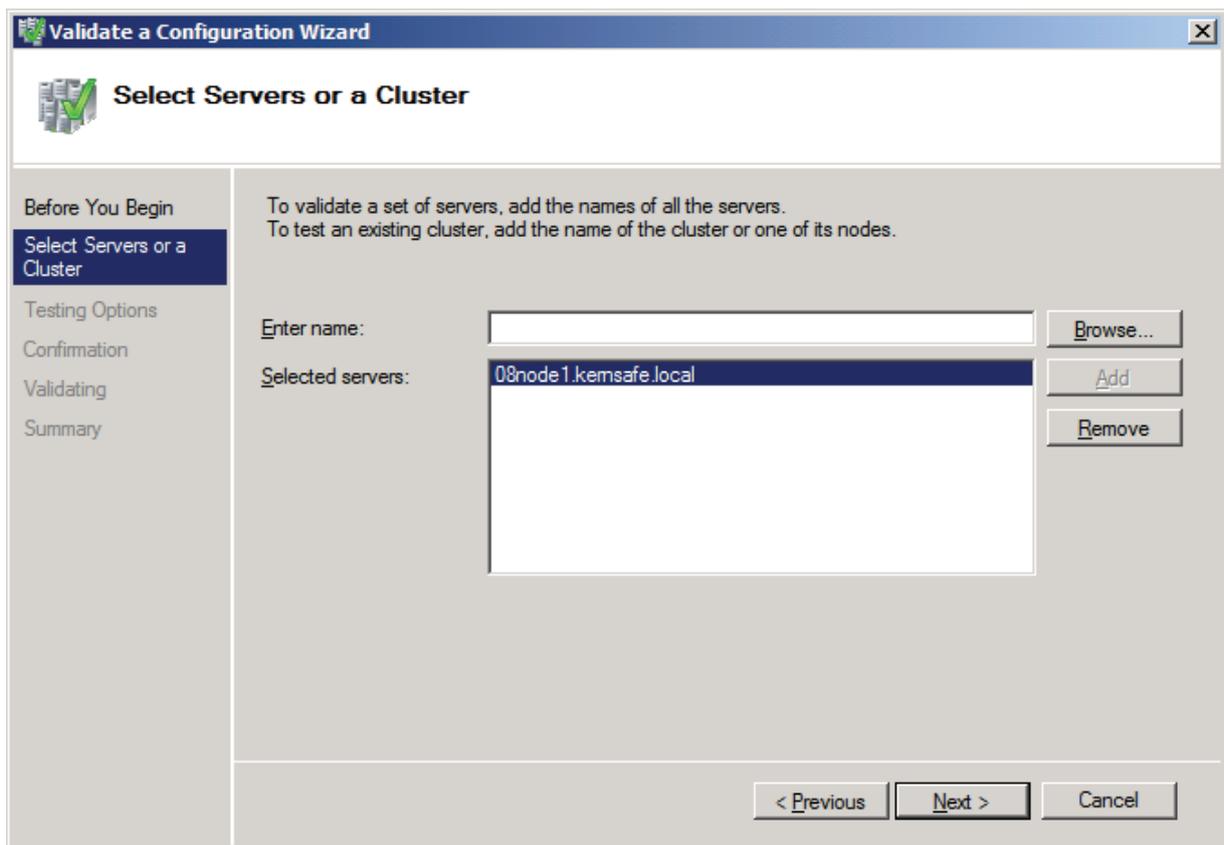
Press the **Advanced...** button.



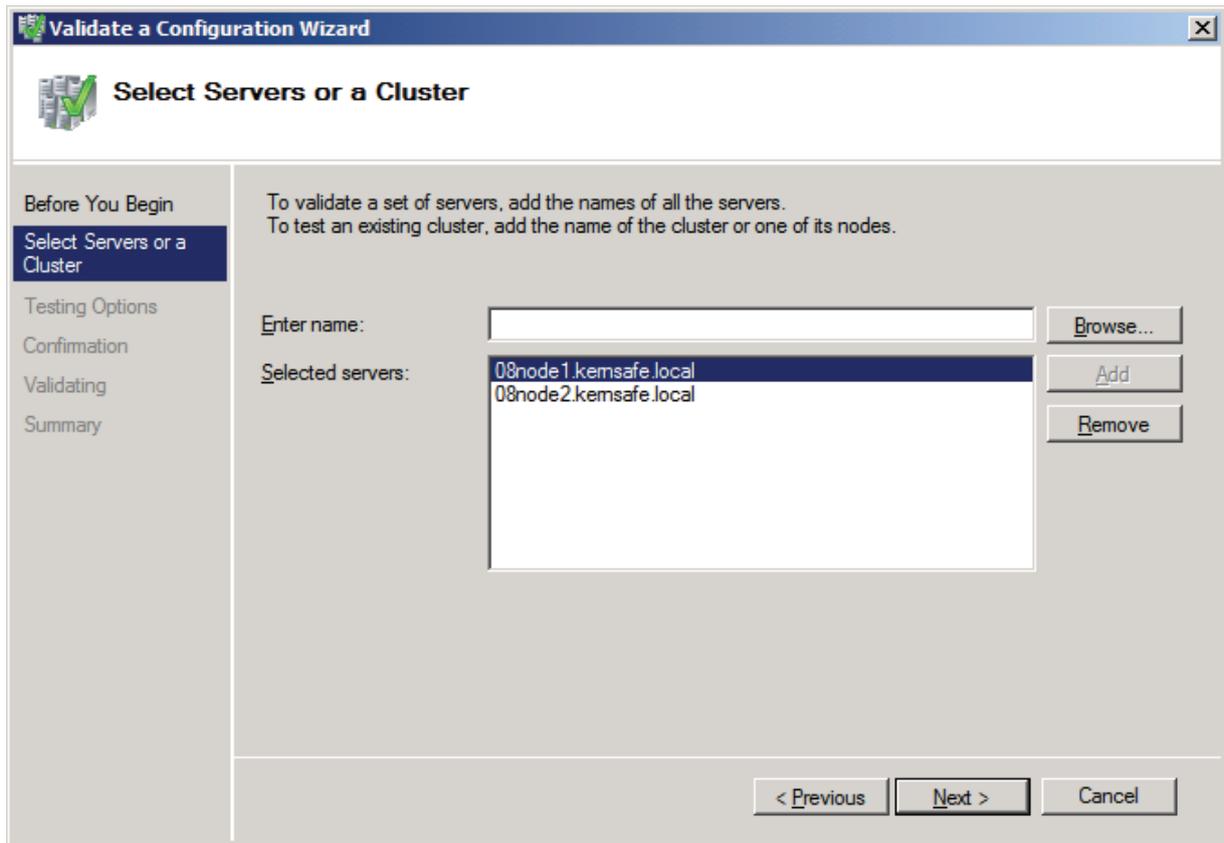
Select the **08NODE1** item and then press the **OK** button to add.



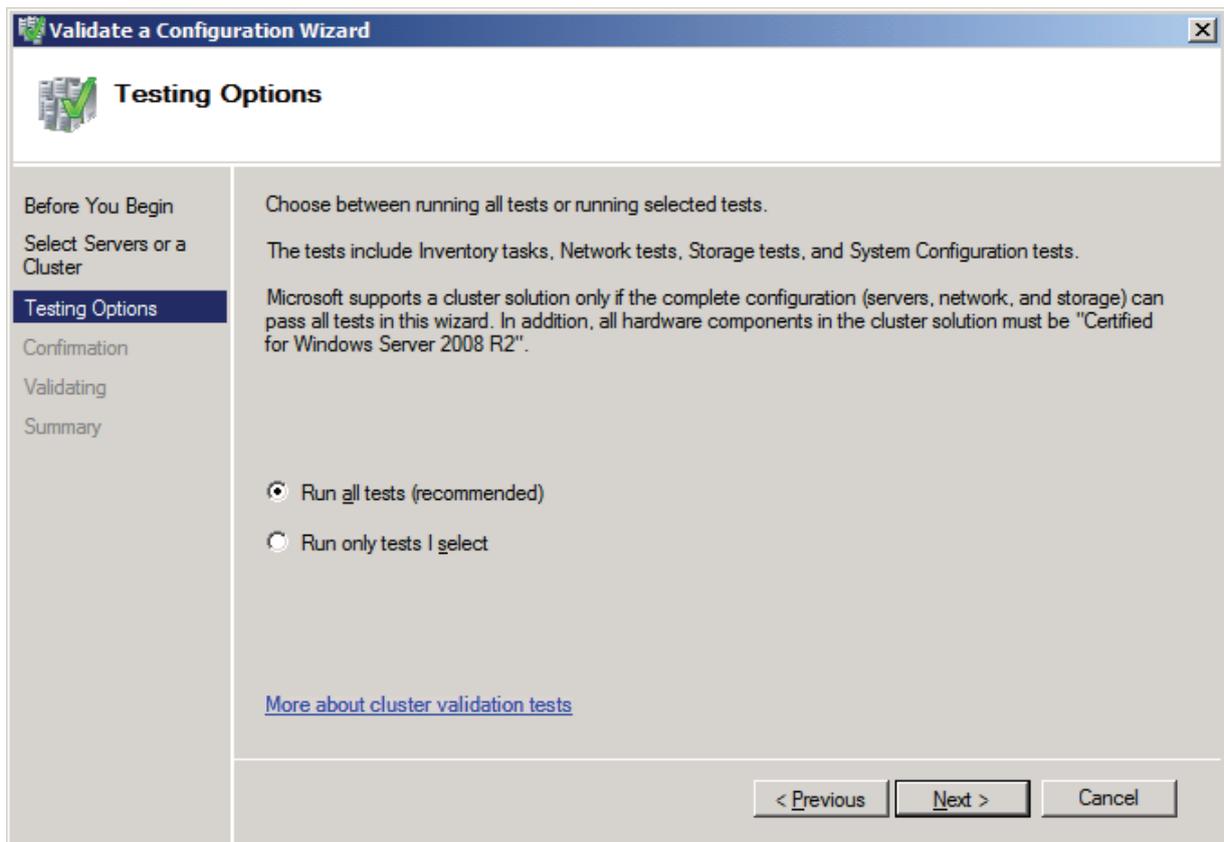
Press the **OK** button.



Press the **Browse...** button and add **08NODE2** by through the same way.

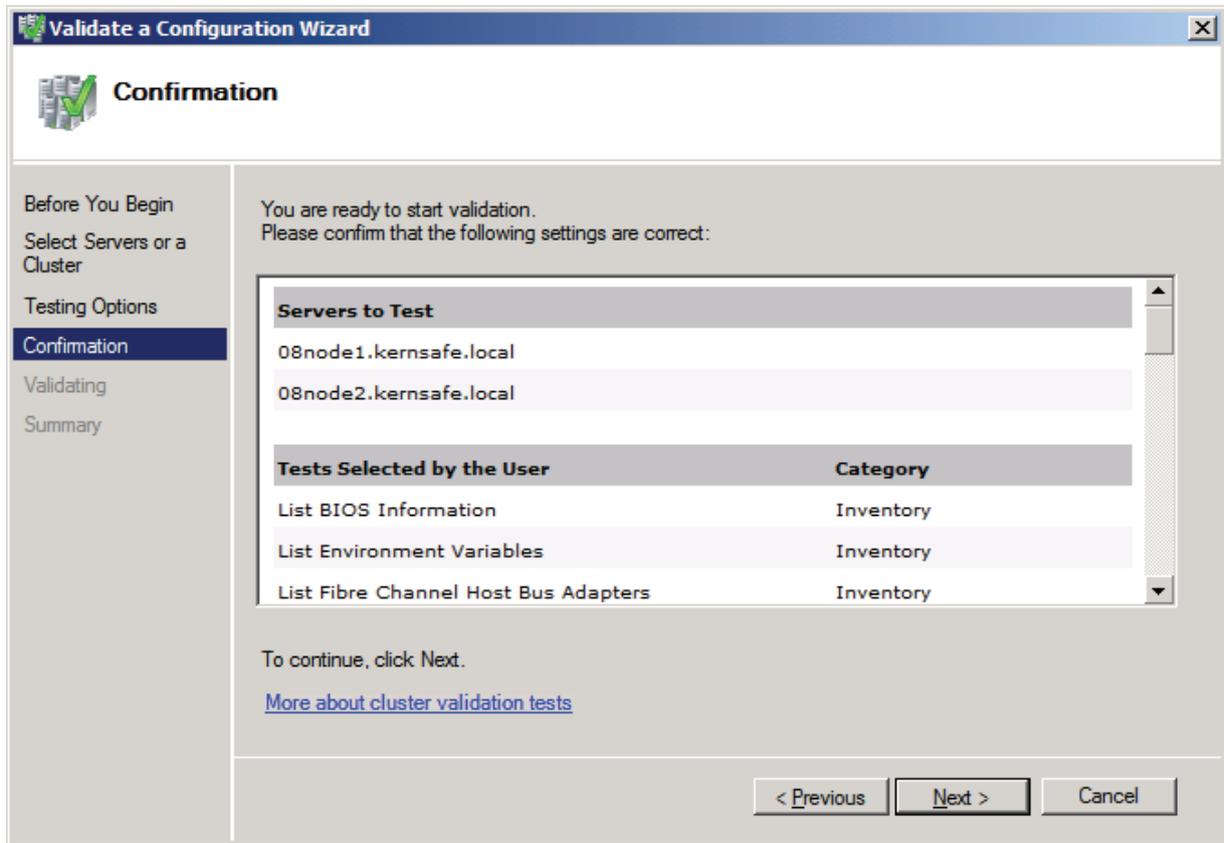


Press the **Next** button to continue.



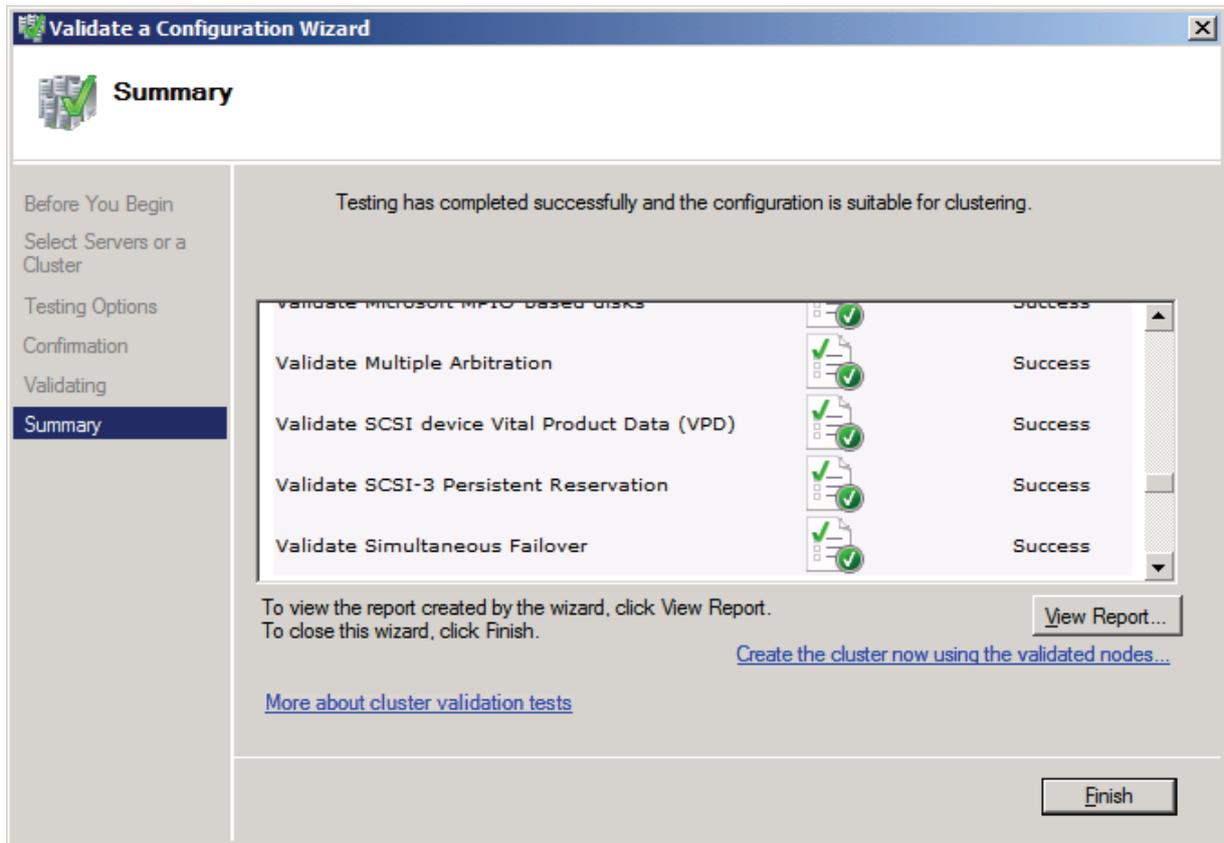
Select **Run all tests (recommended)**.

Press the **Next** button to continue.



Press the **Next** button to continue.

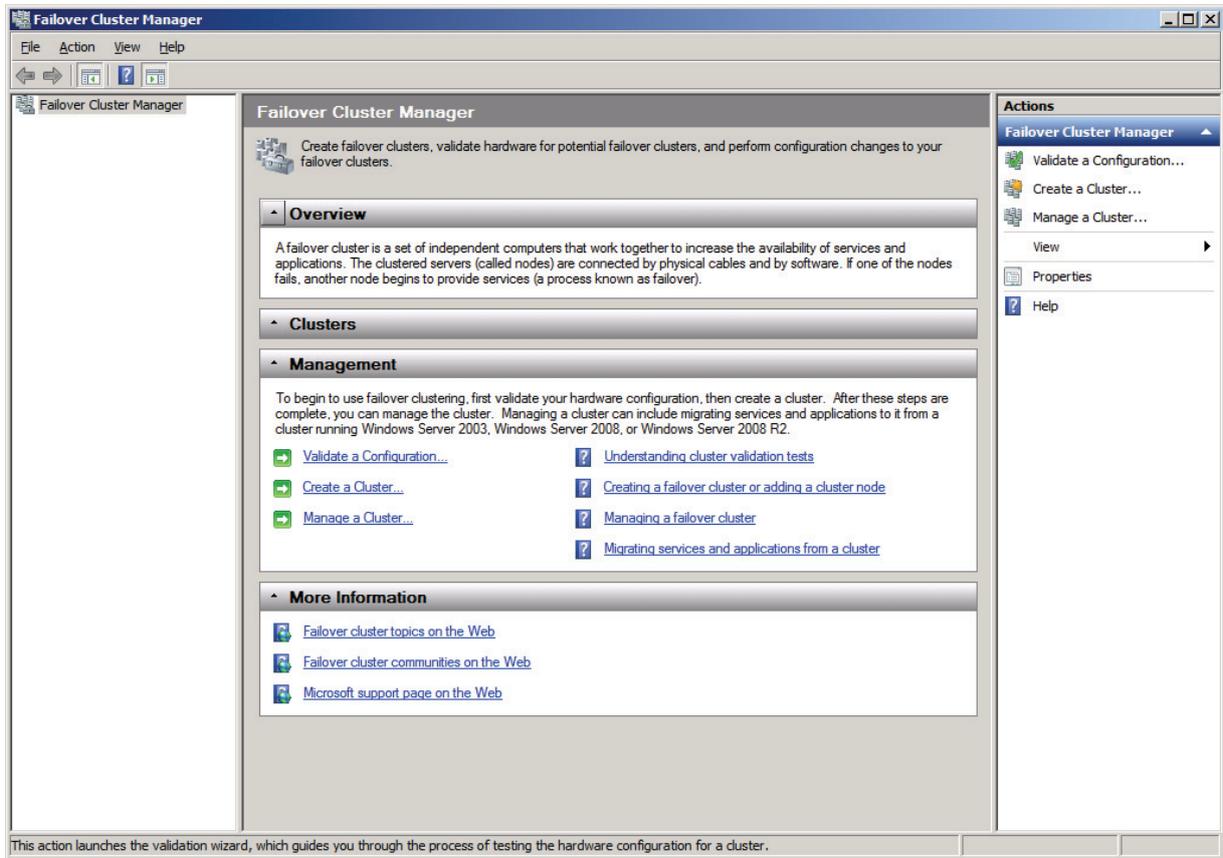
If successful, all the tests include **SCSI-3 Persistent Reservation** are valid and shown as the figure below.



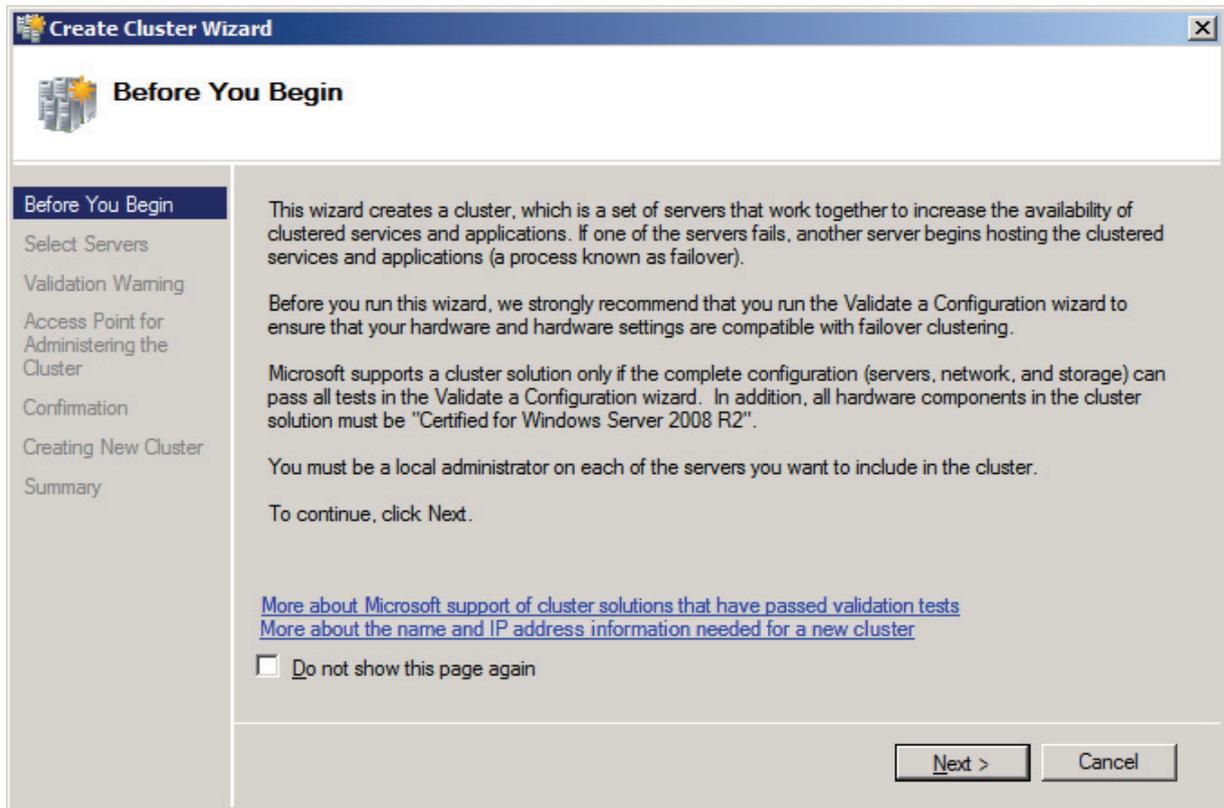
Press the **Finish** button to complete configuration validation.

## Create a Failover Cluster

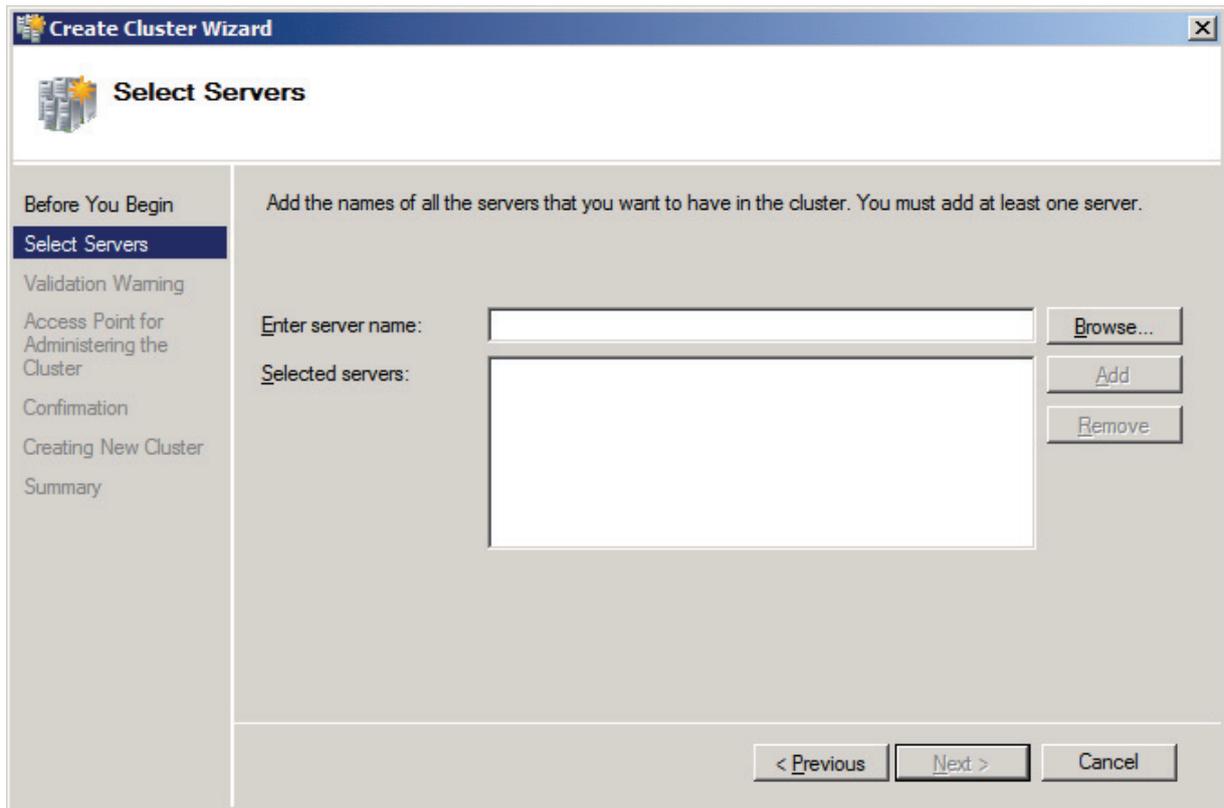
Click on the **Create a Cluster...** item in the **Actions** panel of **Failover Cluster Manager**.



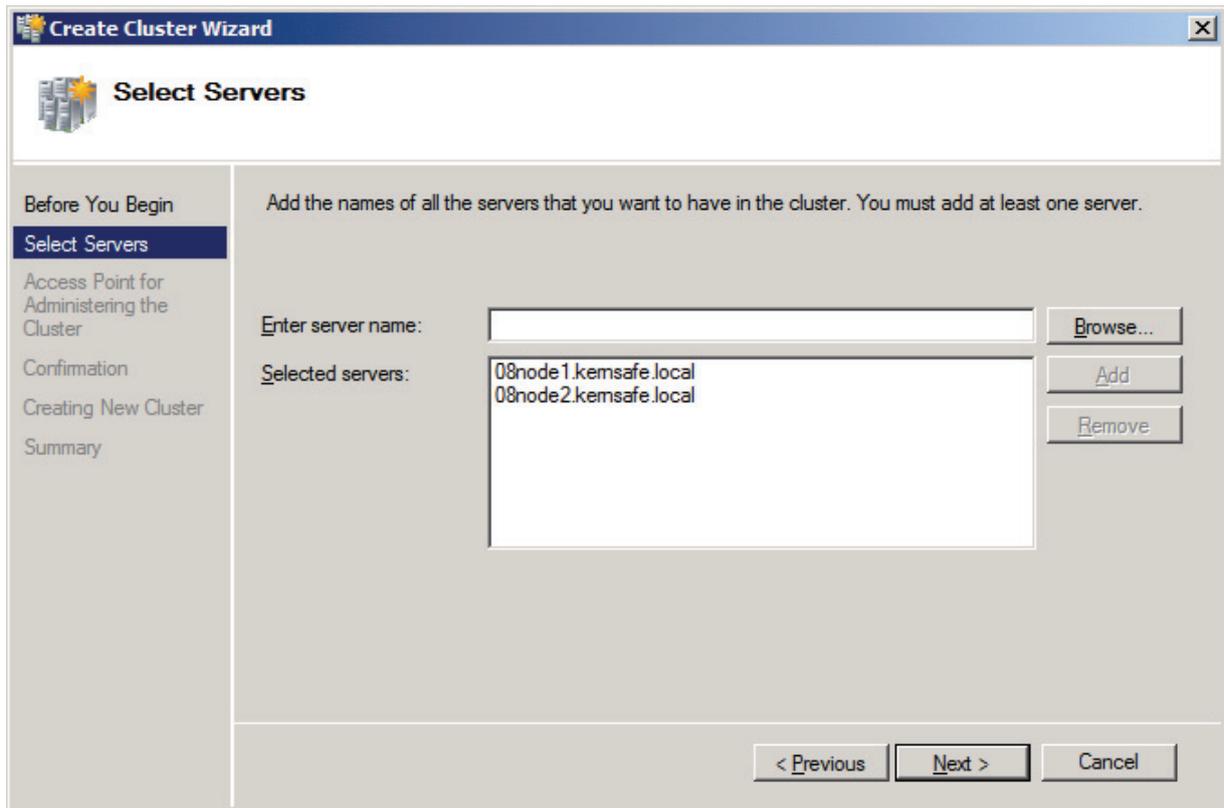
The Create **Cluster Wizard** is shown.



Press the **Next** button to continue.

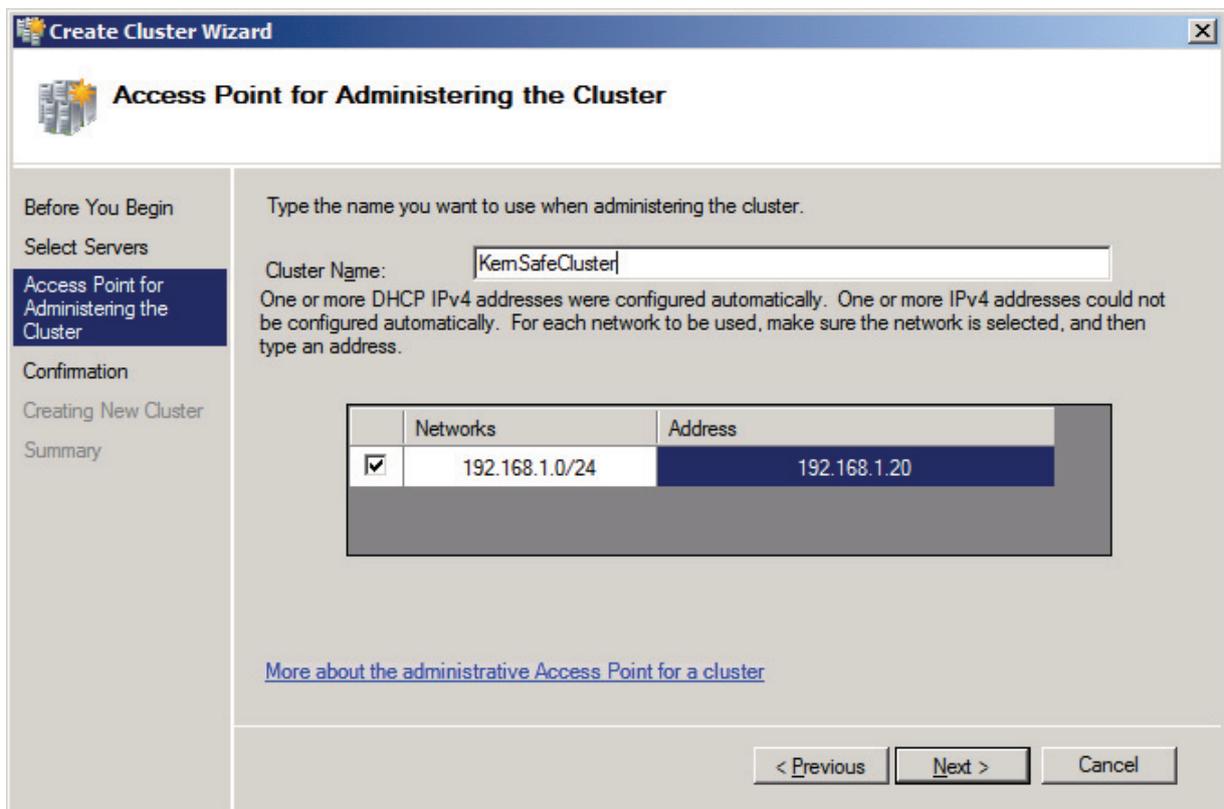


Press the **Browse...** button and the **Add** button to add nodes to this cluster.



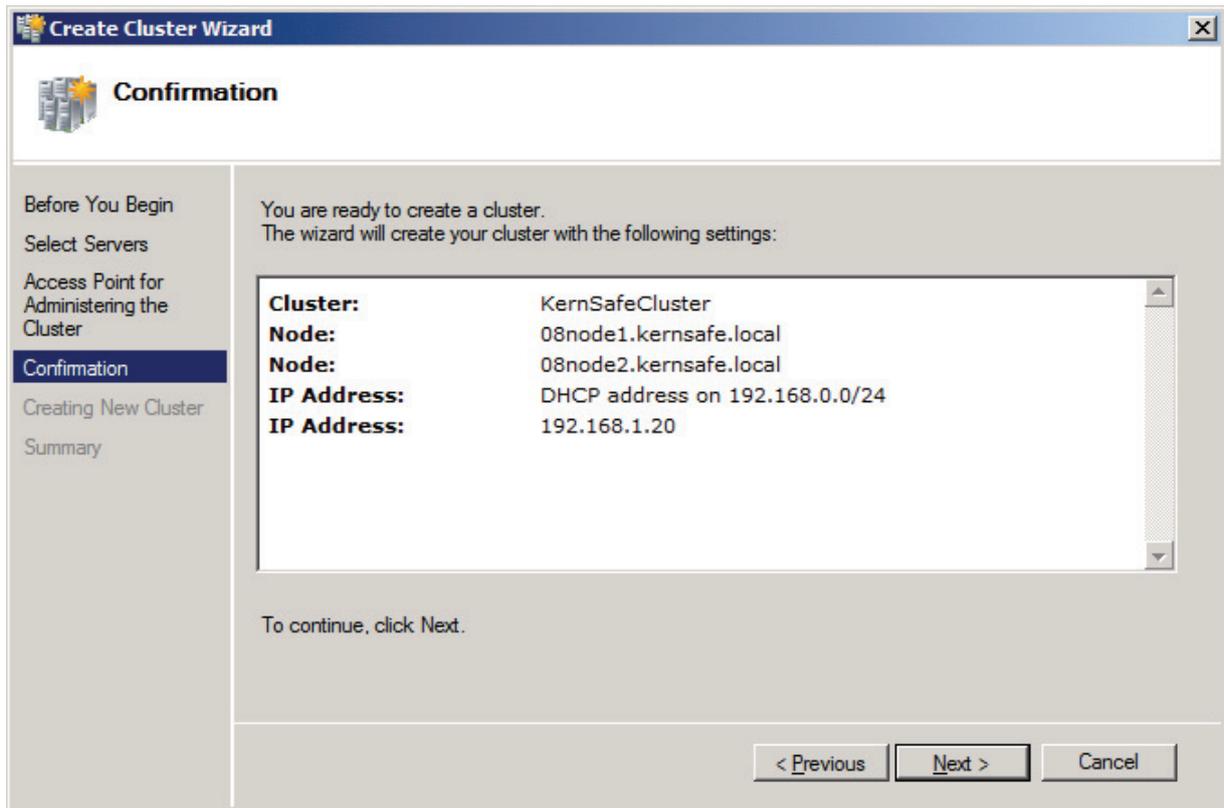
Press the **Next** button to continue.

Specify IP address for the cluster.



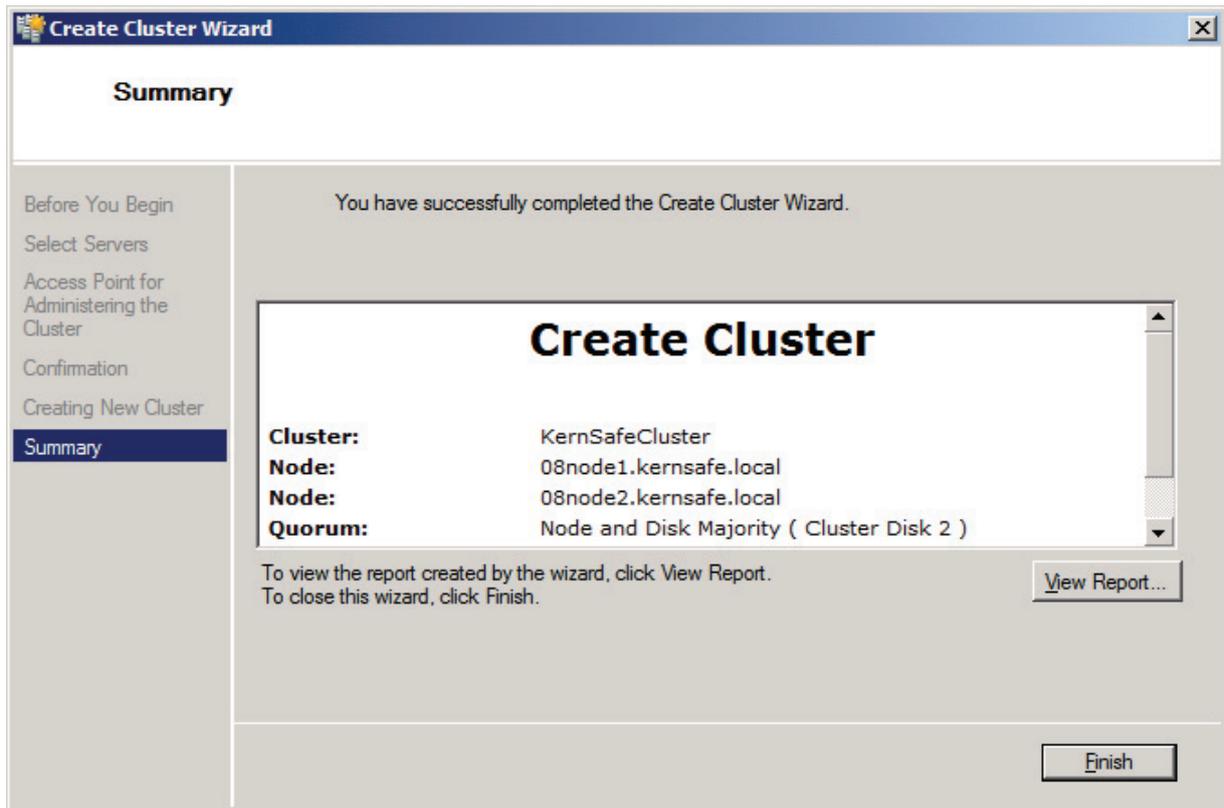
Type an IP address in the **Address** field.

Press the **Next** button to continue.

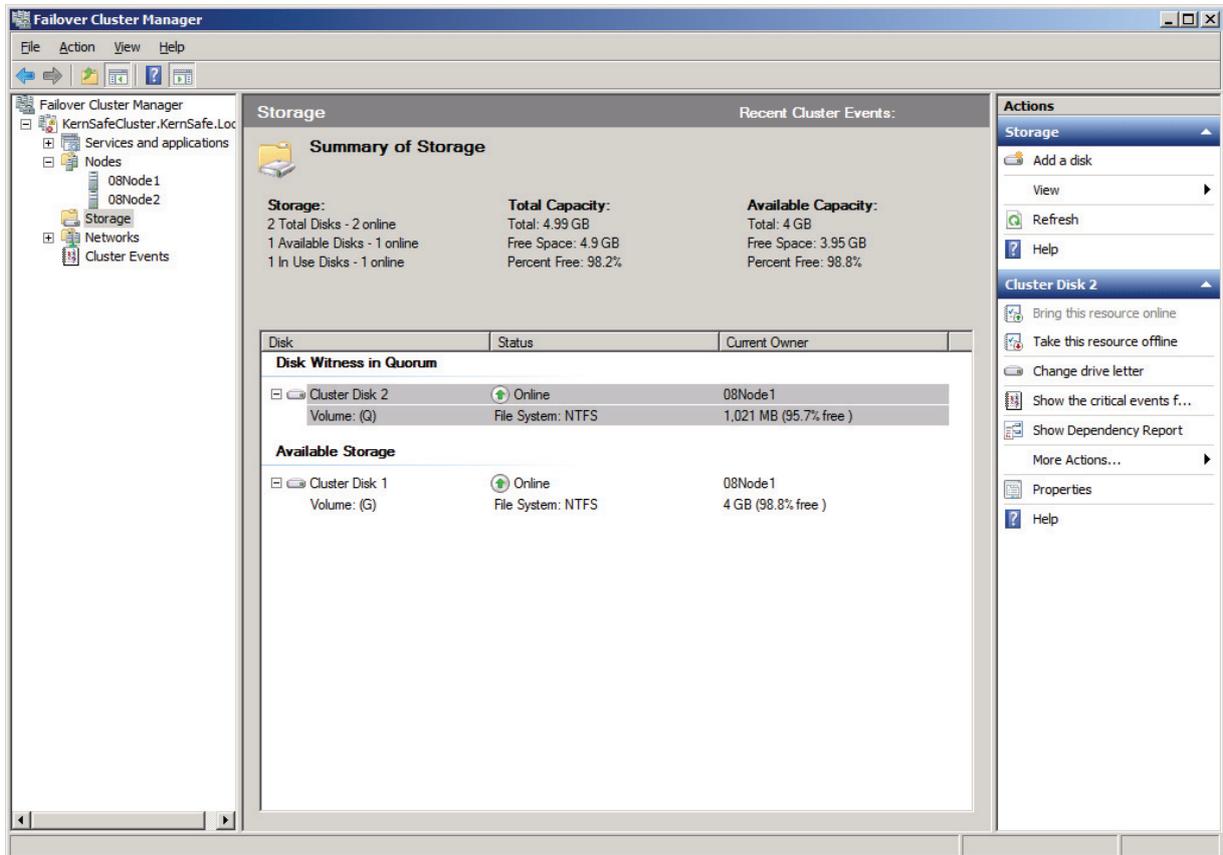


Press the **Next** button to continue or press the **Previous** button if any changes are needed.

If successful, the **Create Cluster Wizard** complete as shown in the figure below.



Press the **Finish** button to continue.



Now the creation of the cluster is completed, expand the cluster node and select the Storage node, it will shown as the figure below, both cluster disk are shown online.

## Contact

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Sales: [sales@kernsafe.com](mailto:sales@kernsafe.com)  
Home Page: <http://www.kernsafe.com/>  
Product Page: <http://www.kernsafe.com/product.aspx?id=5>  
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