

# **iStorage Server: Working with Windows Cluster**

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KernSafe Technologies, Inc.

[www.kernsafe.com](http://www.kernsafe.com)

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## 1. 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. 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 popular in storage industry world and make iStorage Server is suitable for any size of business.

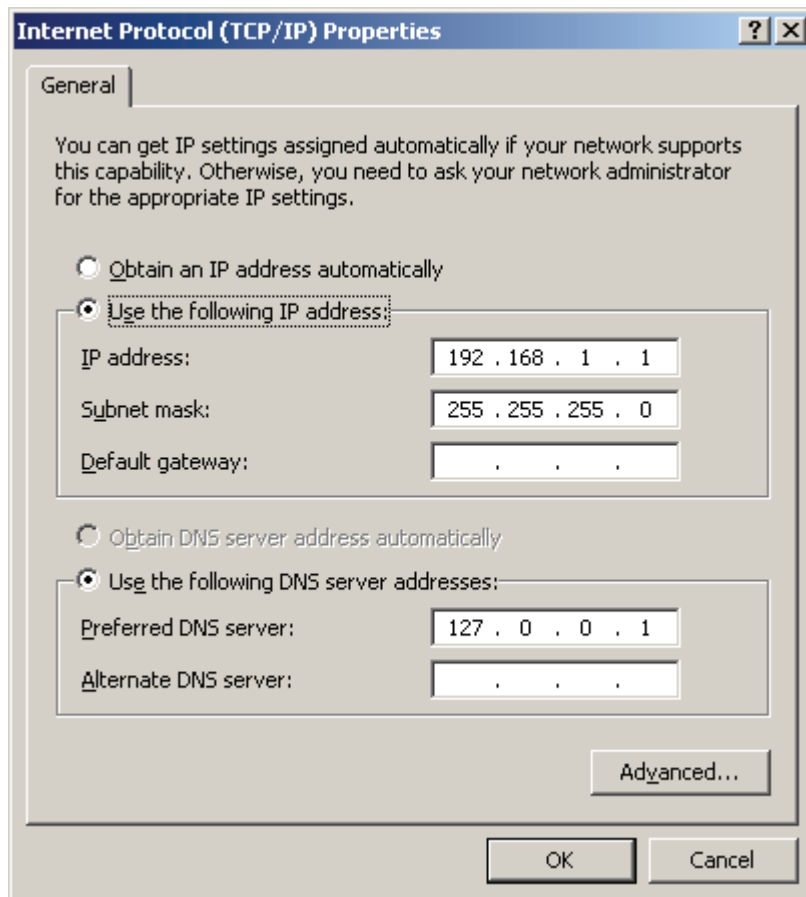
High-availability clusters (also known as HA Clusters or Failover Clusters) are computer clusters that are implemented primarily for the purpose of providing high availability of services which the cluster provides. They operate by having redundant computers or nodes which are then used to provide service 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.

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 Windows Server 2003 clustering.

This article demonstrates how to build Windows Server 2003 high availability cluster by using KernSafe iSCSI Target. In this case, at least three computers are needed, respectively domain controller, node 1 and node 2. Each computer requires two network adapters. The computer names here are 03DCx64, node 1 and node 2.

## 2. Domain Controller Settings

Domain Controller Network Settings

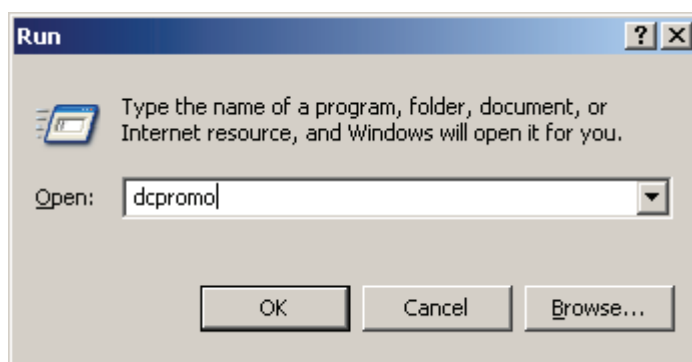


Select 03DCx64 as the Domain Controller and the first network adapter of this computer shall be set as shown in the figure below.

IP address shall be set as 192.168.1.1.

Subnet mask is set as 255.255.255.0.

Preferred DNS server is set as 127.0.0.1.

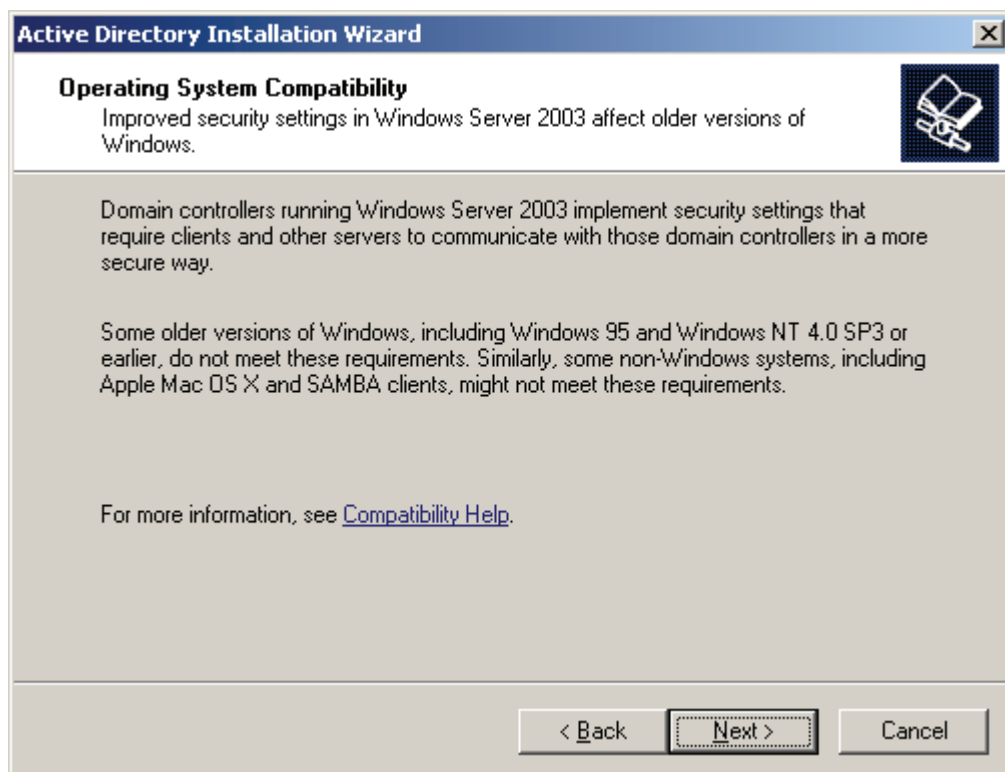


Enter **dcpromo** in Start -> Run and the **Domain Controller setup wizard** is shown.



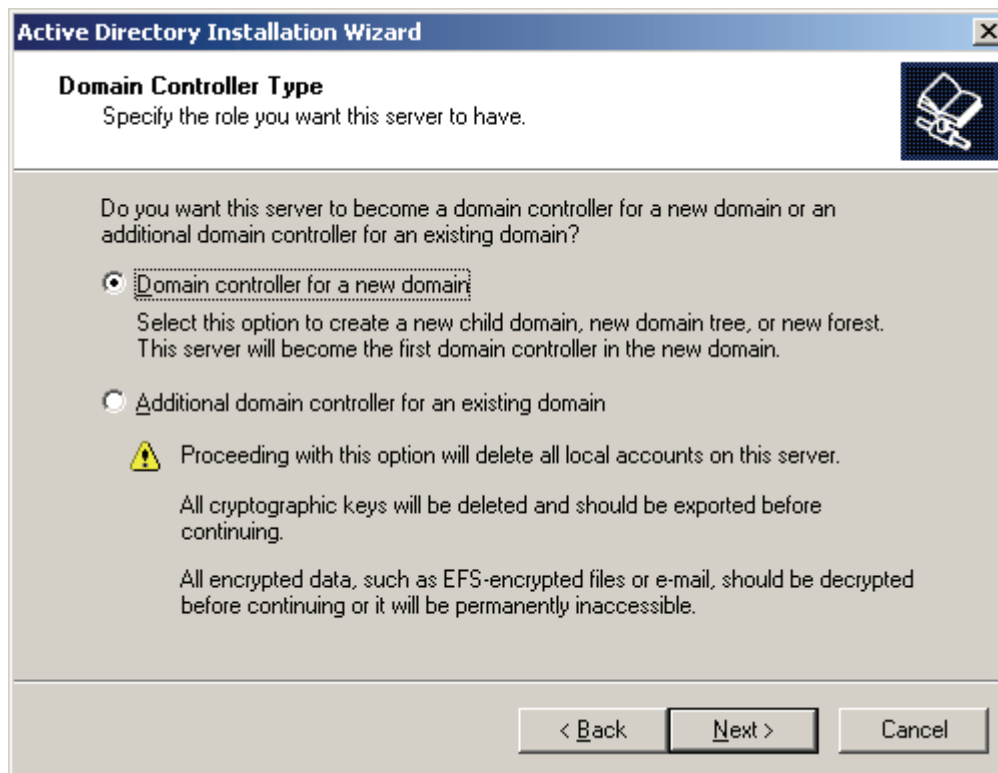
Press the **Next** button in the pop-up wizard to continue.

Check operation system compability



Press the **Next** button to continue

## Specify domain controller type




**Active Directory Installation Wizard**

**Domain Controller Type**  
Specify the role you want this server to have.

Do you want this server to become a domain controller for a new domain or an additional domain controller for an existing domain?

**Domain controller for a new domain**  
Select this option to create a new child domain, new domain tree, or new forest. This server will become the first domain controller in the new domain.

**Additional domain controller for an existing domain**

 Proceeding with this option will delete all local accounts on this server.

All cryptographic keys will be deleted and should be exported before continuing.

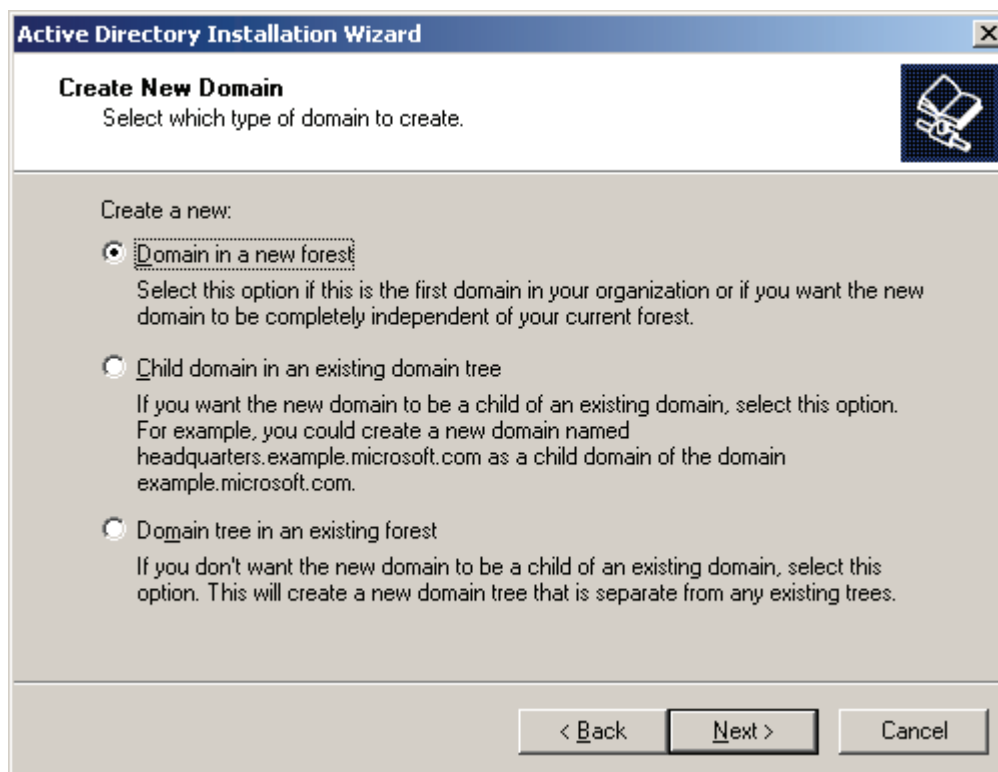
All encrypted data, such as EFS-encrypted files or e-mail, should be decrypted before continuing or it will be permanently inaccessible.

< Back   Next >   Cancel

Select Domain controller for a new domain.

Press the **Next** button to continue.

Select which type of domain to create



**Active Directory Installation Wizard**

**Create New Domain**  
Select which type of domain to create.

Create a new:

**Domain in a new forest**  
Select this option if this is the first domain in your organization or if you want the new domain to be completely independent of your current forest.

**Child domain in an existing domain tree**  
If you want the new domain to be a child of an existing domain, select this option. For example, you could create a new domain named `headquarters.example.microsoft.com` as a child domain of the domain `example.microsoft.com`.

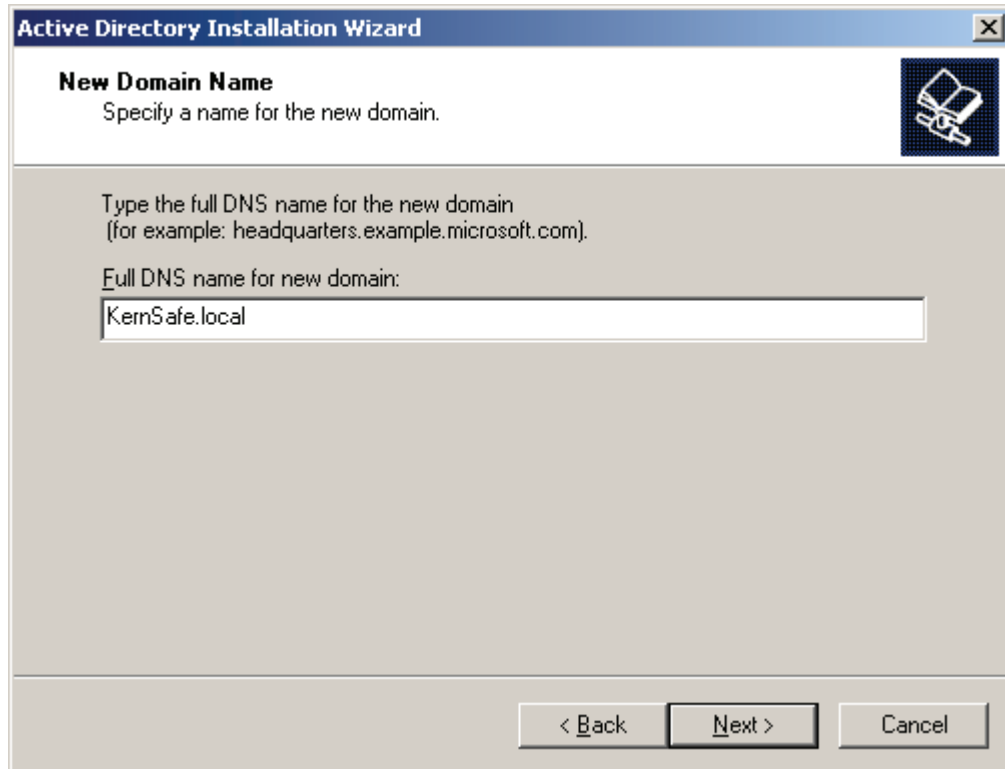
**Domain tree in an existing forest**  
If you don't want the new domain to be a child of an existing domain, select this option. This will create a new domain tree that is separate from any existing trees.

< Back   Next >   Cancel

As we are creating domain controller, select **Domain in a new forest**.

Press the **Next** button to continue.

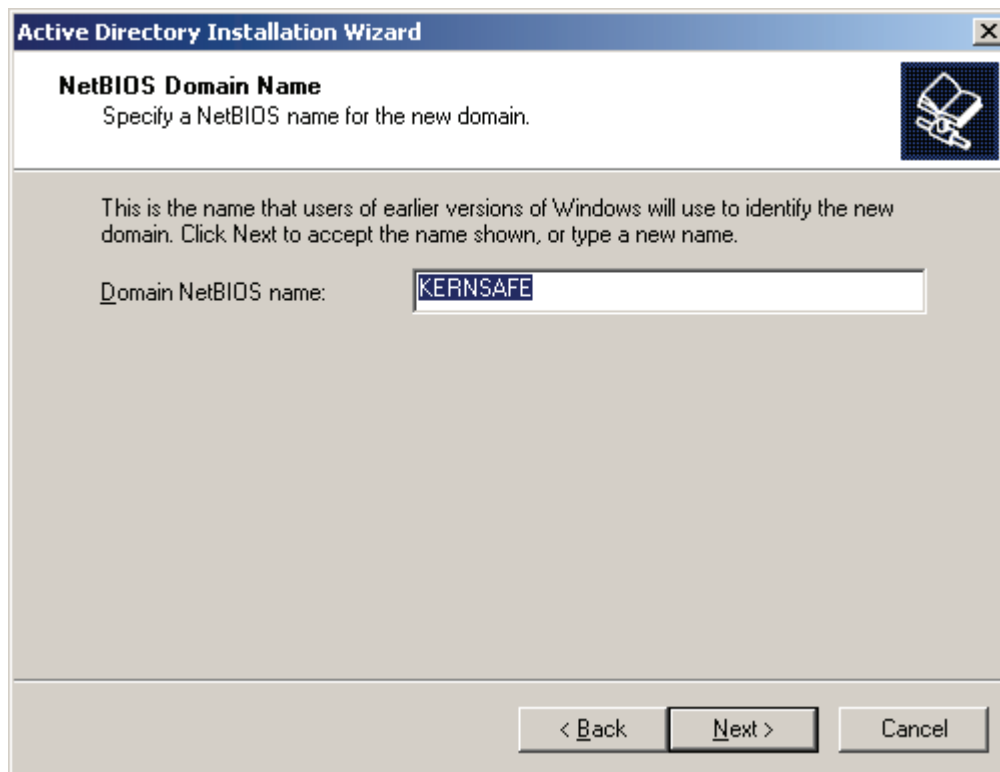
Type new domain name



The screenshot shows a window titled "Active Directory Installation Wizard" with a close button in the top right corner. The main heading is "New Domain Name" with a sub-instruction: "Specify a name for the new domain." To the right of this text is a small icon of a computer monitor with a hand pointing at it. Below this, there is a text prompt: "Type the full DNS name for the new domain (for example: headquarters.example.microsoft.com)." Underneath is a label "Full DNS name for new domain:" followed by a text input field containing "KernSafe.local". At the bottom of the window are three buttons: "< Back", "Next >", and "Cancel".

Enter the name of DNS. Take KernSafe.local as an example and press the **Next** button to continue.

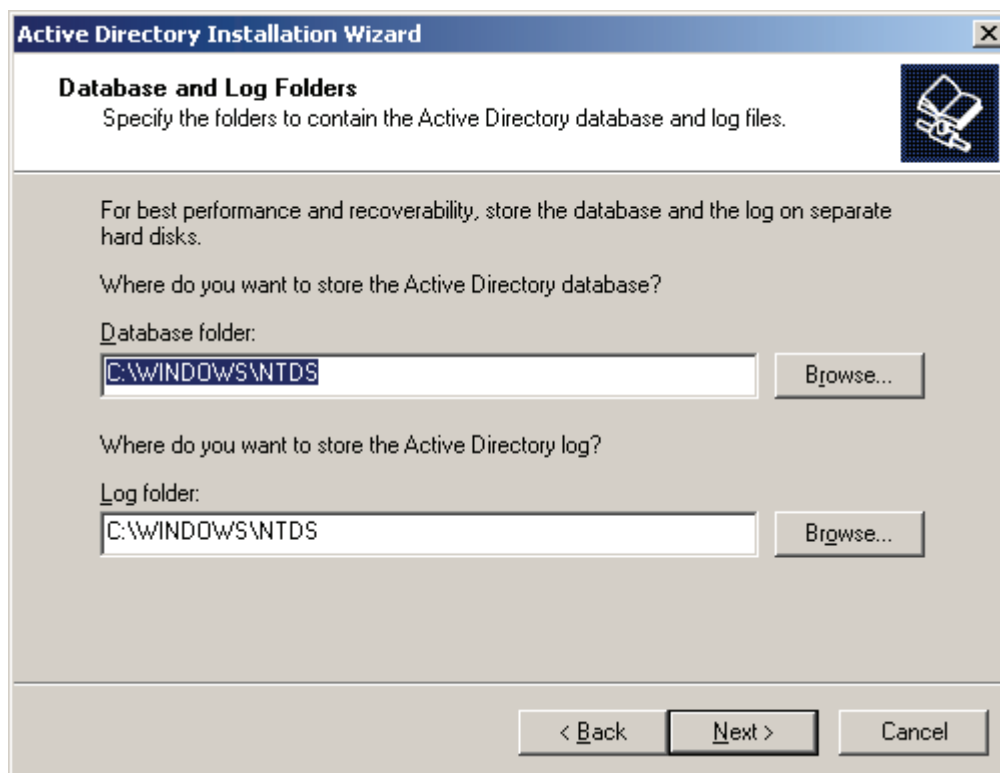
Specify NetBIOS name



Enter the name of NetBIOS, which is KERNSAFE here.

Press the **Next** button to continue.

Specify the folders to contain the Active Directory database and log file

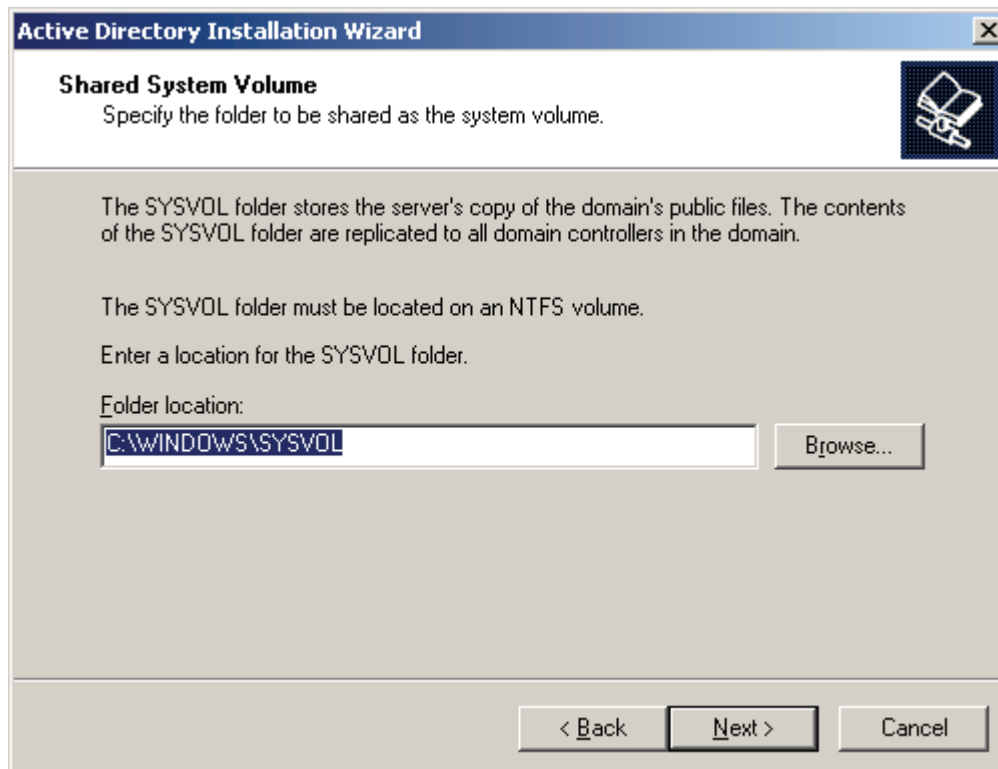


Select the storage location of Database and Log Folders.



Press the **Next** button to continue.

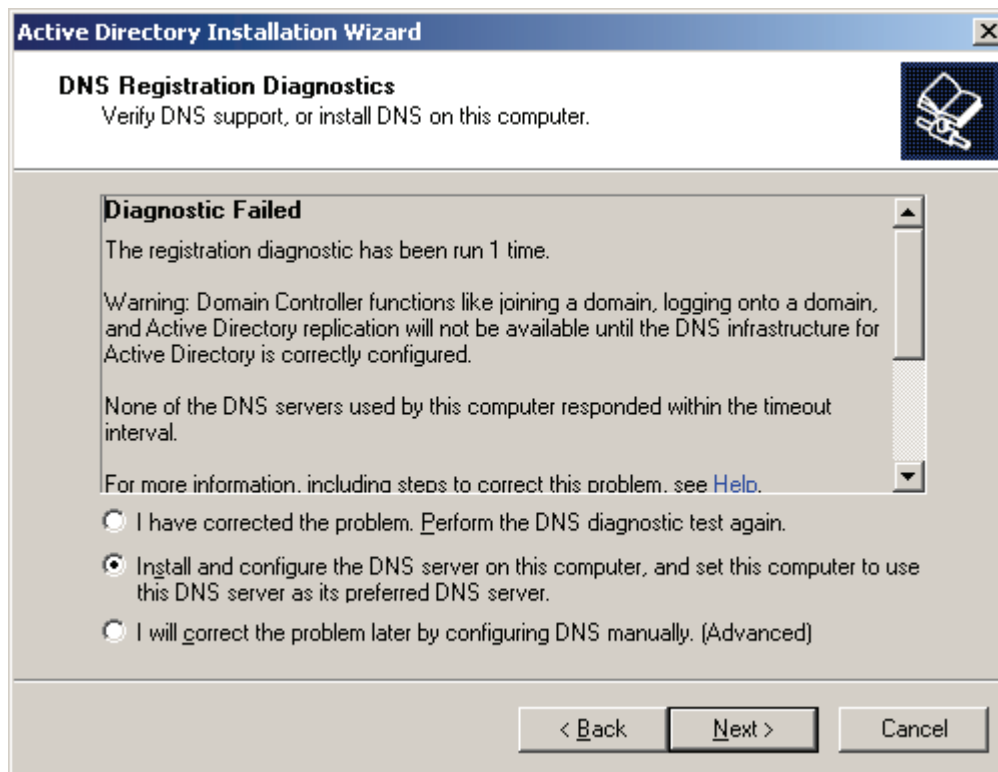
Specify the folder to be shared as the system volume



Select the storage location of file SYSVOL.

Press the **Next** button to continue.

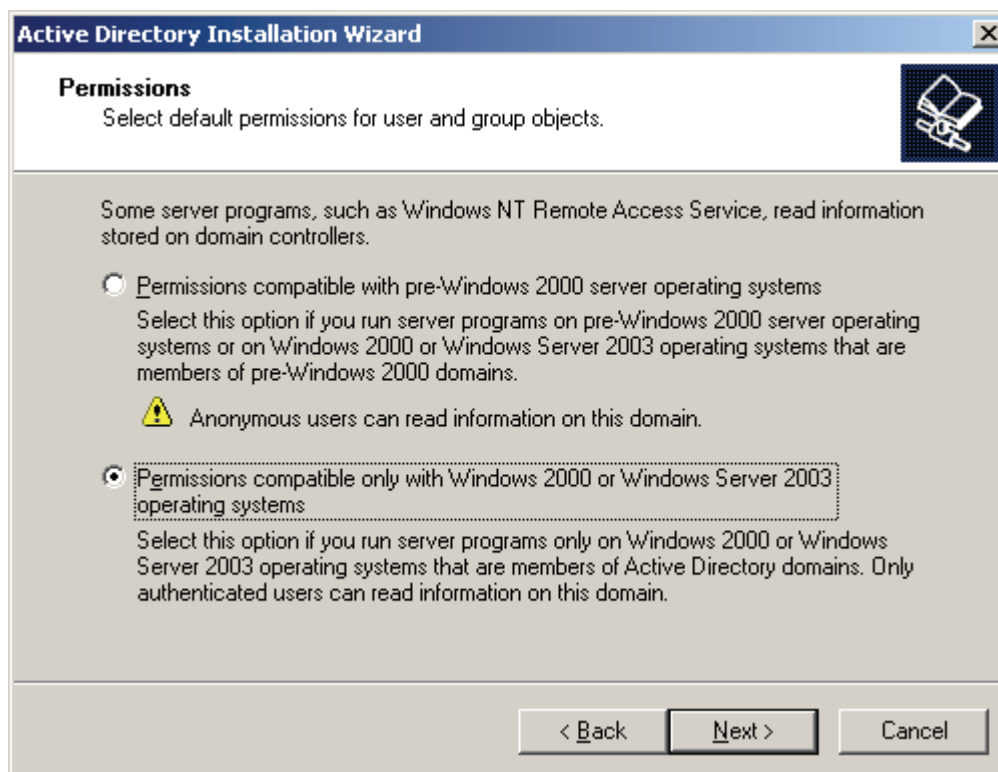
Diagnostic DNS registration



Select **Install and configure the DNS server on this computer, and set this computer to use this DNS server as its preferred DNS server.**

Press the **Next** button to continue.

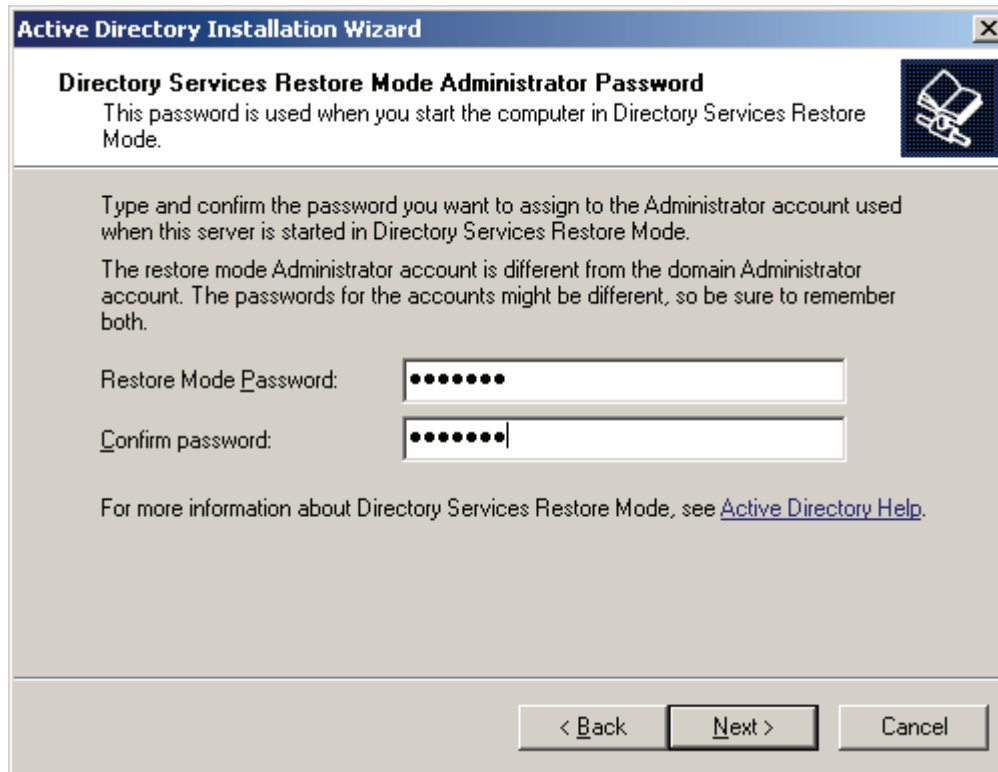
Select default permissions for user and group objects



Select **Permissions compatible only with Windows 2000 or Windows Server 2003 operating systems**.

Press the **Next** button to continue.

Specify restore mode administrator password

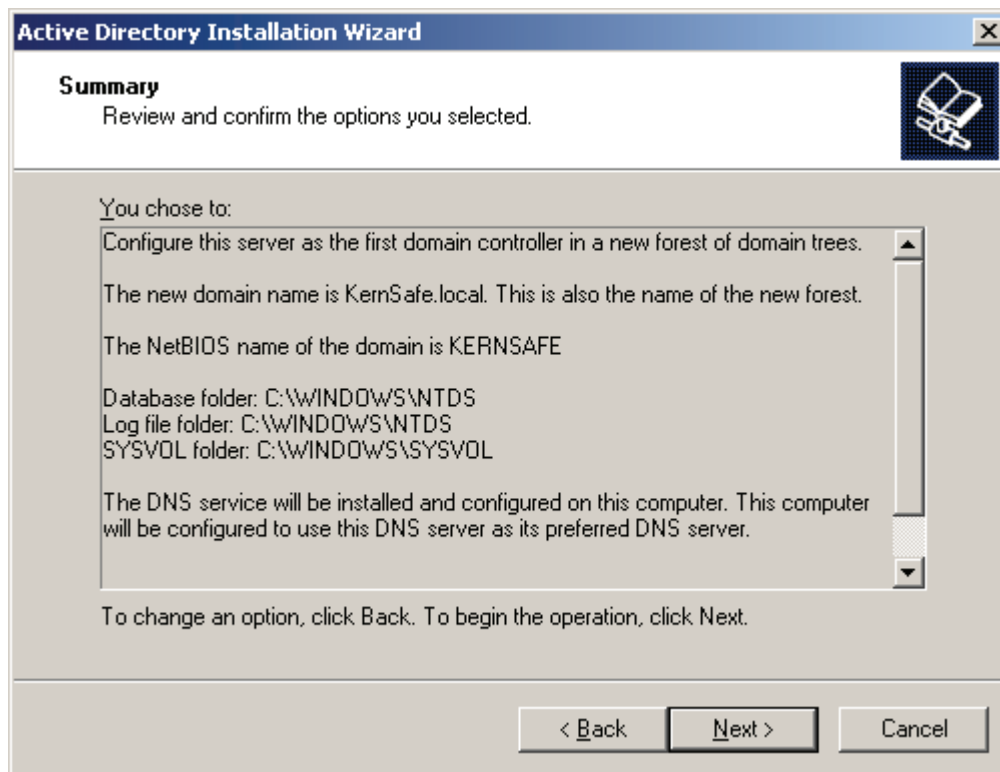


The screenshot shows a Windows dialog box titled "Active Directory Installation Wizard". The main heading is "Directory Services Restore Mode Administrator Password". Below the heading, it states: "This password is used when you start the computer in Directory Services Restore Mode." To the right of this text is a small icon of a computer monitor with a hand pointing at it. The main body of the dialog contains the following text: "Type and confirm the password you want to assign to the Administrator account used when this server is started in Directory Services Restore Mode. The restore mode Administrator account is different from the domain Administrator account. The passwords for the accounts might be different, so be sure to remember both." Below this text are two text input fields. The first is labeled "Restore Mode Password:" and contains seven dots. The second is labeled "Confirm password:" and also contains seven dots. At the bottom of the dialog, there are three buttons: "< Back", "Next >", and "Cancel".

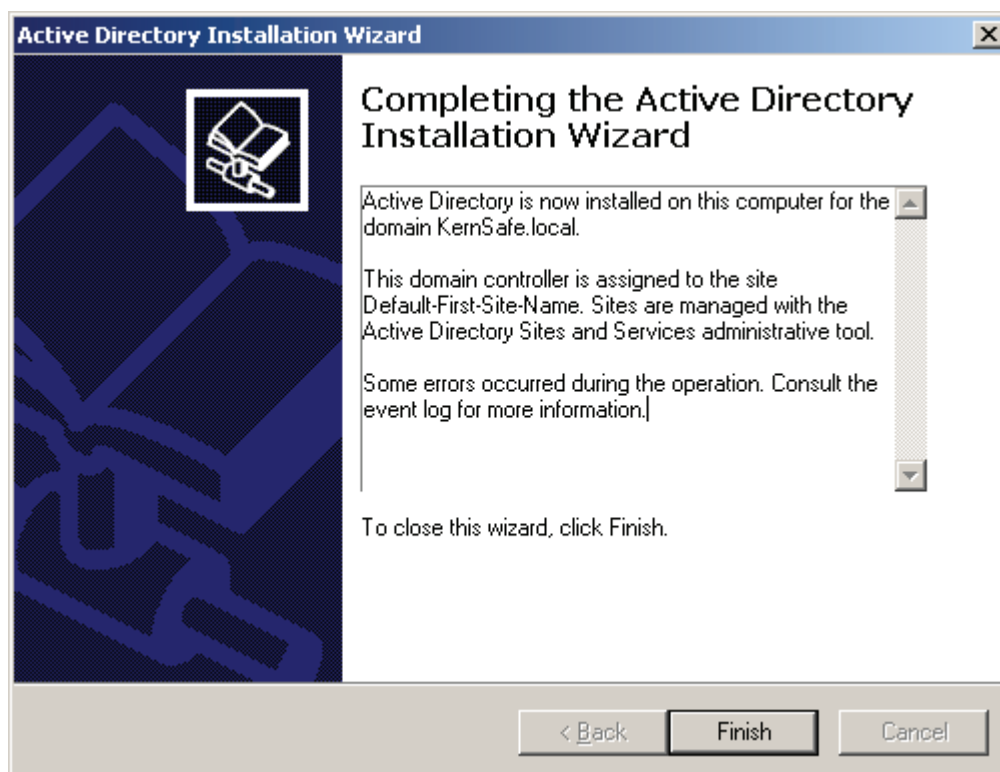
Set the administrator password, take abc.123 for example here.

Press the **Next** button to continue.

Finish Active Directory installation wizard



Press the **Next** button to continue.



Press the **Finish** button.

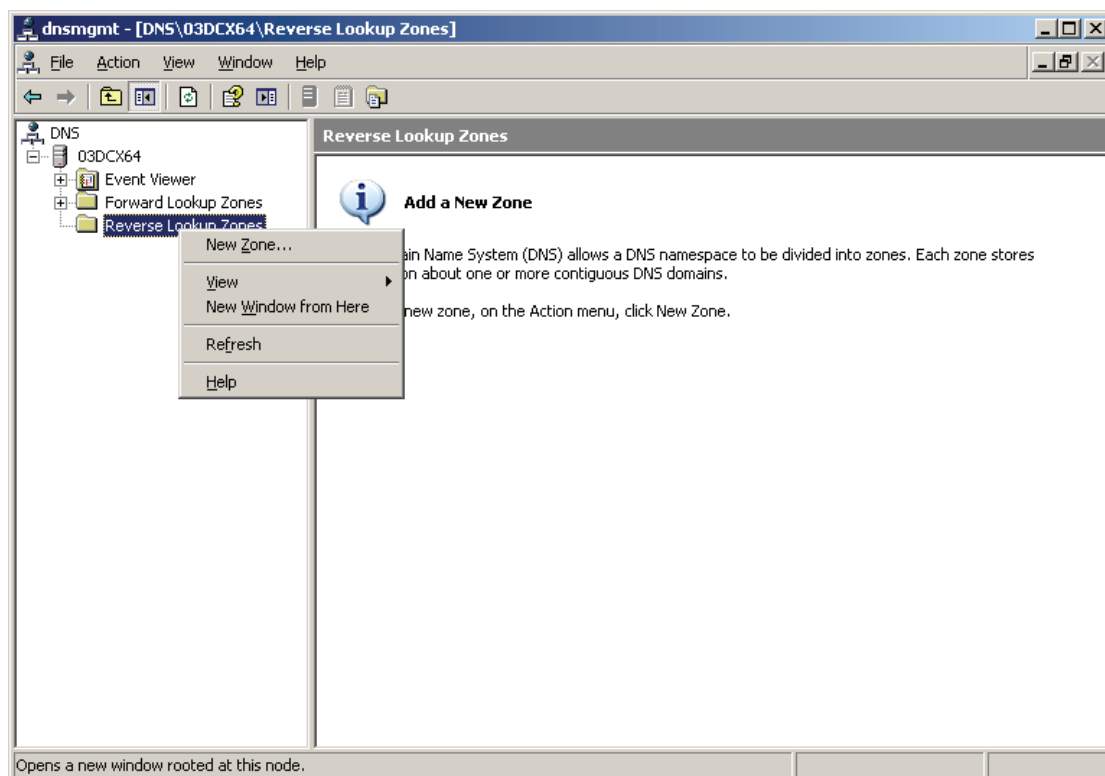
Restart operation system



Now restart the computer and the new settings will take effect.

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

Enter **dcpromo** in Start - > Run and the **Domain Controller setup wizard** is shown.

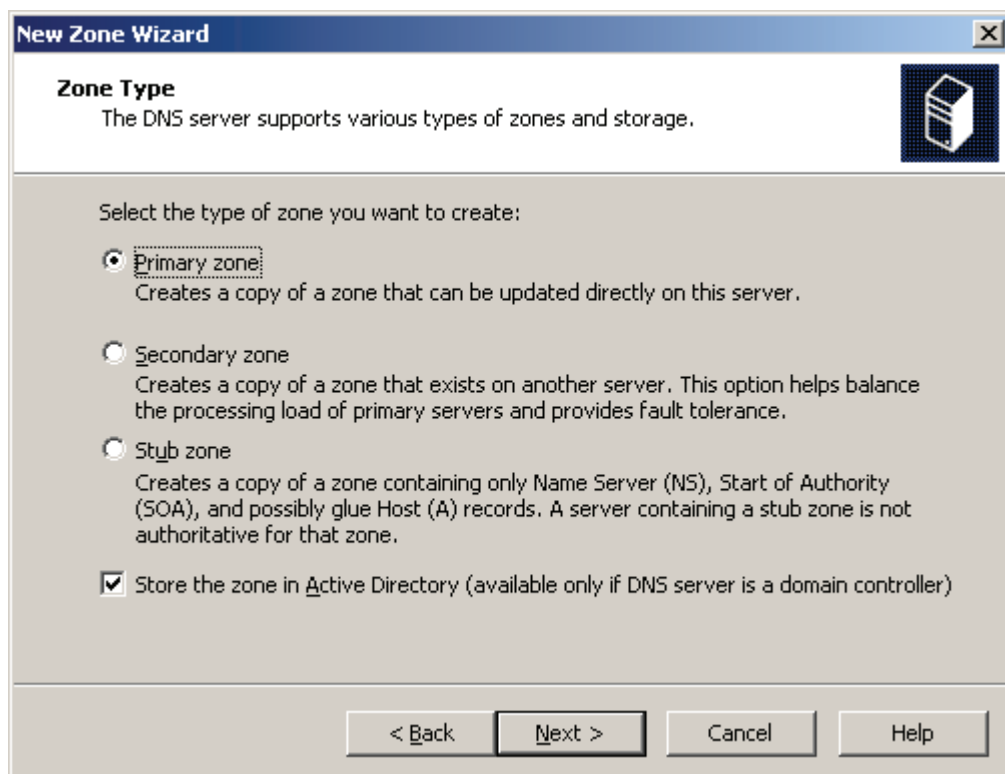


Open **DNS Manager**, right click on **Reverse Lookup Zone** and select **New Zone**, the **New Zone Wizard** is shown.



Press the **Next** button to continue.

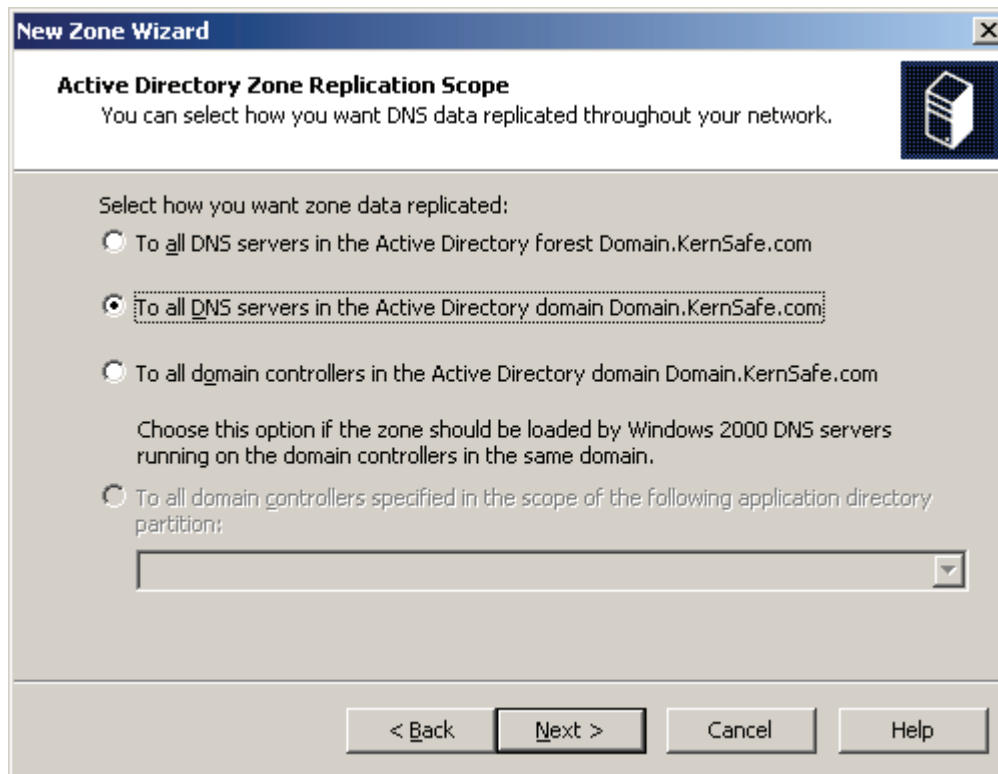
Select zone type



Select **Primary zone**.

Press the **Next** button to continue.

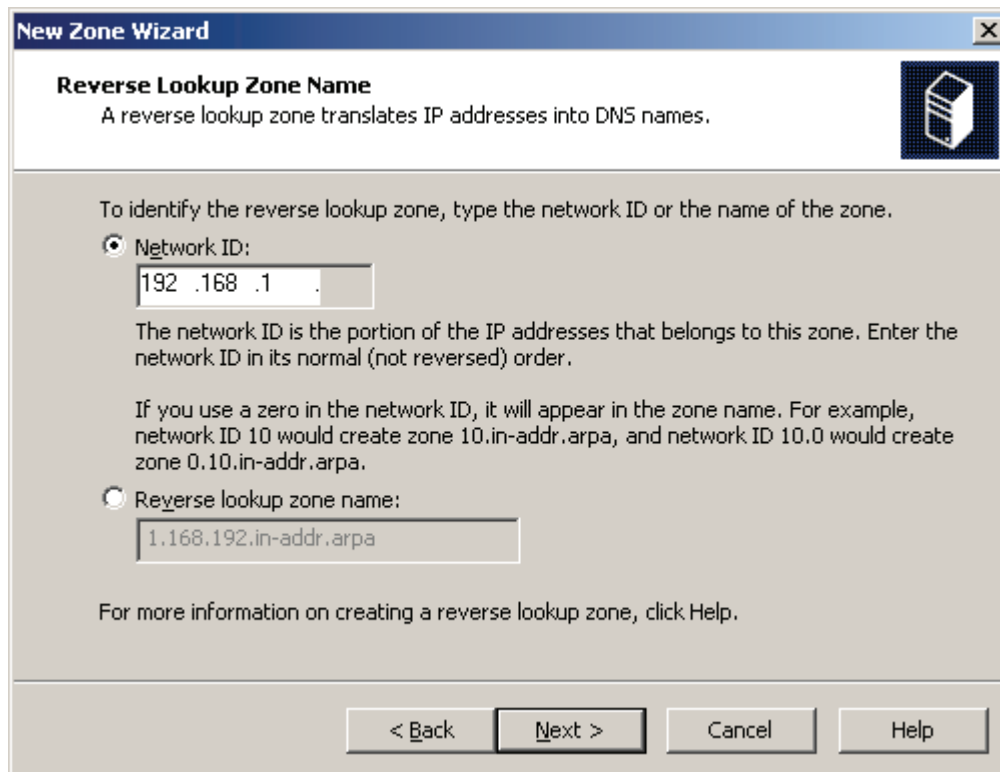
Select zone data replicated



Select **To all DNS servers in the Activity Directory domain Domain.KernSafe.com.**

Press the **Next** button to continue.

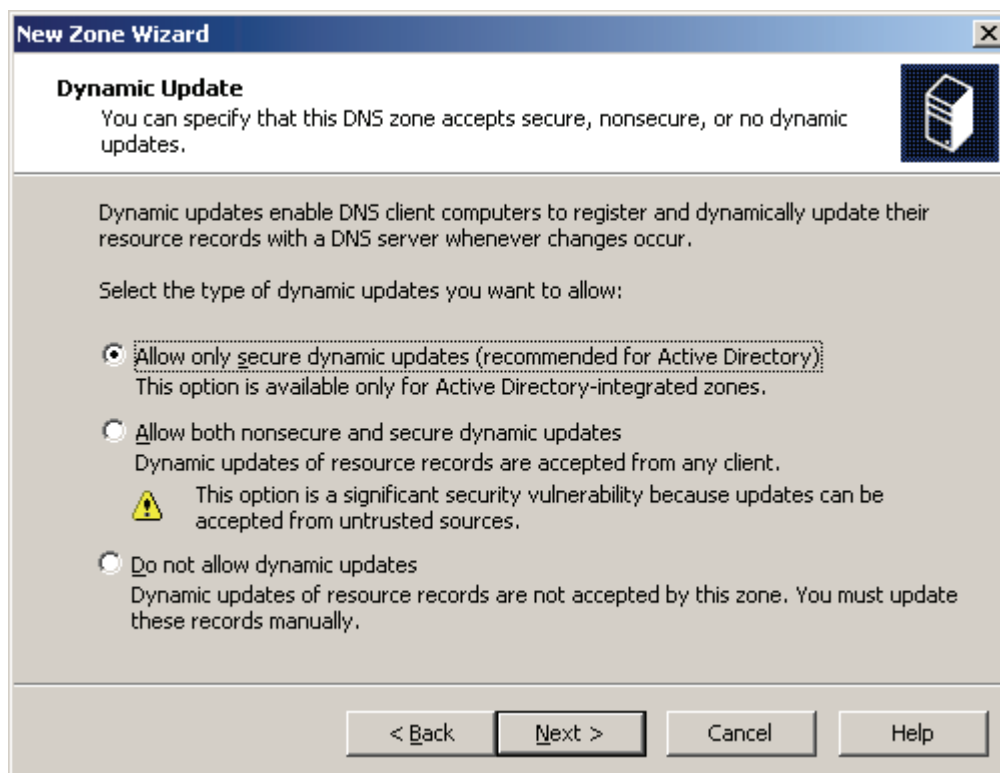
Specify reverse lookup zone name



Select Network ID, enter 192.168.1.

Press the **Next** button to continue.

Set Dynamic update types



Select **Allow only secure dynamic updates (recommended for Active Directory)**.



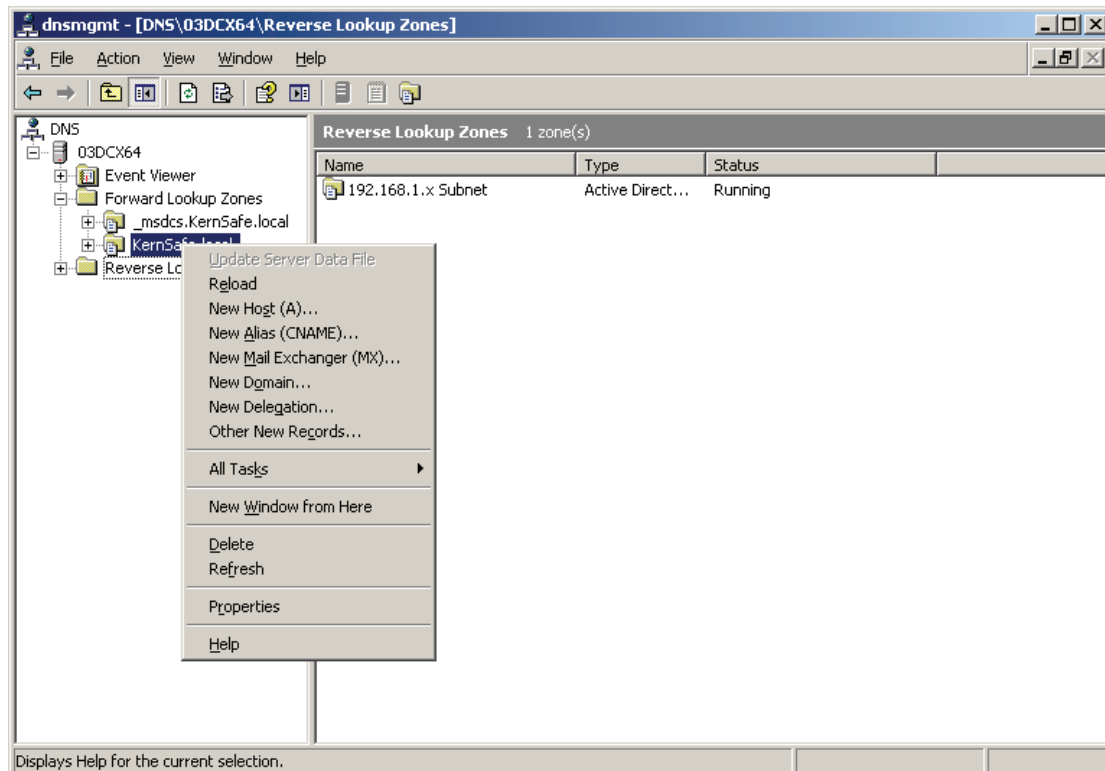
Press the **Next** button to continue.

Complete the **New Zone Wizard**

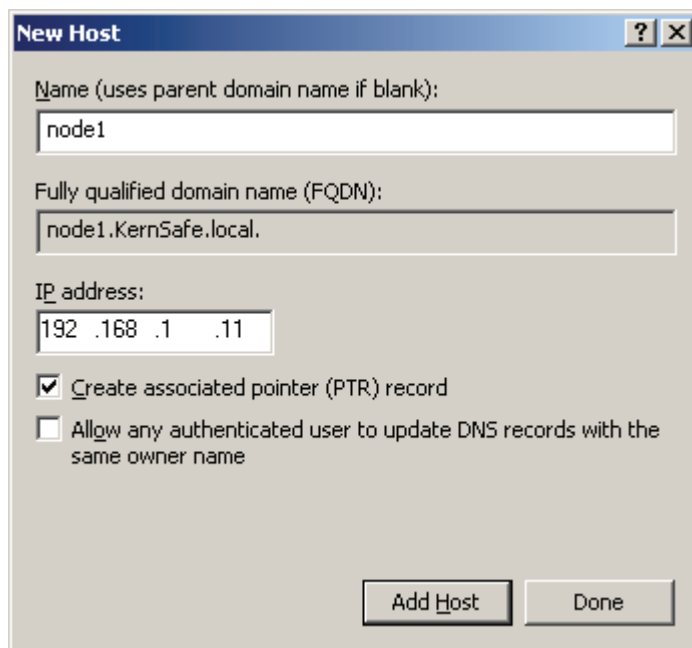


Press the **Finish** button.

Come back to the domain controller management console.



Right click on **KernSafe.local** and select **New Host (A)**, the **New Host dialog** is shown.



**New Host** ? X

Name (uses parent domain name if blank):  
node1

Fully qualified domain name (FQDN):  
node1.KernSafe.local.

IP address:  
192.168.1.11

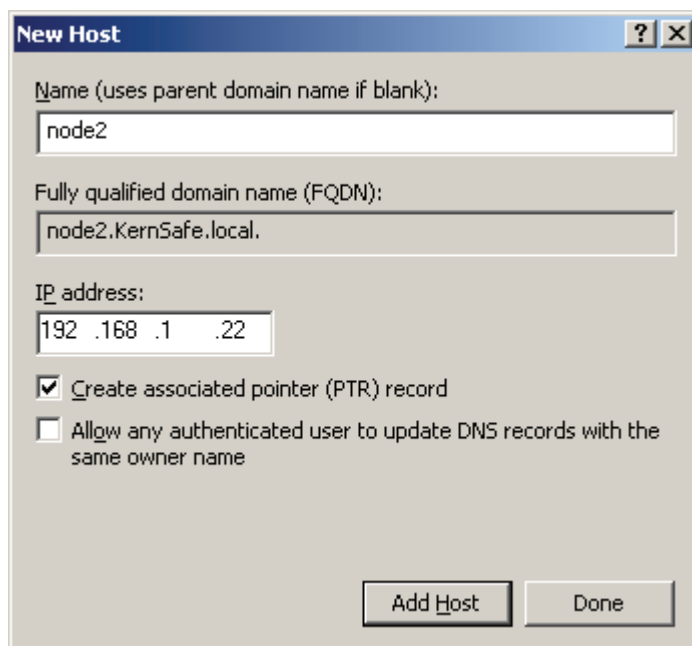
Create associated pointer (PTR) record

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

Add Host Done

Type node in Name field, 192.168.1.11 in the IP address field and check **Create associated pointer (PTR) record**.

Press the **Add Host** button to continue.



**New Host** ? X

Name (uses parent domain name if blank):  
node2

Fully qualified domain name (FQDN):  
node2.KernSafe.local.

IP address:  
192.168.1.22

Create associated pointer (PTR) record

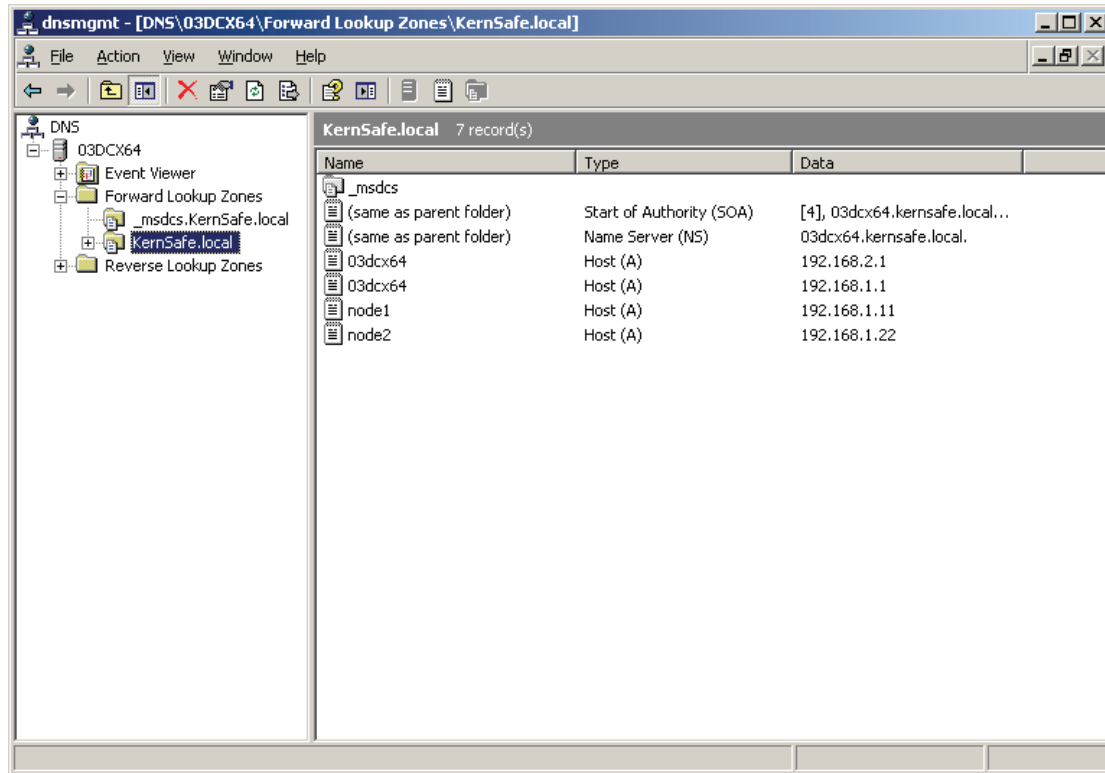
Allow any authenticated user to update DNS records with the same owner name

Add Host Done

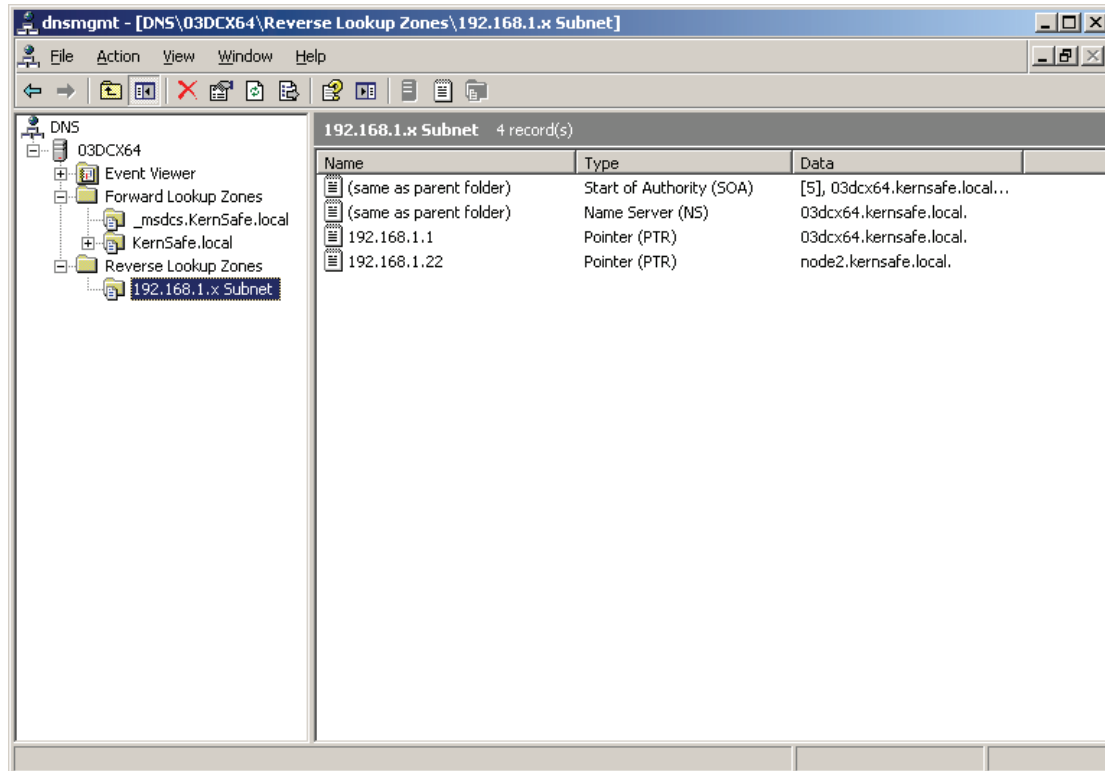
Type node2 in Name field, 192.168.1.22 in the IP address field and check **Create associated pointer (PTR) record**.

Press the **Add Host** button to continue.

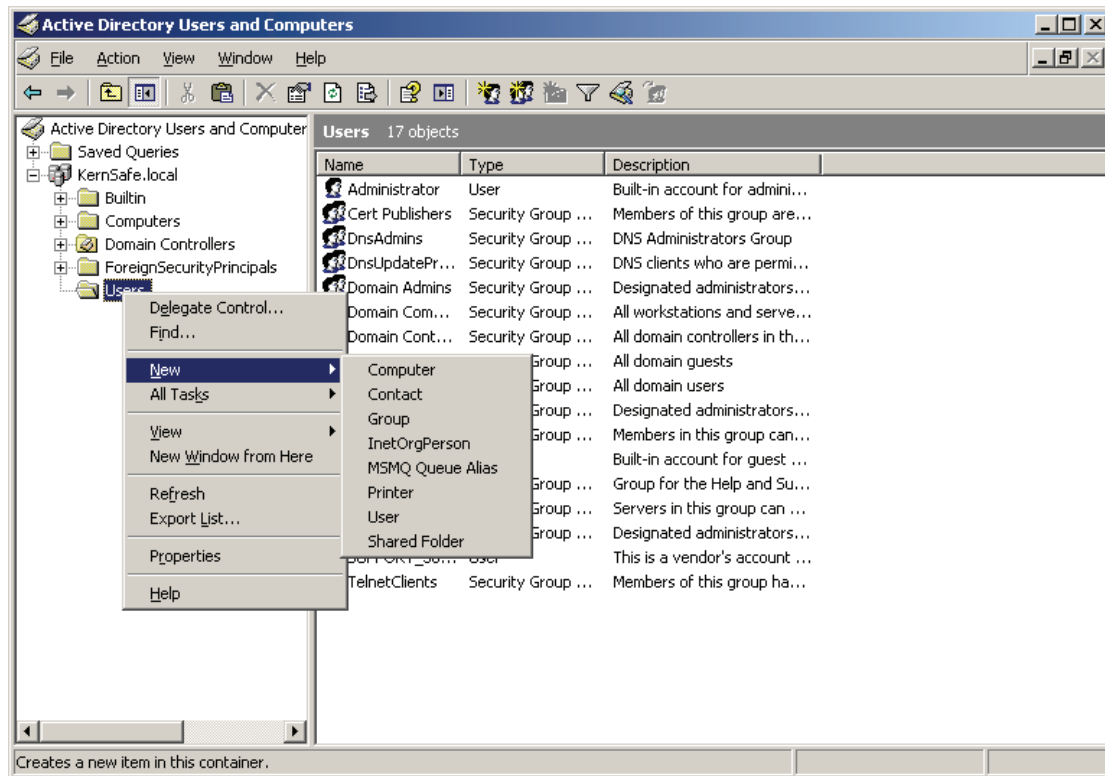
Come back to the domain controller management console.



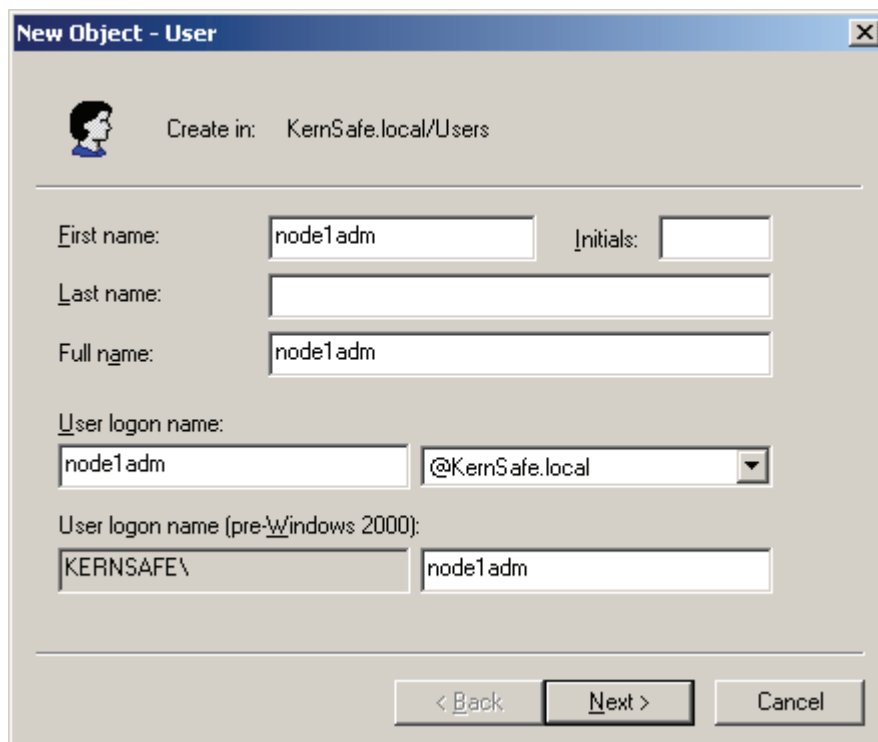
After all the above operations are done successfully, the status of DNS Manager is shown as in the figure below.



Open Active Directory Users and Computers console



Right click on Users and select New -> User, the **New Object-User** dialog is shown



Create any user as shown in the picture, take node1adm as an example.

Press the **Next** button to continue.

Specify user's password

New Object - User

Create in: KernSafe.local/Users

Password: [.....]

Confirm password: [.....]

User must change password at next logon

User cannot change password

Password never expires

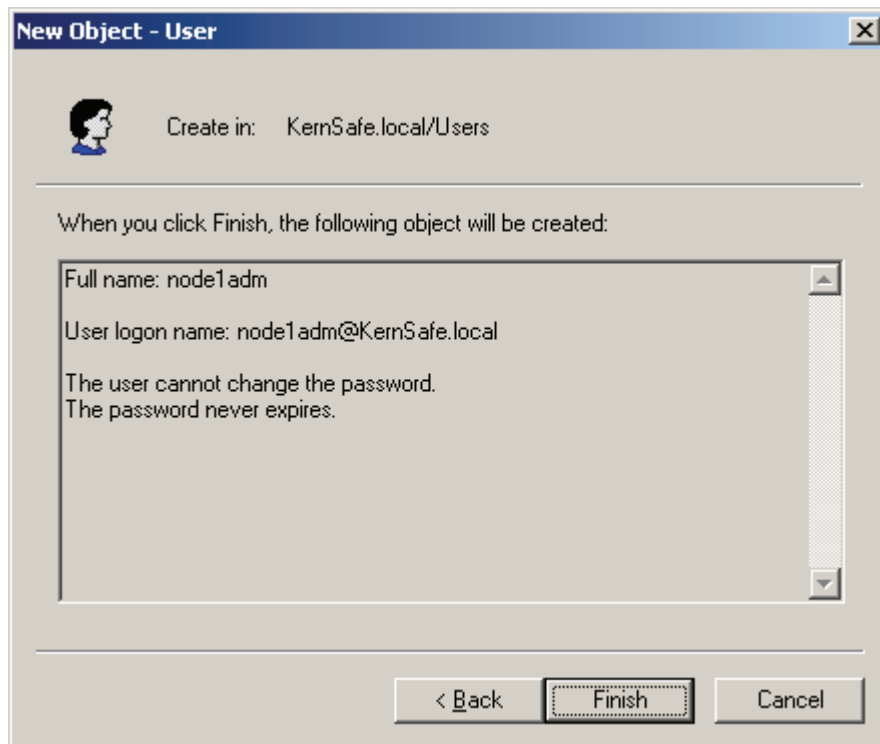
Account is disabled

< Back   Next >   Cancel

Enter password, take abc.123 for example here, check **User cannot change password and Password never expires.**

Press the **Next** button to continue.

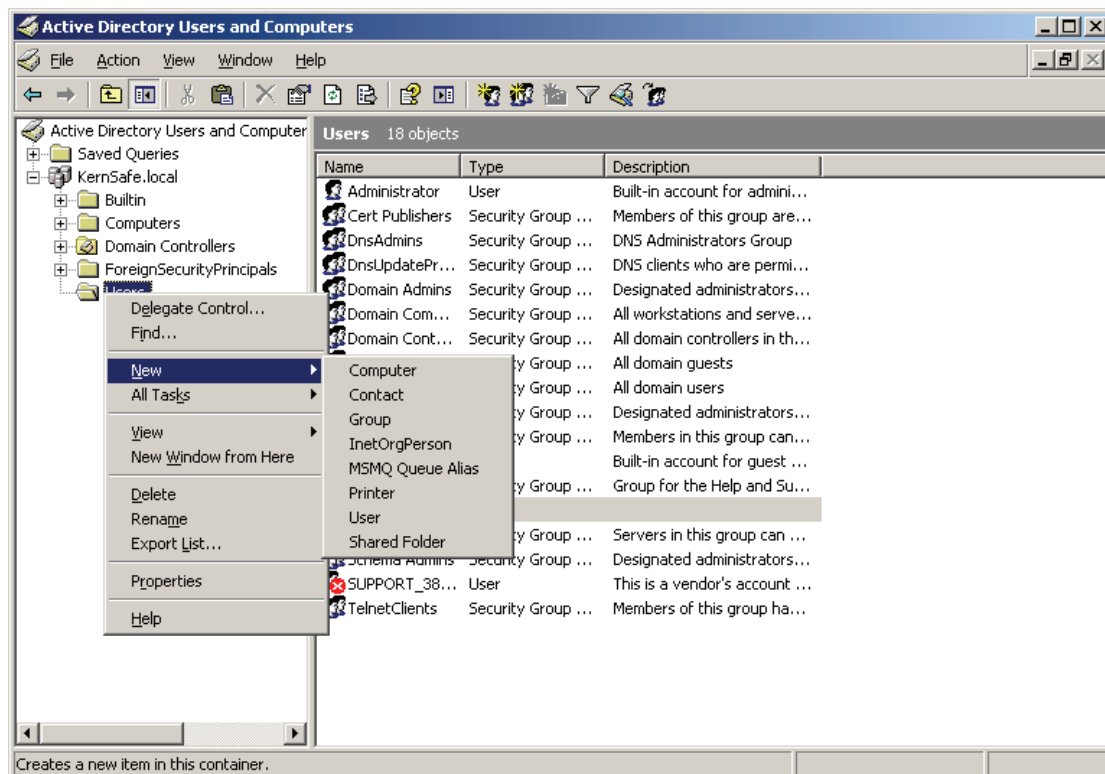
Finish creating user



Press the **Finish** button.

Come back to Active Directory Users and Computers console

Create the second user.



Right click on **Users** and select **New -> User**, the **New Object-User** dialog is shown.

**New Object - User**

Create in: KernSafe.local/Users

First name: node2adm Initials:

Last name:

Full name: node2adm

User logon name: node2adm @KernSafe.local

User logon name (pre-Windows 2000): KERNSAFE\' node2adm

< Back Next > Cancel

Create any user as shown in the figure, take node2adm as an example.

Press the Next button to continue.

Specify user's password

**New Object - User**

Create in: KernSafe.local/Users

Password:

Confirm password:

User must change password at next logon

User cannot change password

Password never expires

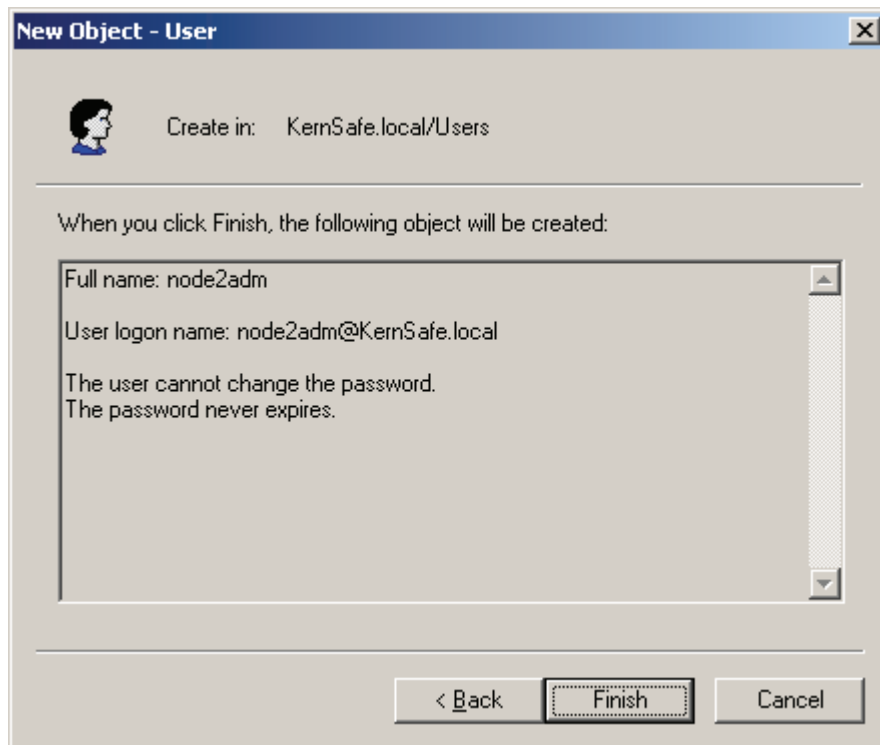
Account is disabled

< Back Next > Cancel

Enter password, take abc.123 as an example, check **User cannot change password** and **Password never expires**.

Press the **Next** button to continue.

Finish creating user

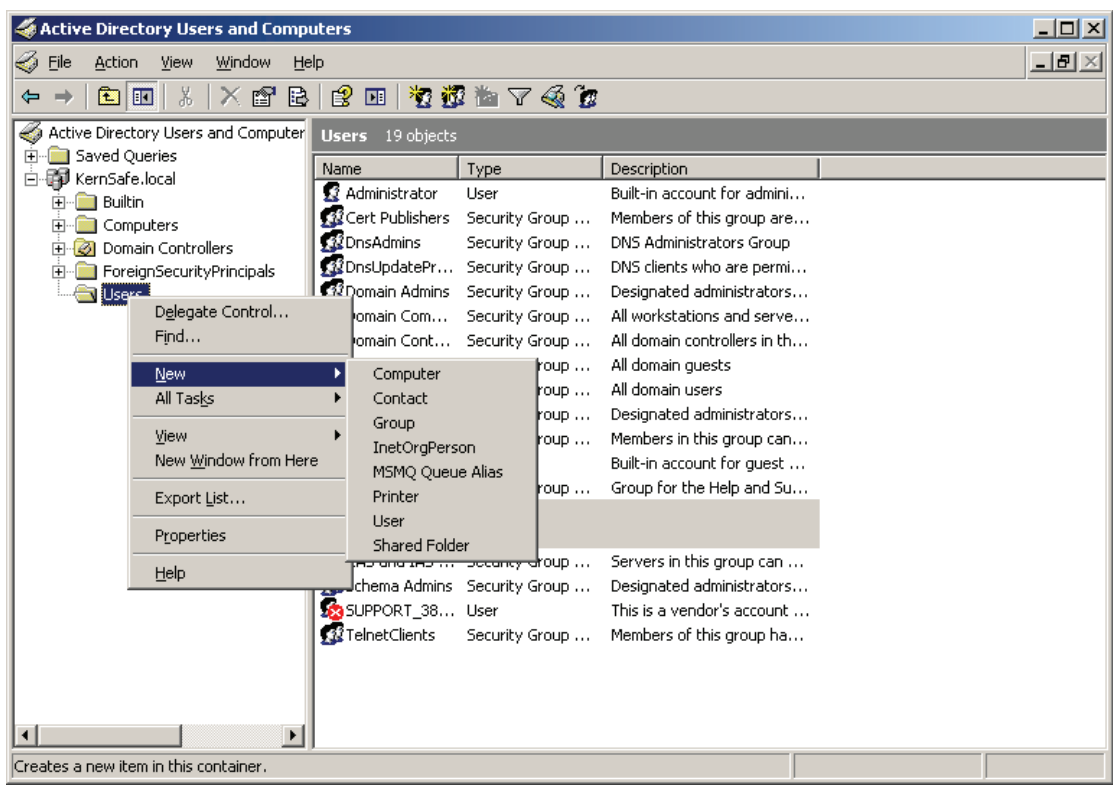


Press the **Finish** button to finish user creating.

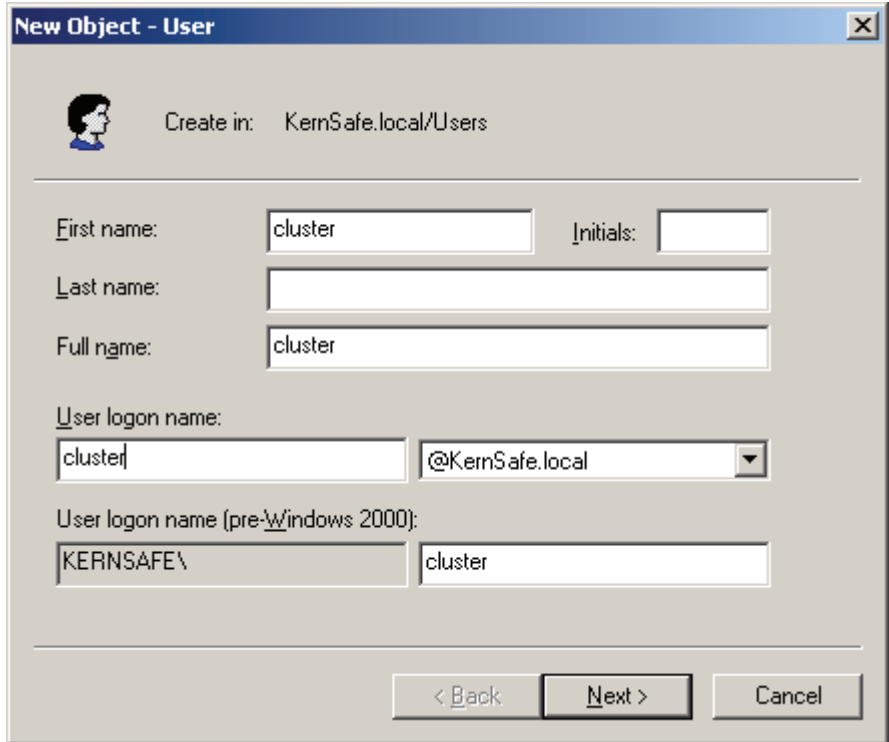
Come back to Active Directory Users and Computers console

Create a user cluster





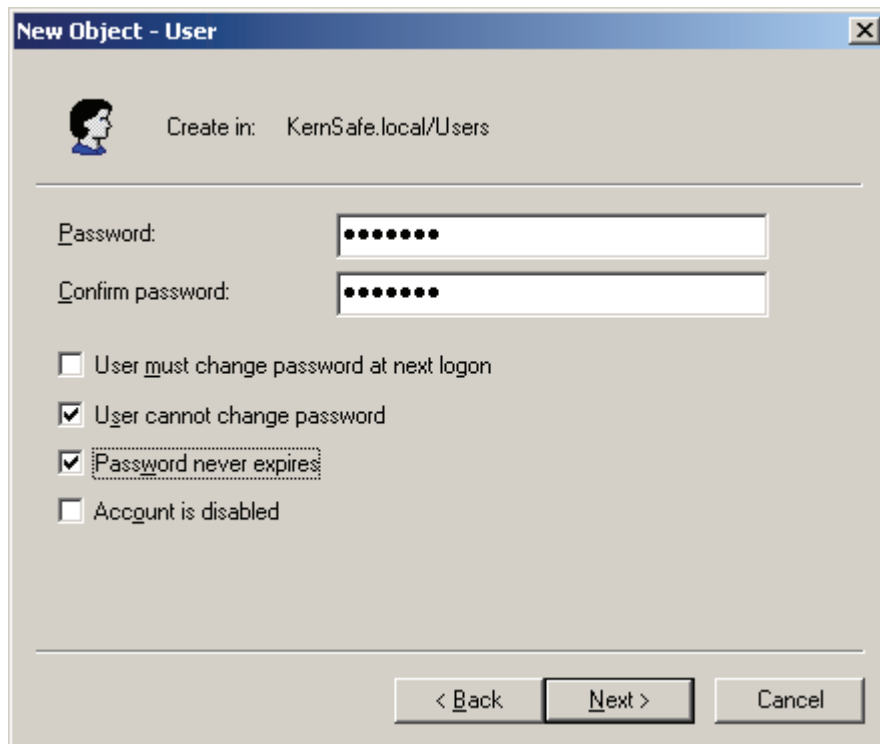
Right click on **Users** and select **New -> User**, the **New Object-User** dialog is shown



Create any user as shown in the figure, take cluster as an example.

Press the **Next** button to continue.

Specify user's password

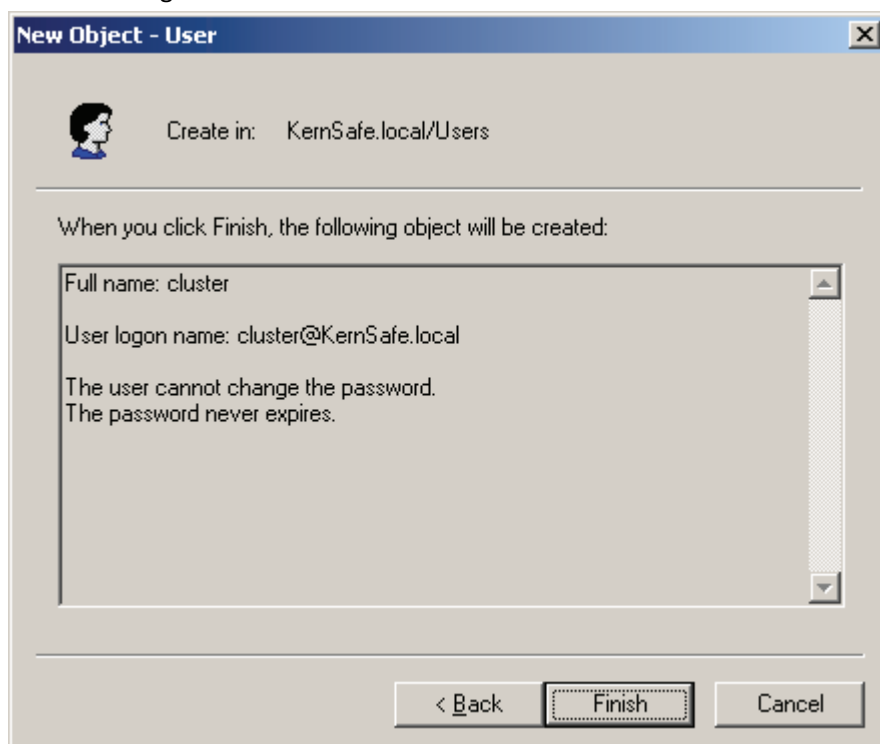


The dialog box is titled "New Object - User" and has a close button (X) in the top right corner. It features a user icon and the text "Create in: KernSafe.local/Users". Below this, there are two password input fields: "Password:" and "Confirm password:", both containing seven dots. A list of checkboxes follows: "User must change password at next logon" (unchecked), "User cannot change password" (checked), "Password never expires" (checked), and "Account is disabled" (unchecked). At the bottom, there are three buttons: "< Back", "Next >", and "Cancel".

Enter password, take abc.123 as an example, check **User cannot change password** and **Password never expires**.

Press the Next button to continue.

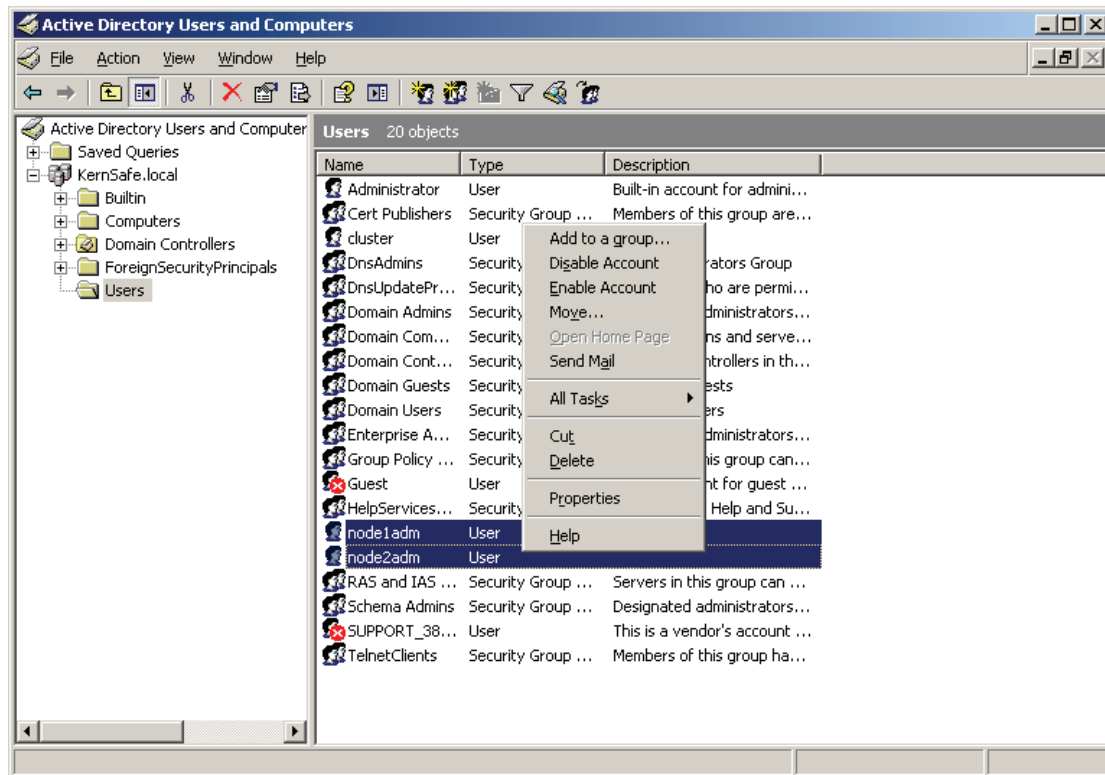
Finish creating user



The dialog box is titled "New Object - User" and has a close button (X) in the top right corner. It features a user icon and the text "Create in: KernSafe.local/Users". Below this, it says "When you click Finish, the following object will be created:". A scrollable text area contains the following information: "Full name: cluster", "User logon name: cluster@KernSafe.local", "The user cannot change the password.", and "The password never expires.". At the bottom, there are three buttons: "< Back", "Finish", and "Cancel".

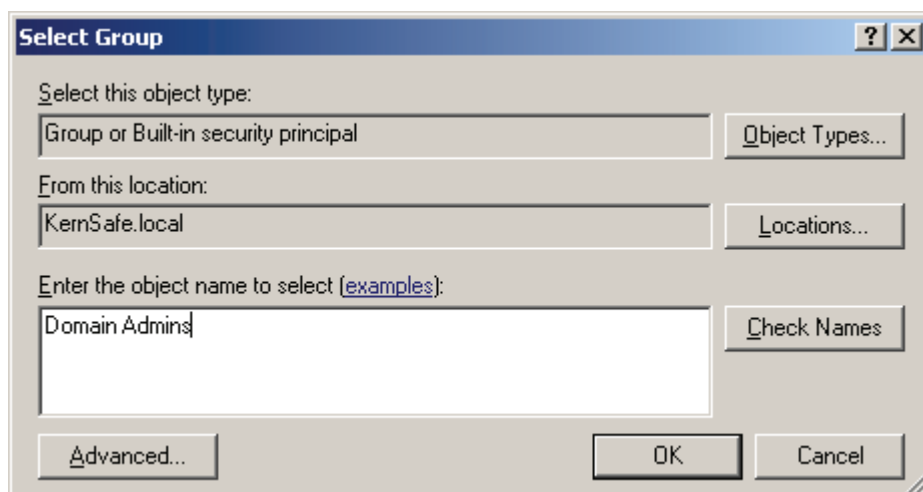
Press the Finish button.

Come back to Active Directory Users and Computers console

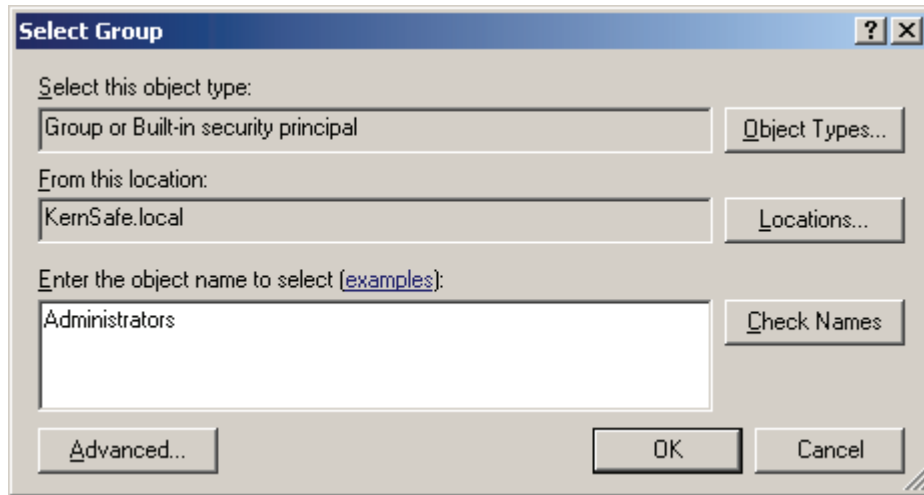


Add node1adm and node2adm to **Domain Admins** and **Administrators** groups.

Select node1adm and node2adm and right click to select Add to a group, the **Select Group** dialog is shown.



Enter Domain Admins and press the **OK** button.

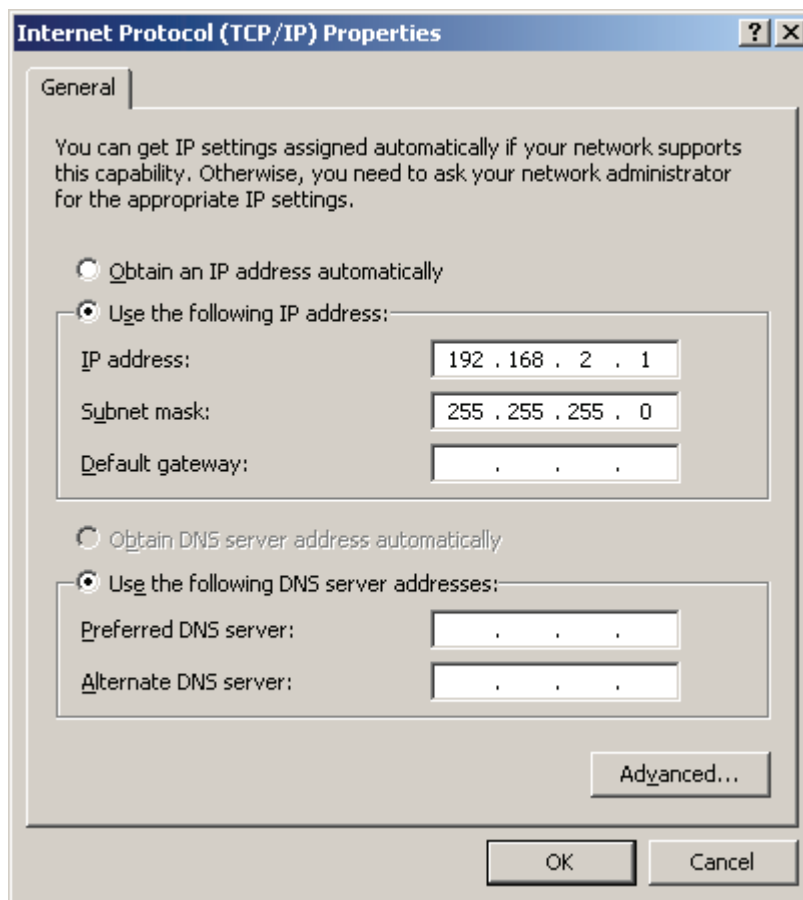


Enter Administrators and press the **OK** button.

### 3. KernSafe iStorage Server Settings

If three computers are used, you can install KernSafe iStorage Server on the Domain Controller, or use a fourth computer to install KernSafe iStorage Server. Taking three computers for example, this article installs KernSafe iStorage Server on the Domain Controller.

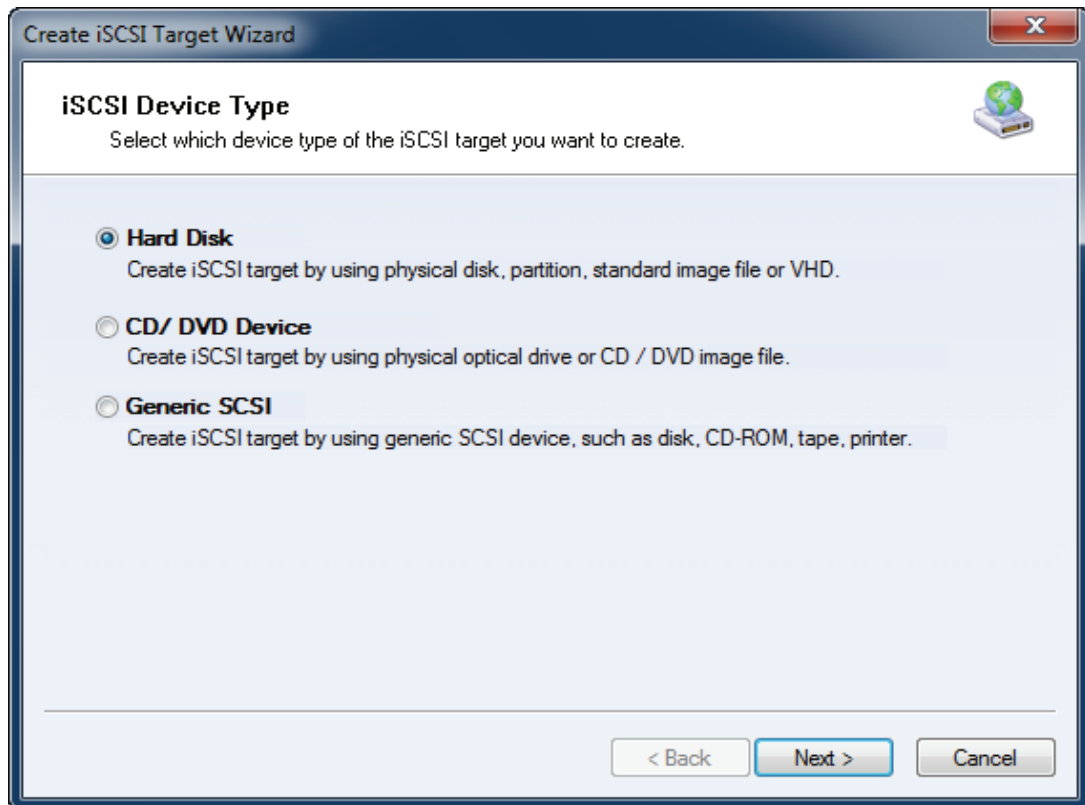
Network setting



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.

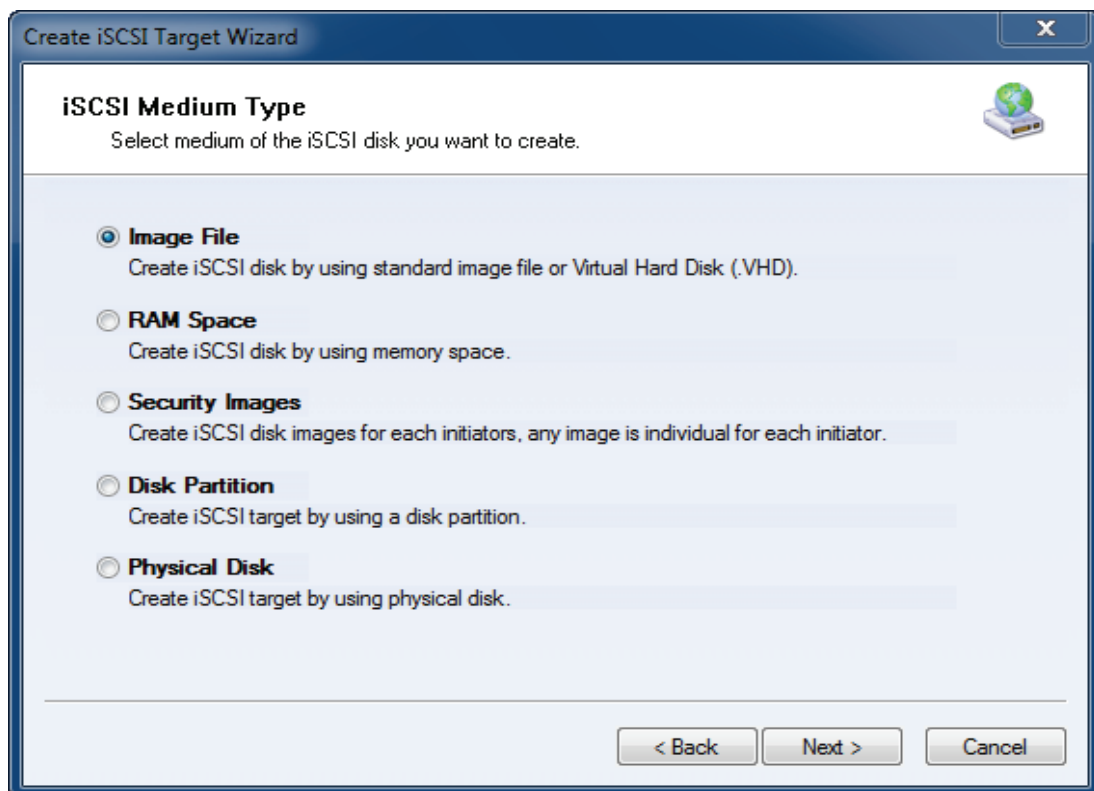
Create iSCSI device, press the **Create** button on the toolbar of iStorage Server management console, the **Create Device Wizard** is shown.

Select a device type



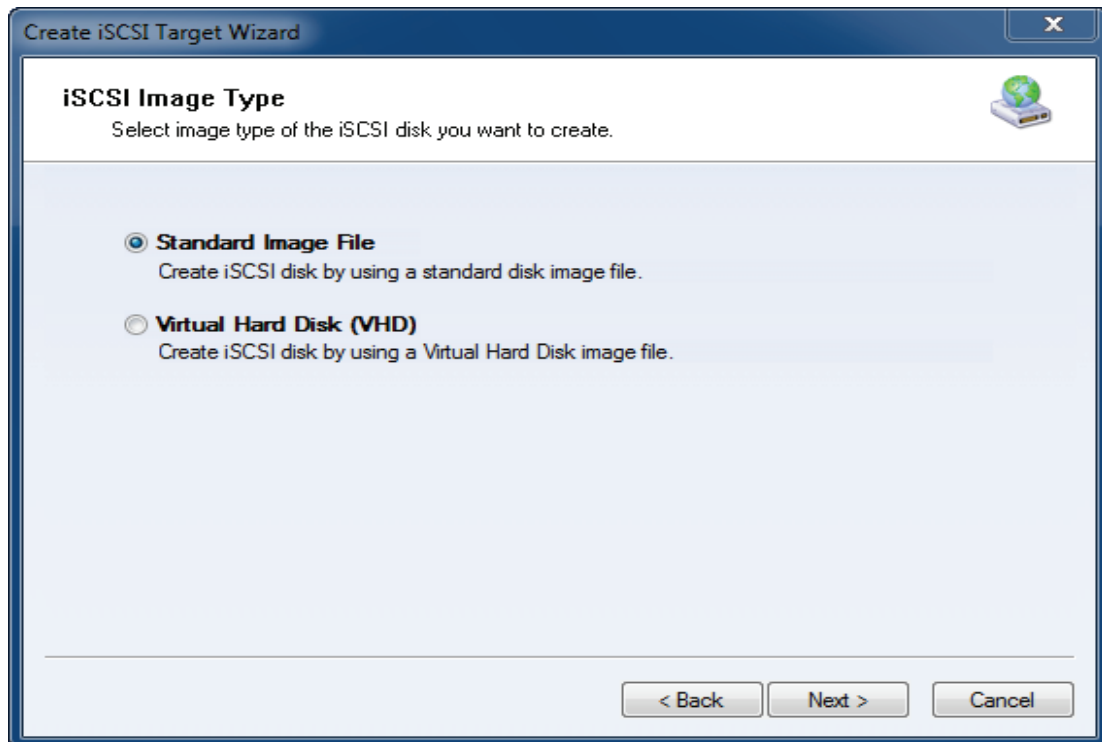
Choose **Hard Disk**.

Press the **Next** button to continue.



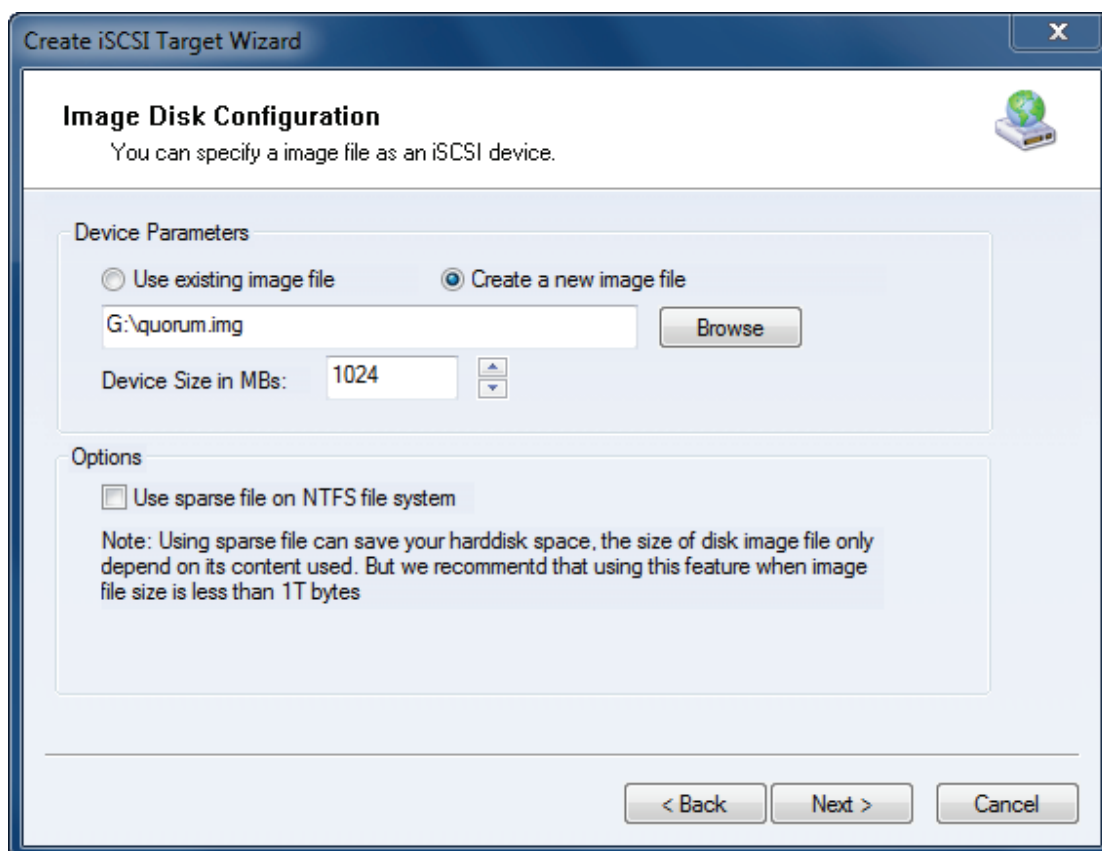
Choose **Image File** in **iSCSI Medium Type** window.

Press the **Next** button to continue.



We choose **Standard Image File** and then press the **Next** button.

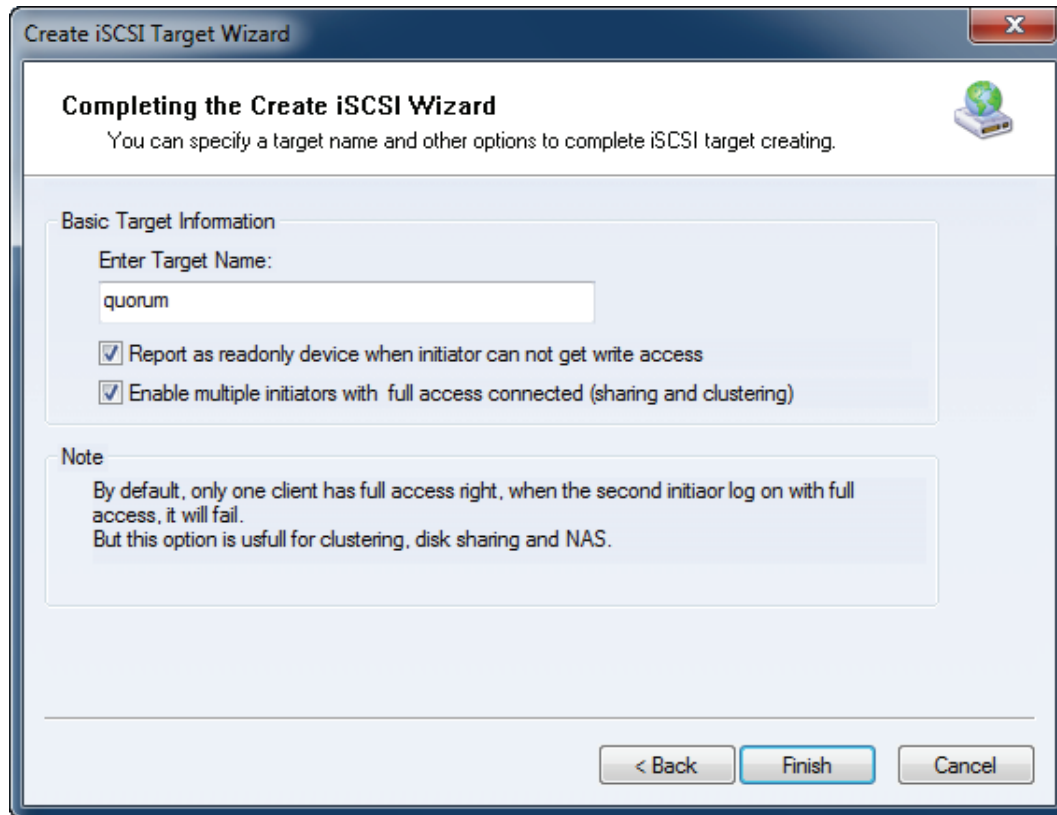
Set image disk parameters



Create an .img file named quorum with a size of 1024MB as an example.

Press the **Next** button to continue.

Finish creating iSCSI Target



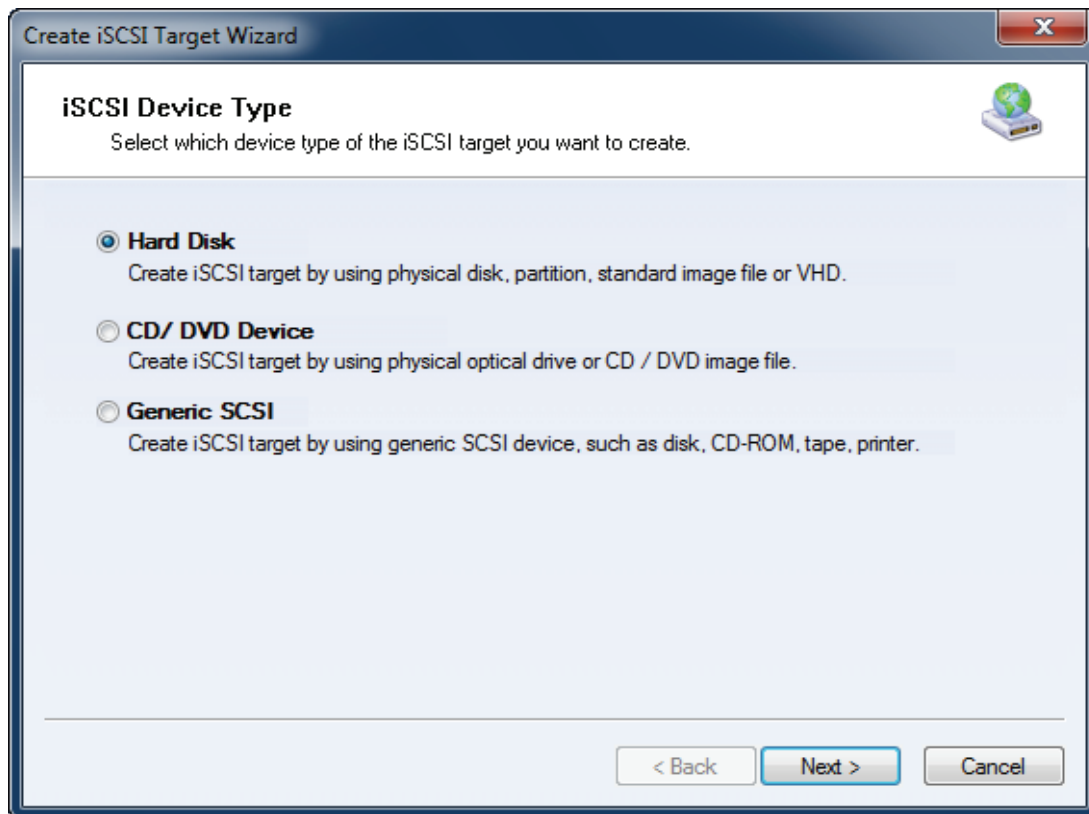
Enter quorum as the name of Target, check Enable multiple initiators with full access connected (sharing and clustering).

Press the **Finish** button to complete target creation.

Create the second iSCSI Target.

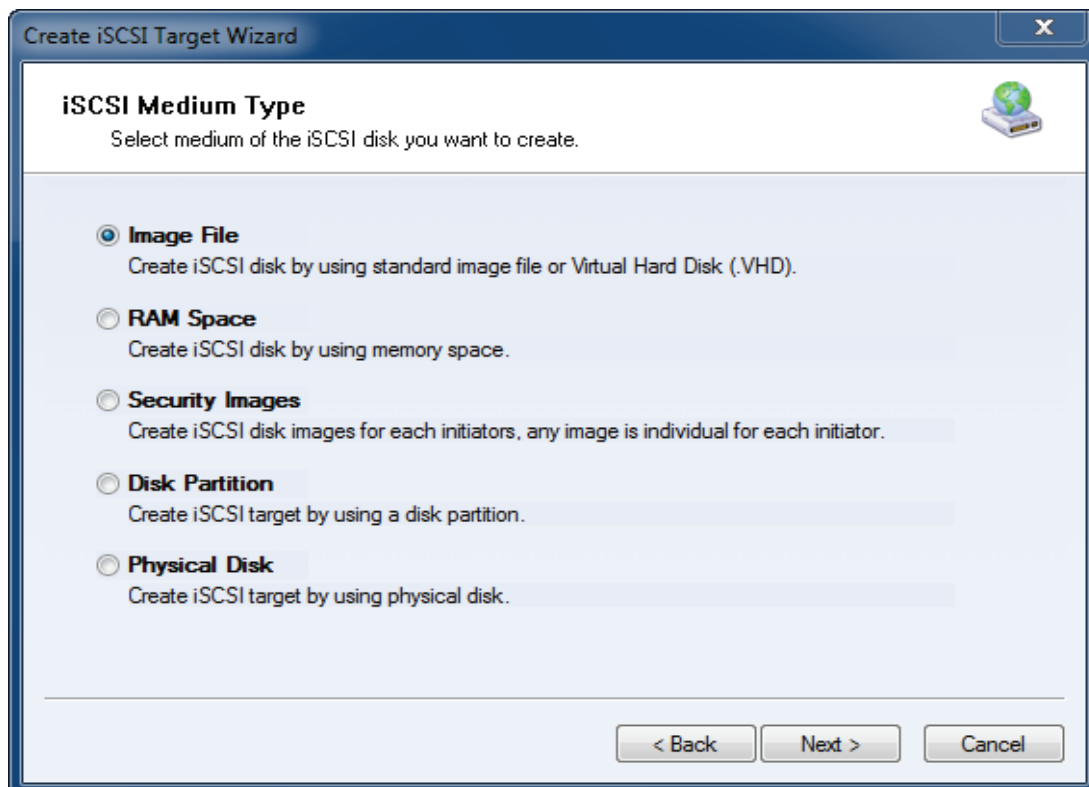
Select a device type





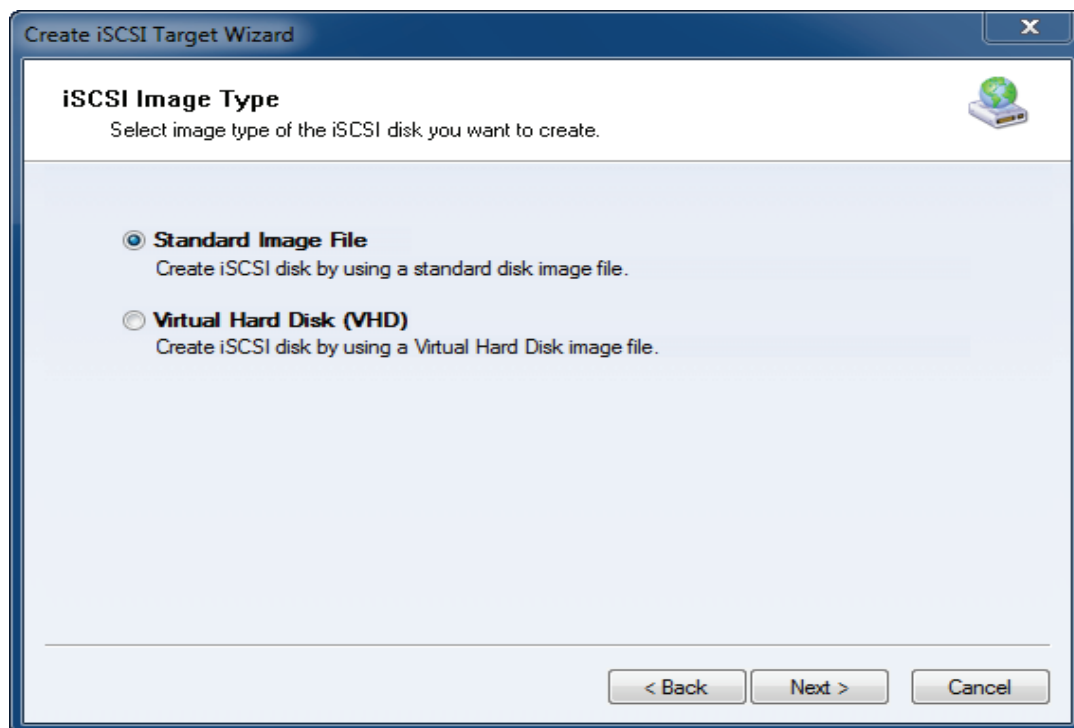
Choose **Hard Disk**.

Press the **Next** button to continue.



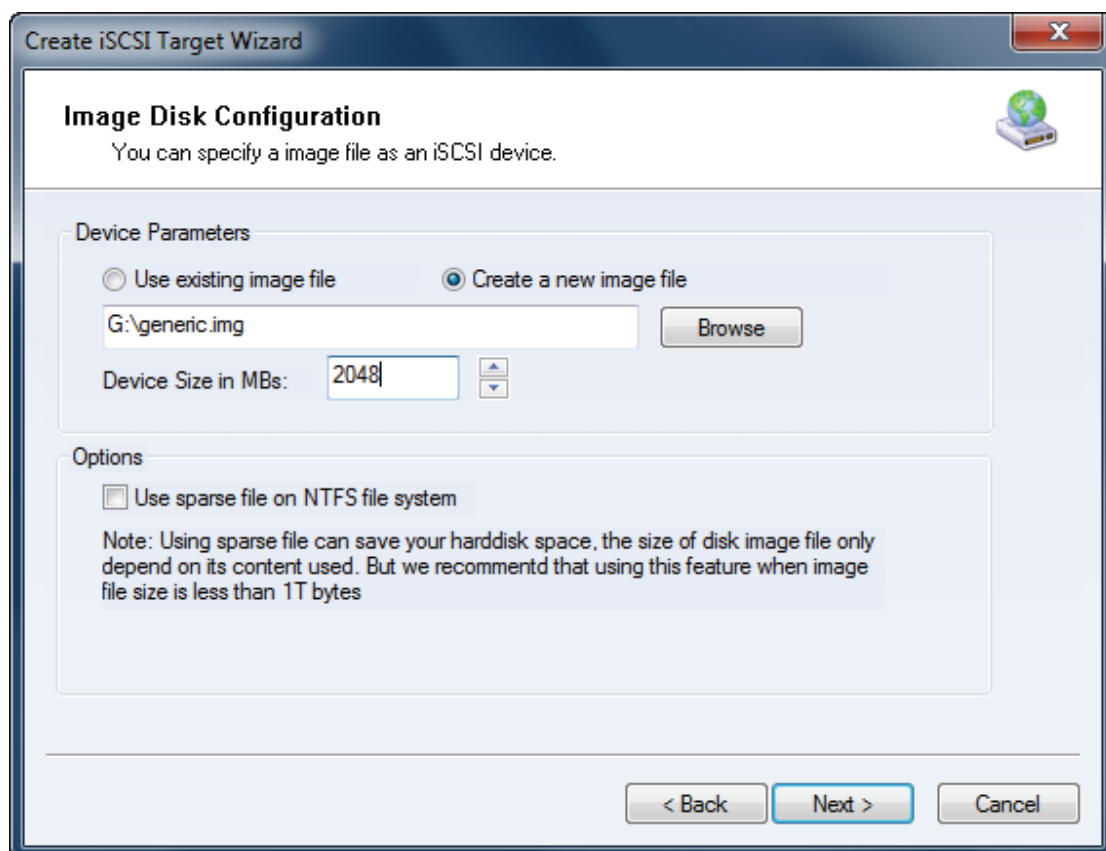
Choose **Image File** in **iSCSI Medium Type** window.

Then press **Next** button to continue.



We choose **Standard Image File** and then press **Next** button.

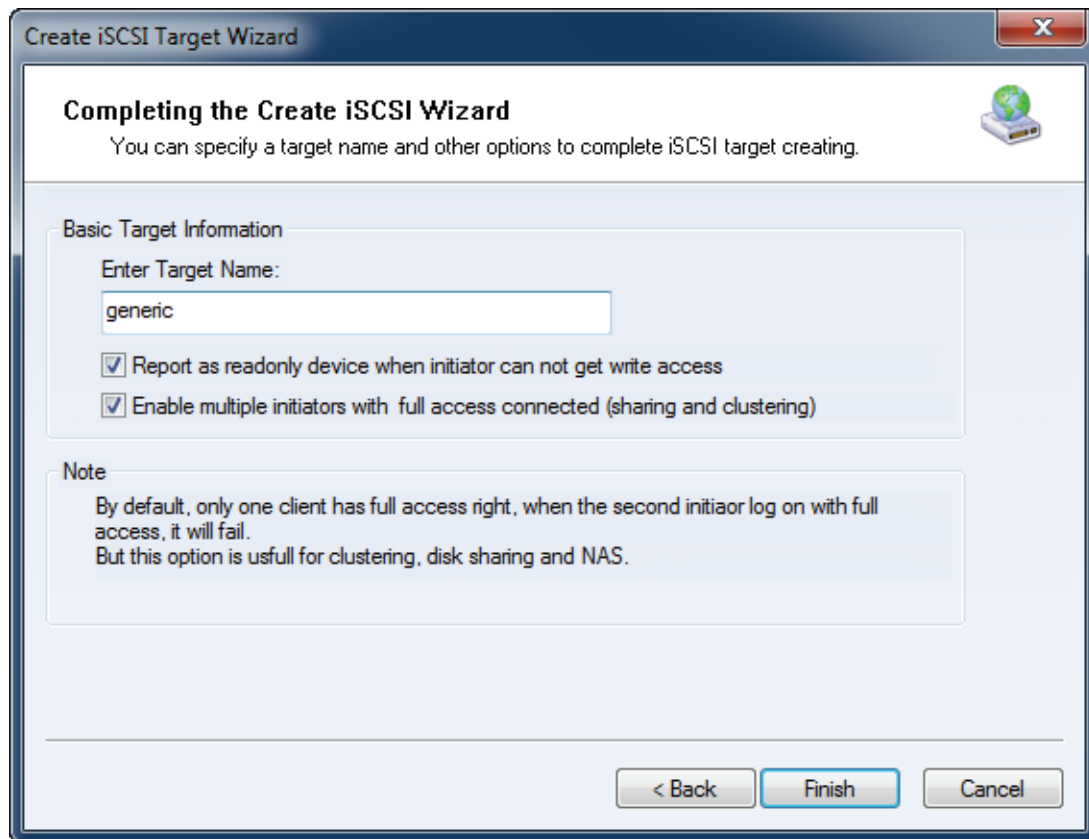
Set image disk parameters



Create an image file named generic with a size of 2048MB as an example.

Press the Next button to continue.

Finish creating iSCSI Target

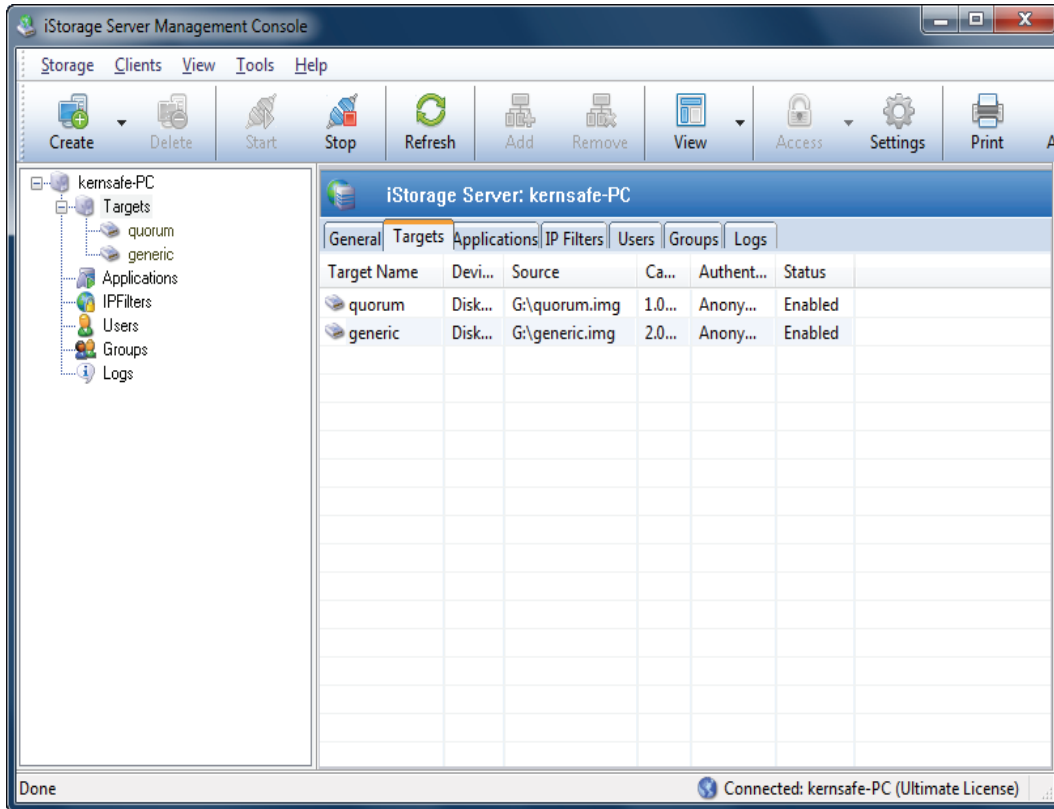


Enter generic as the name of Target, check Enable multiple initiators with full access connected (sharing and clustering).

Press the **Finish** button to finish creating iSCSI Targets.

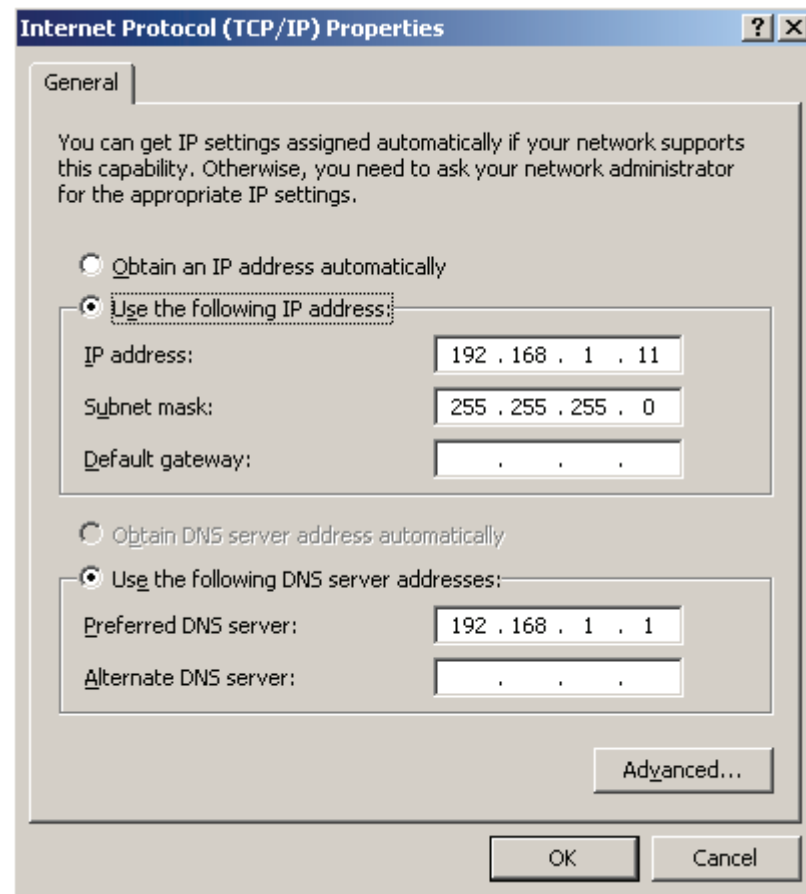
Come back to iStorage Server management console.

After the successful creation, the detail shown in the figure.



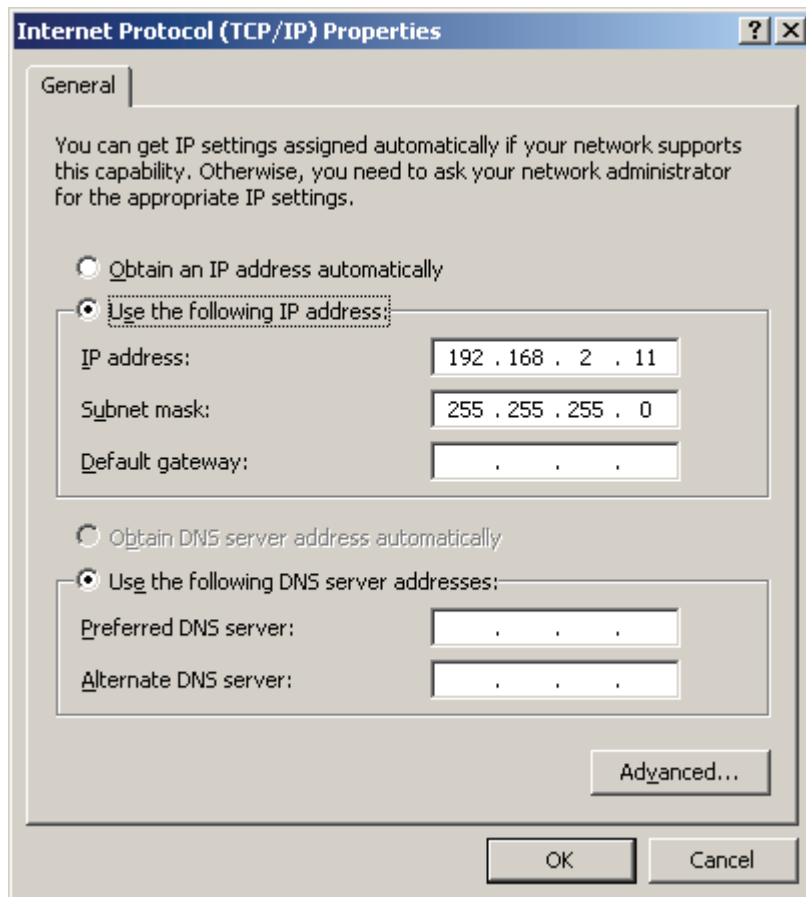
## 4. Node1 Settings

Network settings



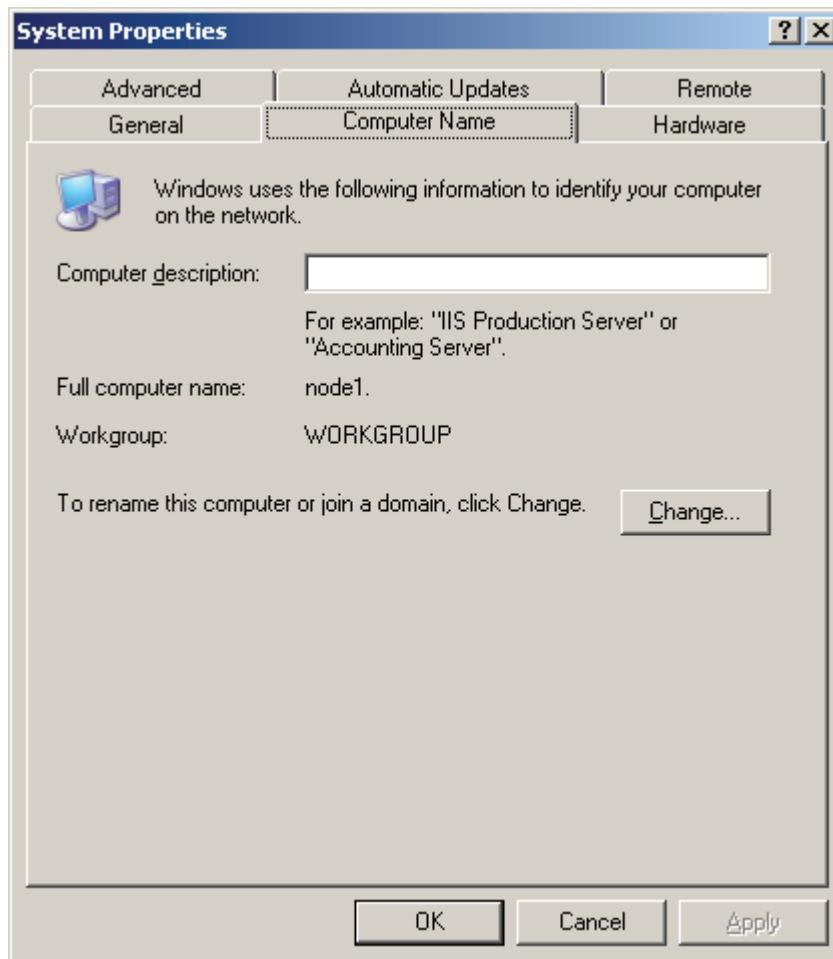
Set the first network adapter of node1 as shown in the picture.

IP address is set as 192.168.1.11, Subnet mask is set as 255.255.255.0 and Rreferred DNS Server is set as 192.168.1.1.

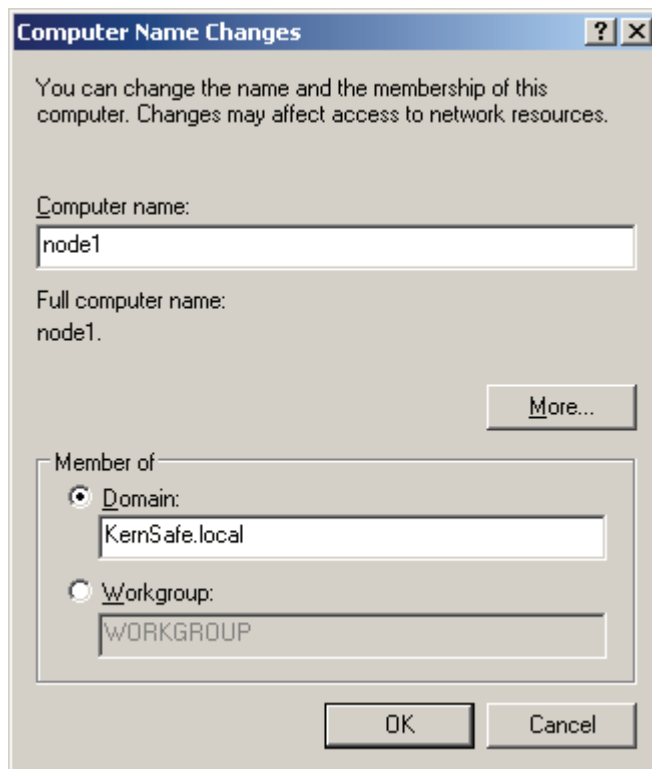


Set the second network adapter of node1 as shown in the picture.  
IP address is set as 192.168.2.11 and Subnet mask is set as 255.255.255.0.

Add nodes to domain, open **System Properties** page



Click **Change** in the page of Computer Name, the **Computer Name Changes** dialog is shown.



Select Domain and enter Domain name, here the name is KernSafe.local.  
Press the **OK** button to continue.

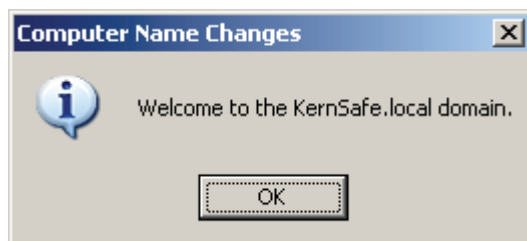
Type domain user and password



Enter the username and password of node1.

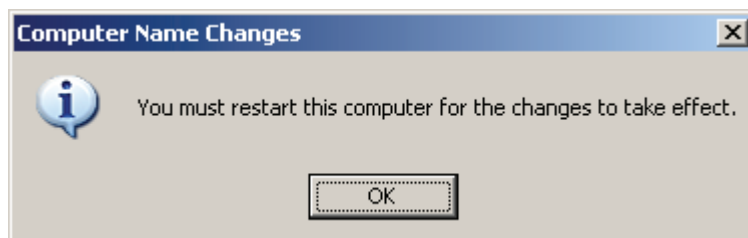
Press the **OK** button to continue.

The **Computer Name Changes** message dialog is shown



Press the **OK** button to continue.

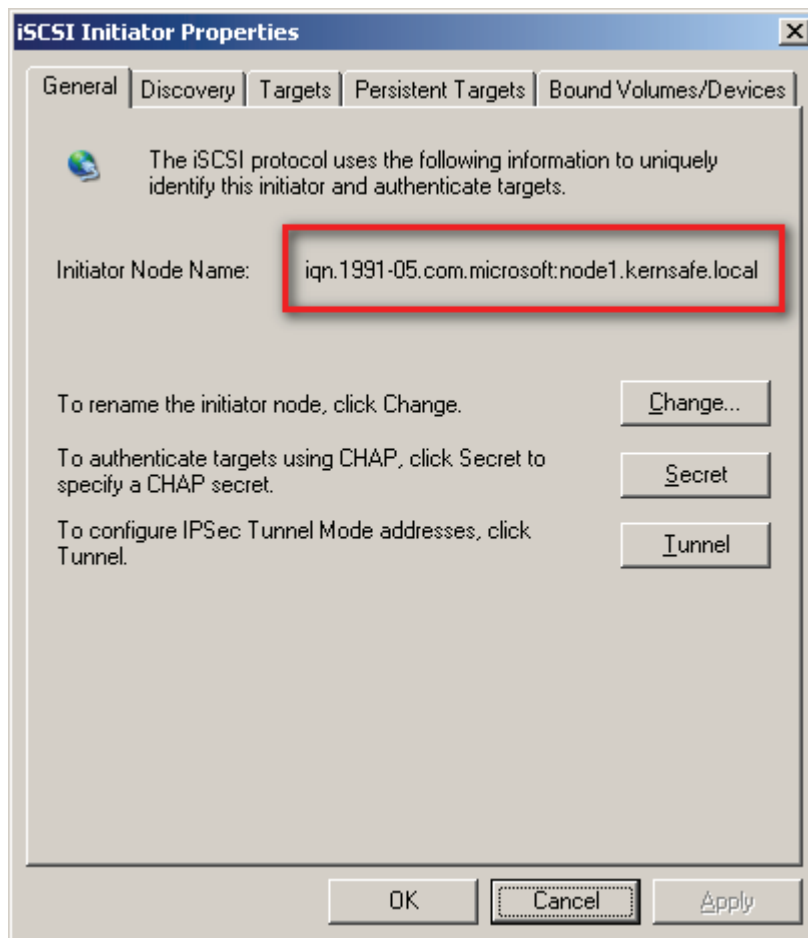
Restarting computer is needed.



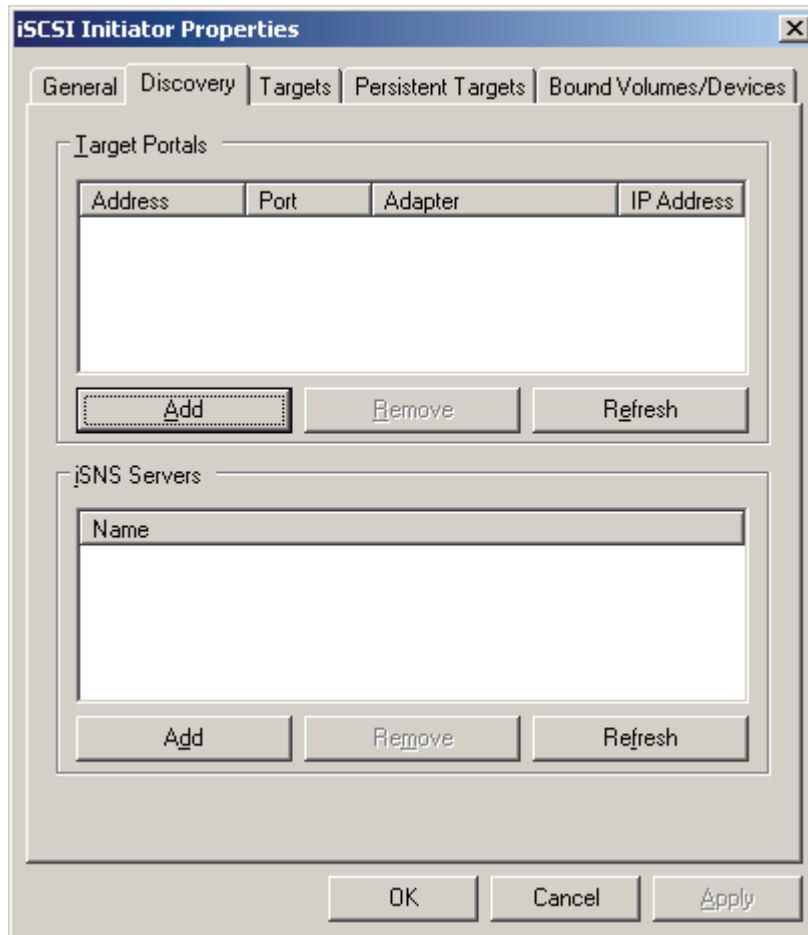
Press the **OK** button to restart computer.

Open iSCSI Initiator.



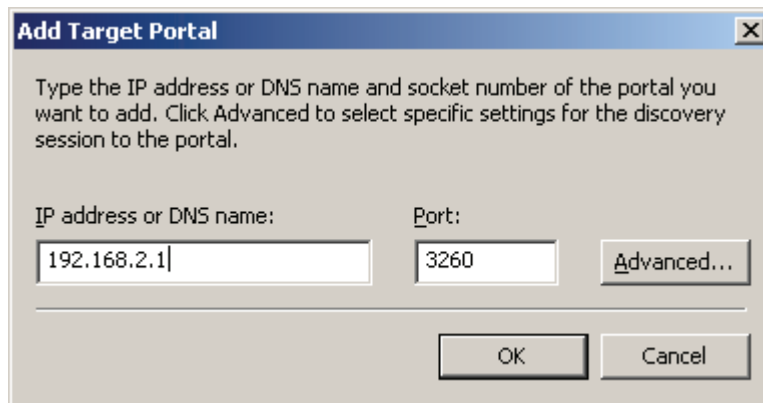


Change to Discovery page



Press the Add button in the Discovery page.

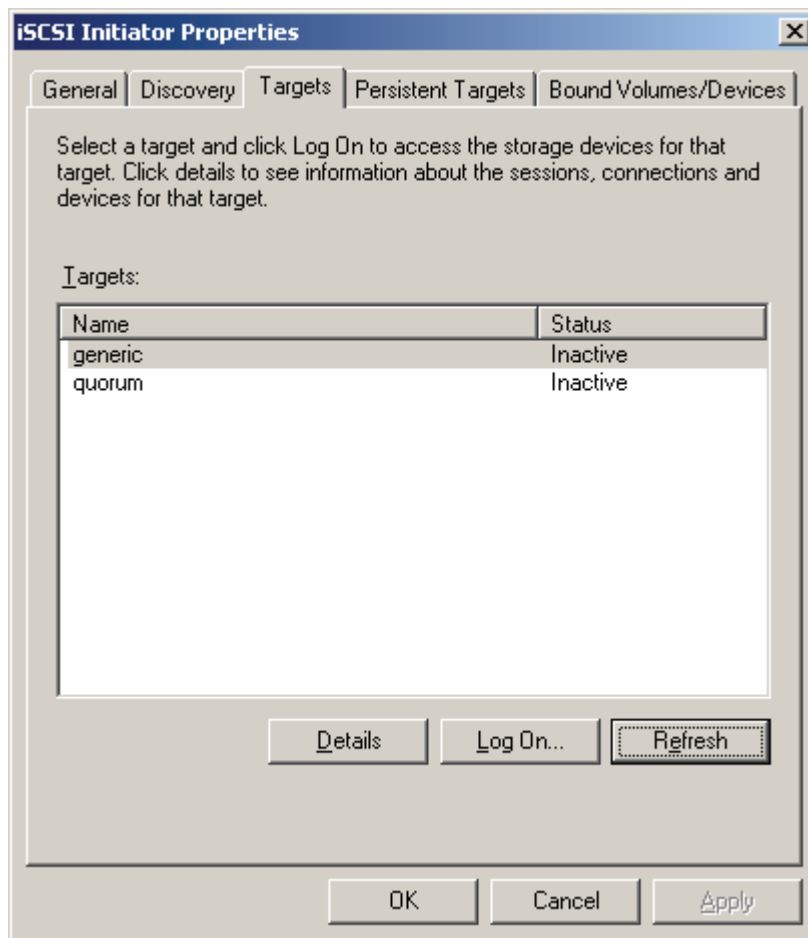
The **Add Target Portal dialog** is shown.



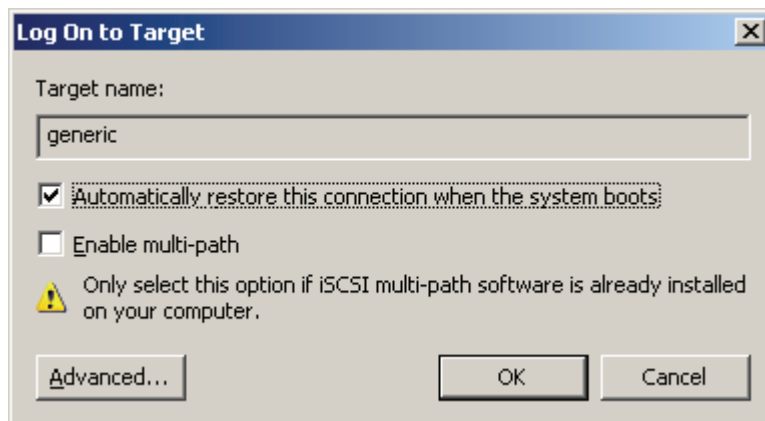
Press the Add button and enter the IP address of KernSafe iStorage Server, which is 192.168.2.1 here.

Press the **OK** button to continue.

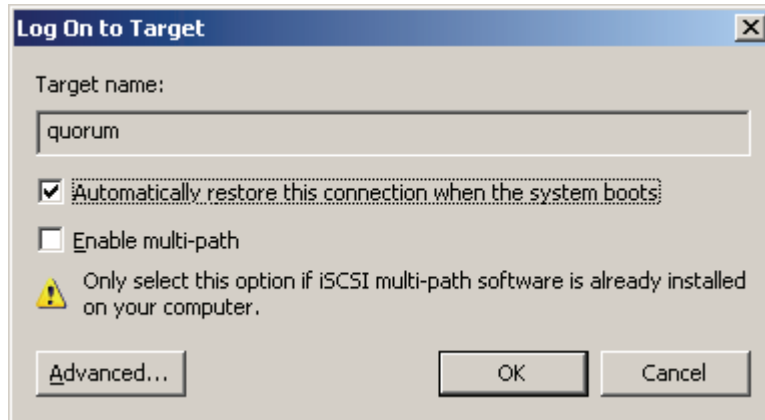
Change to Targets page



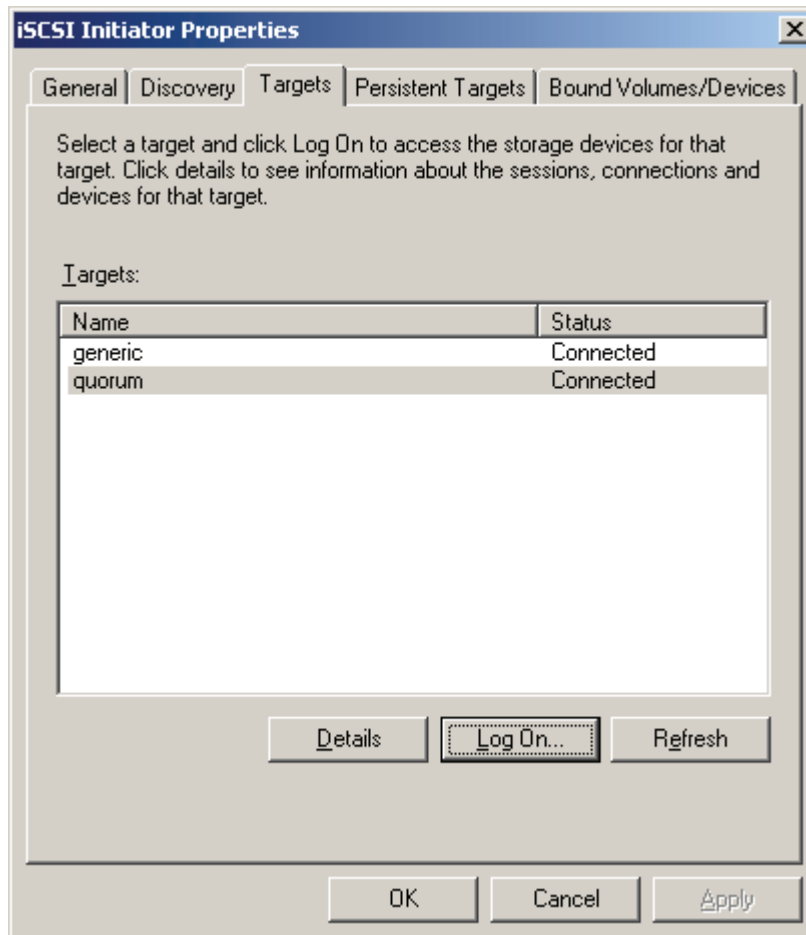
Select one Target and then press the **Log On** button, the **Log On to Target** dialog is shown.



Select generic and click Log On. Check **Automatically restore this connection when the system boots**.

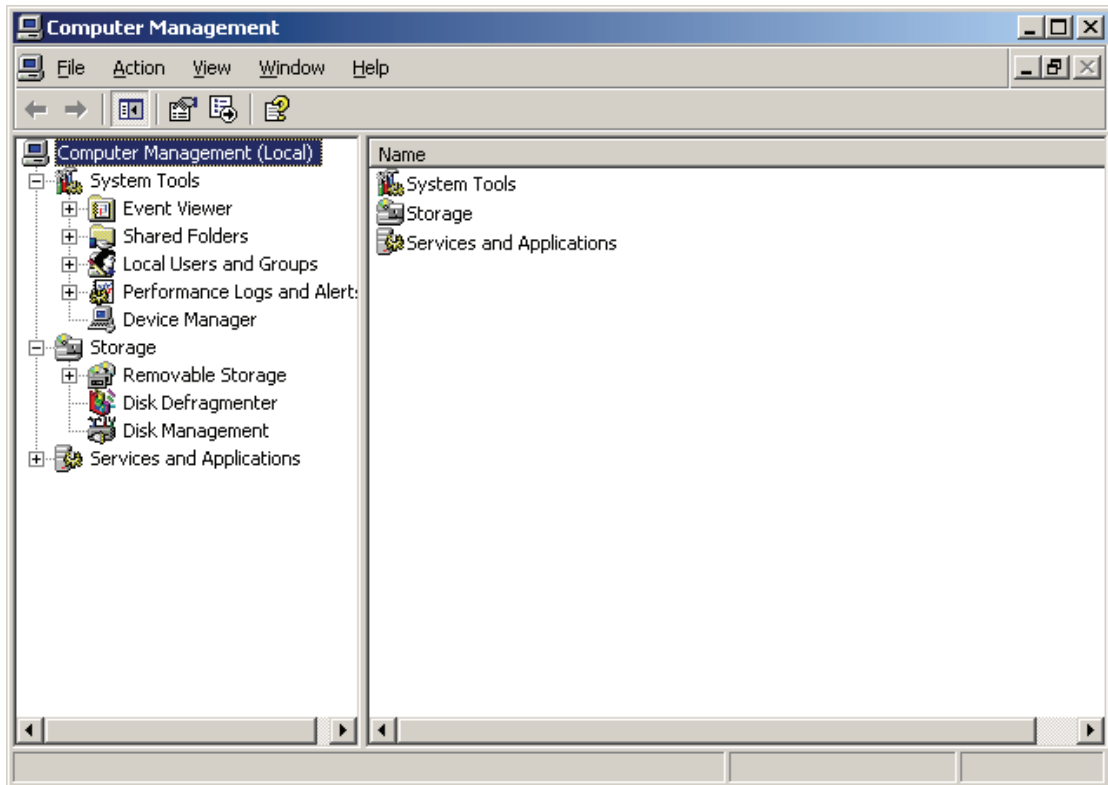


Select quorum and Log On. Check **Automatically restore this connection when the system boots** .



After the successful operation, the status is shown as in the picture.

Open Computer Management

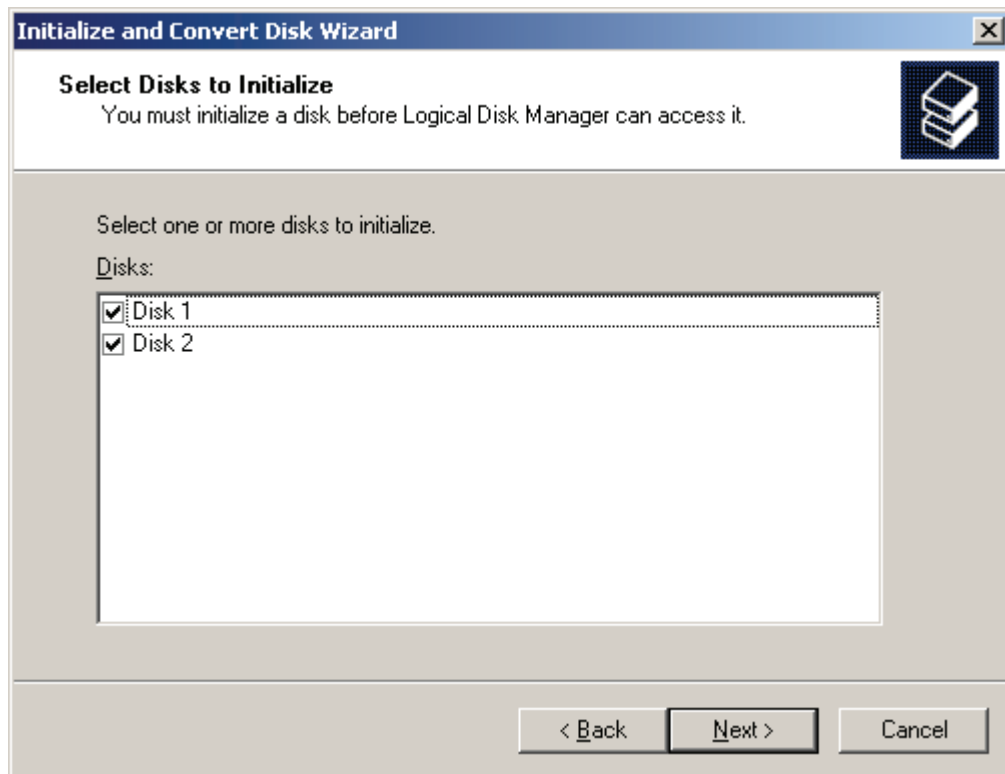


Select Disk Management, the **Initialize and Convert Disk Wizard** is shown.



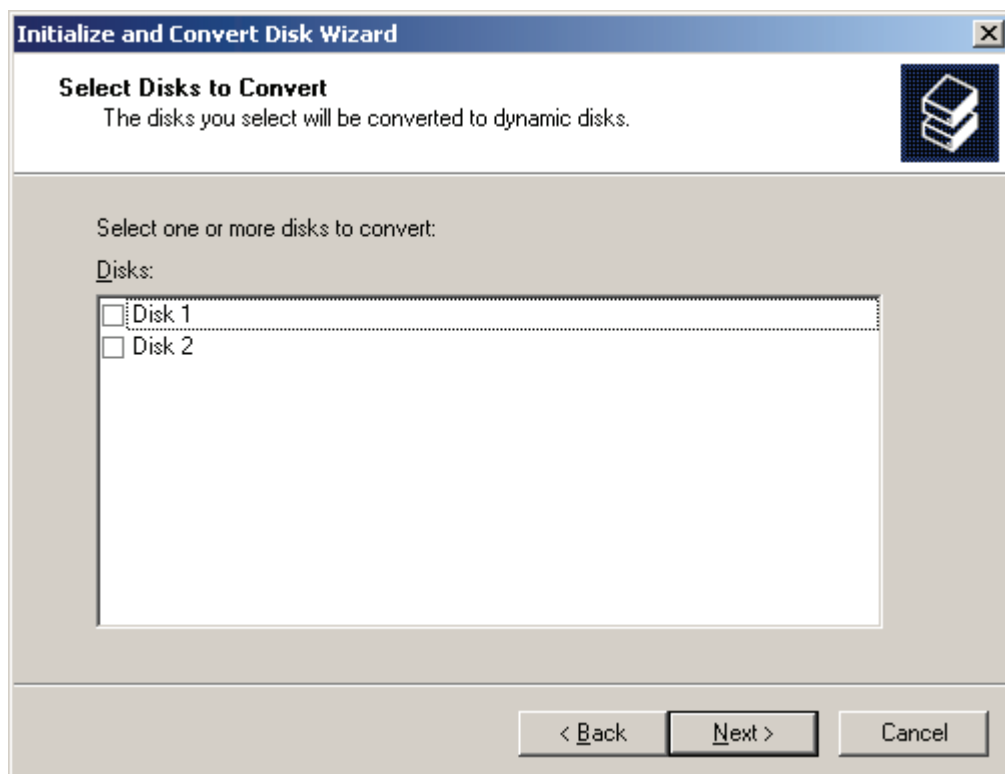
Press the **Next** button to continue.

Select disks to be initialized



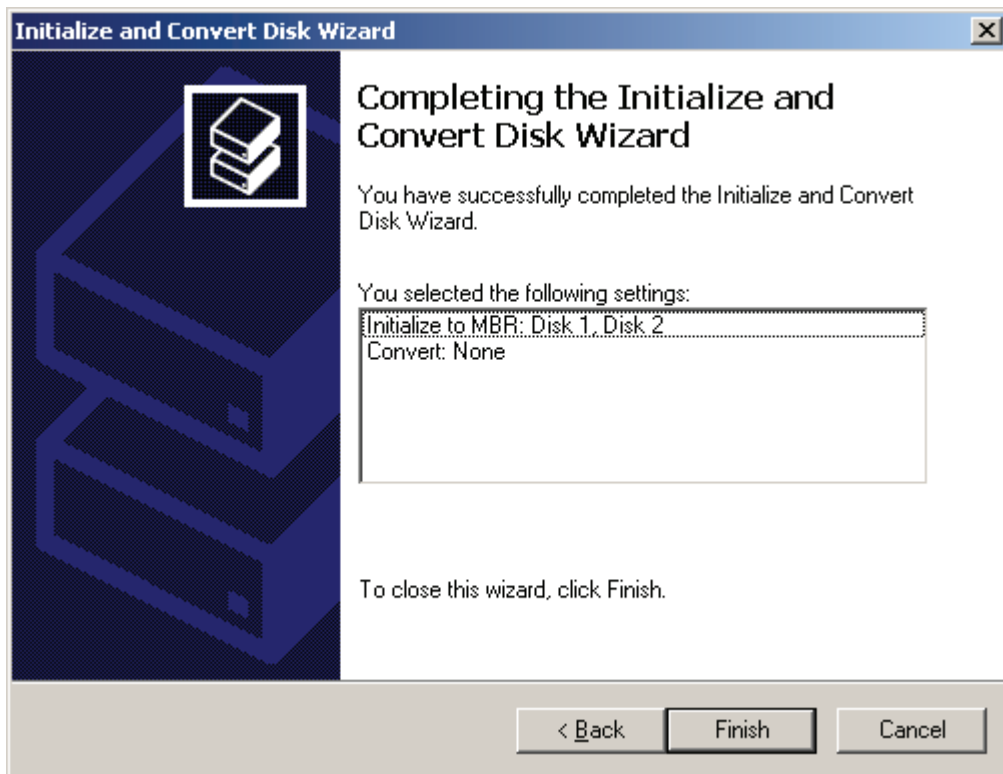
Press the **Next** button to continue.

Select disks to be converted



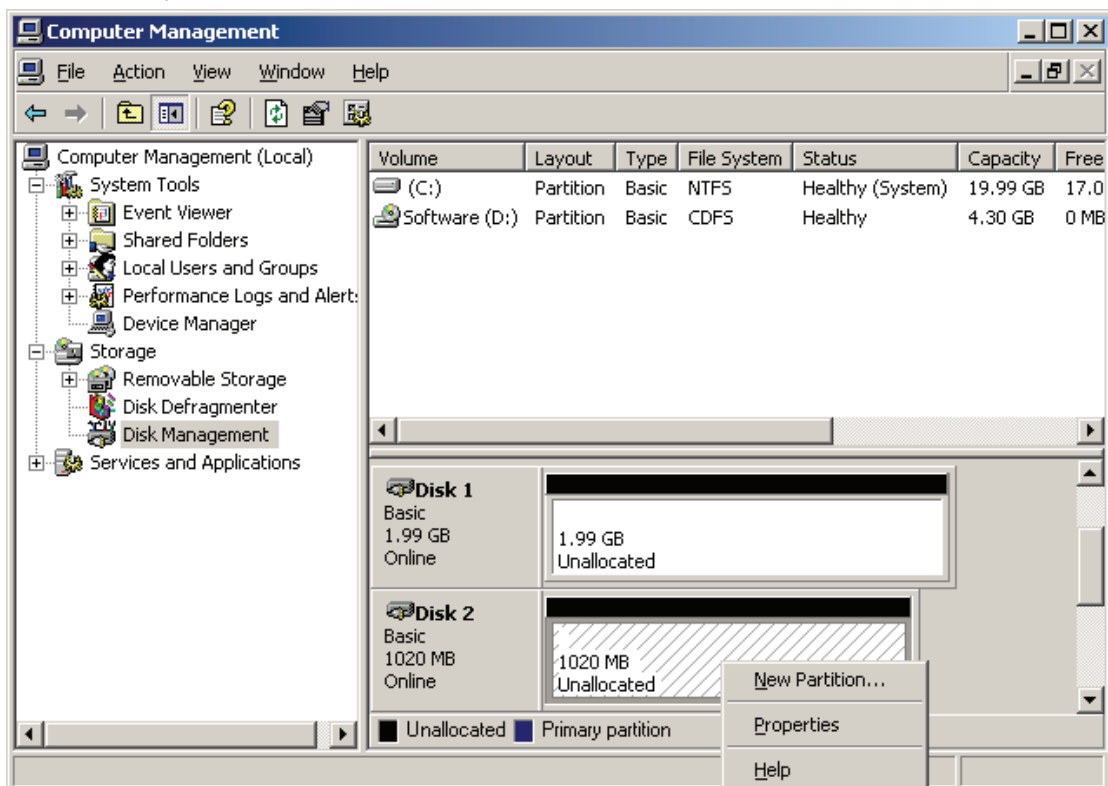
Do not select any one of them, press the **Next** button to continue.

Finish disks initialization

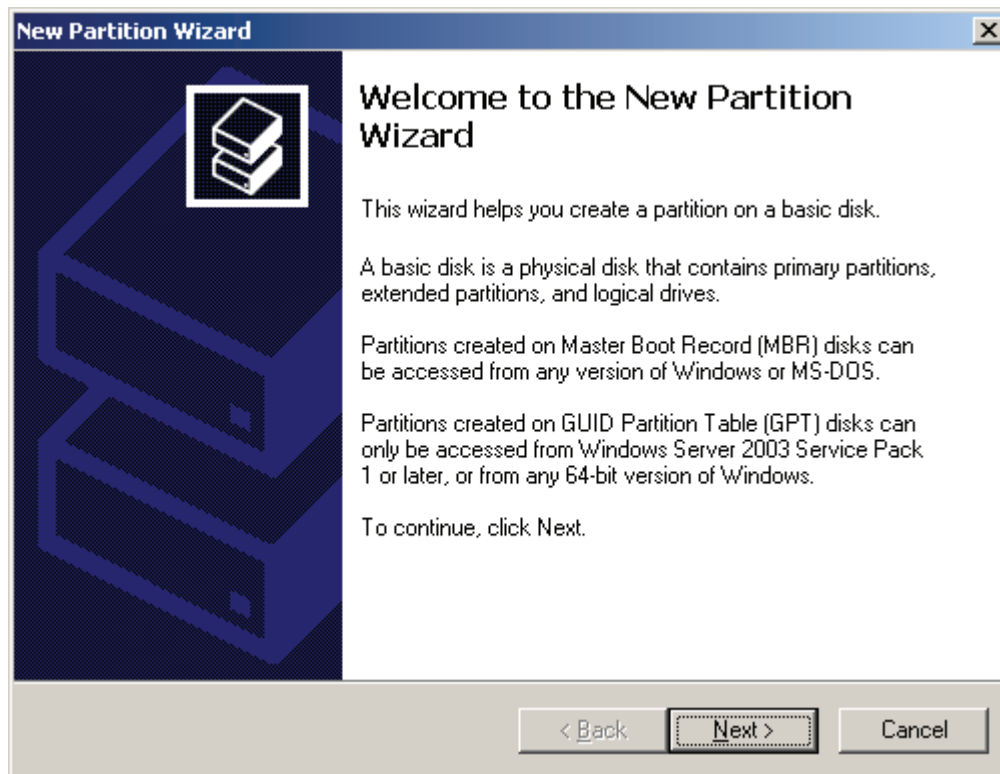


Press the **Finish** button.

Partition the quorum disk.

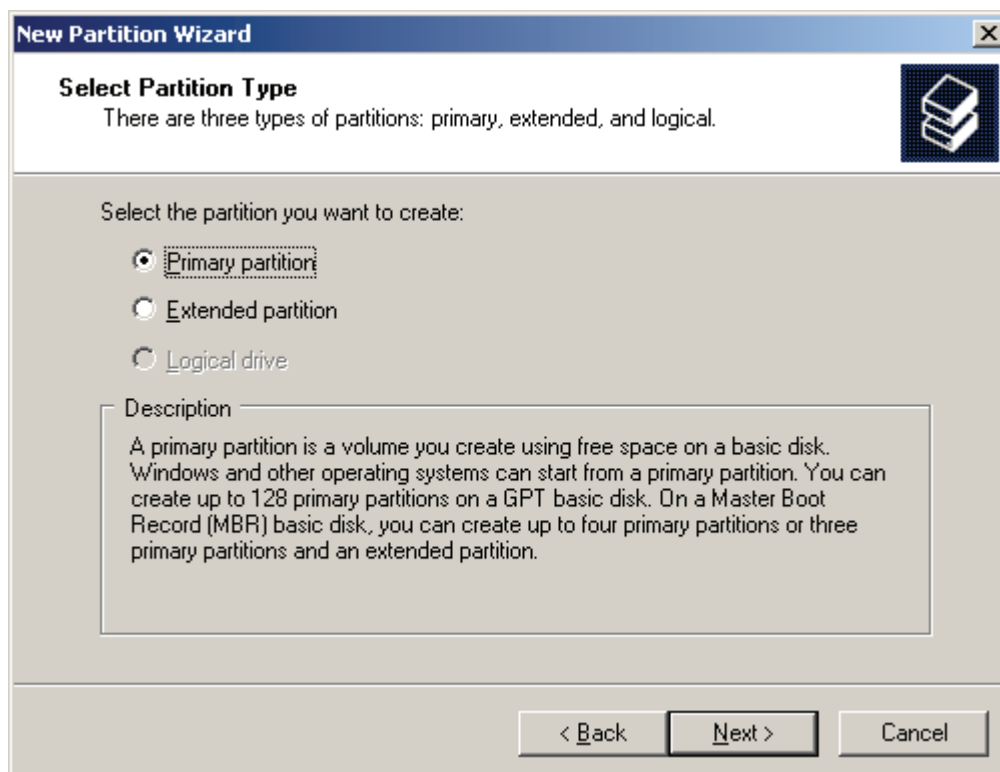


Right click on the disk and select New Partition, the **New Partition Wizard** is shown.



Press the **Next** button to continue.

Select Partition Type

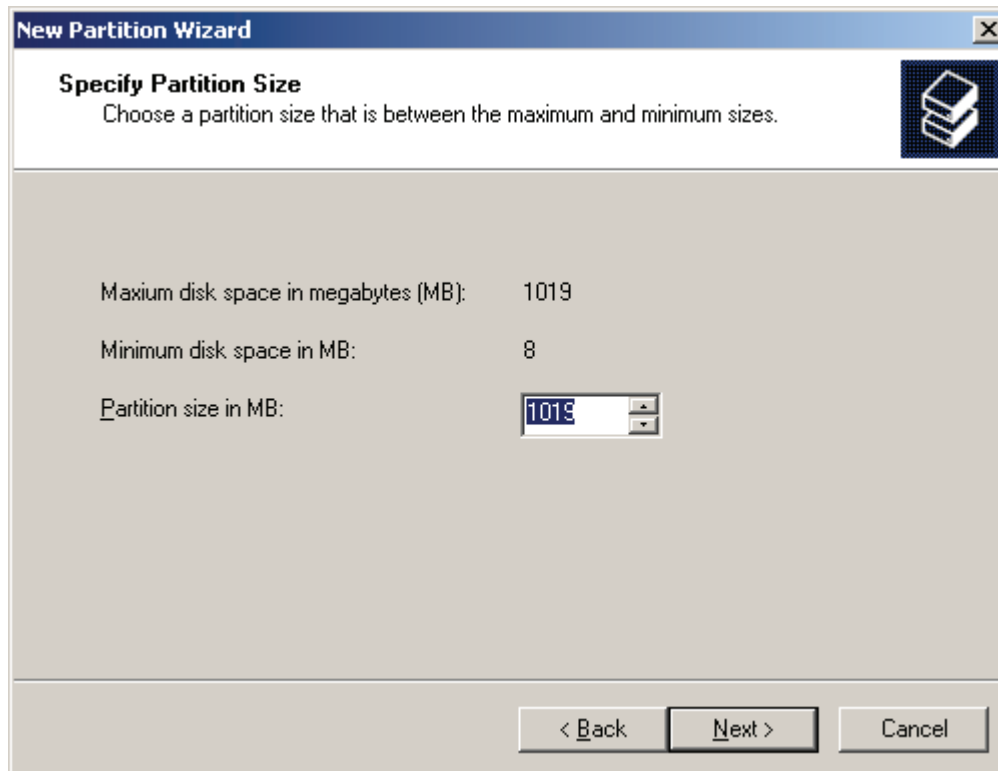


Select Primary partition.

Press the **Next** button to continue.



Specify partition size



**New Partition Wizard** [X]

**Specify Partition Size**  
Choose a partition size that is between the maximum and minimum sizes.

Maximum disk space in megabytes (MB): 1019

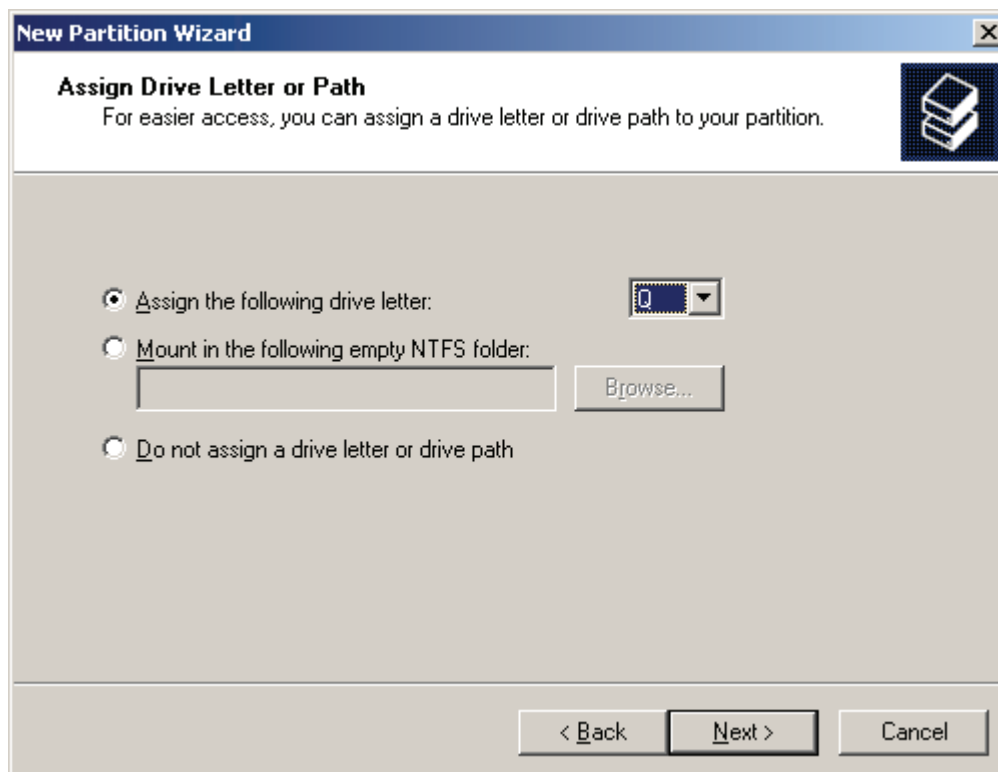
Minimum disk space in MB: 8

Partition size in MB:

< Back   Next >   Cancel

Press the **Next** button to continue.

Assign drive letter



**New Partition Wizard** [X]

**Assign Drive Letter or Path**  
For easier access, you can assign a drive letter or drive path to your partition.

Assign the following drive letter:

Mount in the following empty NTFS folder:

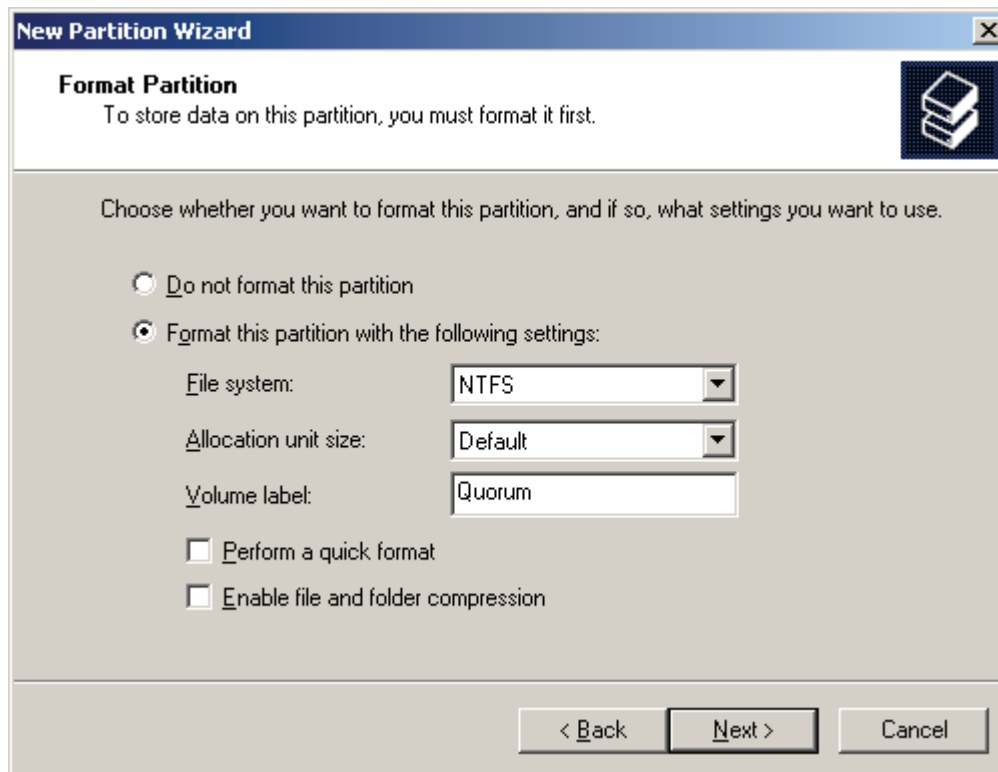
Do not assign a drive letter or drive path

< Back   Next >   Cancel

Assign Q as the drive letter.

Press the **Next** button to continue.

Format disk

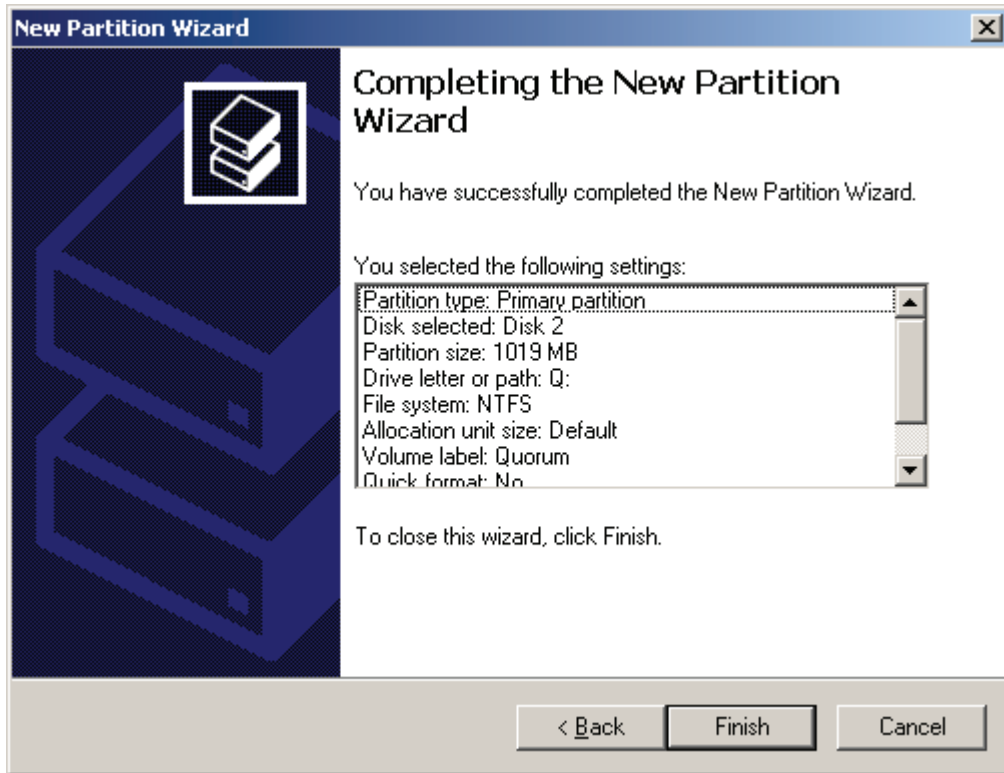


The screenshot shows the 'New Partition Wizard' dialog box, specifically the 'Format Partition' step. The title bar reads 'New Partition Wizard'. Below the title bar, the text says 'Format Partition' and 'To store data on this partition, you must format it first.' There is a small icon of a stack of disks on the right. The main area contains the instruction 'Choose whether you want to format this partition, and if so, what settings you want to use.' There are two radio button options: 'Do not format this partition' (unselected) and 'Format this partition with the following settings:' (selected). Under the selected option, there are three settings: 'File system:' set to 'NTFS', 'Allocation unit size:' set to 'Default', and 'Volume label:' set to 'Quorum'. There are also two checkboxes: 'Perform a quick format' (unchecked) and 'Enable file and folder compression' (unchecked). At the bottom, there are three buttons: '< Back', 'Next >', and 'Cancel'.

Enter Quorum as Volume label.

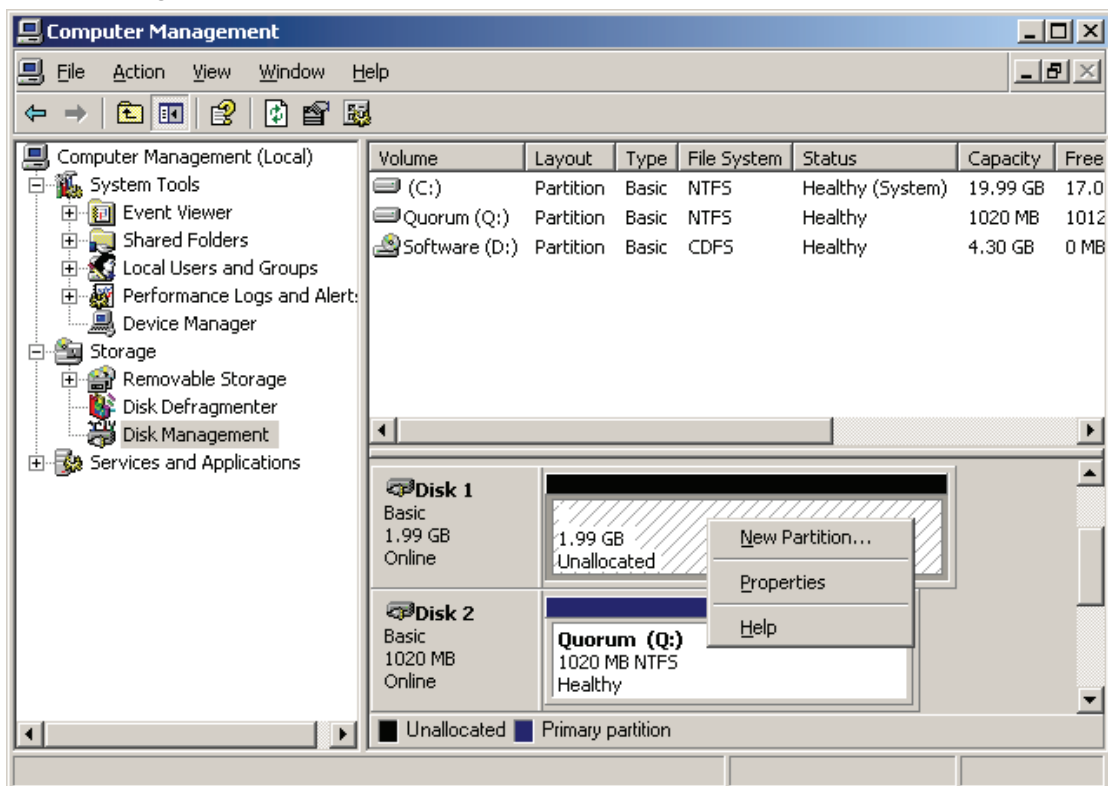
Press the **Next** button to continue.

Finish disk formatting

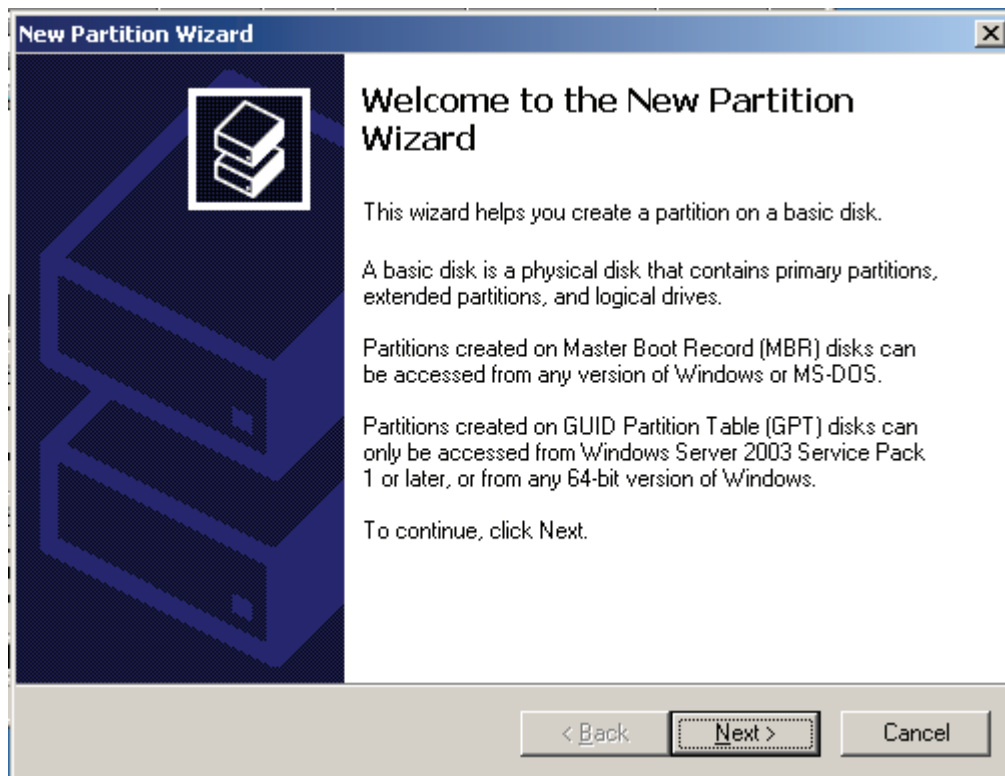


Press the **Finish** button to format the disk.

Partition the generic disk.

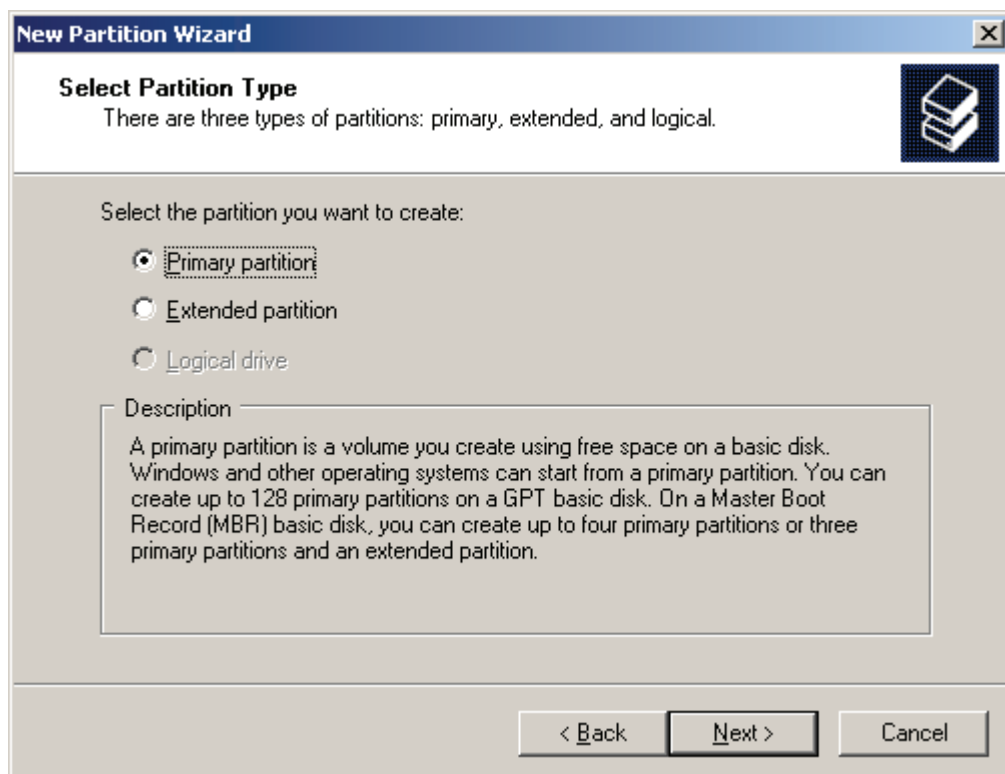


Right click on the disk and select **New Partition**, the **New Partition Wizard** is shown.



Press the **Next** button to continue.

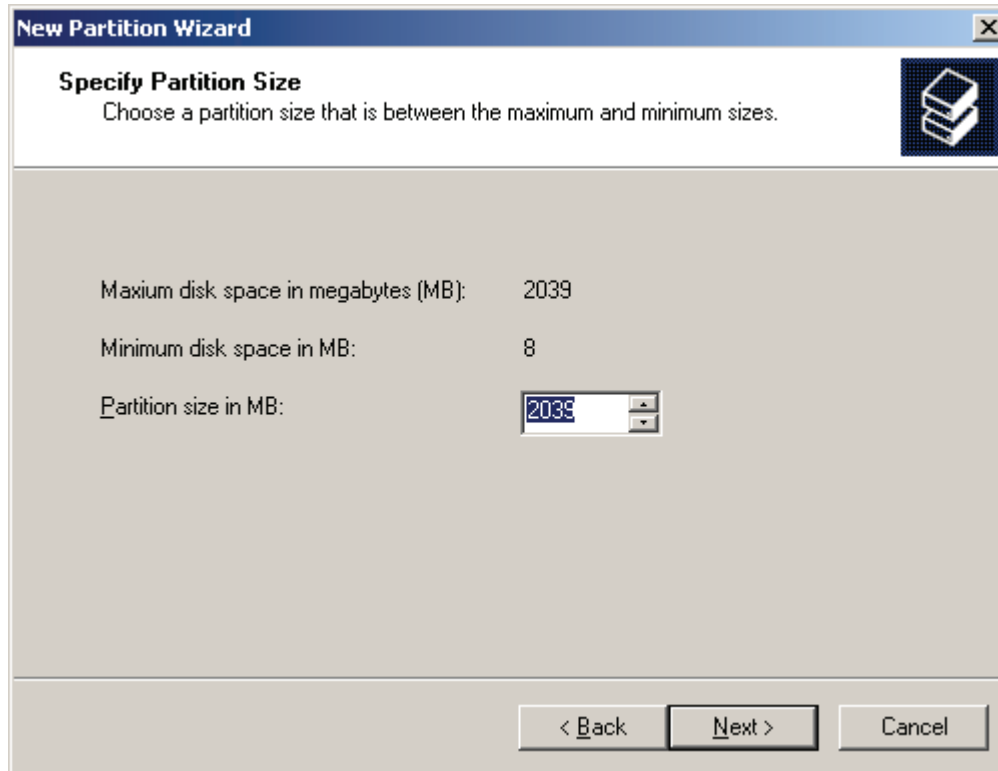
Select partition type



Select Primary partition.

Press the **Next** button to continue.

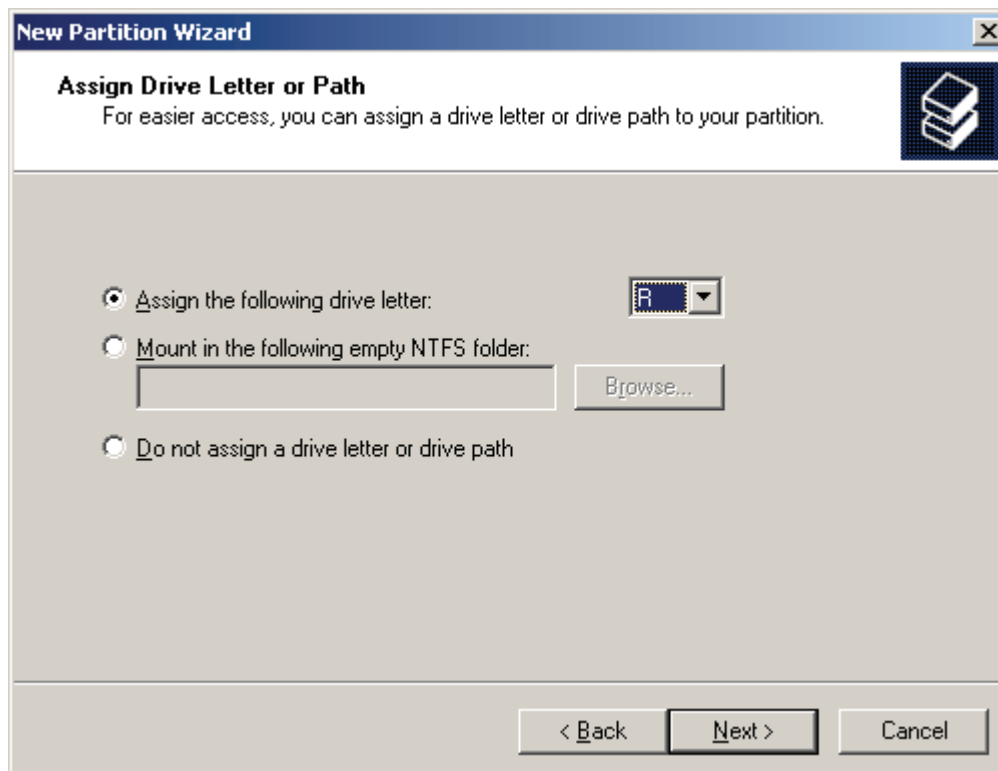
### Specify partition size



The screenshot shows the 'New Partition Wizard' window at the 'Specify Partition Size' step. The title bar reads 'New Partition Wizard' with a close button. The main heading is 'Specify Partition Size' with a sub-instruction: 'Choose a partition size that is between the maximum and minimum sizes.' A floppy disk icon is in the top right. The main area contains three rows of information: 'Maximum disk space in megabytes (MB): 2039', 'Minimum disk space in MB: 8', and 'Partition size in MB: 2039'. The '2039' is in a text box with up and down arrows. At the bottom are three buttons: '< Back', 'Next >', and 'Cancel'.

Press the **Next** button to continue.

### Assign a drive letter

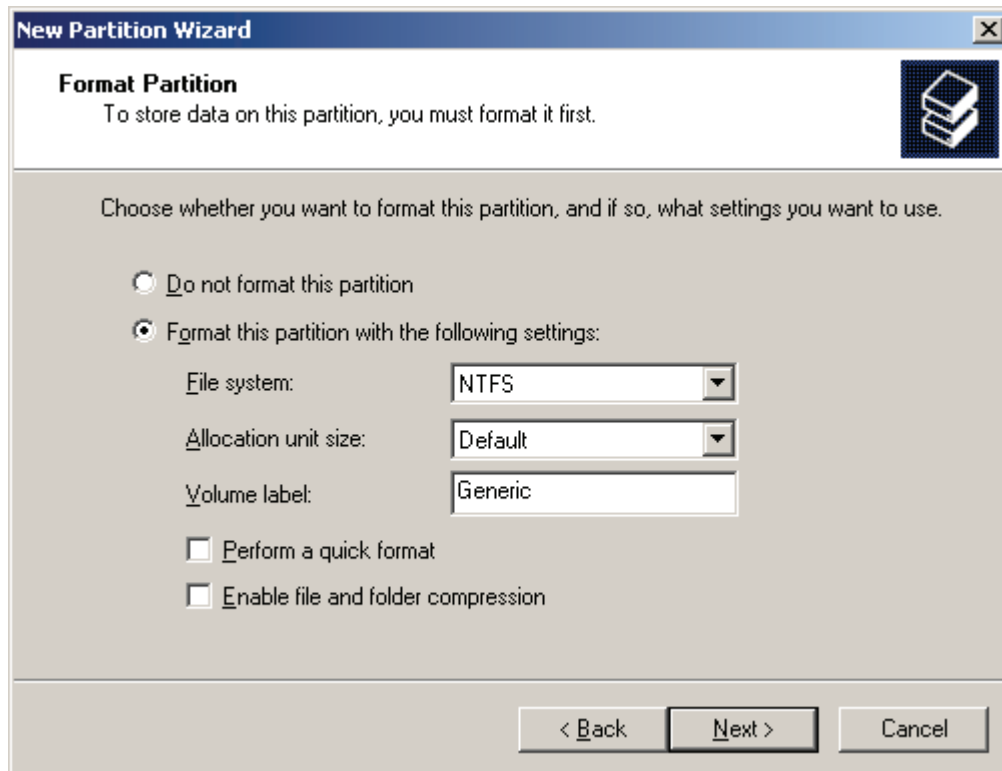


The screenshot shows the 'New Partition Wizard' window at the 'Assign Drive Letter or Path' step. The title bar reads 'New Partition Wizard' with a close button. The main heading is 'Assign Drive Letter or Path' with a sub-instruction: 'For easier access, you can assign a drive letter or drive path to your partition.' A floppy disk icon is in the top right. The main area contains three radio button options: 1) 'Assign the following drive letter:' with a dropdown menu showing 'R'; 2) 'Mount in the following empty NTFS folder:' with an empty text box and a 'Browse...' button; 3) 'Do not assign a drive letter or drive path'. At the bottom are three buttons: '< Back', 'Next >', and 'Cancel'.

Assign Q as the drive letter.

Press the **Next** button to continue.

Format the disk

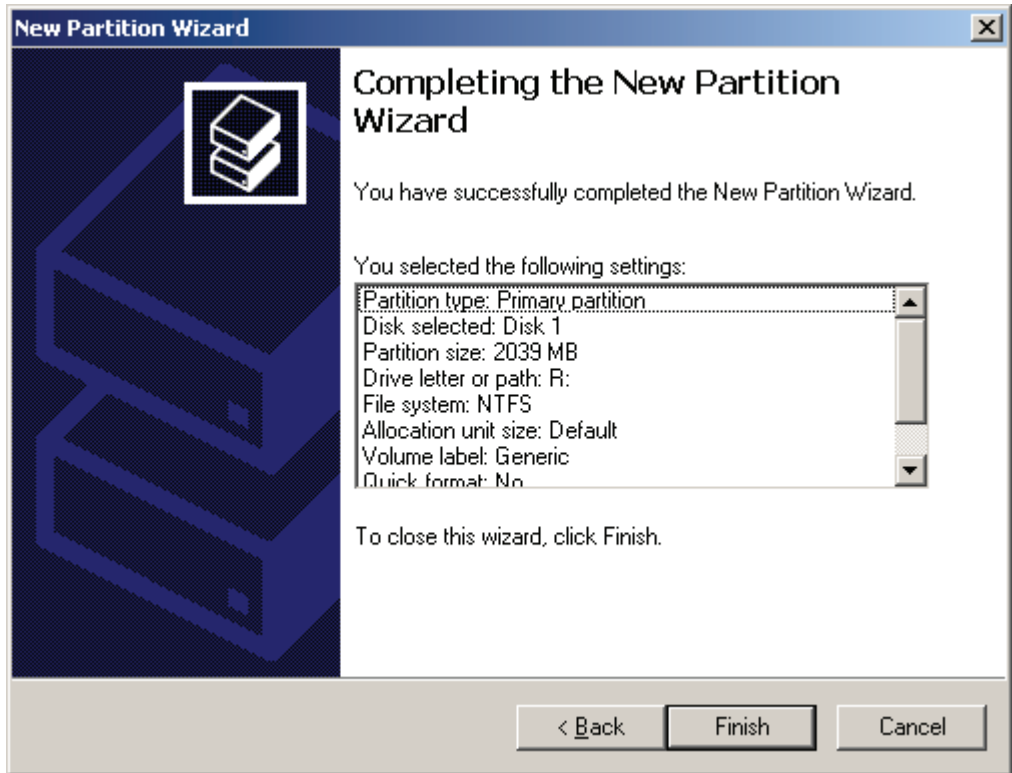


The screenshot shows the 'New Partition Wizard' dialog box, specifically the 'Format Partition' step. The title bar reads 'New Partition Wizard'. Below the title bar, the text 'Format Partition' is displayed, followed by the instruction 'To store data on this partition, you must format it first.' A small icon of a hard drive is visible in the top right corner. The main area contains the instruction 'Choose whether you want to format this partition, and if so, what settings you want to use.' There are two radio button options: 'Do not format this partition' (unselected) and 'Format this partition with the following settings:' (selected). Under the selected option, there are three settings: 'File system:' set to 'NTFS', 'Allocation unit size:' set to 'Default', and 'Volume label:' set to 'Generic'. There are also two checkboxes: 'Perform a quick format' (unchecked) and 'Enable file and folder compression' (unchecked). At the bottom, there are three buttons: '< Back', 'Next >', and 'Cancel'.

Enter Generic as Volume label.

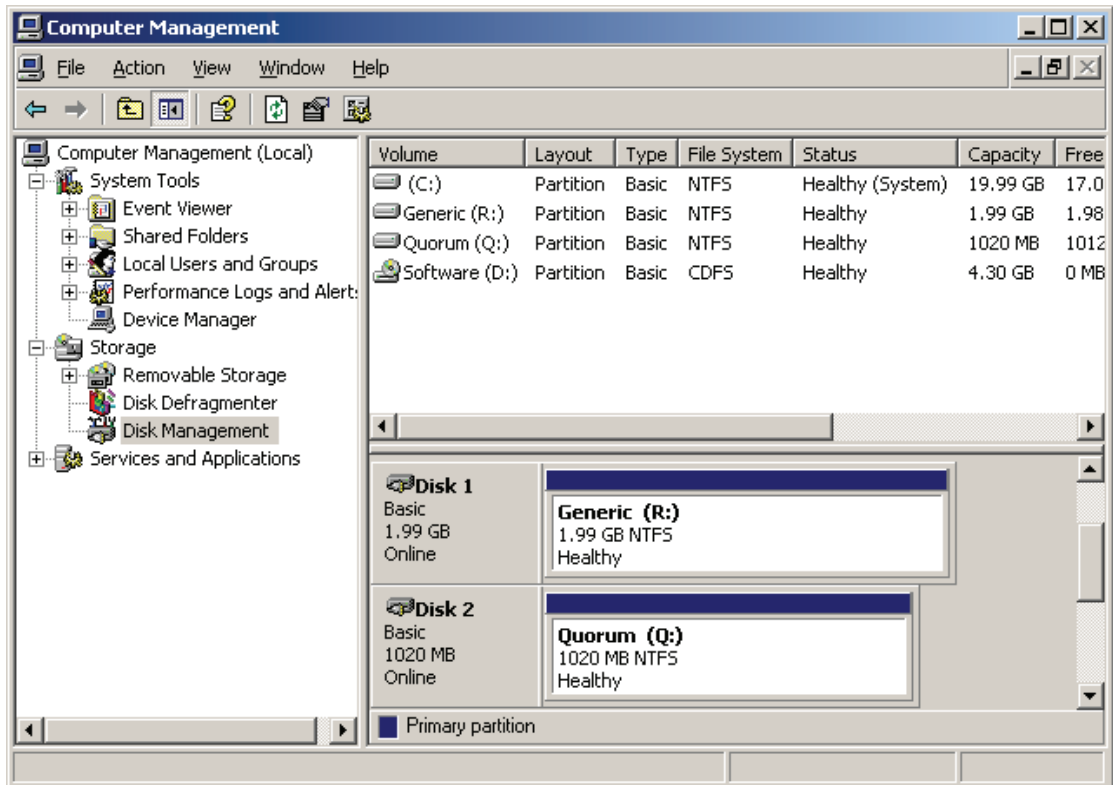
Press the **Next** button to continue

Finish partition disk.



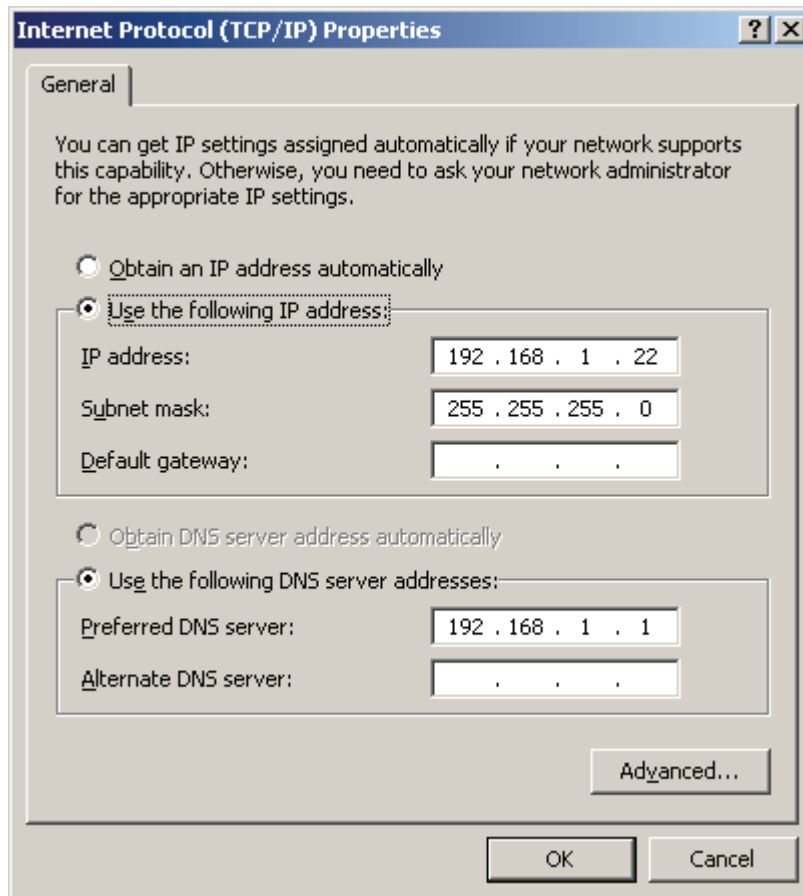
Press the **Finish** button.

Come back to the Computer Management console, after the successful operation, the status is shown as in the figure.



## 5. Node2 Settings

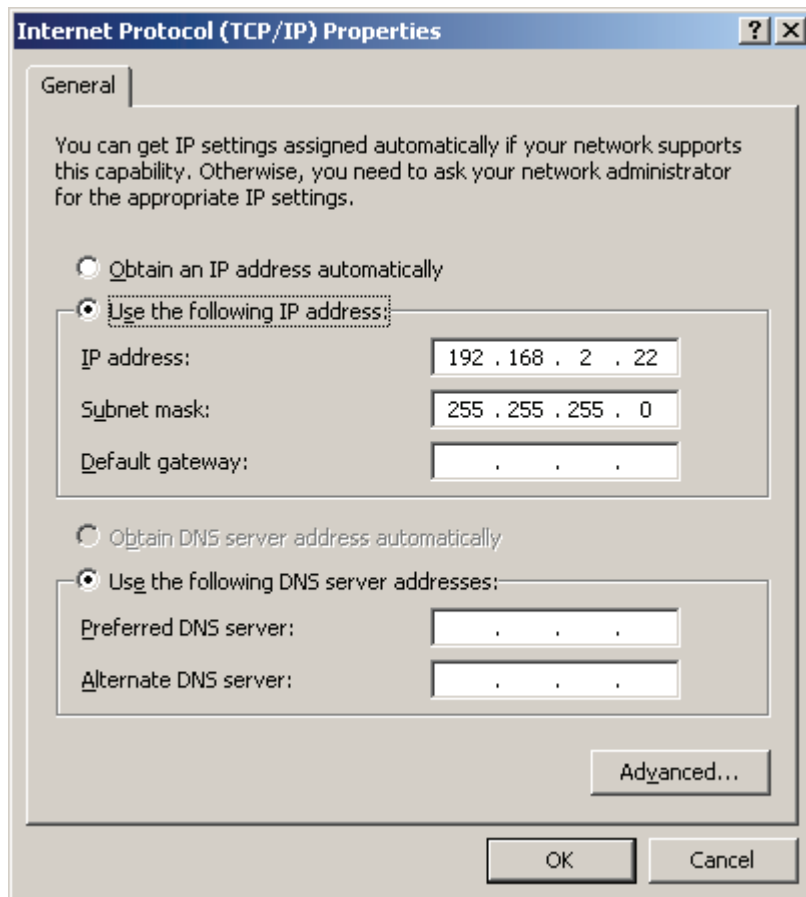
Networking settings



Set the first network adapter of node2 as shown in the figure.

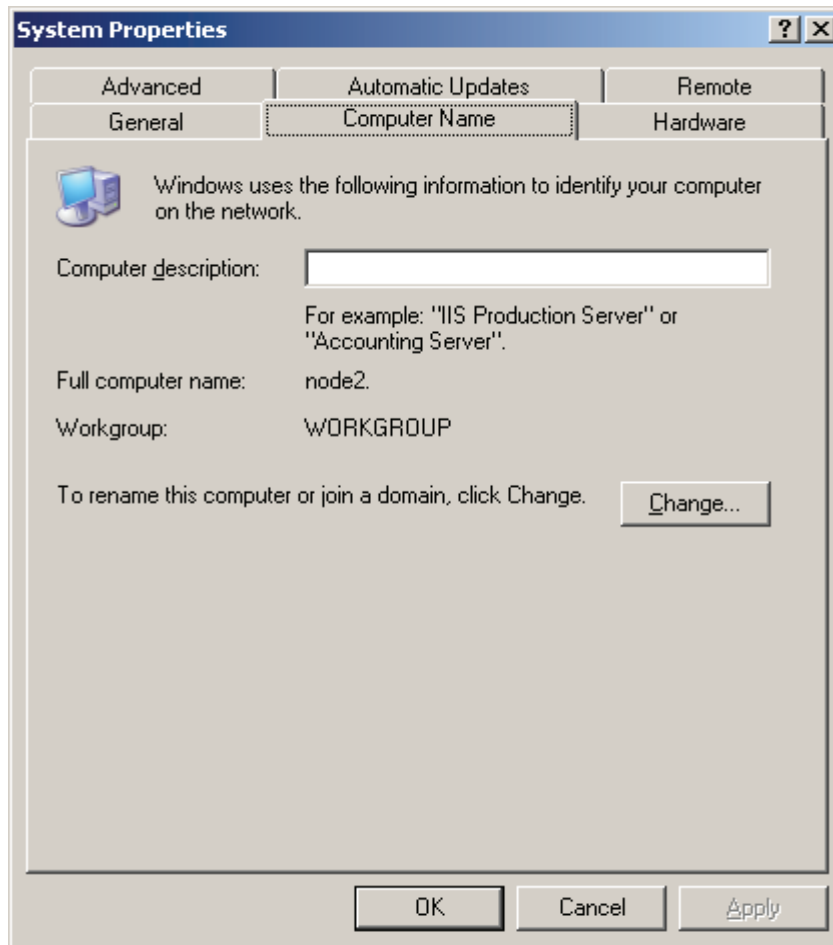
IP address is set as 192.168.1.22, Subnet mask is set as 255.255.255.0 and **Rreferred DNS Server** is set as 192.168.1.1.



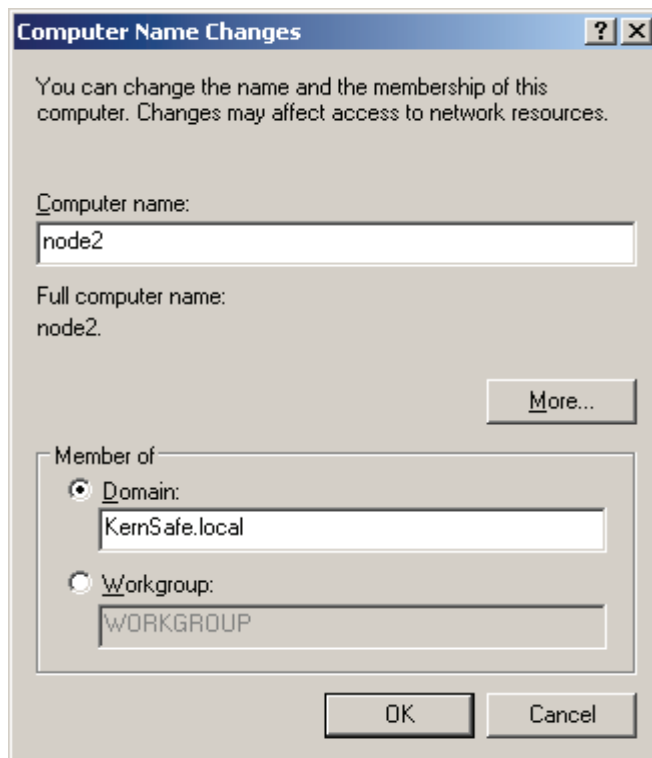


Set the second network adapter of node2 as shown in the picture.  
IP address is set as 192.168.2.22 and Subnet mask is set as 255.255.255.0.

Add nodes to domain, open **System Properties** page



Click Change in the page of Computer Name, the **Computer Name Changes** dialog is shown.



Select Domain and enter Domain name, which is KernSafe.local here.

Press the **OK** button, the **Computer Names Changes dialog** is shown.

Specify user and password

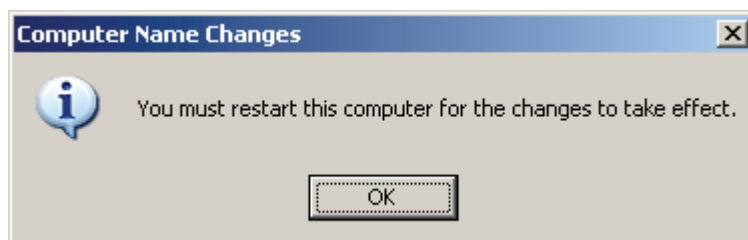


Enter the username and password of node2.

Press the **OK** button, and then the **Computer Name Changes** message dialog is shown.

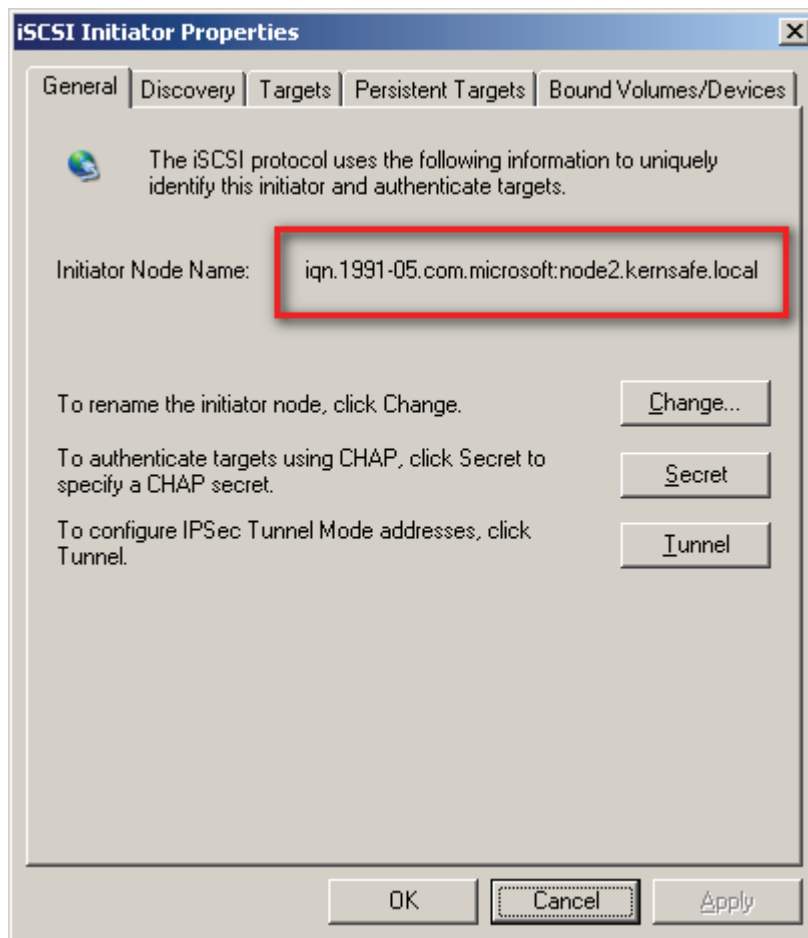


Press the **OK** button, and then the **Computer Name Changes** dialog is shown.

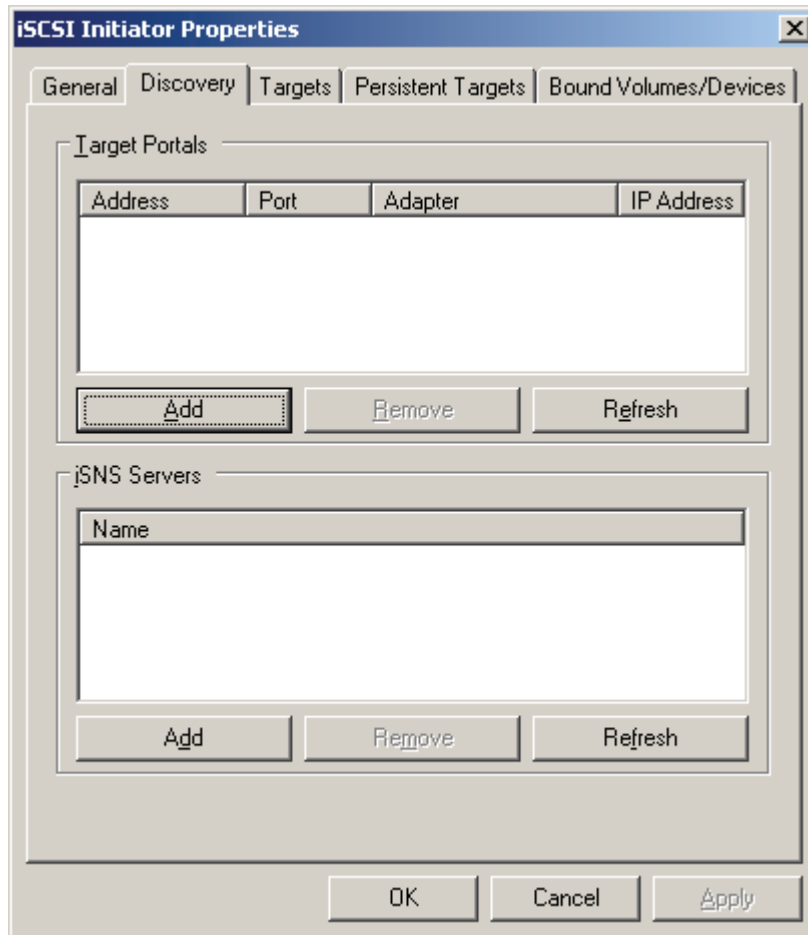


Press the **OK** button to restart the computer.

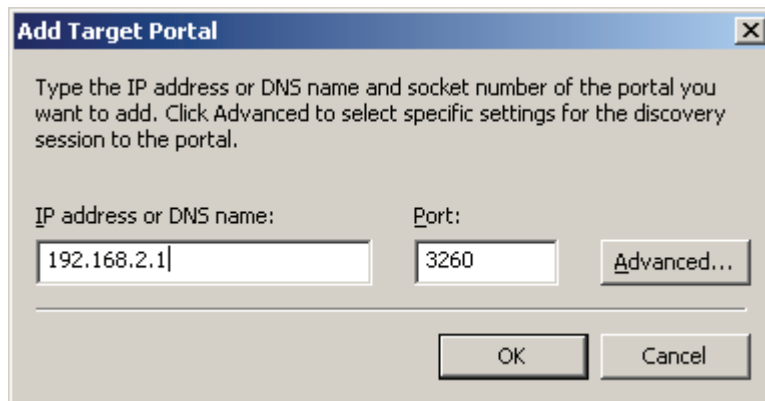
Launch Microsoft iSCSI Initiator.



Change to **Discovery** page



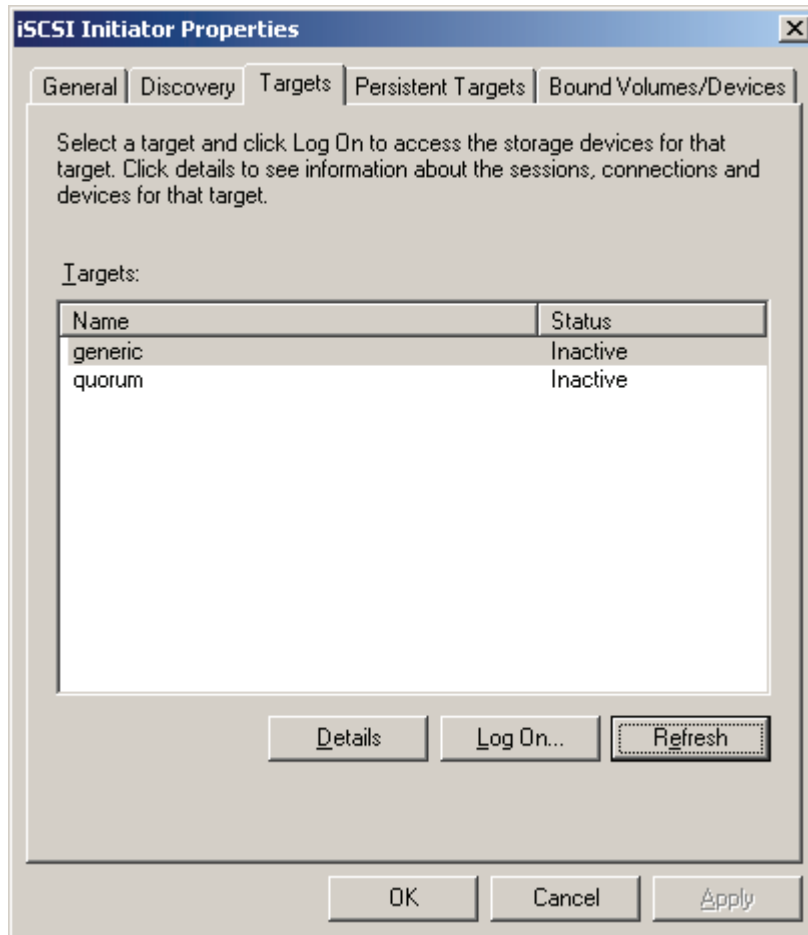
Press the **Add** button in the Discovery page and then the **Add Target Portal dialog** is shown.



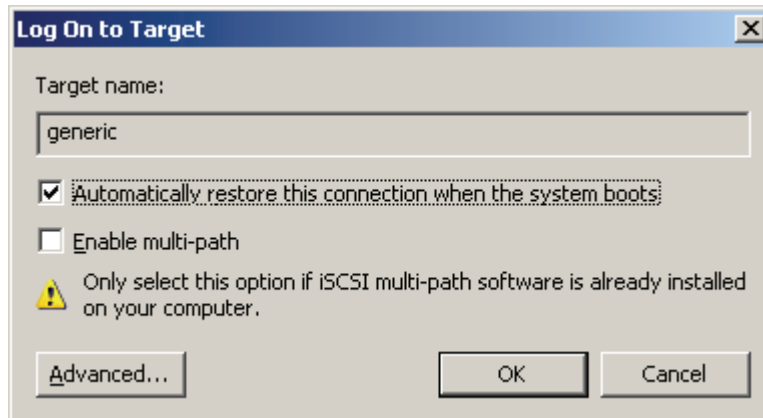
Press the **Add** button and enter the IP address of KernSafe iStorage Server, which is 192.168.2.1 here.

Press the **OK** button to continue.

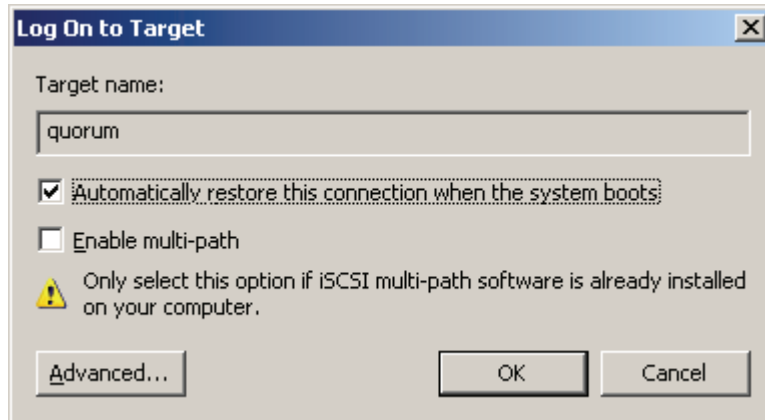
Change to the **Targets** page



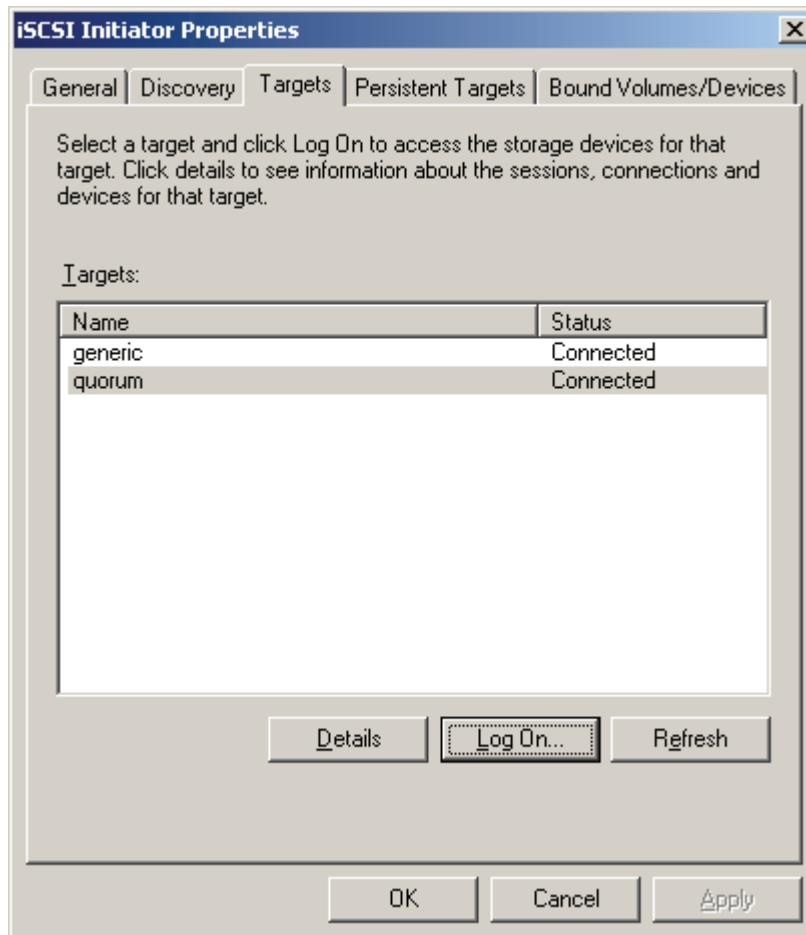
Select a Target and then press the **Log On** button, the **Log On to Target dialog** is shown.



Select generic and click the **Log On** button. Check **Automatically restore this connection when the system boots**.

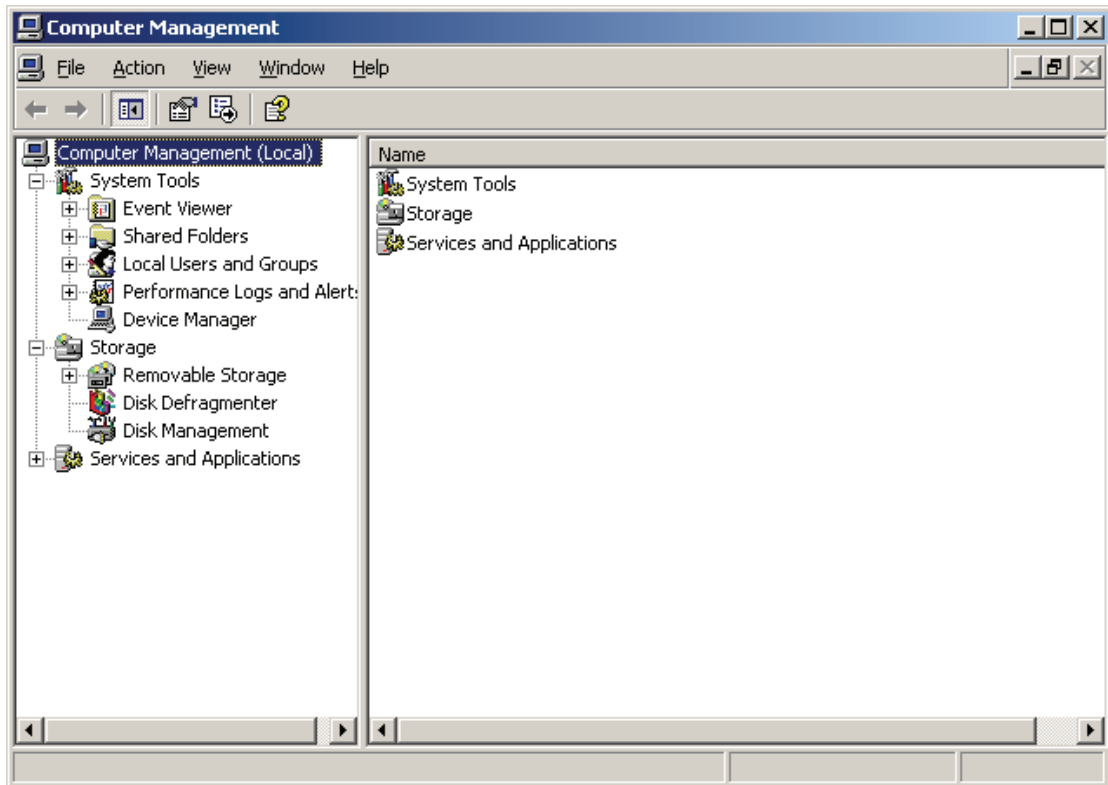


Select quorum and click the **Log On** button. Check **Automatically restore this connection when the system boots**.

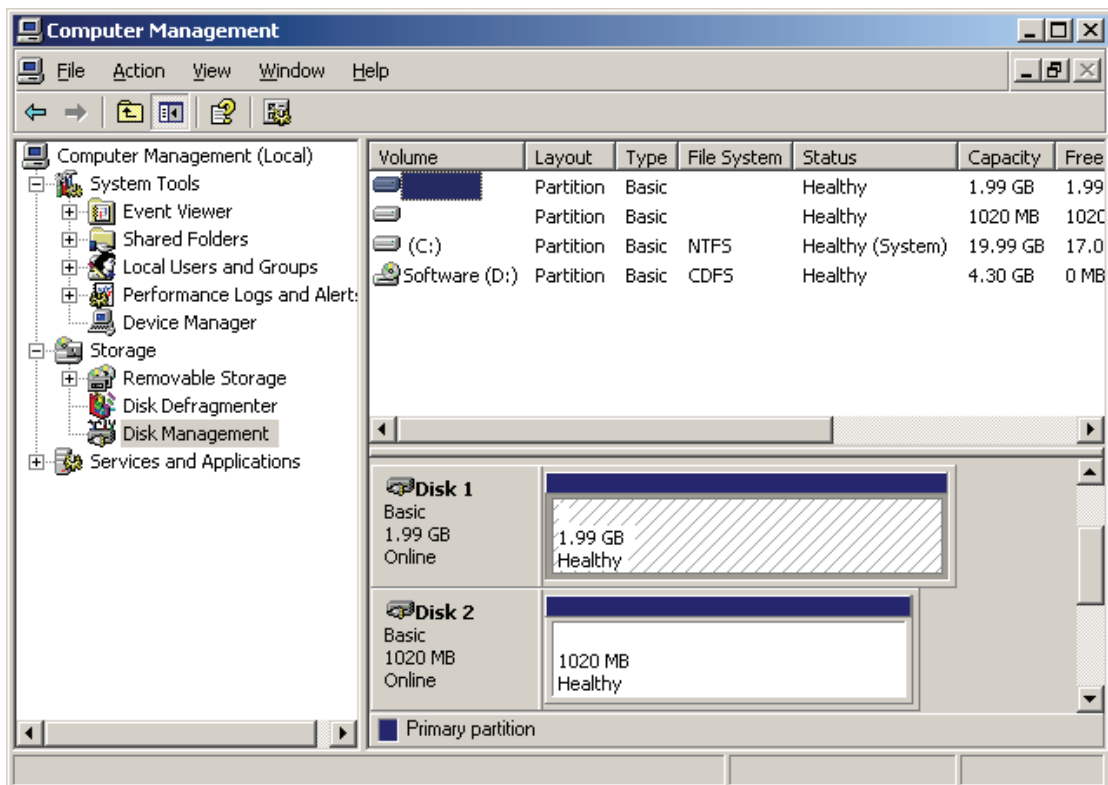


After the successful operation, the status is shown as in the figure.

Open **Computer Management Console**

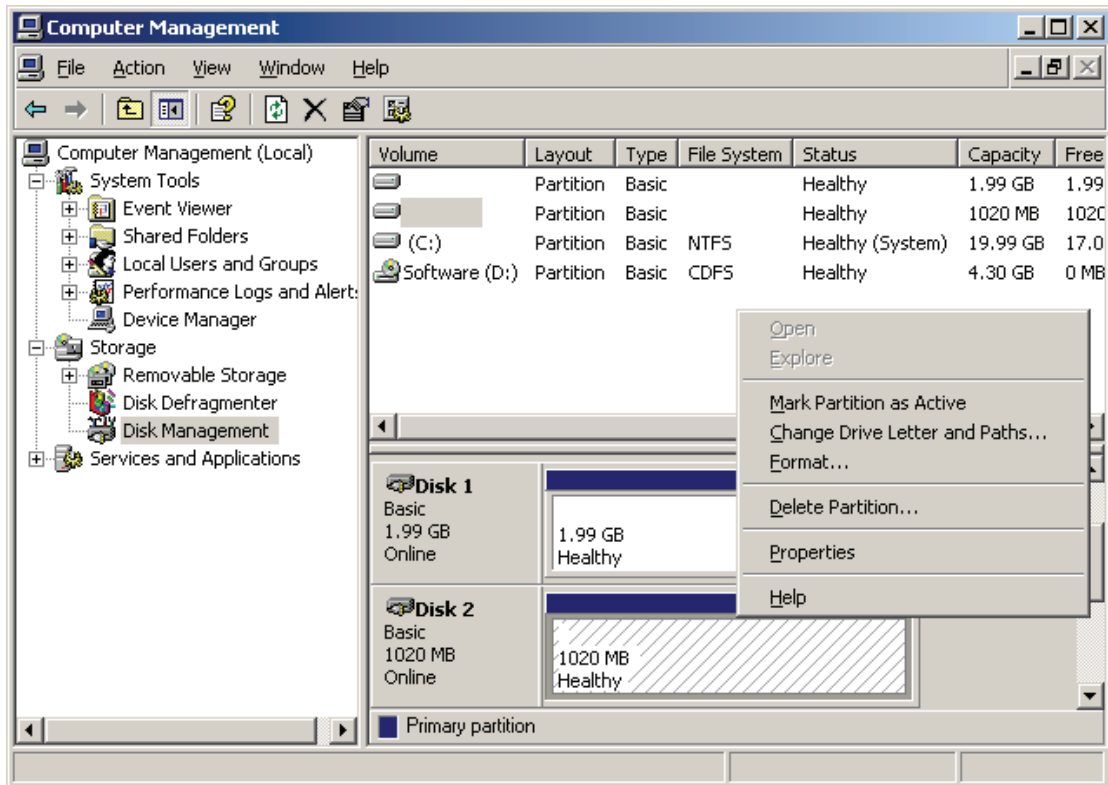


Open Computer Management and select Disk Management.

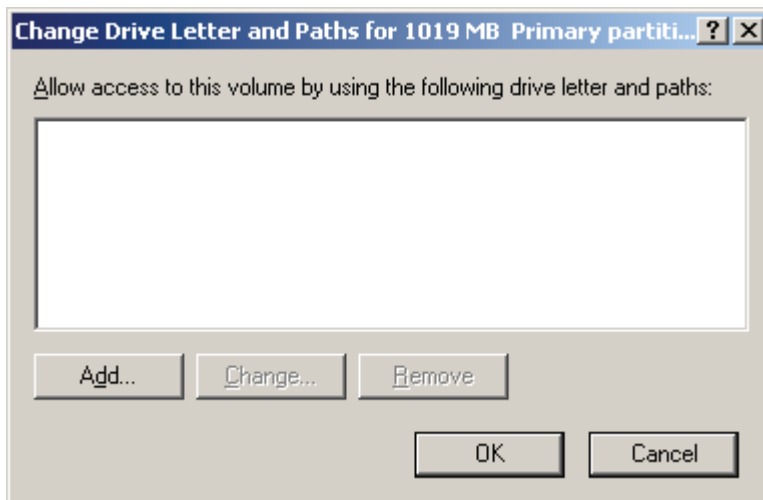


Assign drive letters

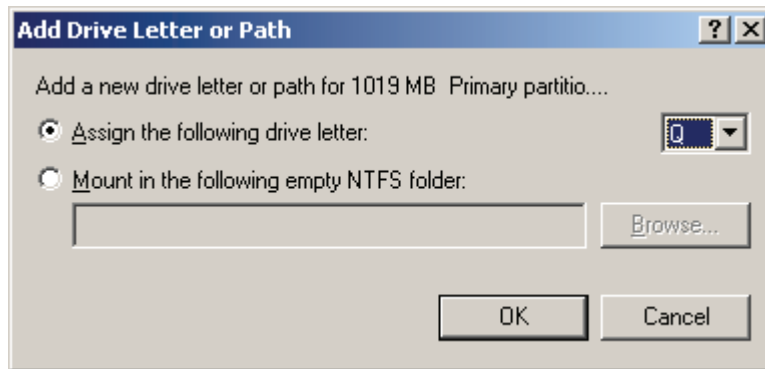




Right click on quorum disk and select Change Drive Letter and Paths.



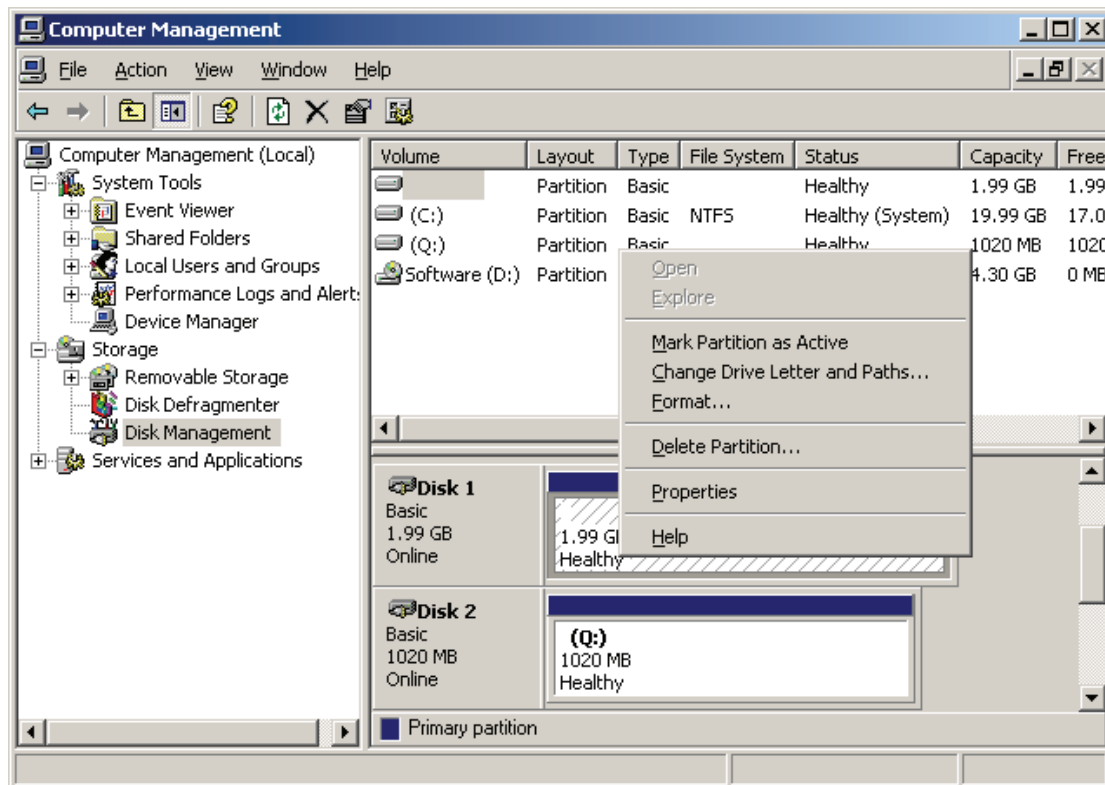
Click the **Add** button, and the **Add Drive Letter or Path dialog** is shown.



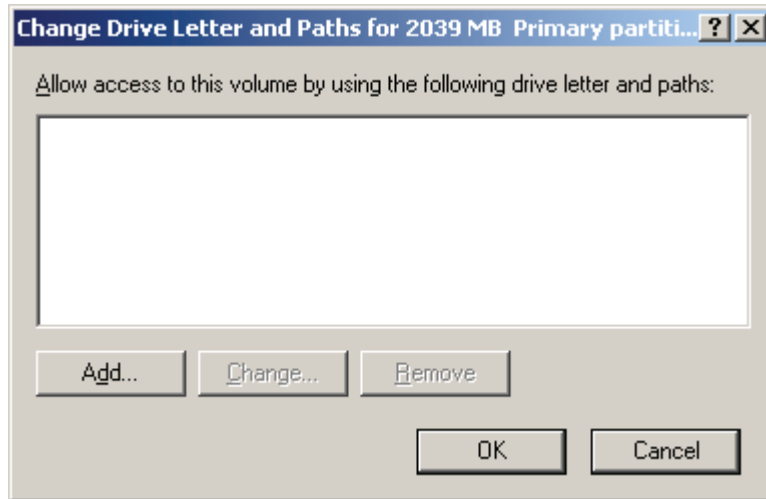
Assign **Q** as drive letter.

Press the **OK** button.

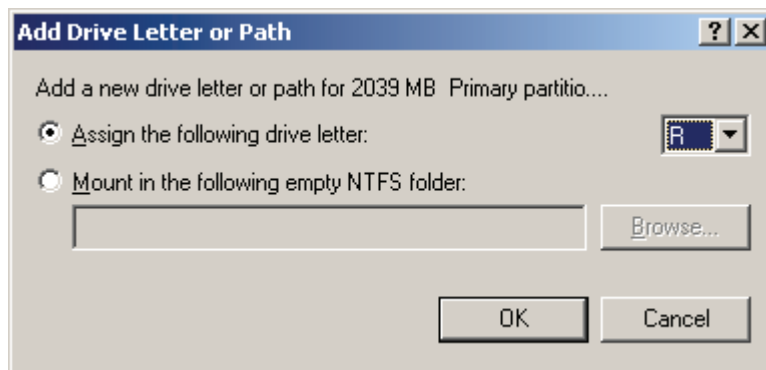
Come back to the Computer Management Console



Right click on generic disk and select Change Drive Letter and Paths.



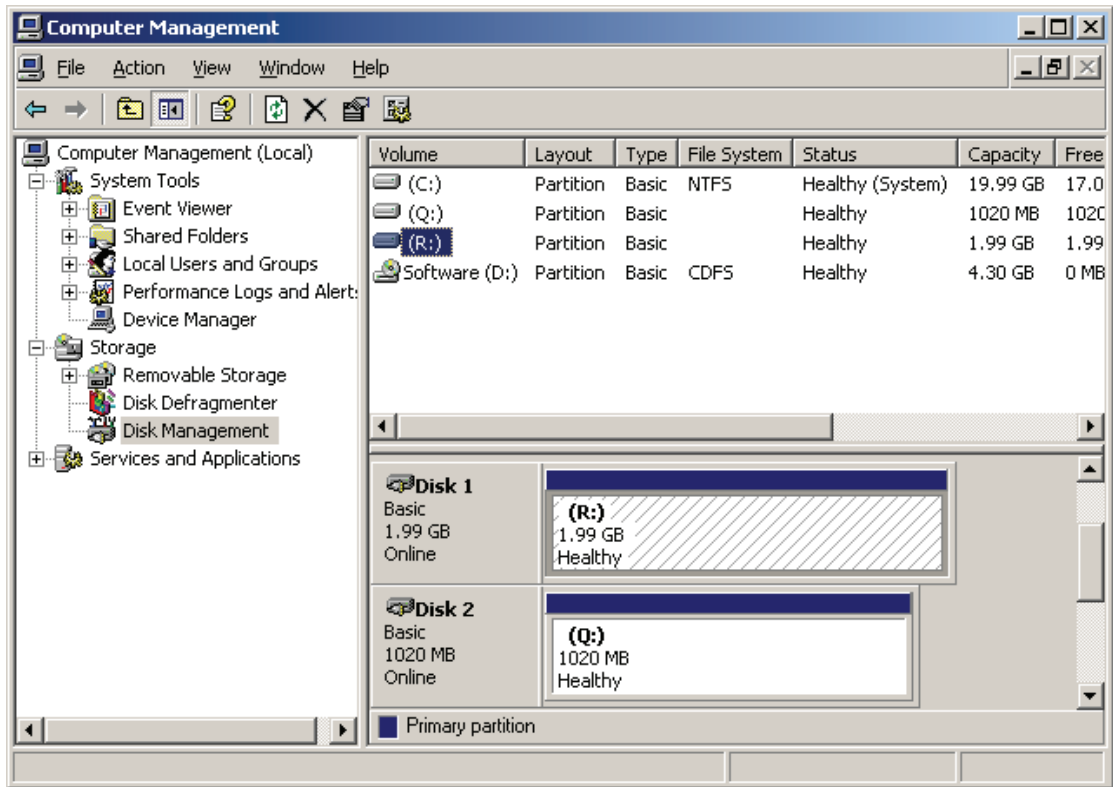
Click the **Add** button, the Add Drive Letter or Path dialog is shown.



Assign **R** as drive letter.

Press the **OK** button to continue.

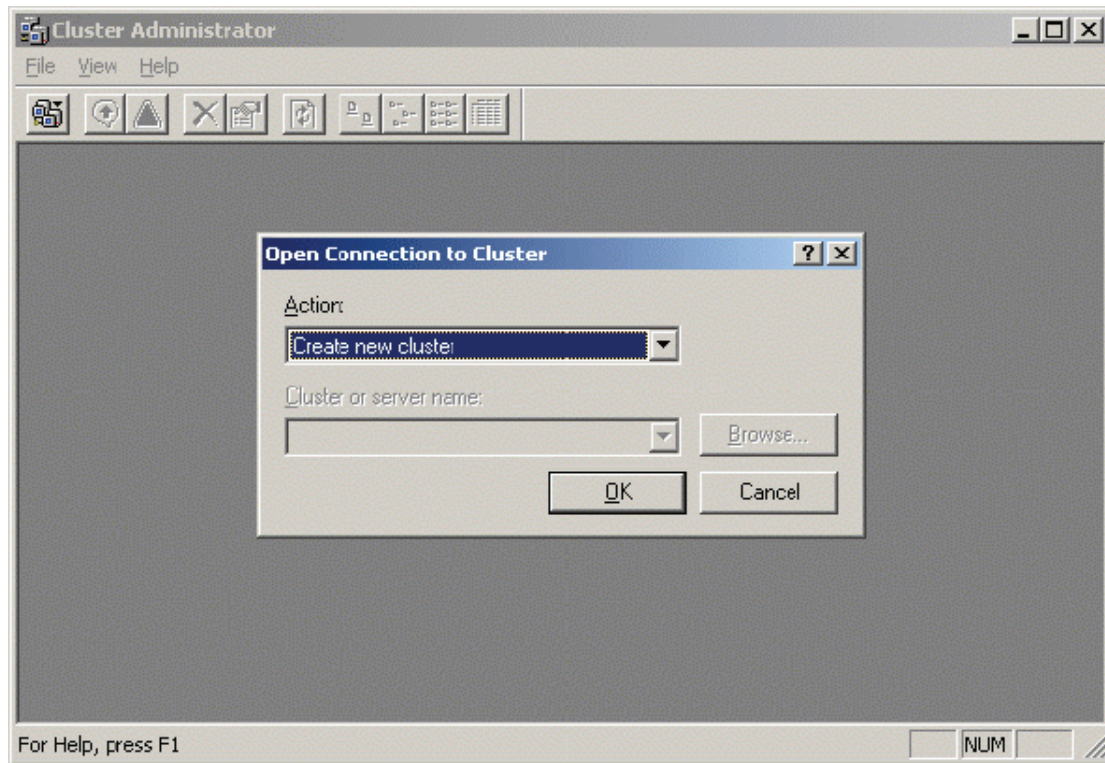
Come back to the Computer Management Console



After the successful operation, the status is shown as in the figure.

## 6. Creating Cluster

Open Cluster Administrator on node1.



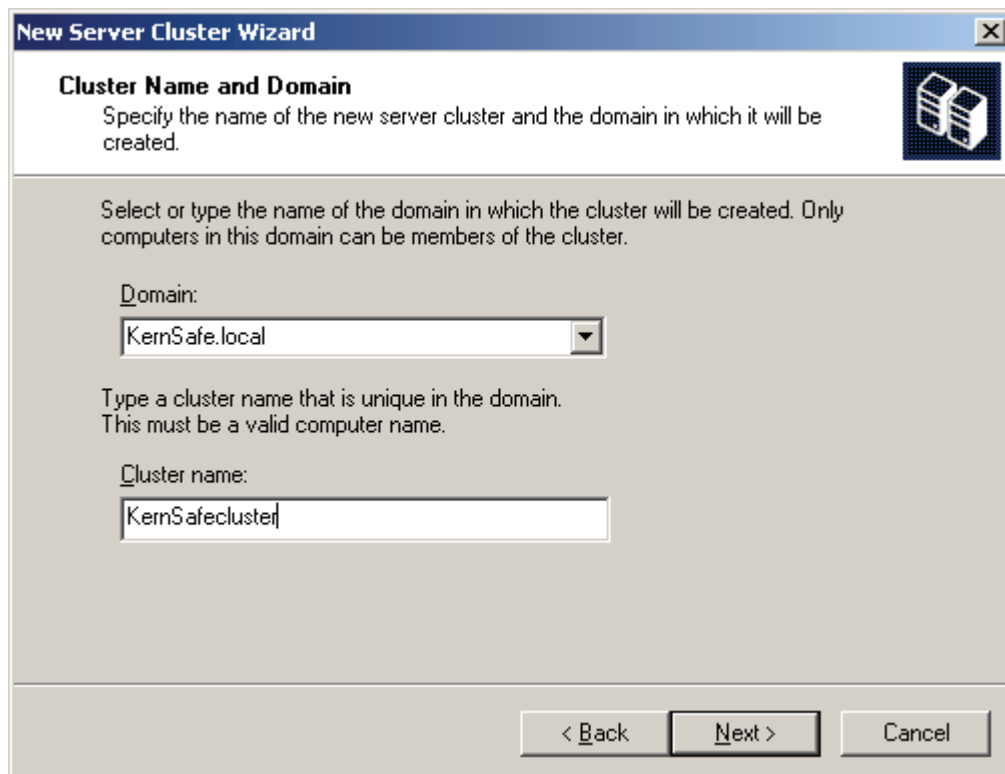
Select Create new cluster.

Press the **OK** button, the **New Server Cluster Wizard** is shown.



Press the **Next** button to continue.

Specify cluster name

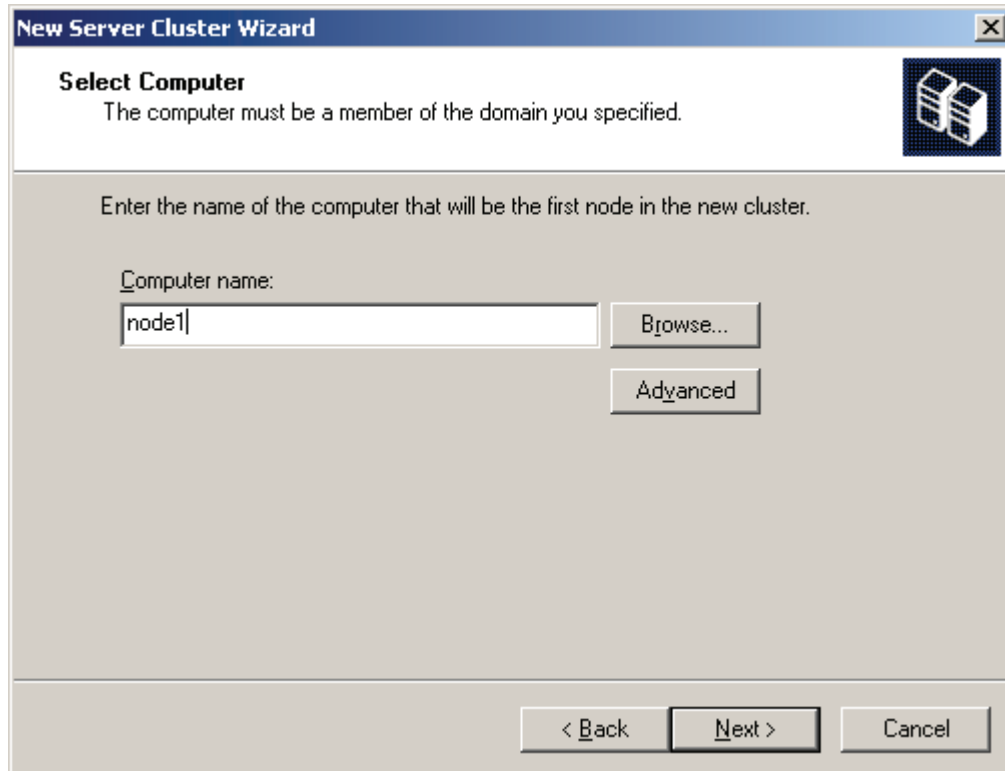


Select Domain and enter Cluster name, KernSafe.local is selected here and the Cluster name is

KernSafecluster.

Press the **Next** button to continue.

Select computer

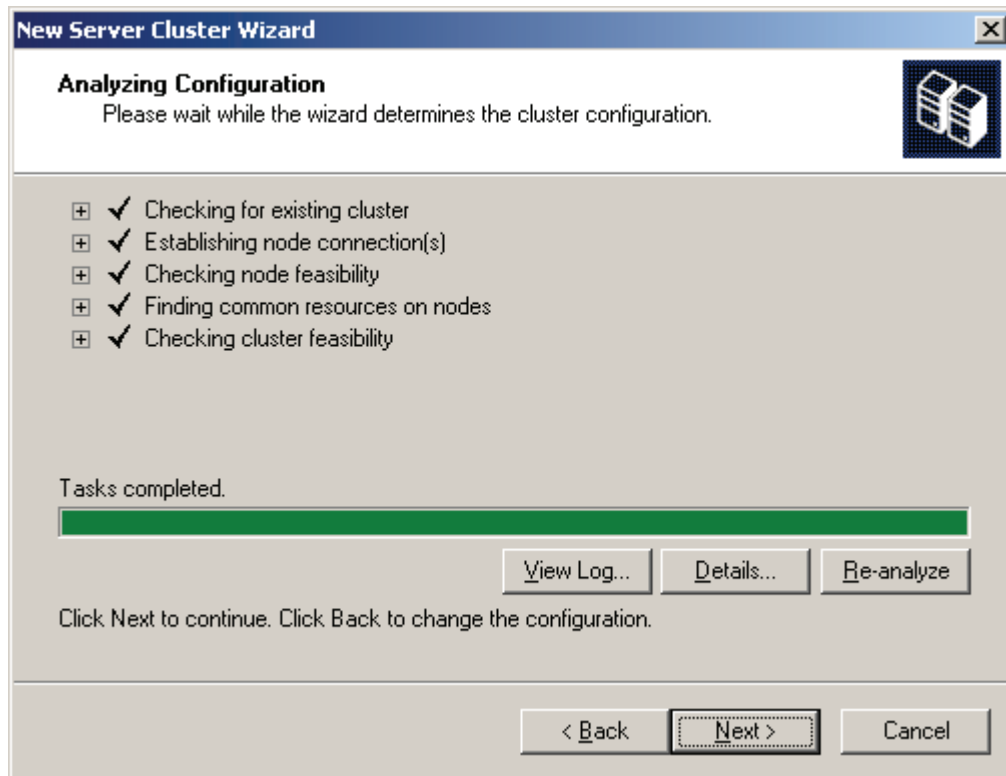


The screenshot shows a Windows-style dialog box titled "New Server Cluster Wizard". The main heading is "Select Computer" with a sub-instruction: "The computer must be a member of the domain you specified." Below this, a text box prompts the user to "Enter the name of the computer that will be the first node in the new cluster." The text box contains "node1" and has a "Browse..." button next to it. There is also an "Advanced" button. At the bottom of the dialog, there are three buttons: "< Back", "Next >", and "Cancel".

Enter node1.

Press the **Next** button to continue.

Analyzing configuration

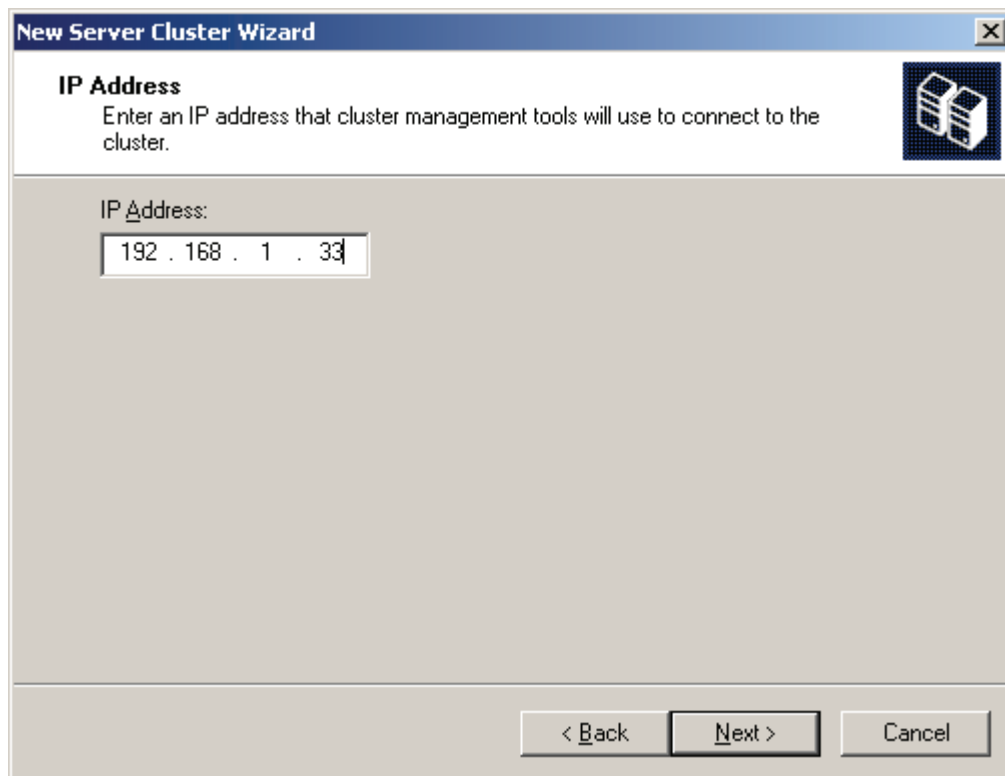


If there is any problem during the testing process, press the **Back** button to change the configuration.

When all the tests are passed, press the **Next** button to continue.

Enter an IP address of the cluster



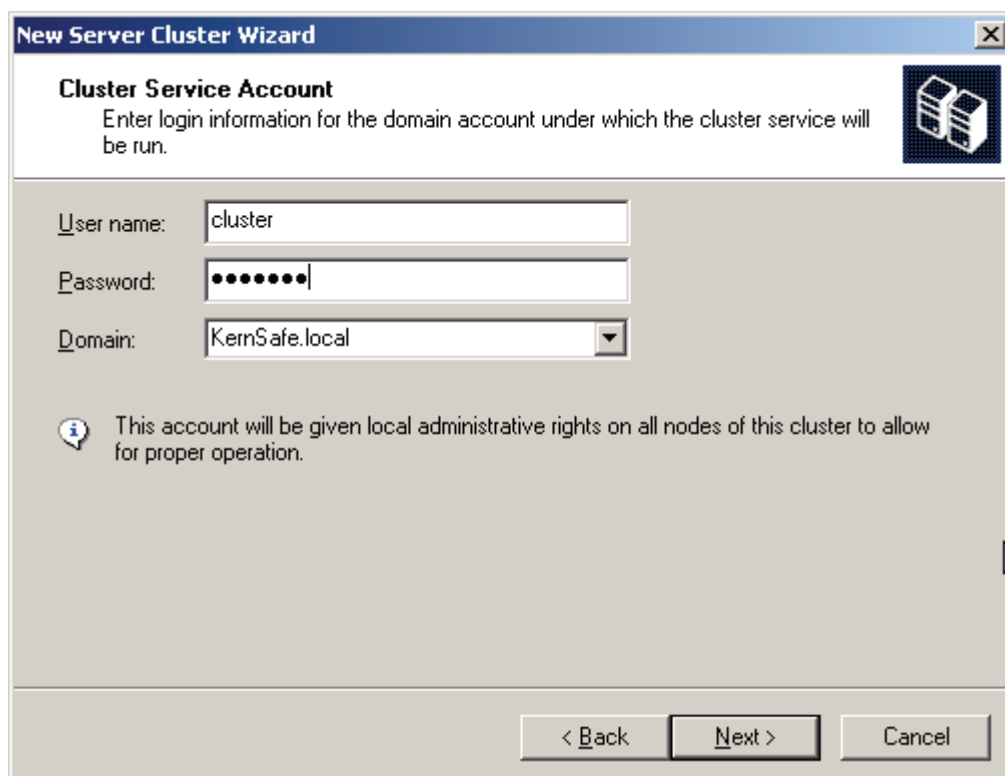


The screenshot shows the 'New Server Cluster Wizard' window. The title bar reads 'New Server Cluster Wizard'. The main heading is 'IP Address'. Below the heading, there is a text box with the instruction: 'Enter an IP address that cluster management tools will use to connect to the cluster.' To the right of this text is an icon of two server racks. Below the instruction is a text input field labeled 'IP Address:' containing the value '192 . 168 . 1 . 33'. At the bottom of the window, there are three buttons: '< Back', 'Next >', and 'Cancel'.

Enter the IP address of Cluster., take 192.168.1.33 for example here.

Press the **Next** button to continue.

Type cluster service account

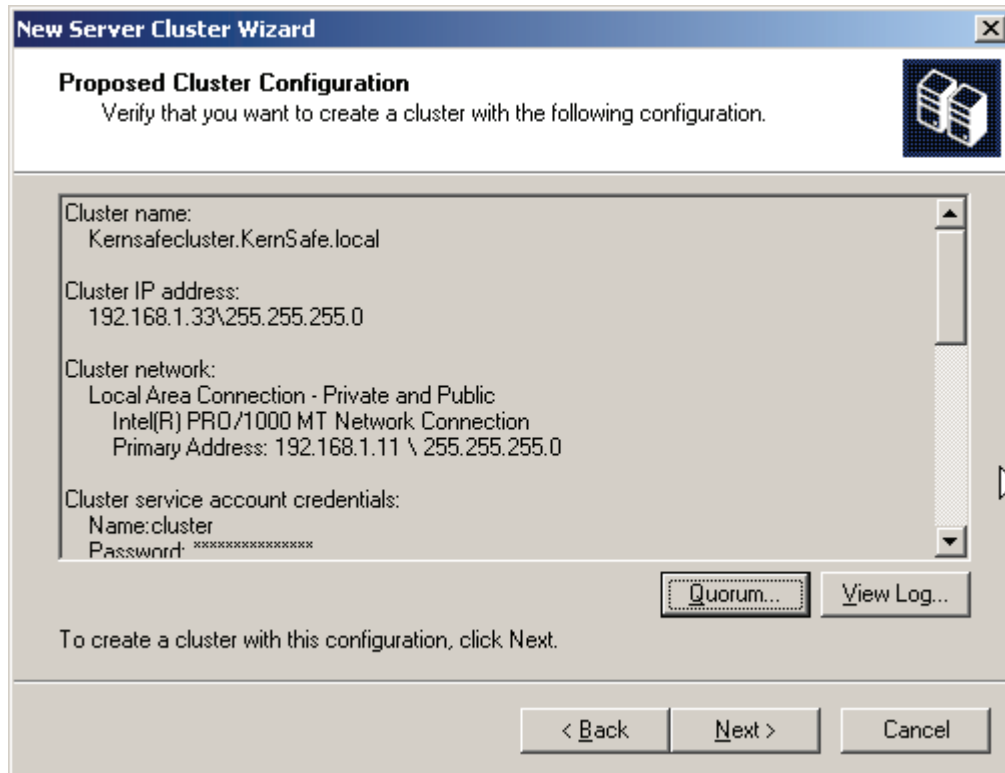


The screenshot shows the 'New Server Cluster Wizard' window. The title bar reads 'New Server Cluster Wizard'. The main heading is 'Cluster Service Account'. Below the heading, there is a text box with the instruction: 'Enter login information for the domain account under which the cluster service will be run.' To the right of this text is an icon of two server racks. Below the instruction are three input fields: 'User name:' with the value 'cluster', 'Password:' with a masked password of seven dots, and 'Domain:' with a dropdown menu showing 'KernSafe.local'. Below these fields is an information icon (i) and a text box that reads: 'This account will be given local administrative rights on all nodes of this cluster to allow for proper operation.' At the bottom of the window, there are three buttons: '< Back', 'Next >', and 'Cancel'.

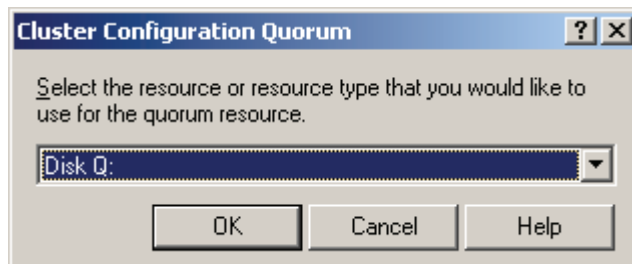
Enter the username and password of cluster.

Press the **Next** button to continue.

Proposed cluster configuration



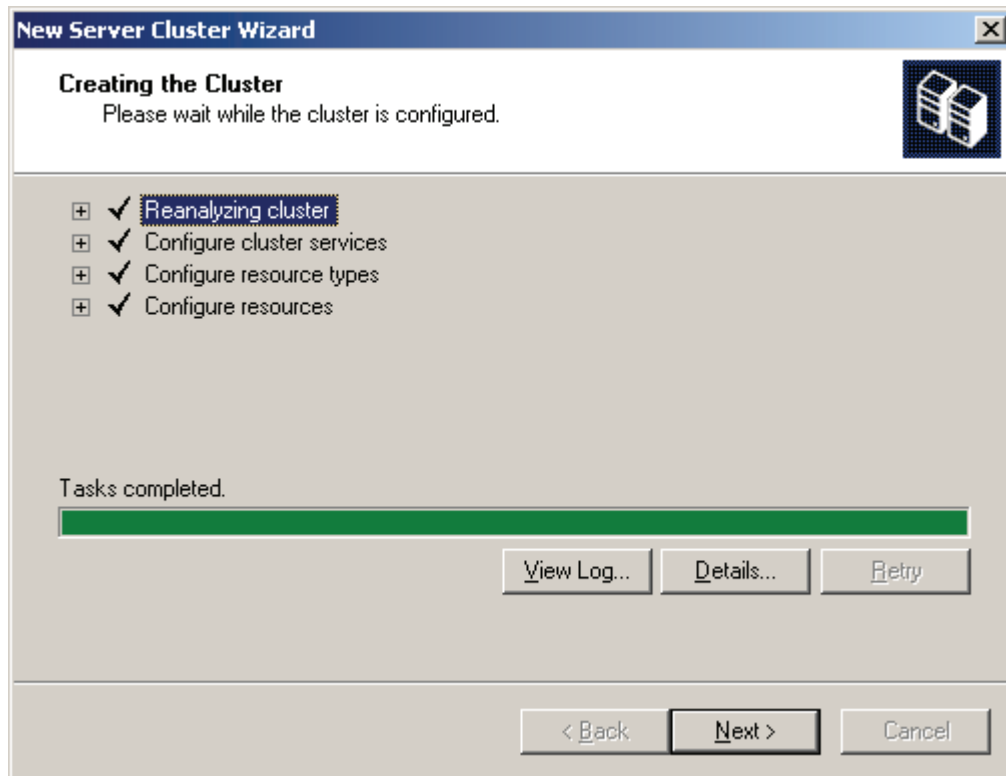
Click the **Quorum** button, the **Cluster Configuration Quorum** dialog is shown.



Select **Disk Q**.

Press the **OK** button to continue.

Creating cluster



If there is any problem during the testing process, press the **Back** button to change the configuration.

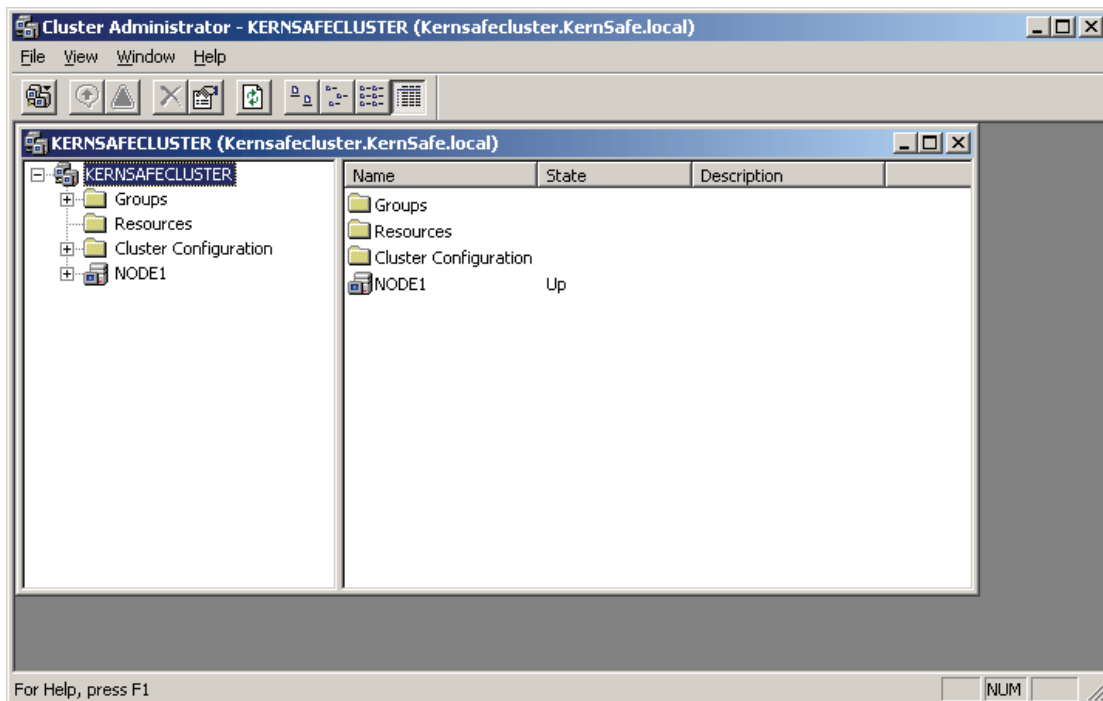
When all the tests are passed, press the **Next** button to continue.

Complete cluster creating



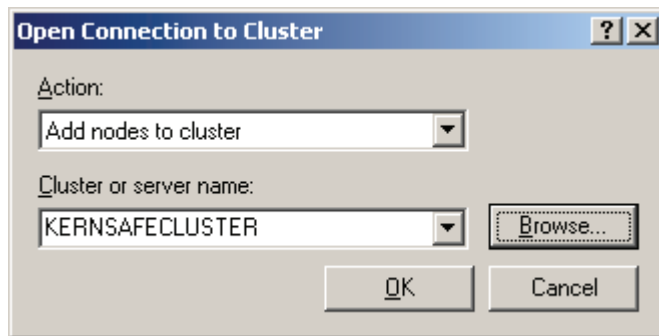
Press the **Finish** button to finish.

Come back to the Cluster Administrator Console



After the successful operation, the status is shown as in the figure.

Add node2 to the cluster



Open Cluster Administrator on node2, select Add nodes to cluster and Cluster name, which is KERNSAFECLUSTER here.

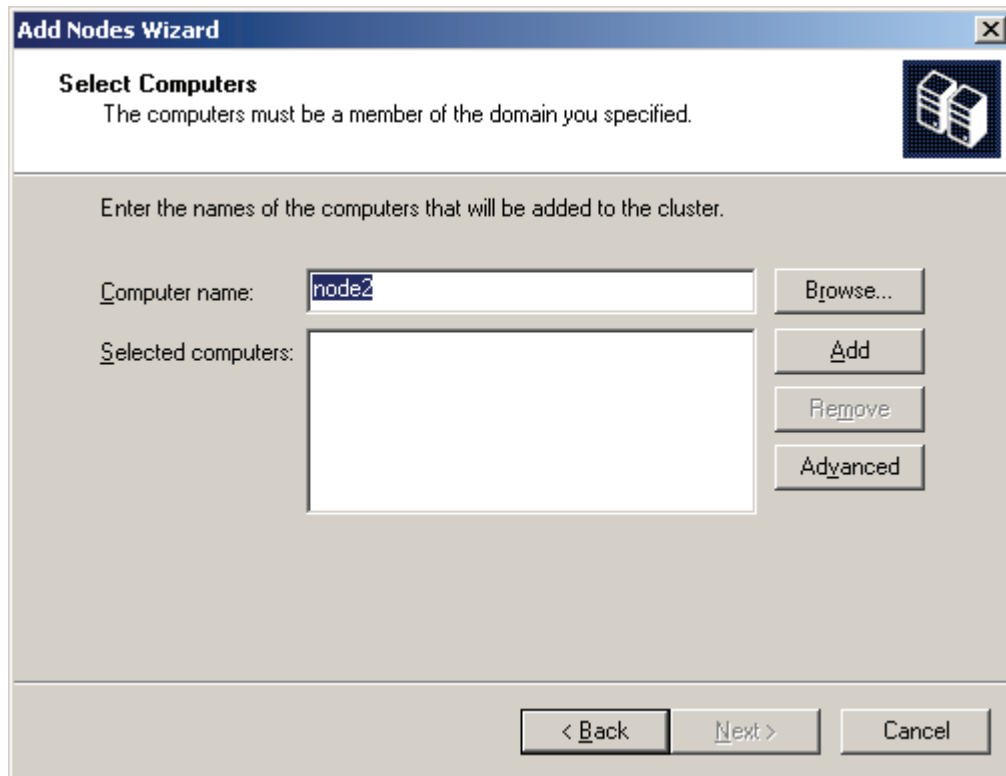
Press the **OK** button to continue.

The **Add Nodes Wizard** is shown

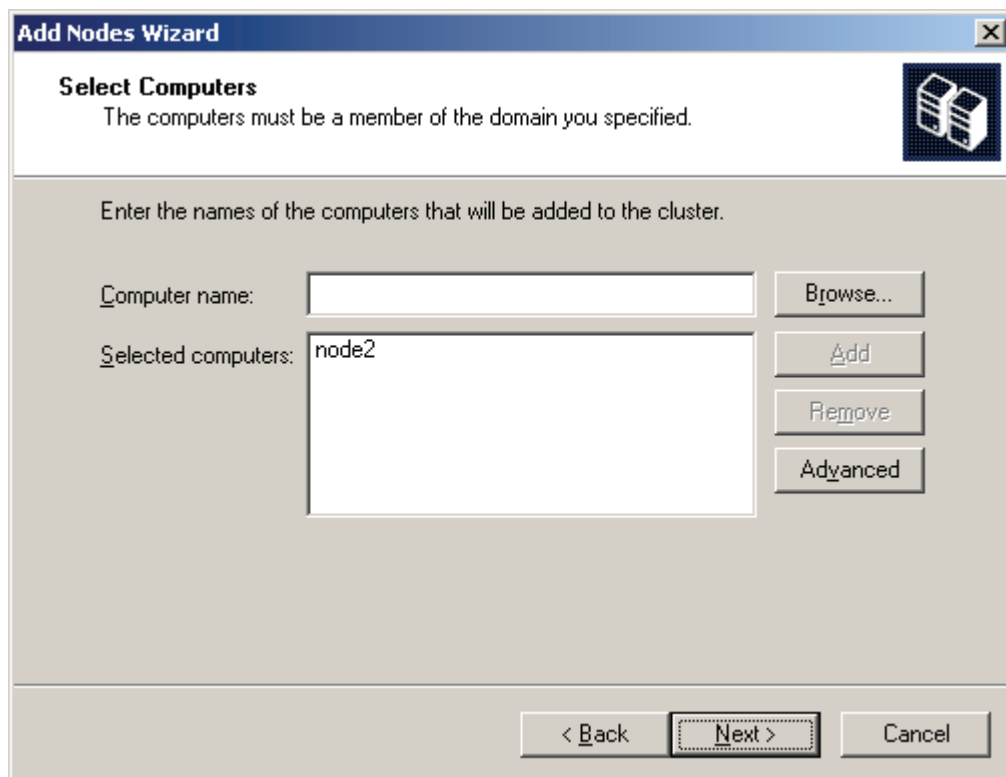


Press the **Next** button to continue.

Select Computers

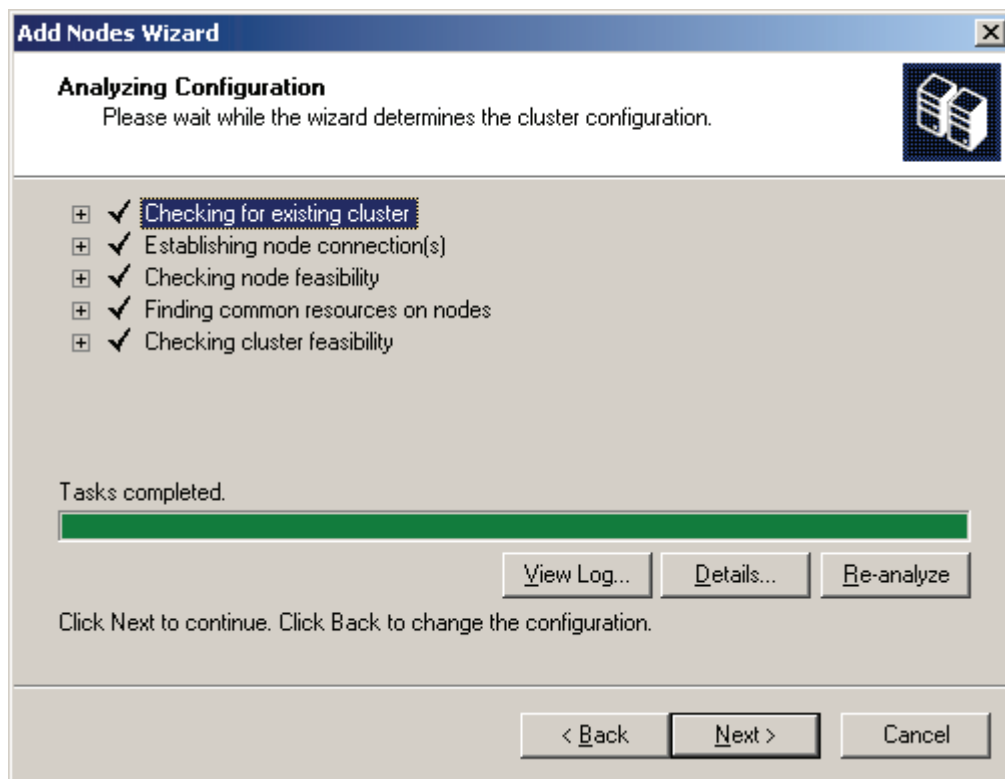


Enter node2 in Computer name and click Add to add node2 into selected computers.



Press the **Next** button to continue.

## Analyzing configuration



If there is any problem during the testing process, press the Back button to change the configuration.

When all the tests are passed, press the **Next** button to continue.

Specify cluster service account


**Add Nodes Wizard** [X]

**Cluster Service Account**  
Enter login information for the domain account under which the cluster service will be run.

User name: cluster

Password: [REDACTED]

Domain: KernSafe.local

 This account will be given local administrative rights on all nodes of this cluster to allow for proper operation.

< Back   Next >   Cancel

Enter the password of cluster user.

Press the **Next** button to continue.

Proposed cluster configuration

**Add Nodes Wizard** [X]

**Proposed Cluster Configuration**  
Verify that you want to add nodes to a cluster with the following configuration.

Cluster name:  
KERNSAFECLUSTER.KernSafe.local

Cluster IP address:  
192.168.1.33\255.255.255.0

Cluster network:  
Local Area Connection - Private and Public

Primary Address: 192.168.1.11 \ 255.255.255.0

Cluster service account credentials:  
Name: cluster  
Password: [REDACTED]

[View Log...](#)

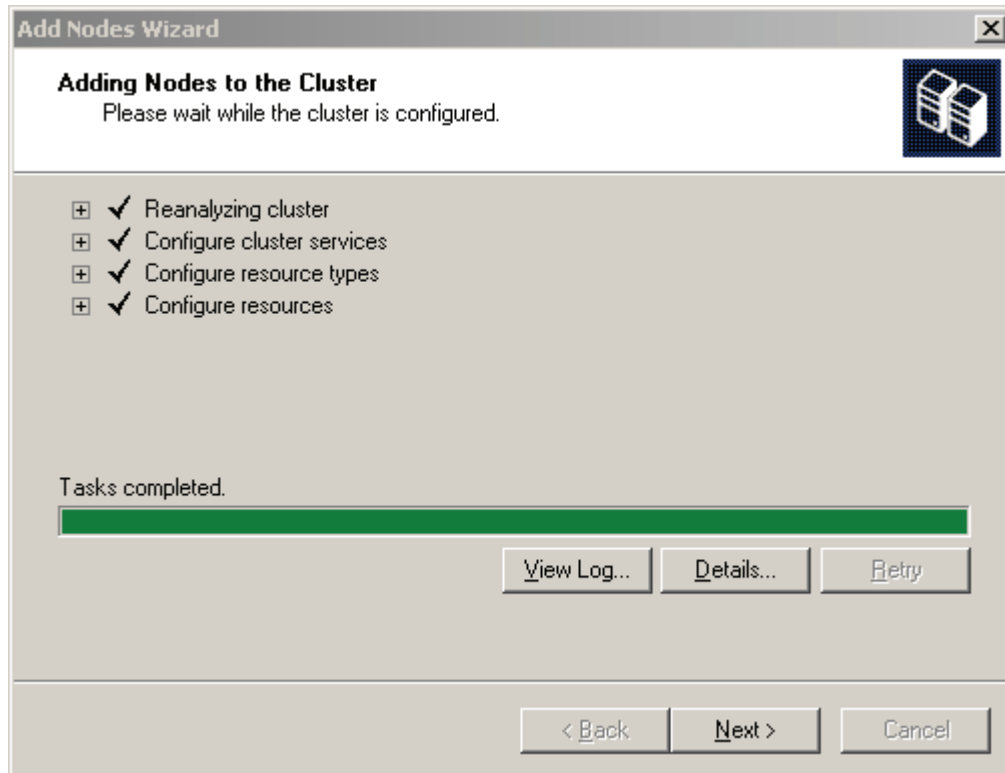
To add nodes to a cluster with this configuration, click Next.

< Back   Next >   Cancel



Press the **Next** button to continue.

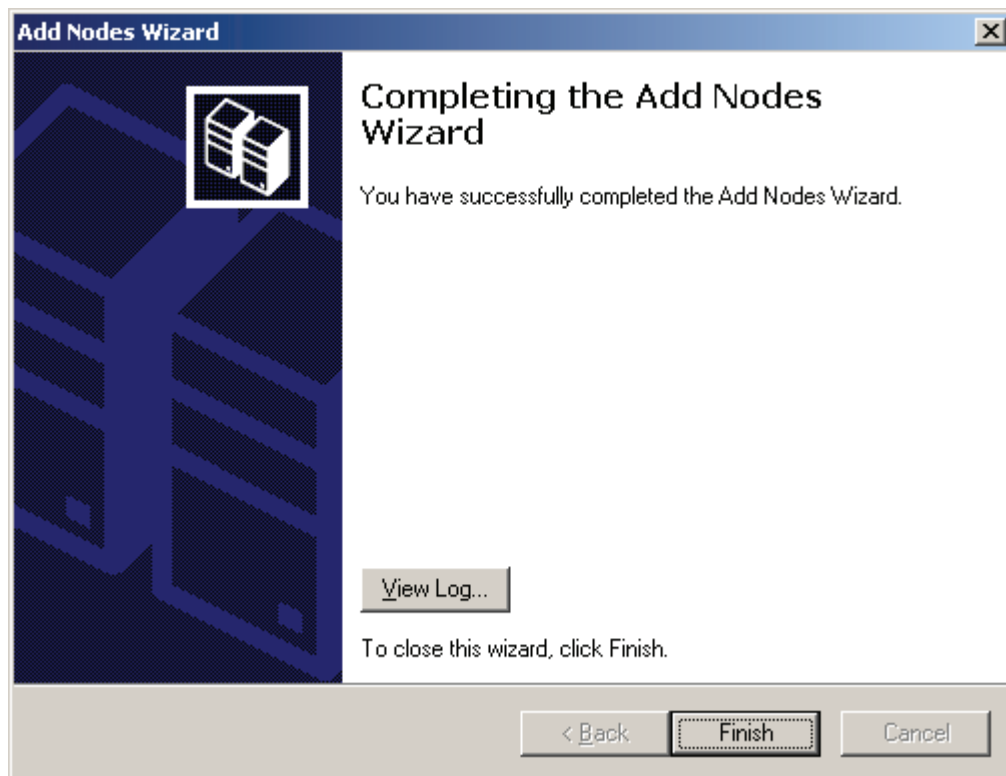
Adding nodes to the cluster



If there is any problem during the testing process, press the **Back** button to change the configuration.

When all the tests are passed, press the **Next** button to continue.

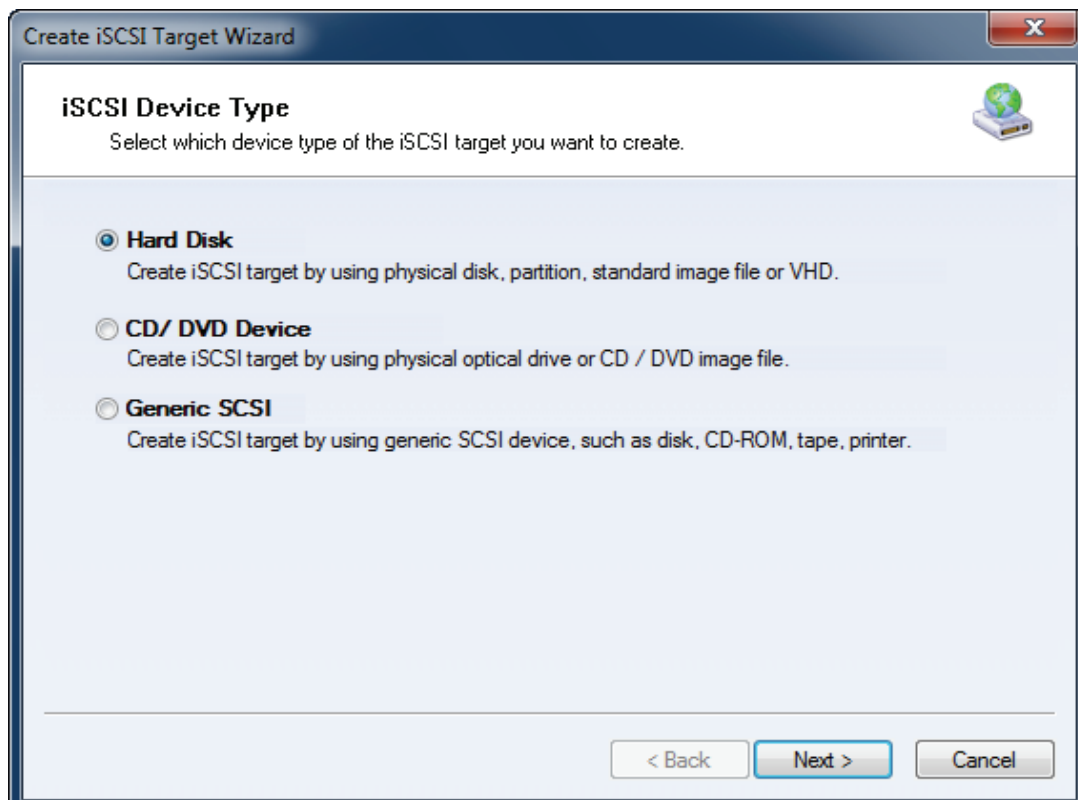
Finish adding node to the cluster.



Press the **Finish** button.

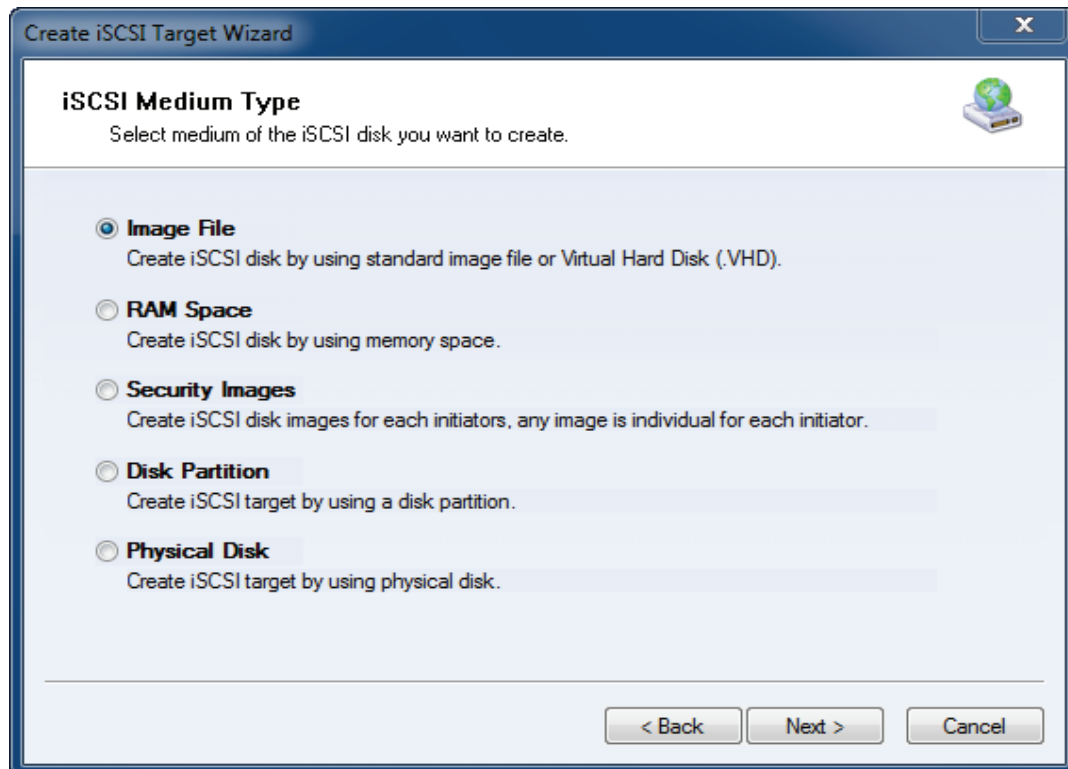
## 7. Add new shared resources

Open iStorage Server Console and then press the Create button on the toolbar, and then the Create Device Wizard is shown.



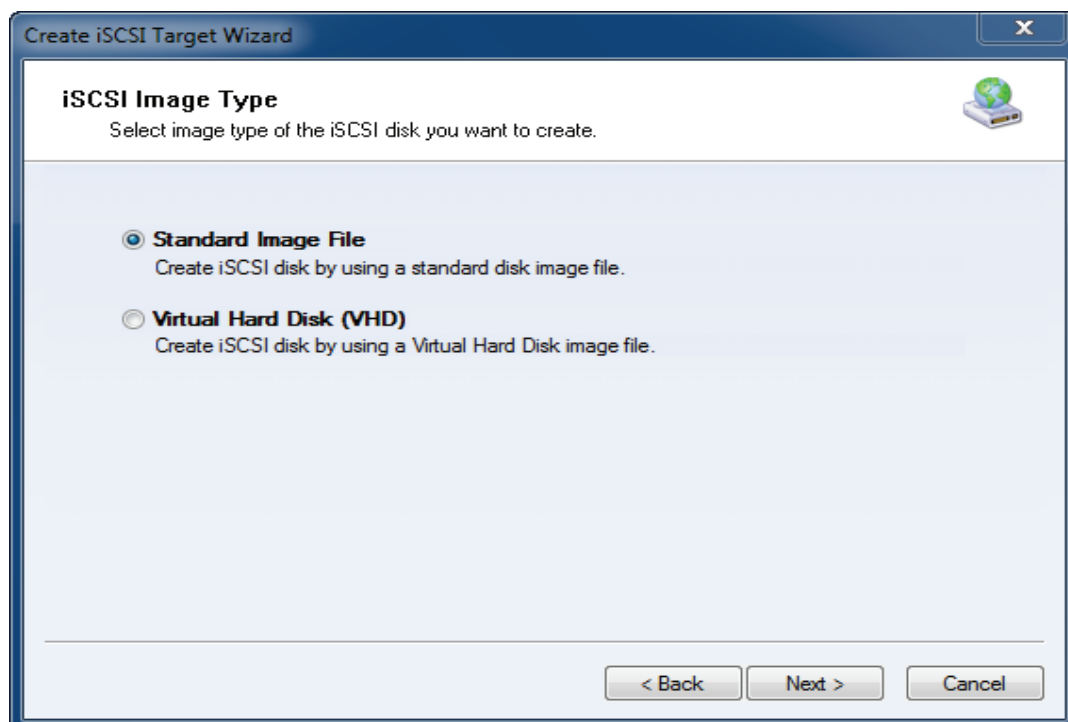
Choose **Hard Disk**.

Press the **Next** button to continue.



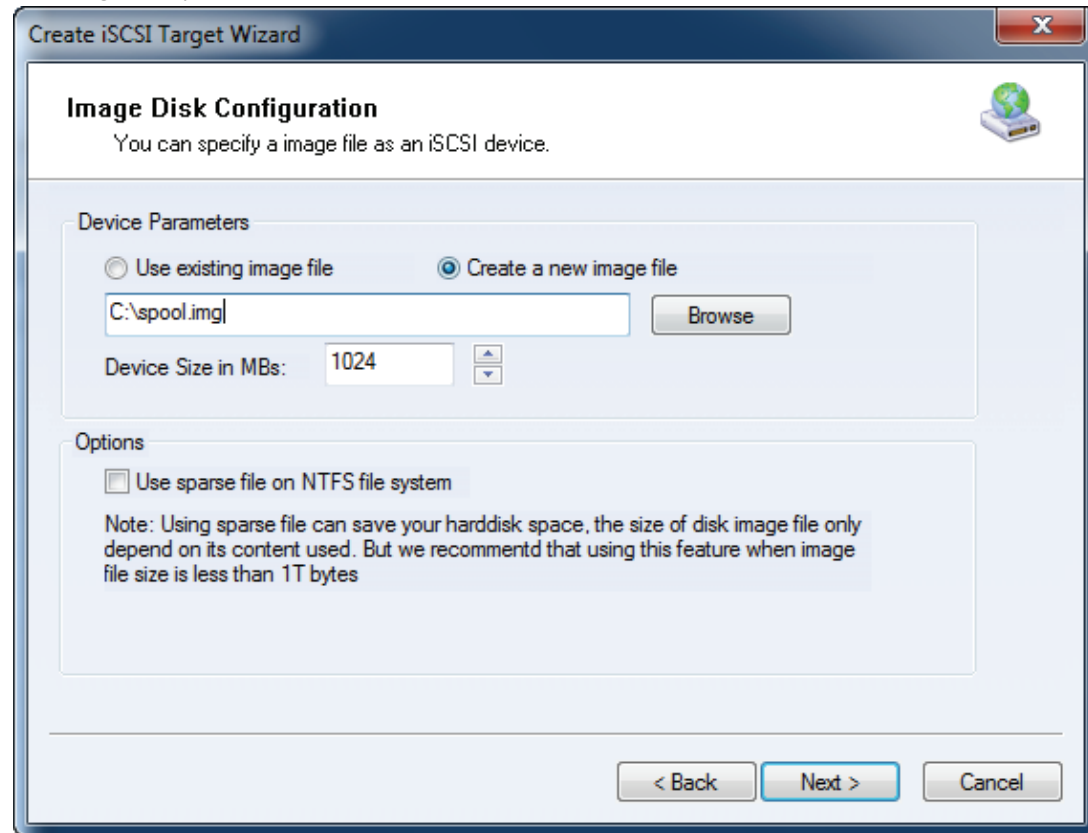
Choose **Image File** in **iSCSI Medium Type** window.

Press the **Next** button to continue.



We choose **Standard Image File** and then press **Next** button.

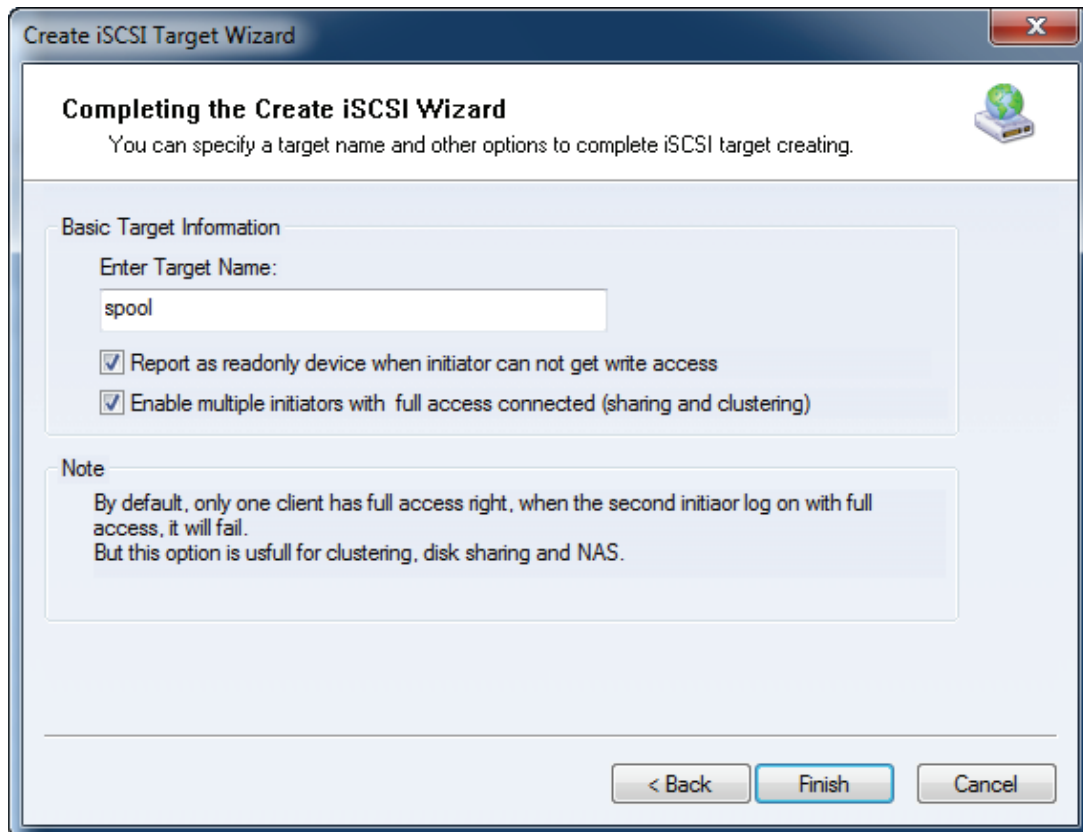
Set image disk parameters



Create an .img file named spool with a size of 1024MB as an example.

Press the **Next** button to continue.

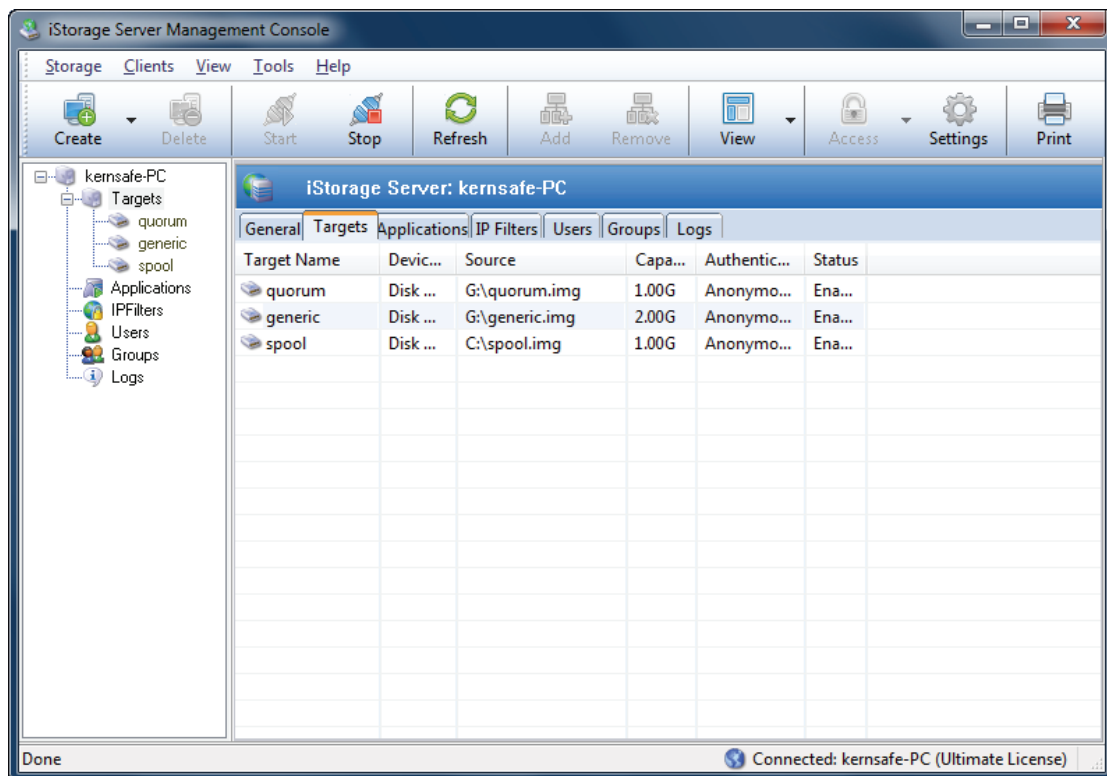
Finish creating iSCSI Target



Enter spool as the Target name, Choose the **Enable multiple initiators with full access connected (sharing and clustering)**.

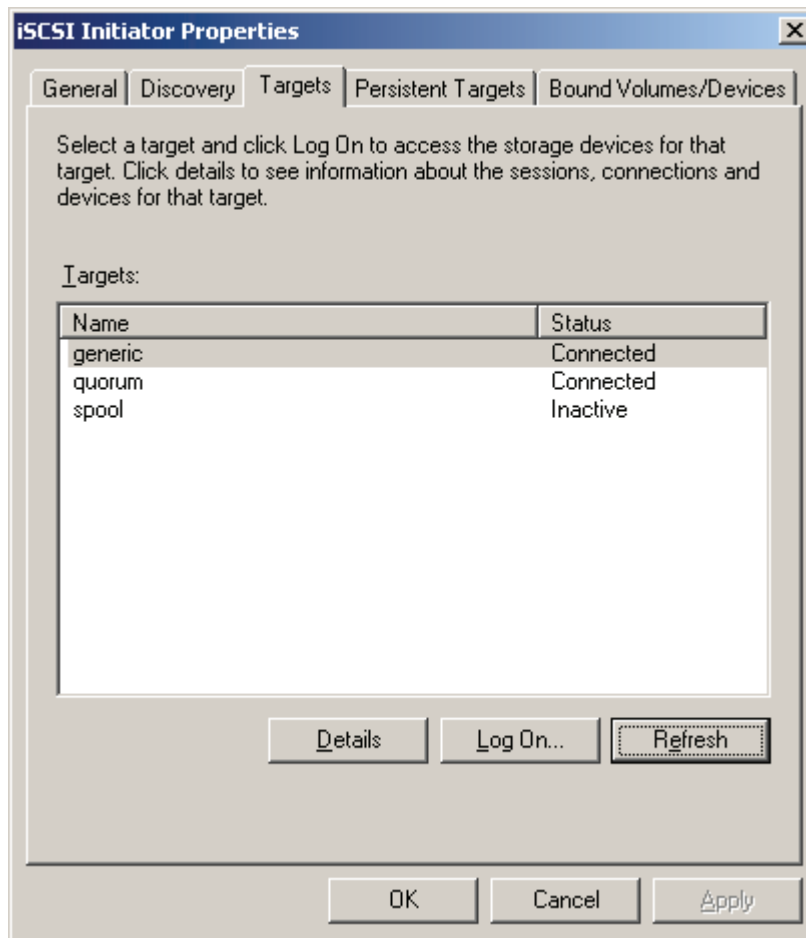
Press the **Finish** button to complete iSCSI Target creation.

Come back to iStorage Server Console.

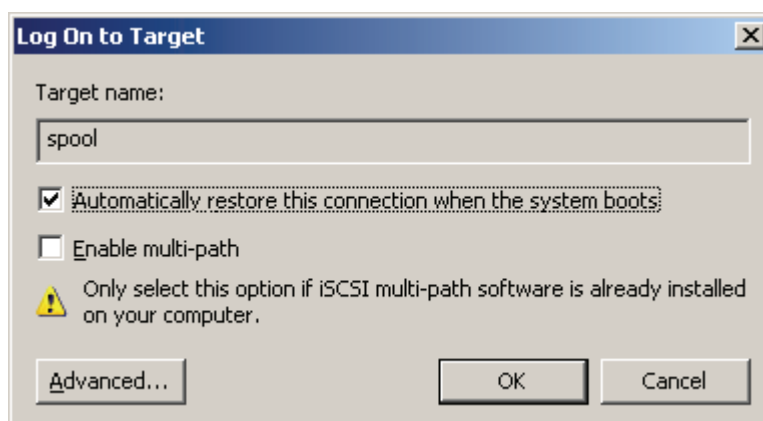


After the successful creation, the status is shown as in the figure.

Open iSCSI Initiator on node1, and then press the **Refresh** button on the **Targets** page.



Press the **Log On** button.



Select spool and click the **Log On** button. Check **Automatically restore this connection when the system boots**

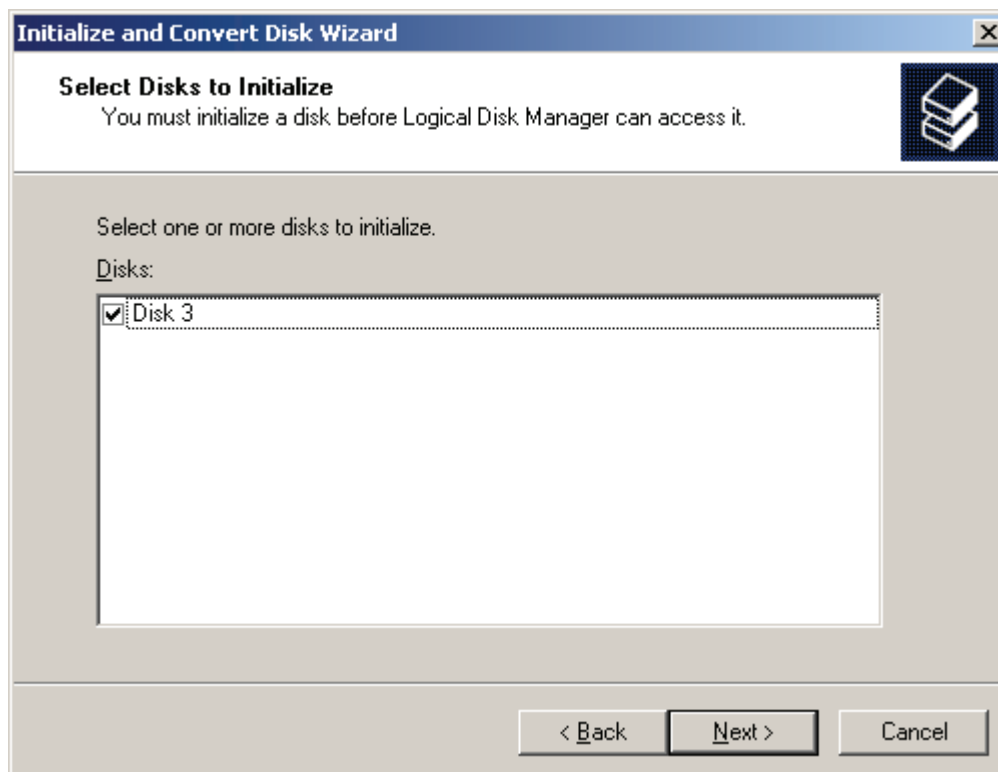
Open Computer Management, select Disk Management and then the **Initialize and Convert Disk**

Wizard is shown.



Press the **Next** button to continue.

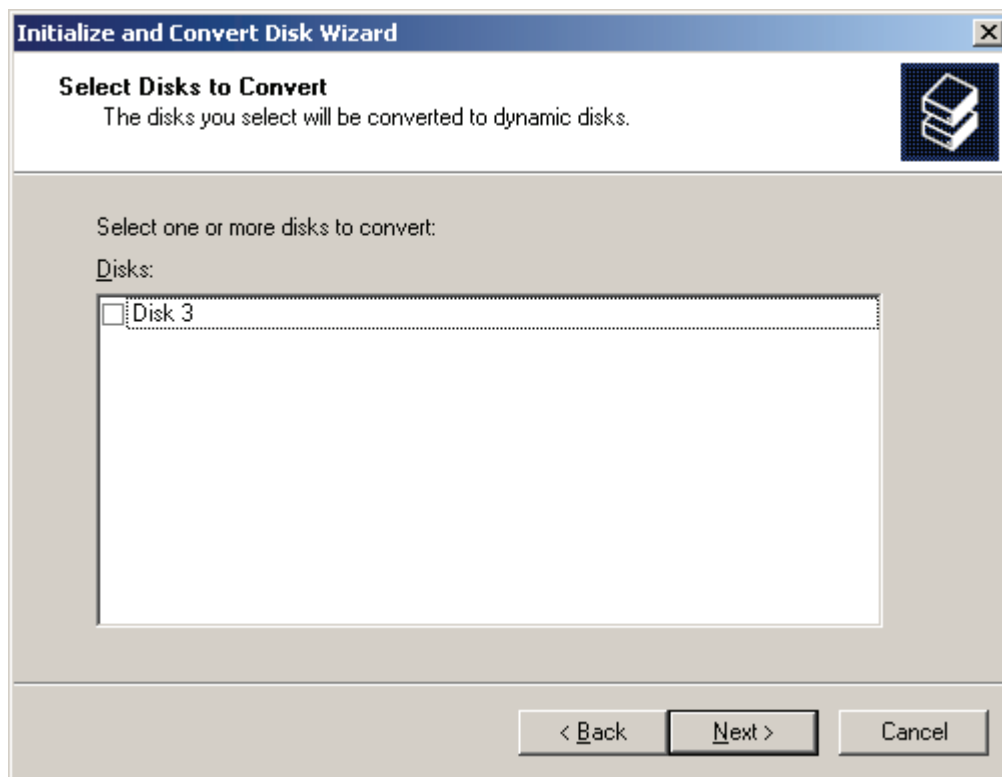
Select disks to be initialized.



Select Disk3.

Press the **Next** button to continue.

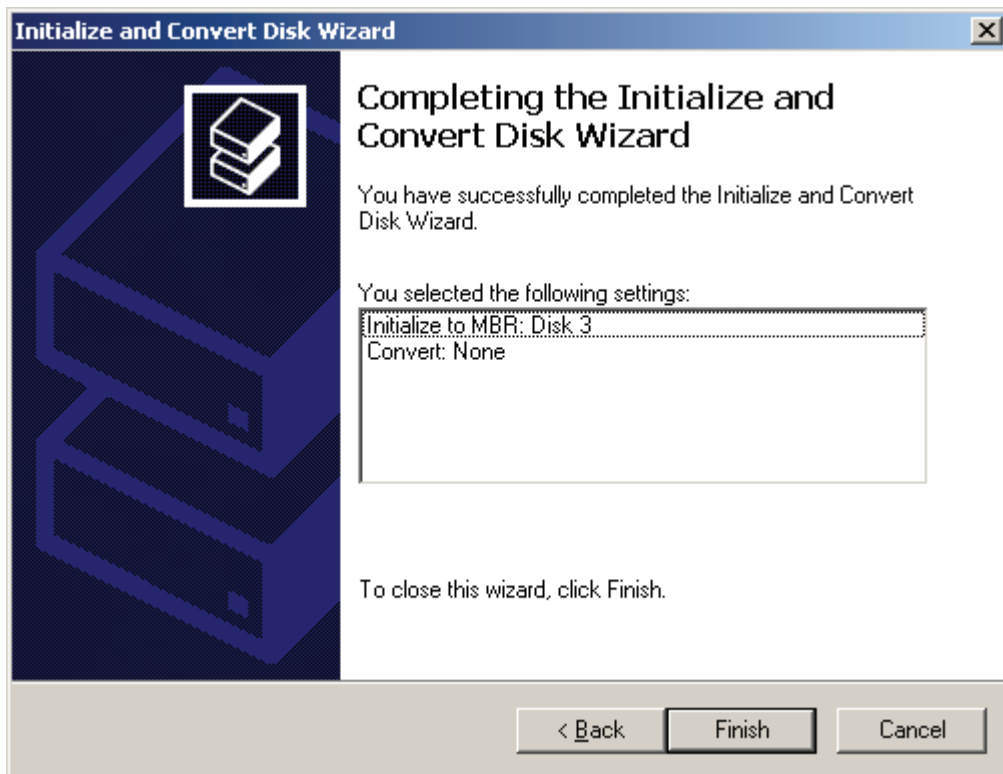
Select disks to be converted.



Press the **Next** button to continue.

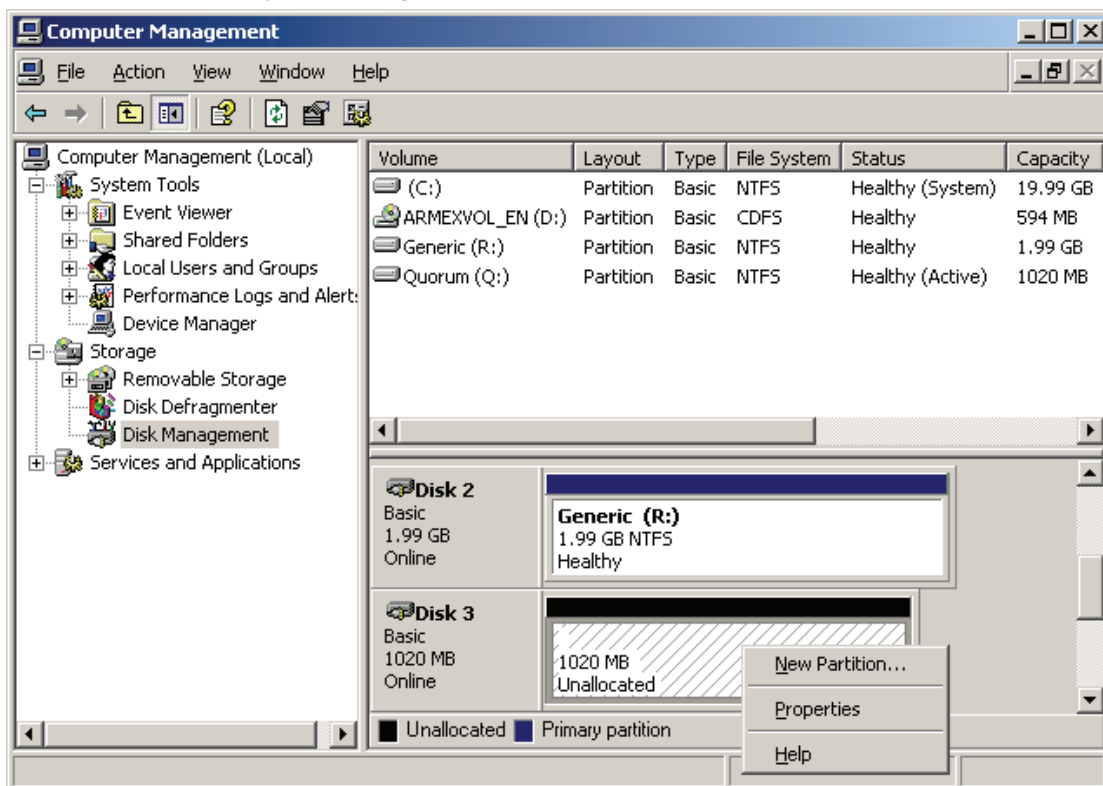
Finish initializing disk.



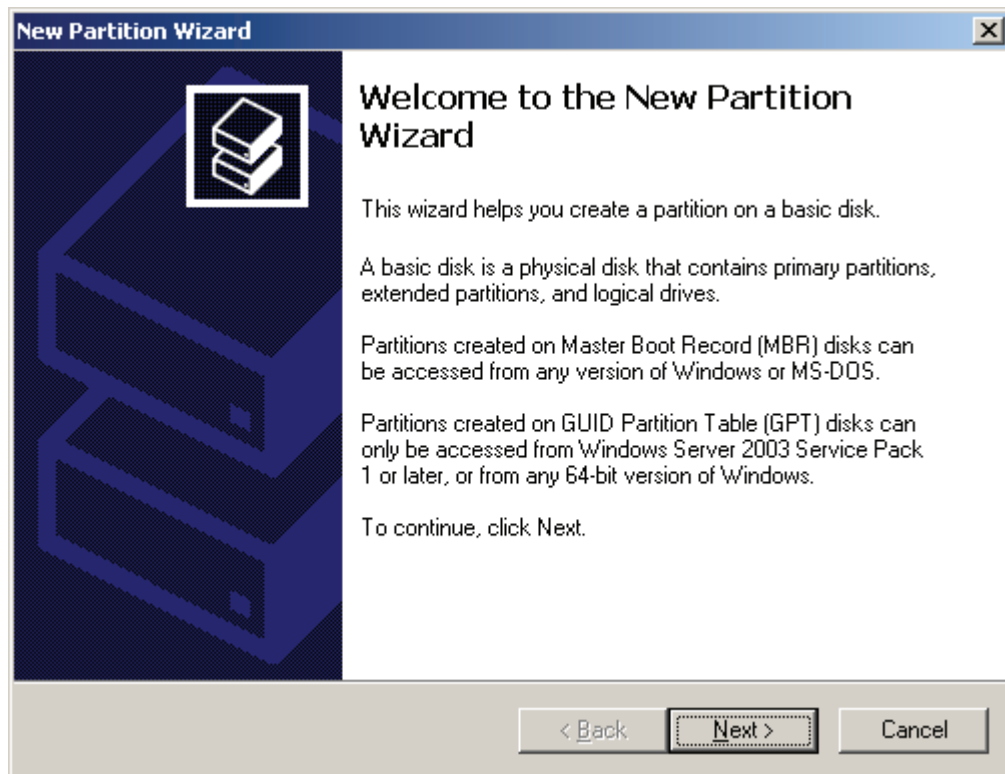


Press the **Finish** button.

Come back to the Computer Management Console.

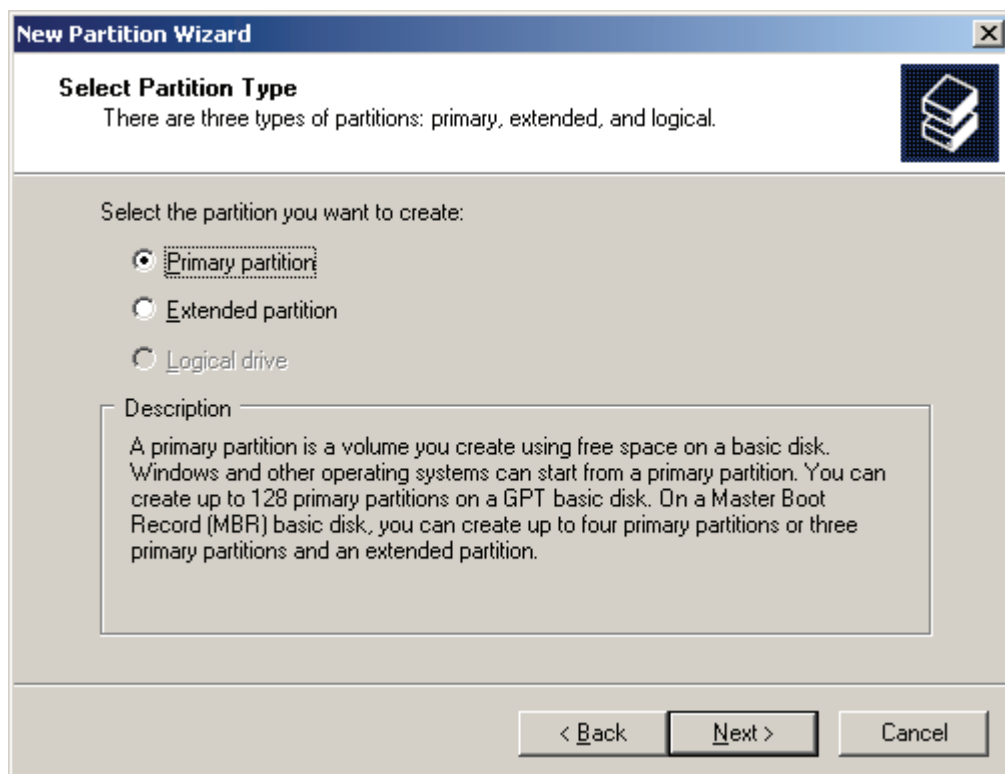


Right click on the disk3 and then select **New Partition**, the **New Partition Wizard** is shown.



Press the **Next** button to continue.

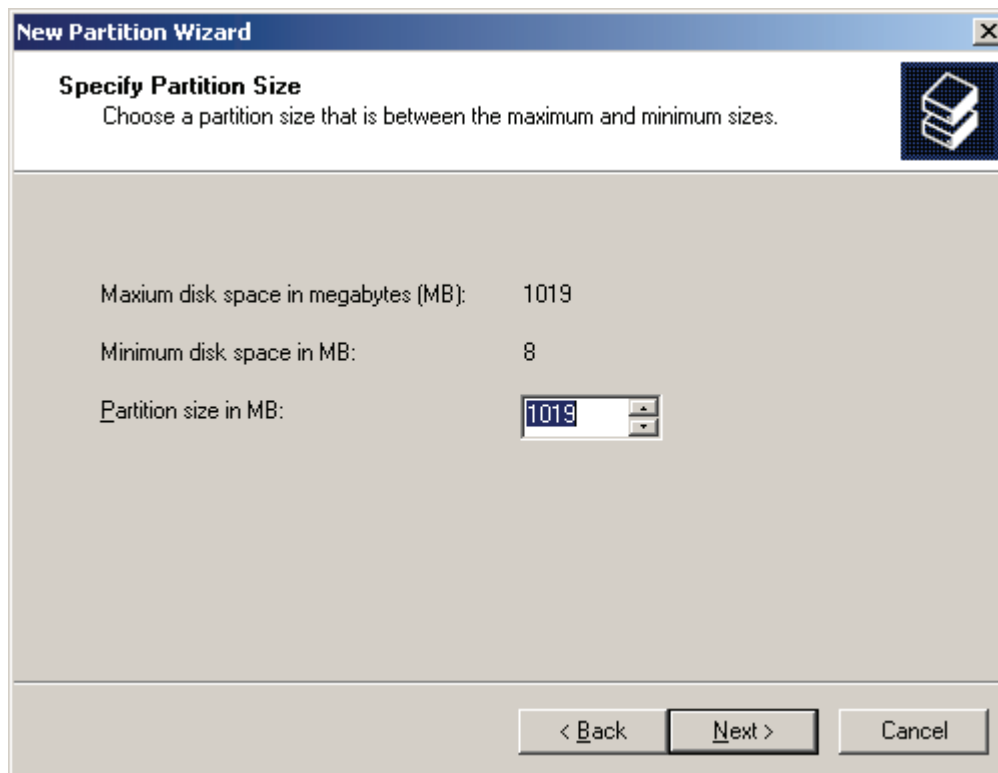
Select partition type.



Select Primary partition

Press the **Next** button to continue.

Specify partition size

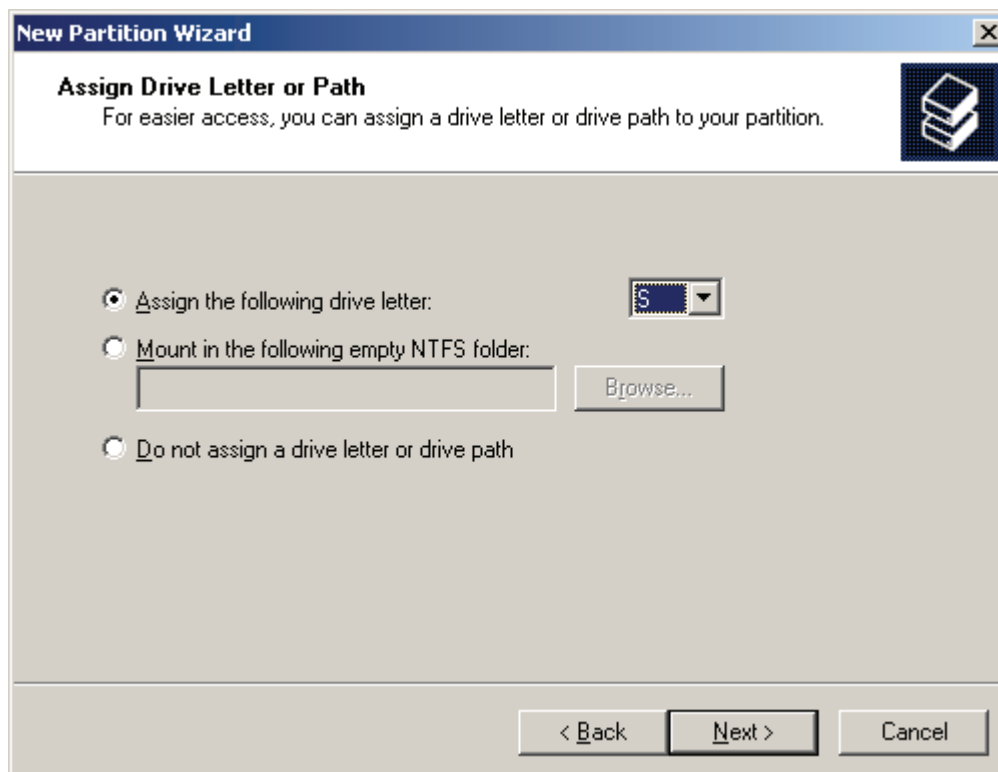


The dialog box is titled "New Partition Wizard" and has a close button (X) in the top right corner. The main heading is "Specify Partition Size" with a sub-instruction: "Choose a partition size that is between the maximum and minimum sizes." There is a disk icon in the top right. The main area contains three rows of information: "Maximum disk space in megabytes (MB): 1019", "Minimum disk space in MB: 8", and "Partition size in MB: 1019" (with a spin box). At the bottom, there are three buttons: "< Back", "Next >", and "Cancel".

Maximum disk space in megabytes (MB):	1019
Minimum disk space in MB:	8
Partition size in MB:	1019

Press the **Next** button to continue.

Assign drive letter

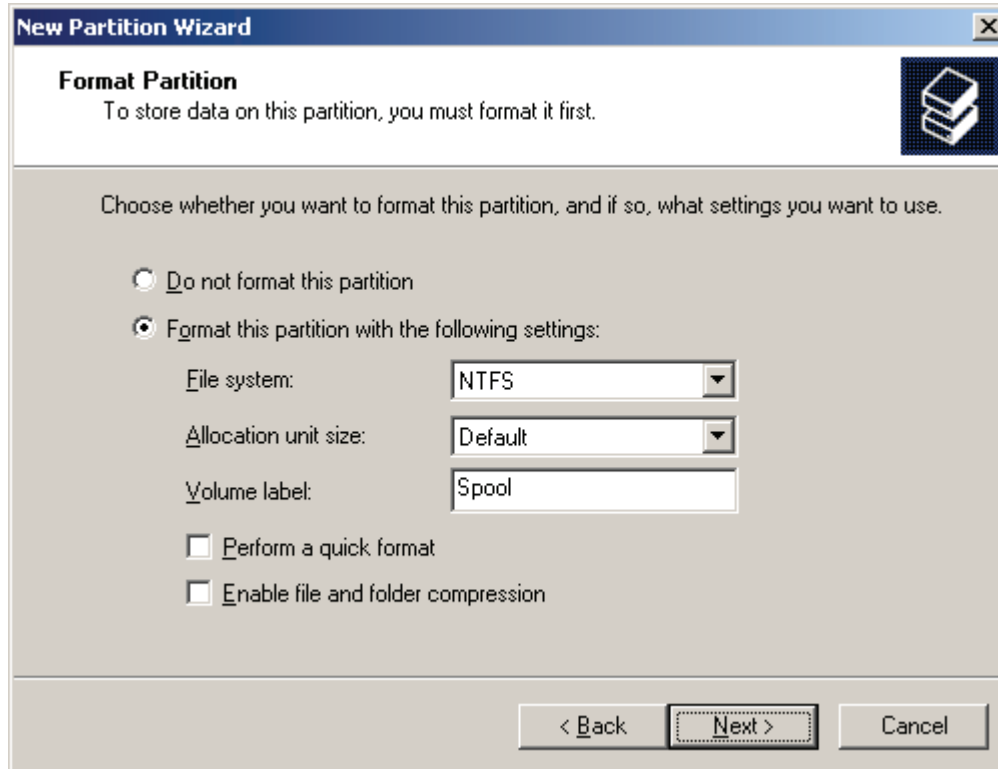


The dialog box is titled "New Partition Wizard" and has a close button (X) in the top right corner. The main heading is "Assign Drive Letter or Path" with a sub-instruction: "For easier access, you can assign a drive letter or drive path to your partition." There is a disk icon in the top right. The main area contains three radio button options: "Assign the following drive letter:" (selected) with a dropdown menu showing 'S'; "Mount in the following empty NTFS folder:" with an empty text box and a "Browse..." button; and "Do not assign a drive letter or drive path". At the bottom, there are three buttons: "< Back", "Next >", and "Cancel".

Assign S as drive letter.

Press the **Next** button to continue.

Format partition

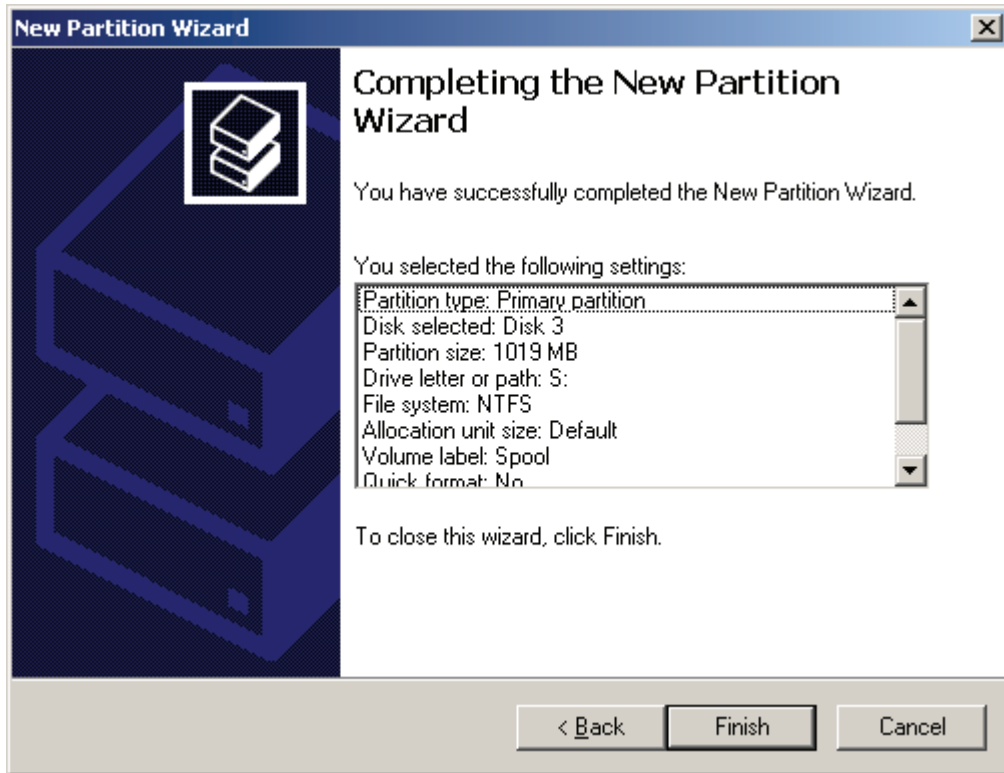


The screenshot shows the 'New Partition Wizard' dialog box, specifically the 'Format Partition' step. The title bar reads 'New Partition Wizard'. Below the title bar, the text says 'Format Partition' and 'To store data on this partition, you must format it first.' There is a small icon of a hard drive in the top right corner. The main area contains the instruction 'Choose whether you want to format this partition, and if so, what settings you want to use.' There are two radio buttons: 'Do not format this partition' (unselected) and 'Format this partition with the following settings:' (selected). Below the second radio button, there are three settings: 'File system:' with a dropdown menu set to 'NTFS', 'Allocation unit size:' with a dropdown menu set to 'Default', and 'Volume label:' with a text box containing 'Spool'. There are also two checkboxes: 'Perform a quick format' (unchecked) and 'Enable file and folder compression' (unchecked). At the bottom, there are three buttons: '< Back', 'Next >' (highlighted with a dashed border), and 'Cancel'.

Enter Spool as Volume label.

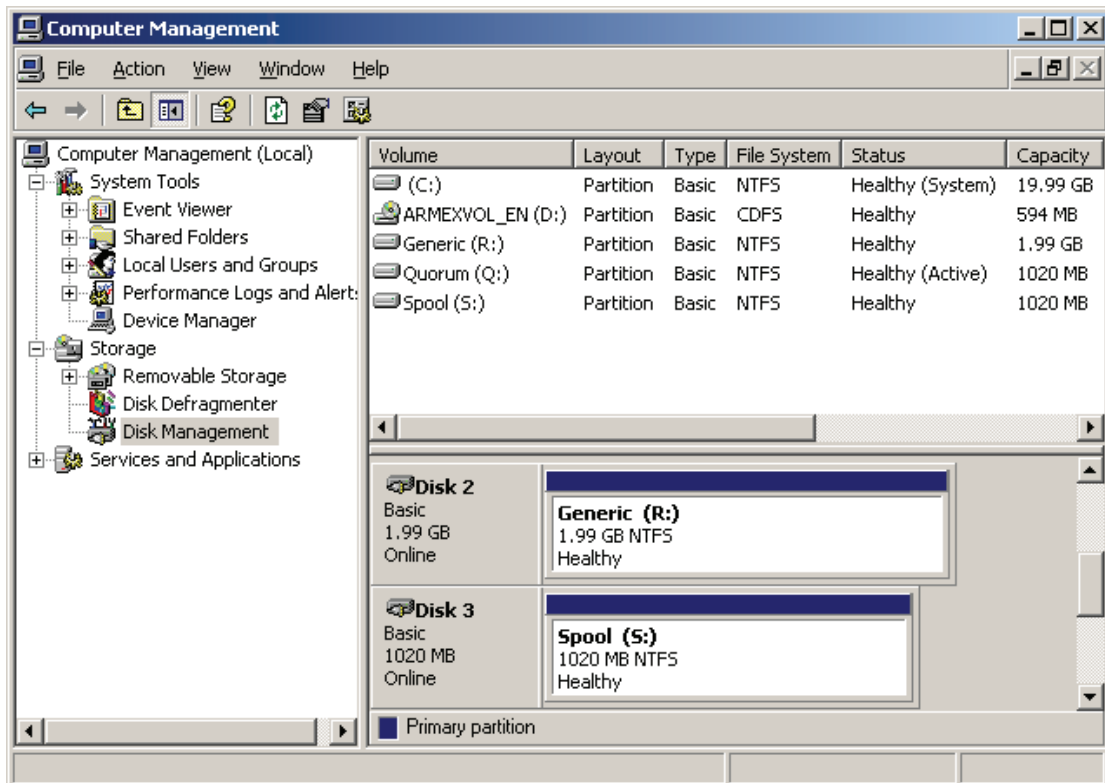
Press the **Next** button to continue.

Finish disk formatting



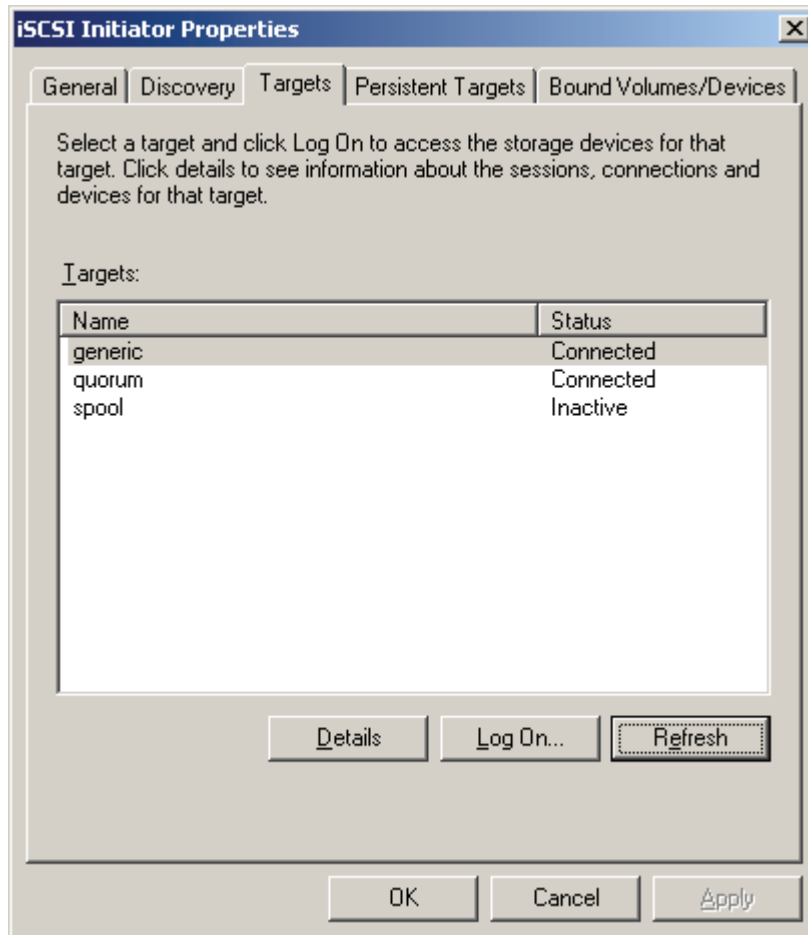
Press the **Finish** button.

Come back to the Computer Management Console.

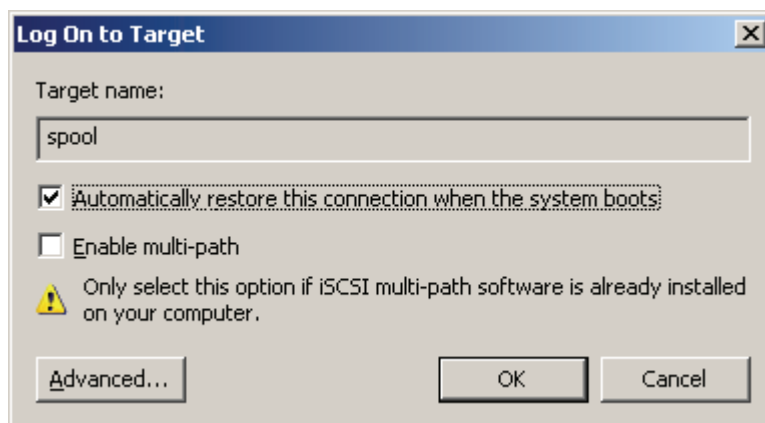


After the successful operation, the status is shown as in the figure.

Open iSCSI Initiator on node2, client the **Refresh** button on the **Targets** page.

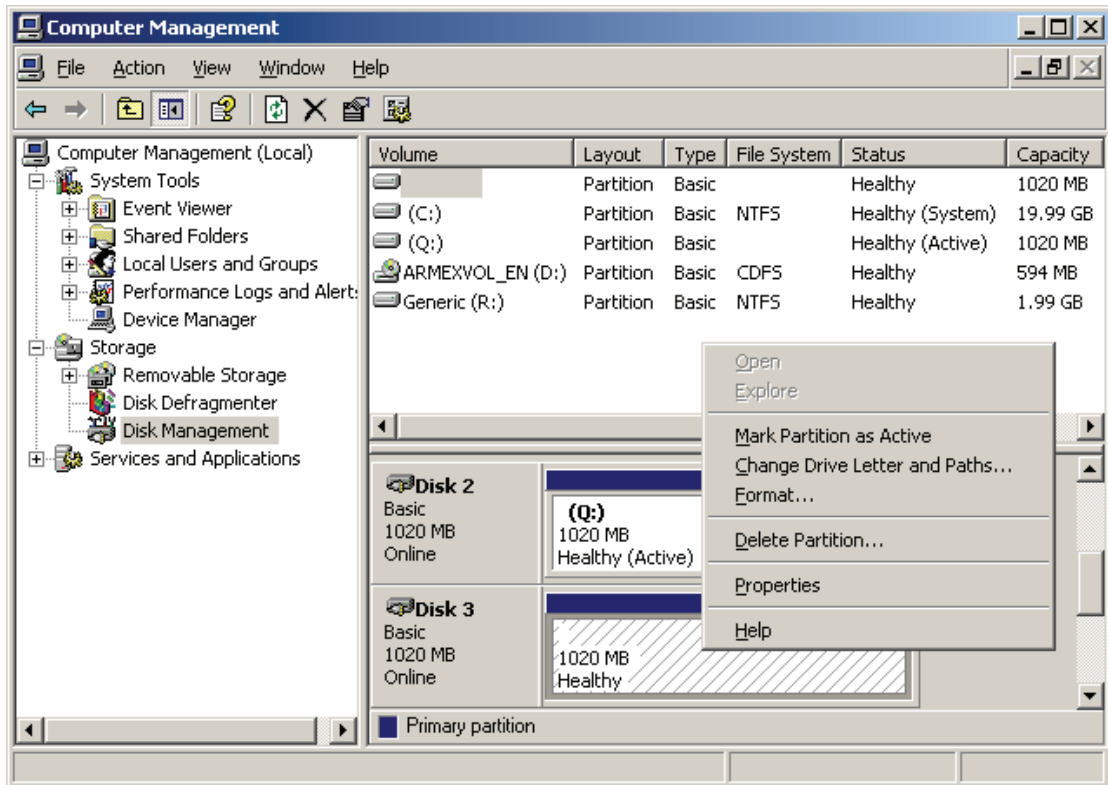


Select spool and then press the **Log On** button, the **Log On to Target dialog** is shown.

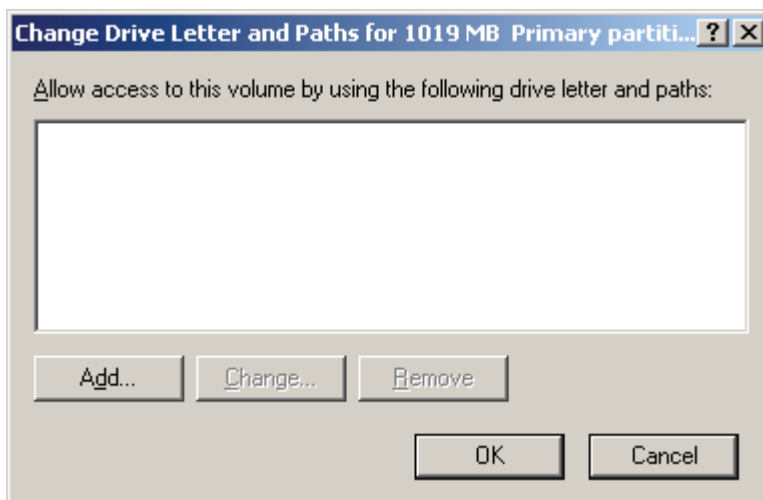


Select spool and click the **Log On** button. Check **Automatically restore this connection when the system boots**.

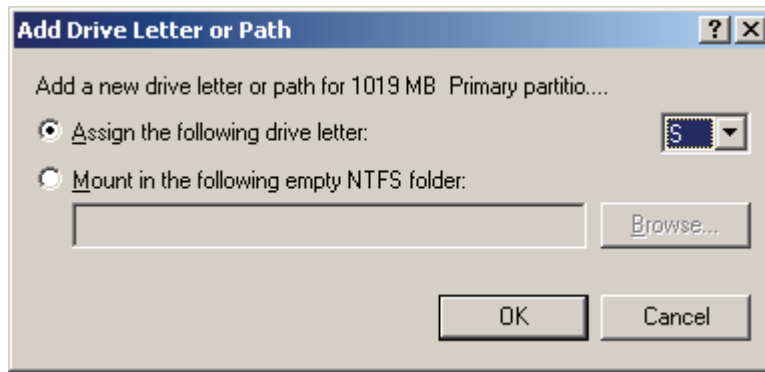
Open Computer Management and select Disk Management.



Right click on spool disk and select **Change Drive Letter and Paths**.

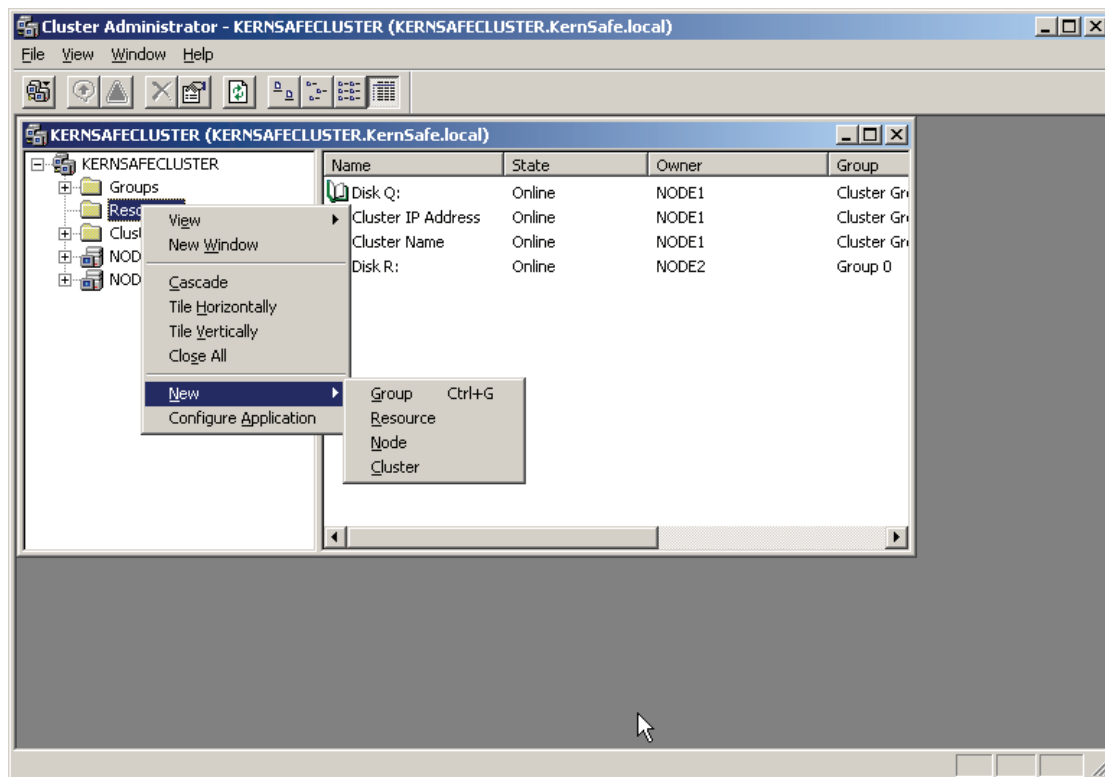


Click the **Add** button.



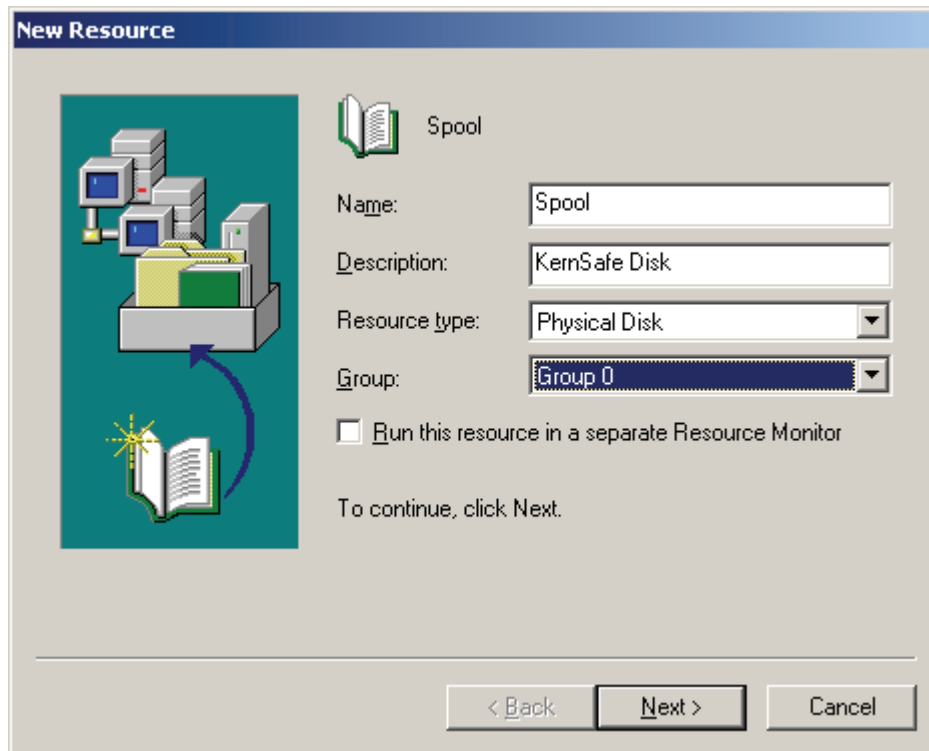
Assign S as drive letter and press the **OK** button.

Open Cluster Administrator



Right click on Resources, then select New -> Resource, the **New Resource dialog** is shown






Enter contents for each item.

Enter Spool as Name, KernSafe Disk as Description, Physical Disk as Resource type and Group 0 as Group.

Press the **Next** button to continue.

**Possible Owners**

 Spool

Possible owners are nodes in the cluster on which this resource can be brought online. Specify the possible owners for this resource.



Available nodes:

Name
------

Add →

← Remove

Possible owners:


Name
 NODE1
 NODE2

< Back   Next >   Cancel

Add node1 and node2 to **Possible owners**.


Press the **Next** button to continue.

**Dependencies**

 Spool

Dependencies are resources which must be brought online by the cluster service first. Specify the dependencies for this resource.

Available resources:

Resource	Resc
 Disk R:	Phys

Add →

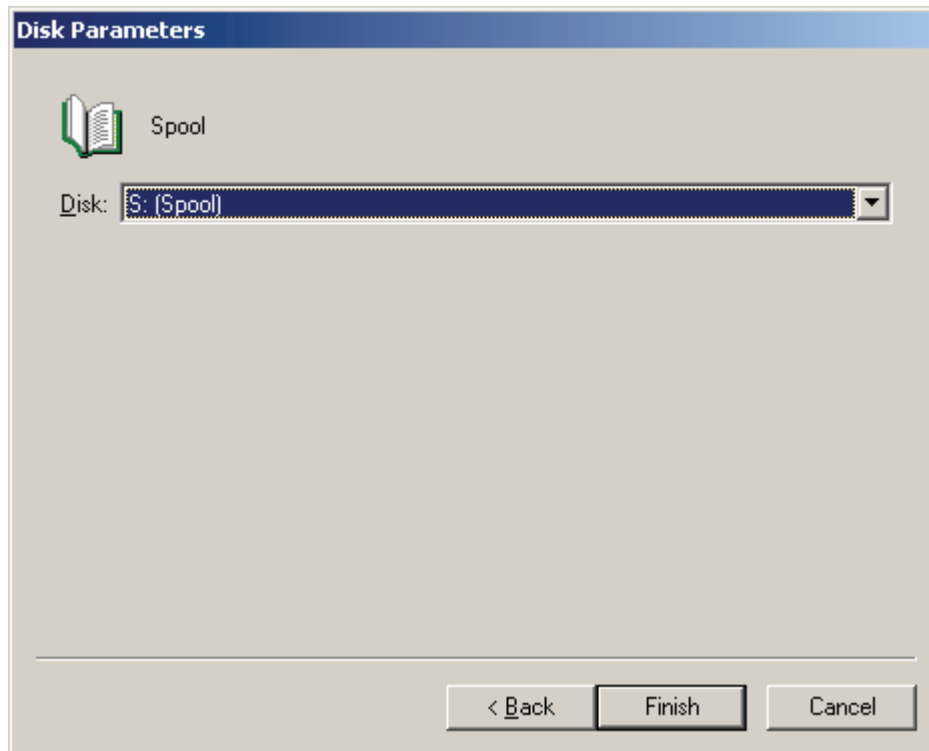
← Remove

Resource dependencies:

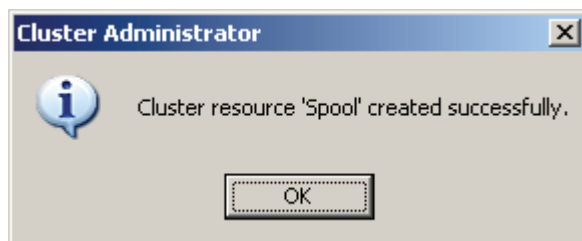
Resource	Resc
----------	------

< Back   Next >   Cancel

Press the **Next** button to continue.

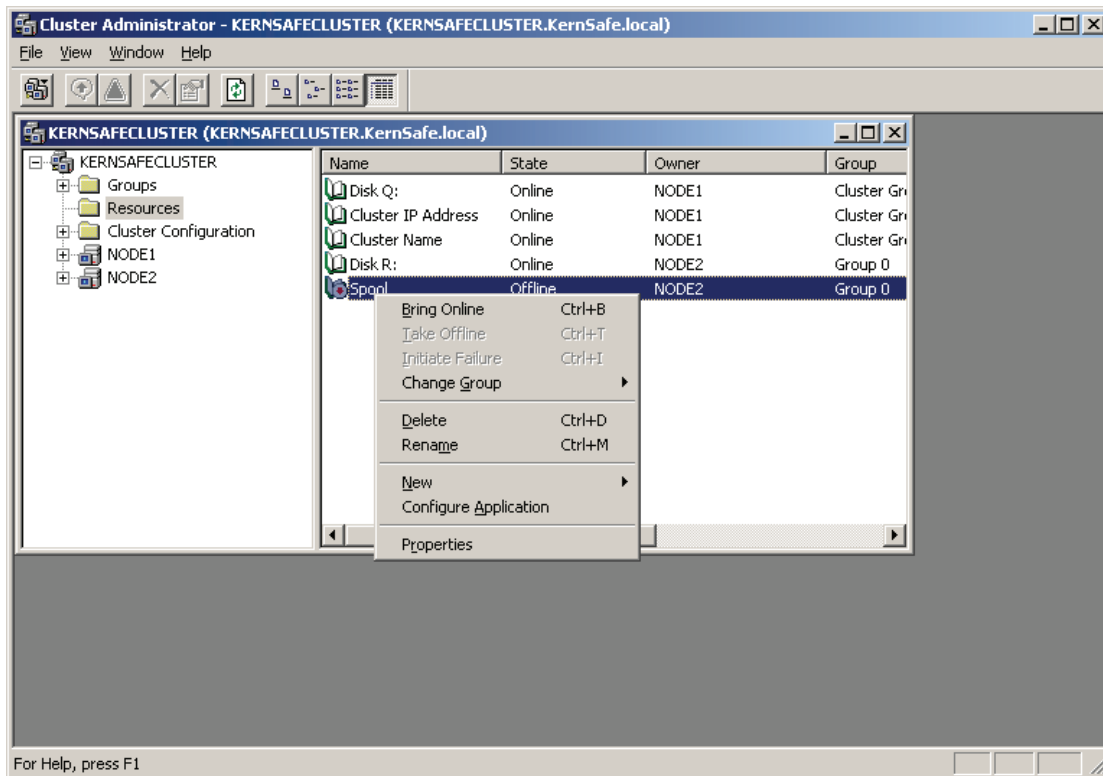


Select **S:(Spool)** and press the **Finish** button.

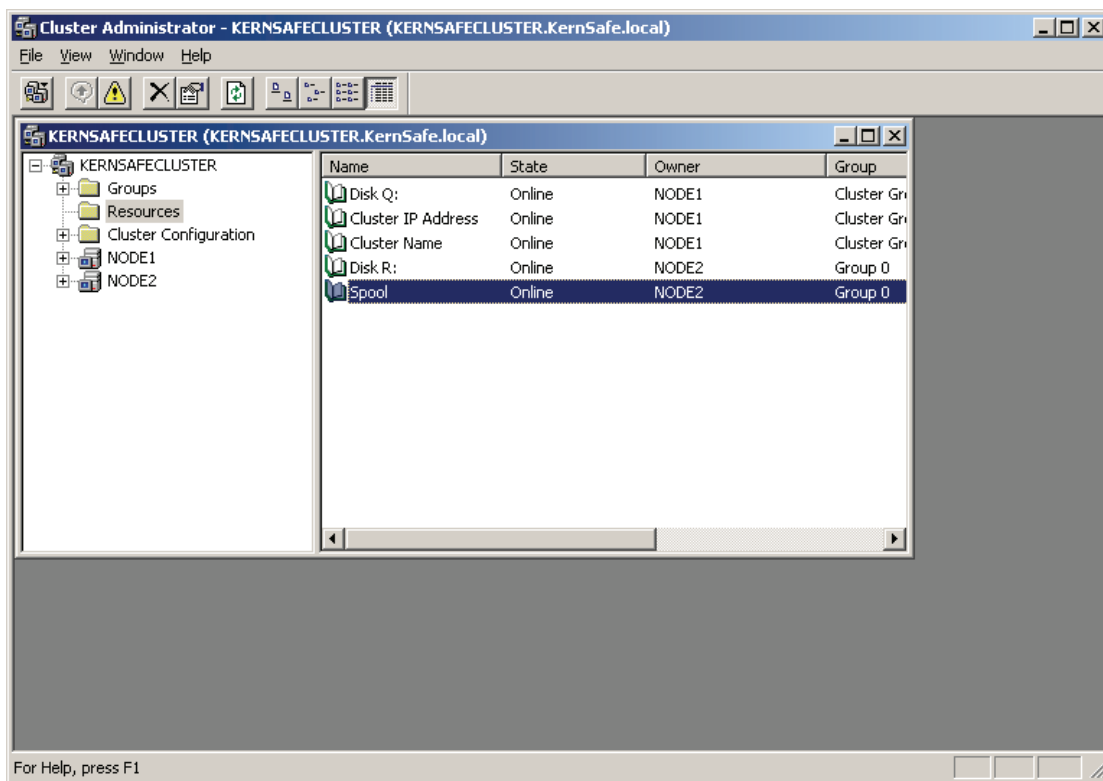


Press the **OK** button.

Come back to the Cluster Administrator Console



Right click on **Spool** and select **Bring Online**.



After the successful operation, the status is shown as in the figure.

Now, the cluster has been created successfully and can increase nodes and resources.