

iStorage Server: Working with Windows Cluster

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KernSafe Technologies, Inc.

www.kernsafe.com

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1. Overview

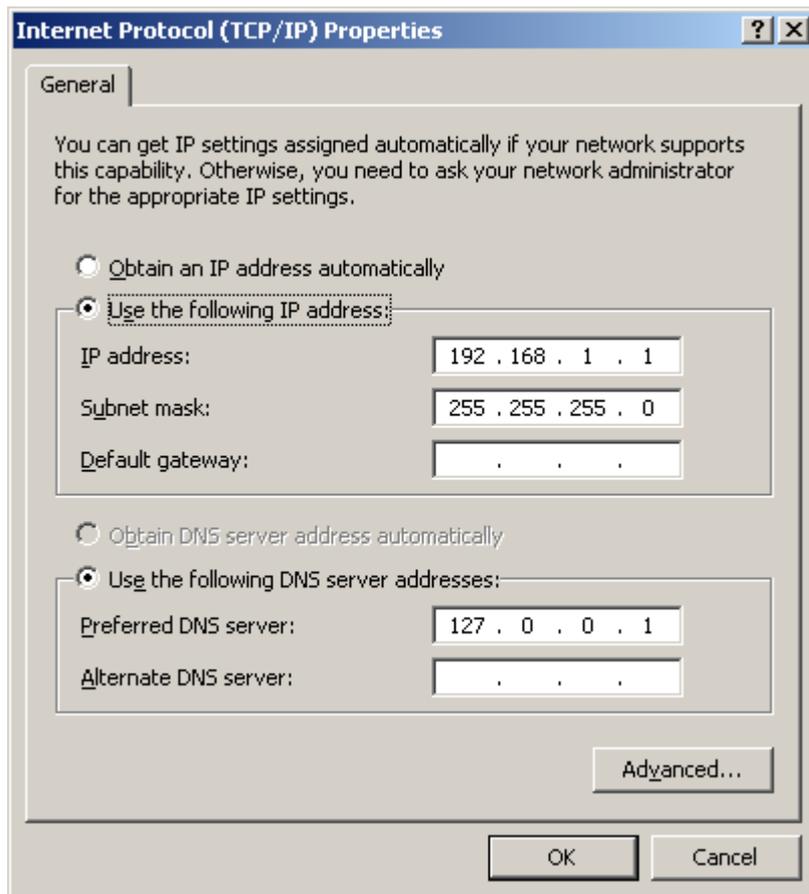
iStorage Server is a network based storage virtualization software powered by KernSafe Technologies. Being a powerful, full-featured and software-only iSCSI Target, iStorage Server is an IP SAN solution that can quickly convert existing Windows computer into IP SAN. Storage media of iSCSI Target can include existing storage devices such as the entire hard disks or partitions, CD-RWs, tapes and USB storage devices, as well as disk image file or CD image files including ISO9660(.iso), .bin, .mdf, .cdi, .b5i, .nrg, .ccd, .sub, .img, .raw and other image file formats.

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 filesystems 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.

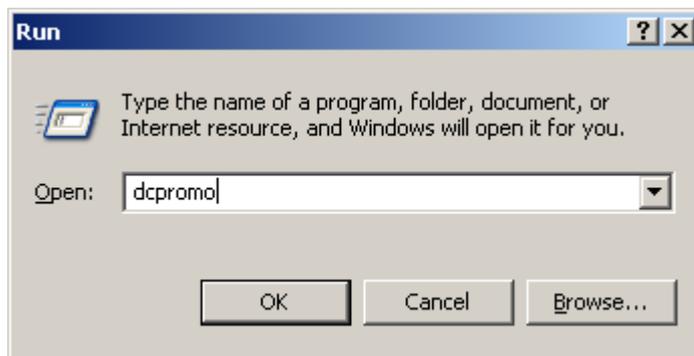
This article demonstrates how to build Windows Server 2003 high availability cluster by using KernSafe iSCSI Target. In this case, at least three computers are needed, respectively domain controller, node 1 and node 2. Each computer requires two network adapters. The computer names here are 03DCx64,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

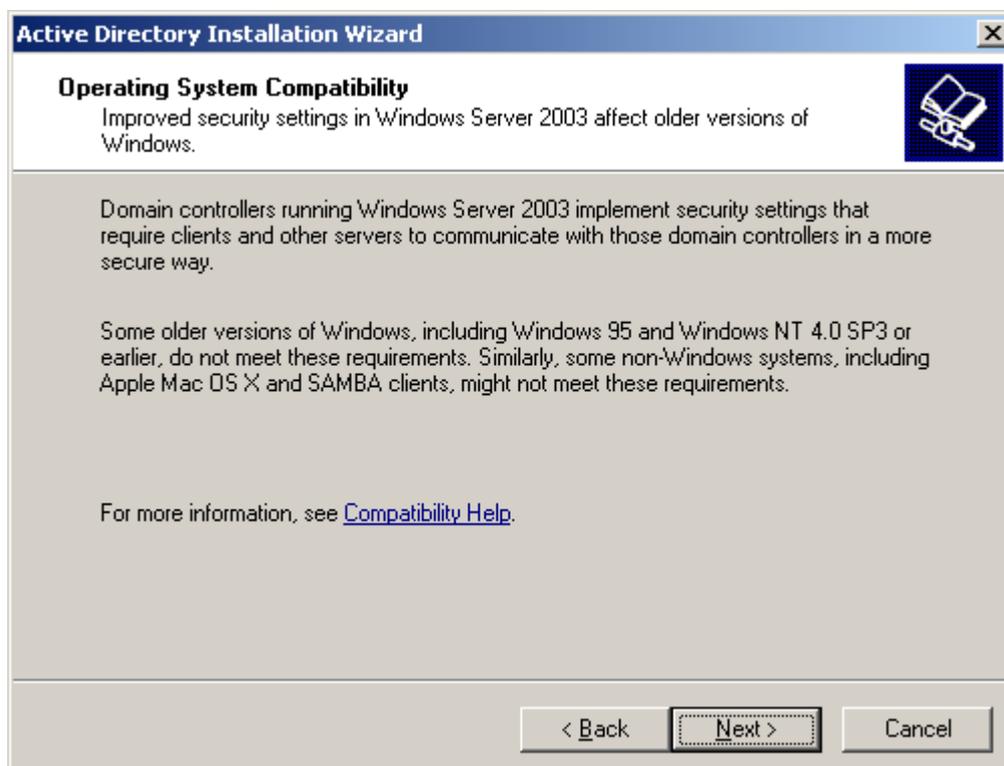


Enter dcpromo in Start -> Run and the Domain Controller setup wizard will be shown.



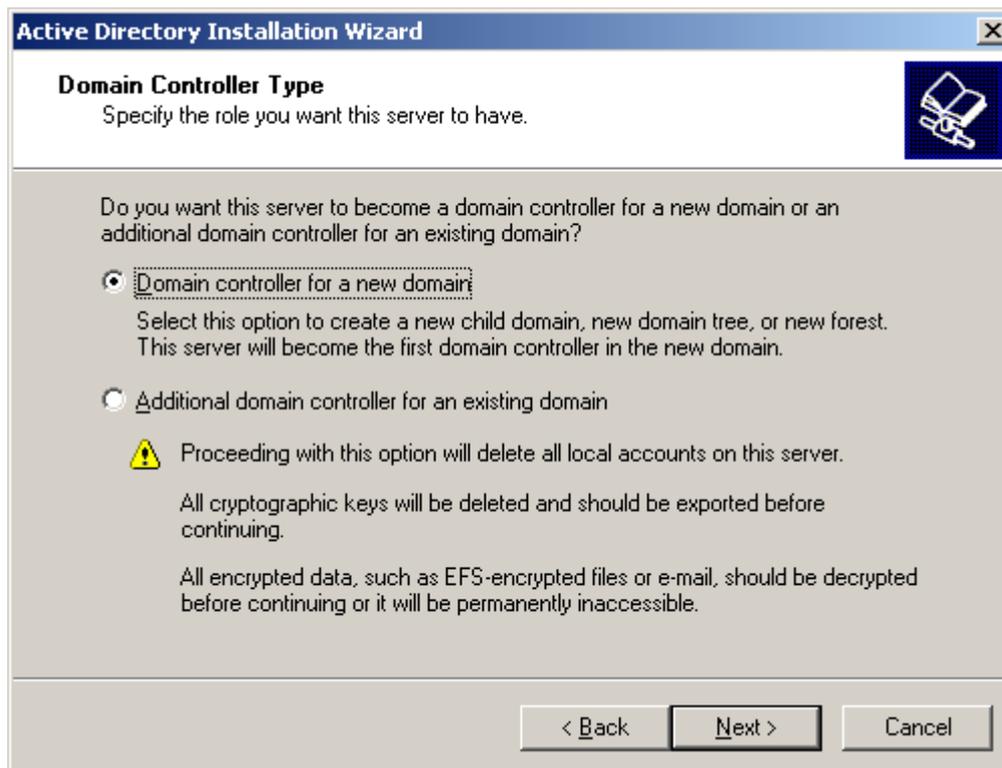
Press the Next button in the pop-up wizard to continue.

Check operation system compability



Press the Next button to continue

Specify domain controller type

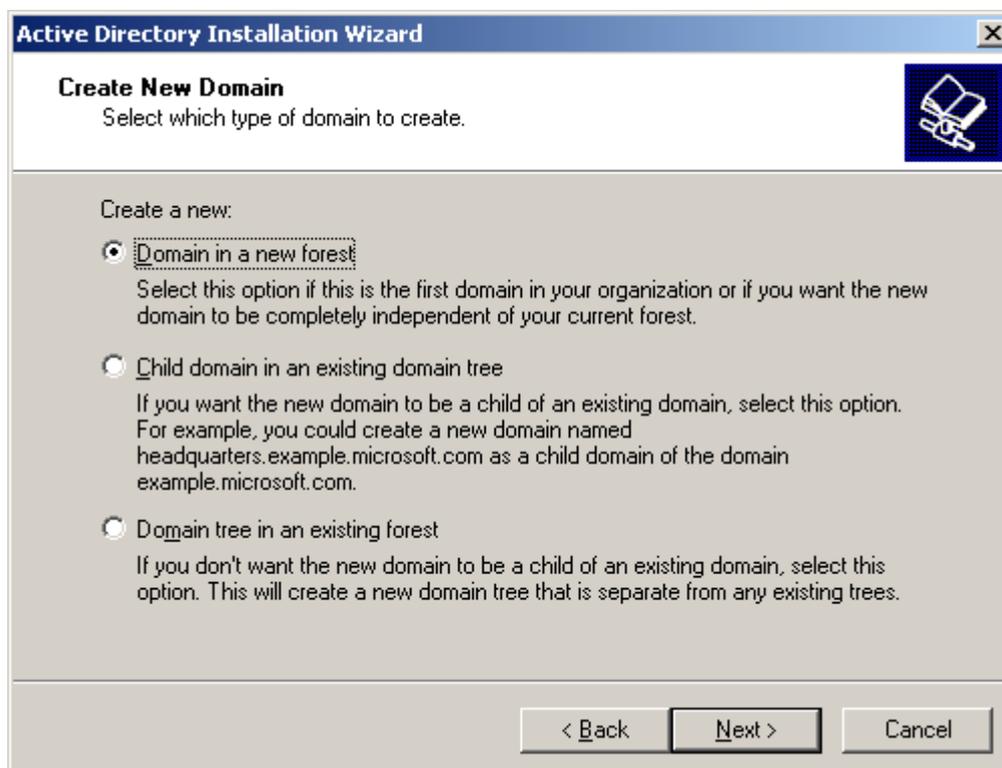


The screenshot shows the 'Active Directory Installation Wizard' window. The title bar reads 'Active Directory Installation Wizard'. The main heading is 'Domain Controller Type' with a sub-instruction: 'Specify the role you want this server to have.' Below this, a question asks: 'Do you want this server to become a domain controller for a new domain or an additional domain controller for an existing domain?'. There are two radio button options: 'Domain controller for a new domain' (which is selected) and 'Additional domain controller for an existing domain'. A yellow warning triangle icon is next to the second option, with text stating: '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.' At the bottom, there are three buttons: '< Back', 'Next >', and 'Cancel'.

Select Domain controller for a new domain.

Press the Next button to continue.

Select which type of domain to create

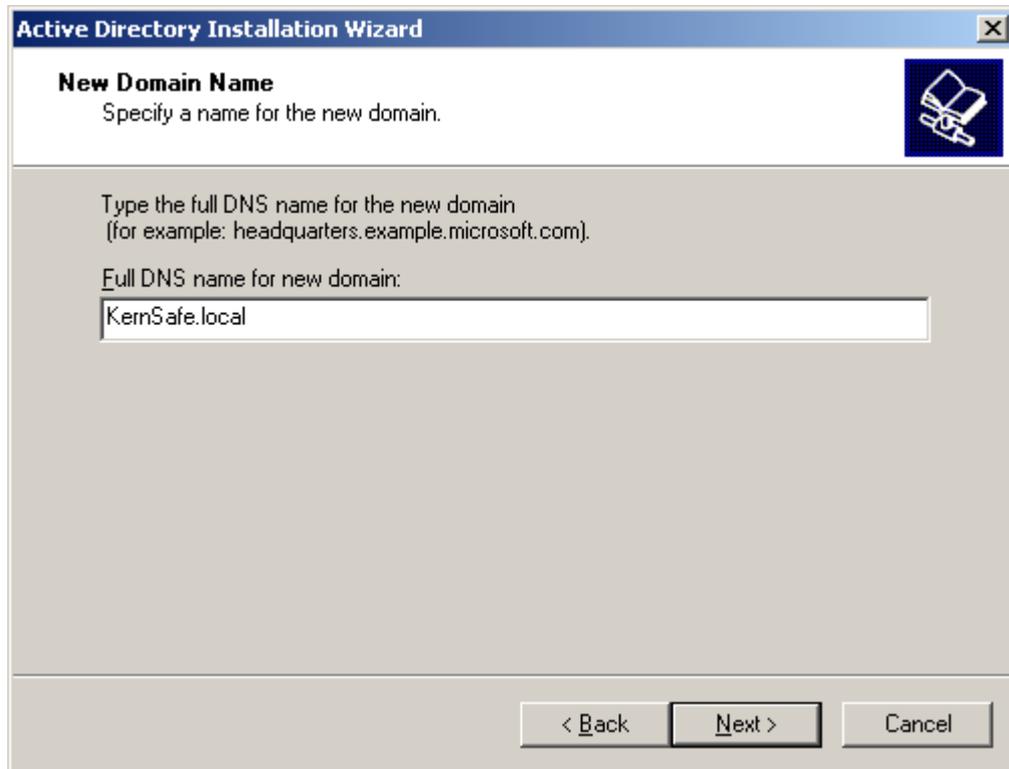


The screenshot shows the 'Active Directory Installation Wizard' window. The title bar reads 'Active Directory Installation Wizard'. The main heading is 'Create New Domain' with a sub-instruction: 'Select which type of domain to create.' Below this, the text says 'Create a new:'. There are three radio button options: 'Domain in a new forest' (which is selected), 'Child domain in an existing domain tree', and 'Domain tree in an existing forest'. Each option has a brief description of its function. At the bottom, there are three buttons: '< Back', 'Next >', and 'Cancel'.

Select Domain in a new forest.

Press the Next button to continue.

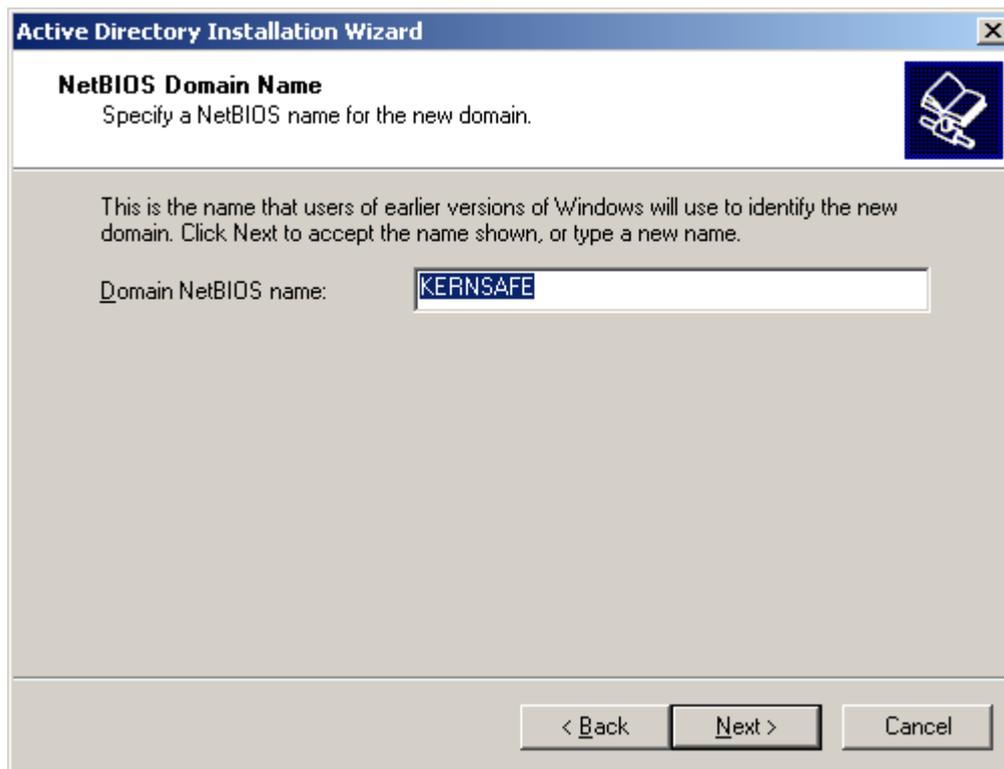
Type new domain name



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 heading is a blue icon of a computer monitor with a hand pointing at it. Below the heading, there is a text prompt: "Type the full DNS name for the new domain (for example: headquarters.example.microsoft.com)." followed by a label "Full DNS name for new domain:" and a text input field containing "KernSafe.local". At the bottom of the window, there are three buttons: "< Back", "Next >", and "Cancel".

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

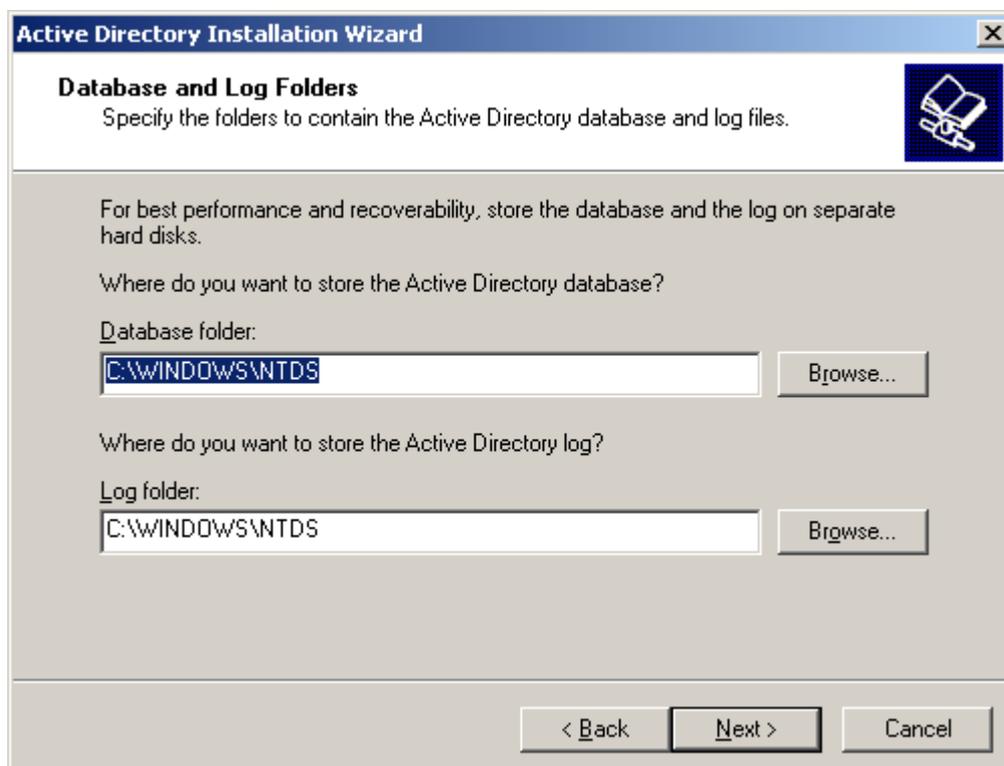
Specify NetBIOS name



Enter the name of NetBIOS, which is KERNSAFE here.

Press the Next button to continue.

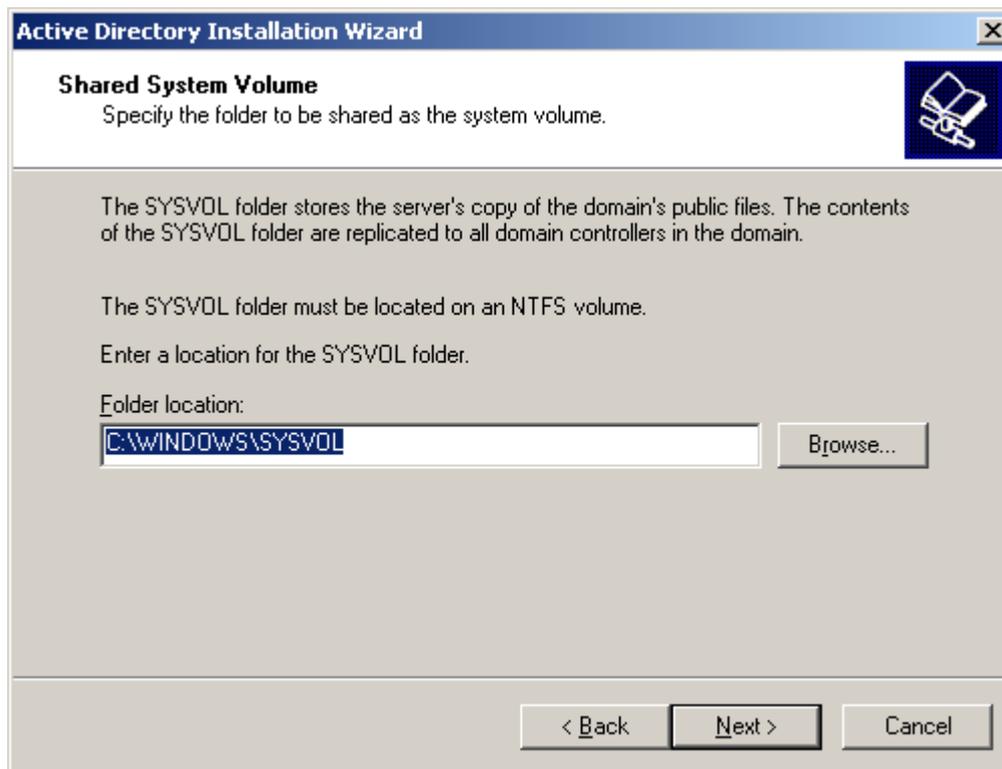
Specify the folders to contain the Active Directory database and log file



Select the storage location of Database and Log Folders.

Press the Next button to continue.

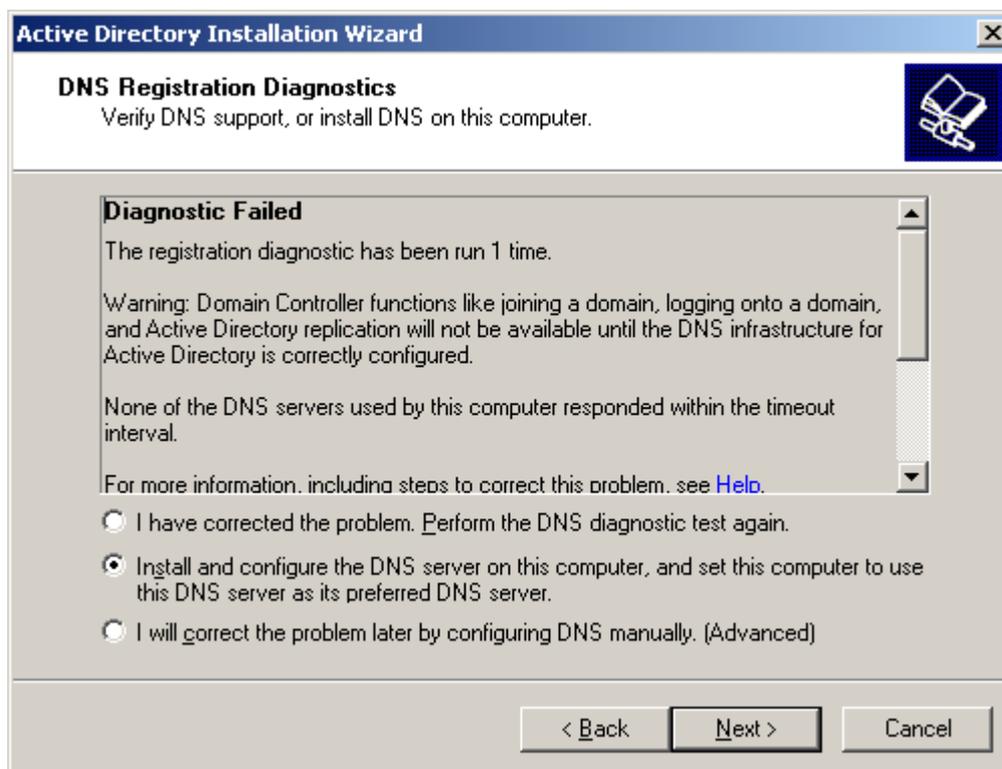
Specify the folder to be shared as the system volume



Select the storage location of file SYSVOL.

Press the Next button to continue.

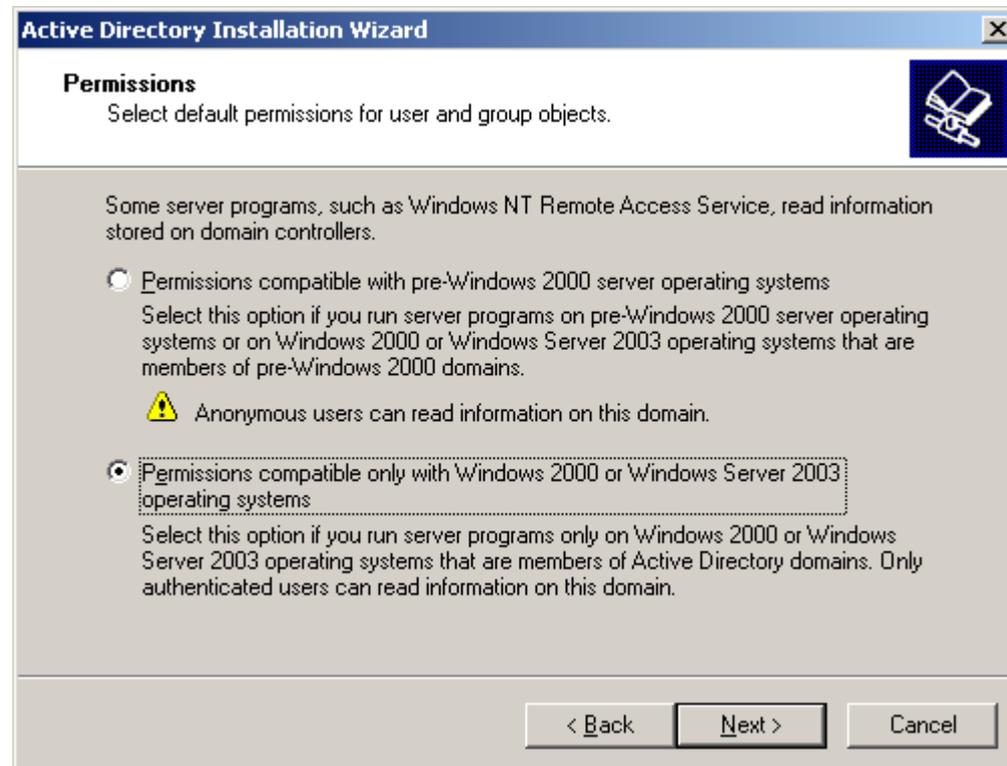
Diagnostic DNS registration



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.

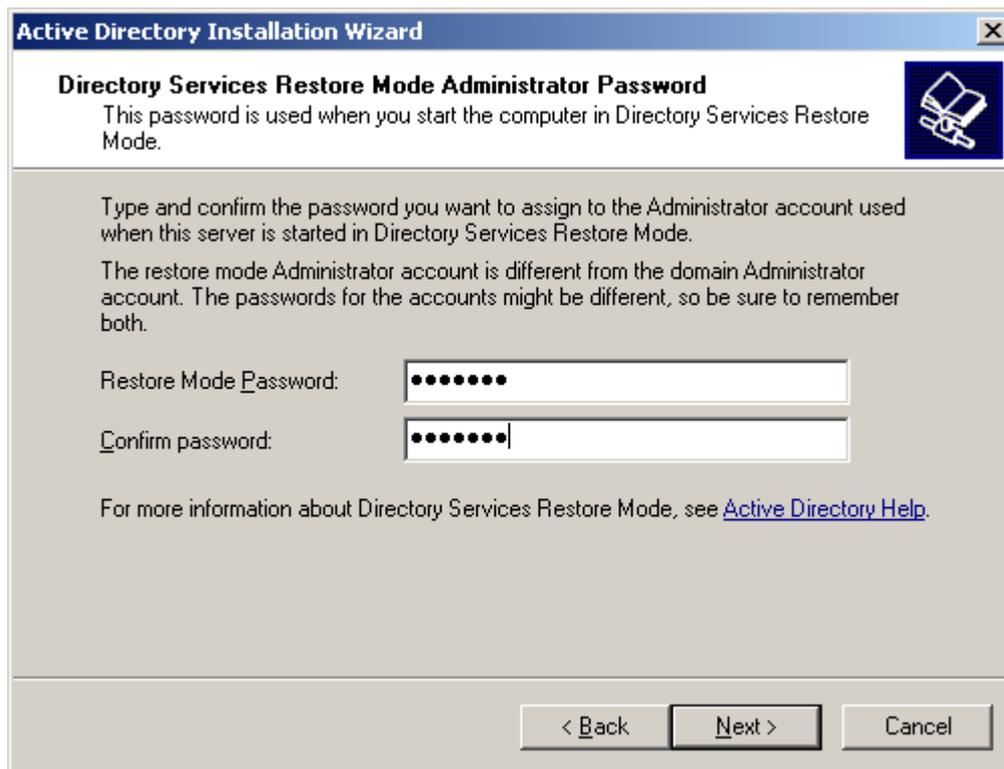
Select default permissions for user and group objects



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

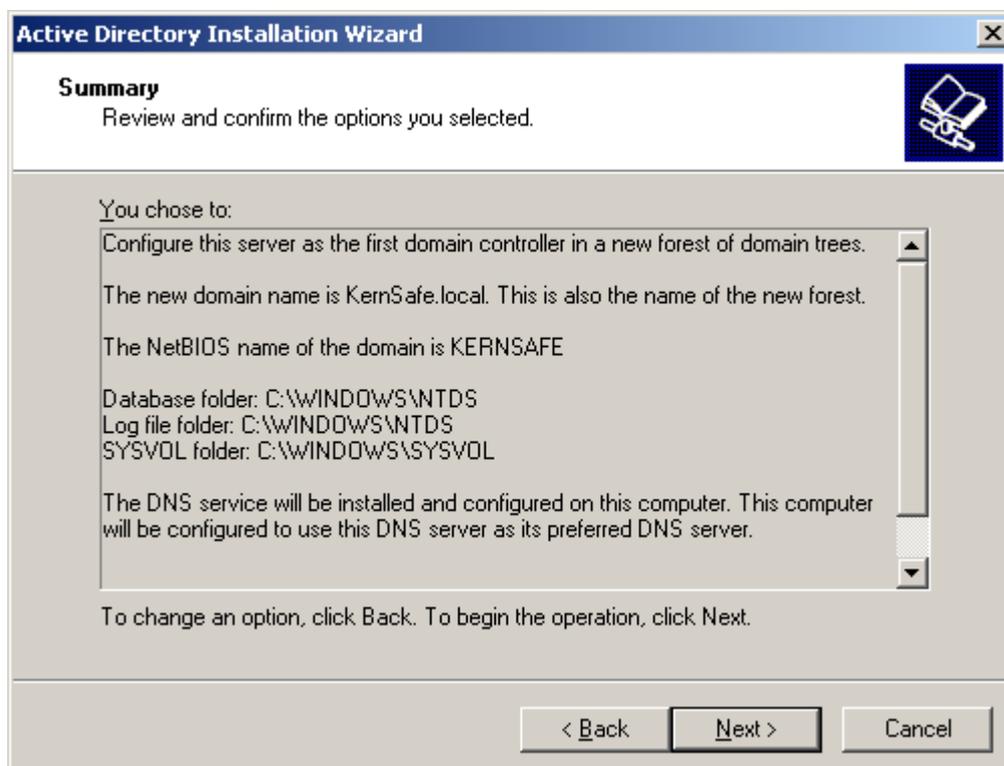
Press the Next button to continue.

Specify restore mode administrator password



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.

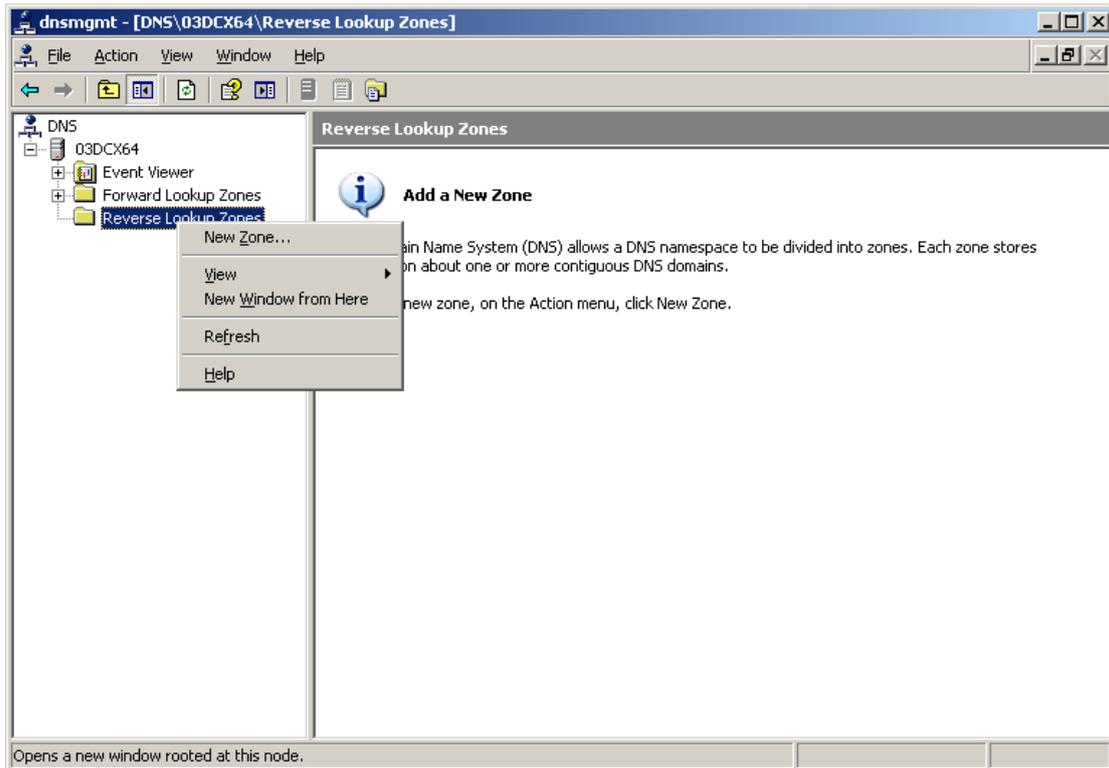
Restart operation system



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 will be shown.

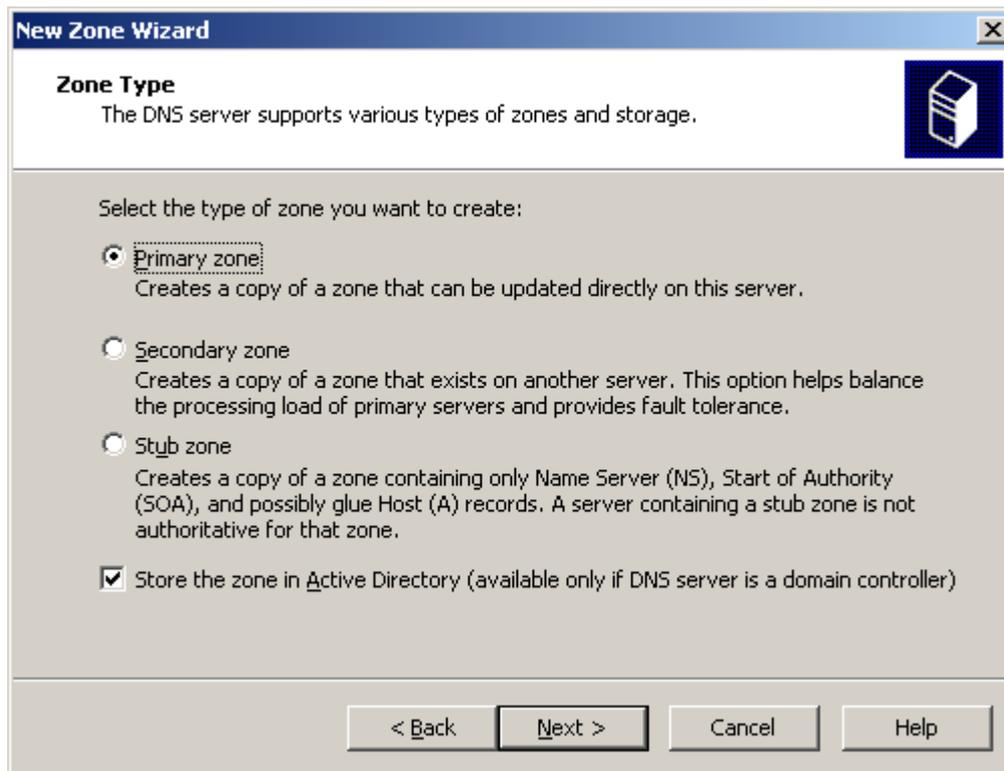


Open DNS Manager, right click on Reverse Lookup Zone and select New Zone, the New Zone Wizard will be shown.



Press the Next button to continue.

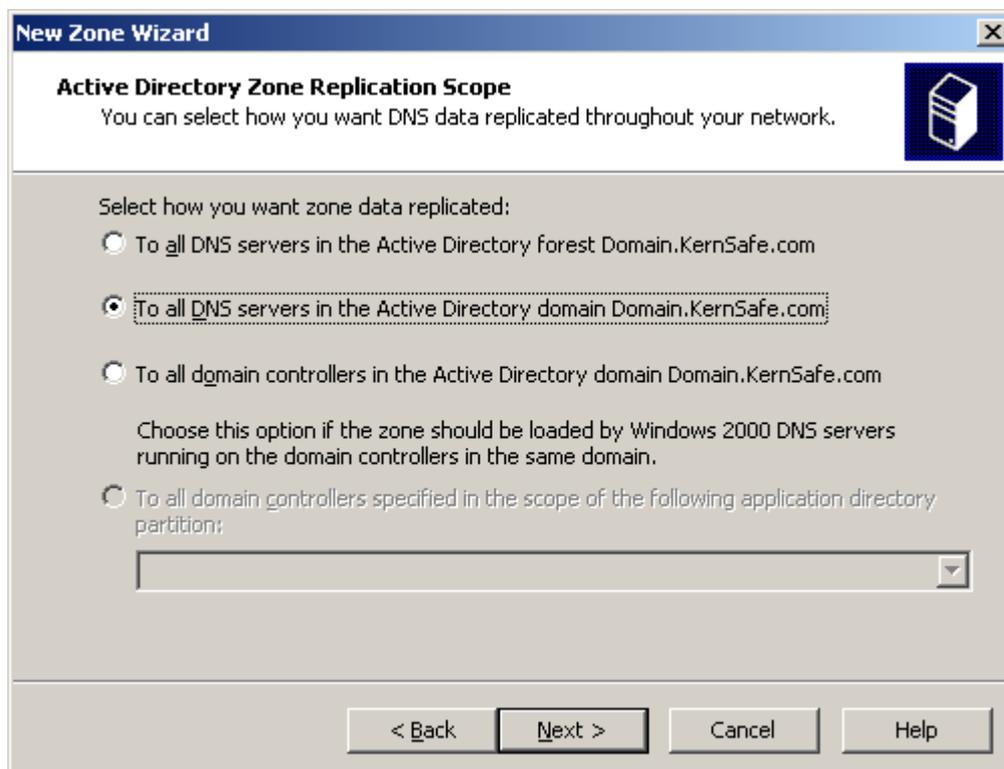
Select zone type



Select Primary zone.

Press the Next button to continue.

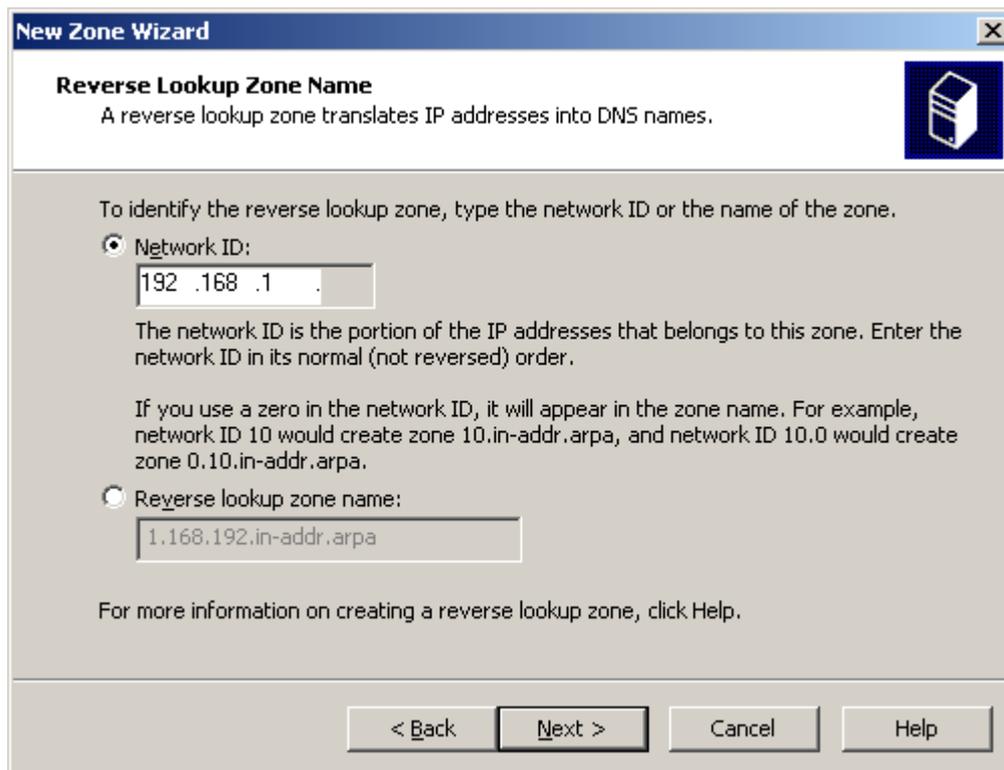
Select zone data replicated



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

Press the Next button to continue.

Specify reverse lookup zone name



New Zone Wizard [X]

Reverse Lookup Zone Name
A reverse lookup zone translates IP addresses into DNS names.

To identify the reverse lookup zone, type the network ID or the name of the zone.

Network ID:
192 .168 .1 .

The network ID is the portion of the IP addresses that belongs to this zone. Enter the network ID in its normal (not reversed) order.

If you use a zero in the network ID, it will appear in the zone name. For example, network ID 10 would create zone 10.in-addr.arpa, and network ID 10.0 would create zone 0.10.in-addr.arpa.

Reverse lookup zone name:
1.168.192.in-addr.arpa

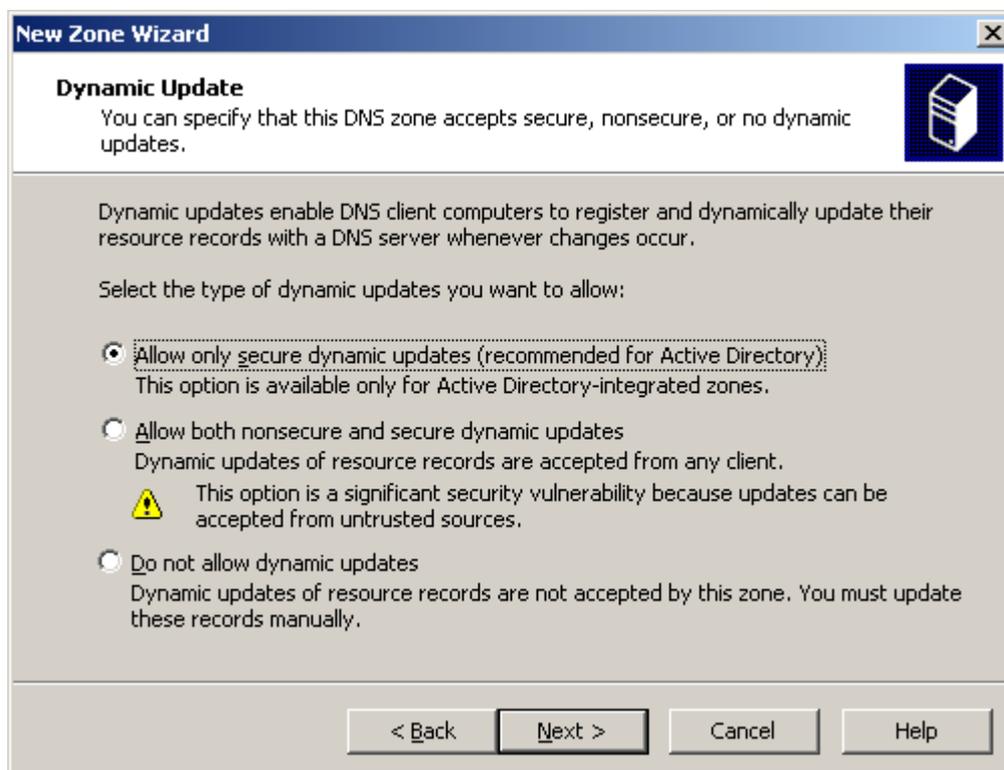
For more information on creating a reverse lookup zone, click Help.

< Back Next > Cancel Help

Select Network ID, enter 192.168.1.

Press the Next button to continue.

Set Dynamic update types



New Zone Wizard [X]

Dynamic Update
You can specify that this DNS zone accepts secure, nonsecure, or no dynamic updates.

Dynamic updates enable DNS client computers to register and dynamically update their resource records with a DNS server whenever changes occur.

Select the type of dynamic updates you want to allow:

Allow only secure dynamic updates (recommended for Active Directory):
This option is available only for Active Directory-integrated zones.

Allow both nonsecure and secure dynamic updates
Dynamic updates of resource records are accepted from any client.
 This option is a significant security vulnerability because updates can be accepted from untrusted sources.

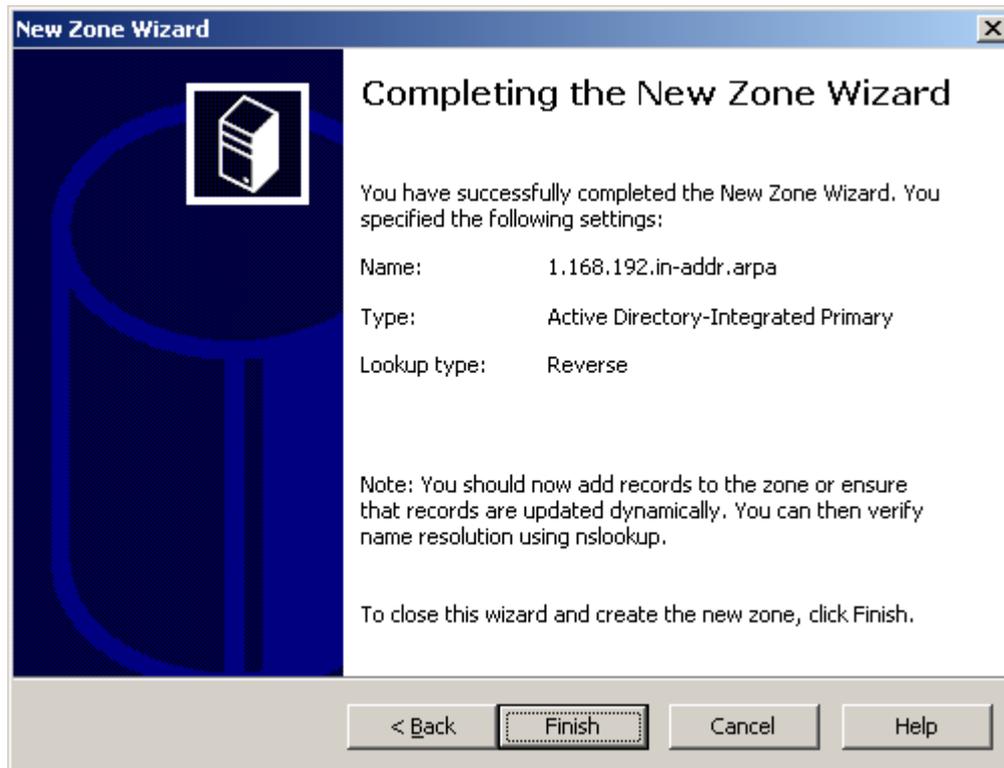
Do not allow dynamic updates
Dynamic updates of resource records are not accepted by this zone. You must update these records manually.

< Back Next > Cancel Help

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

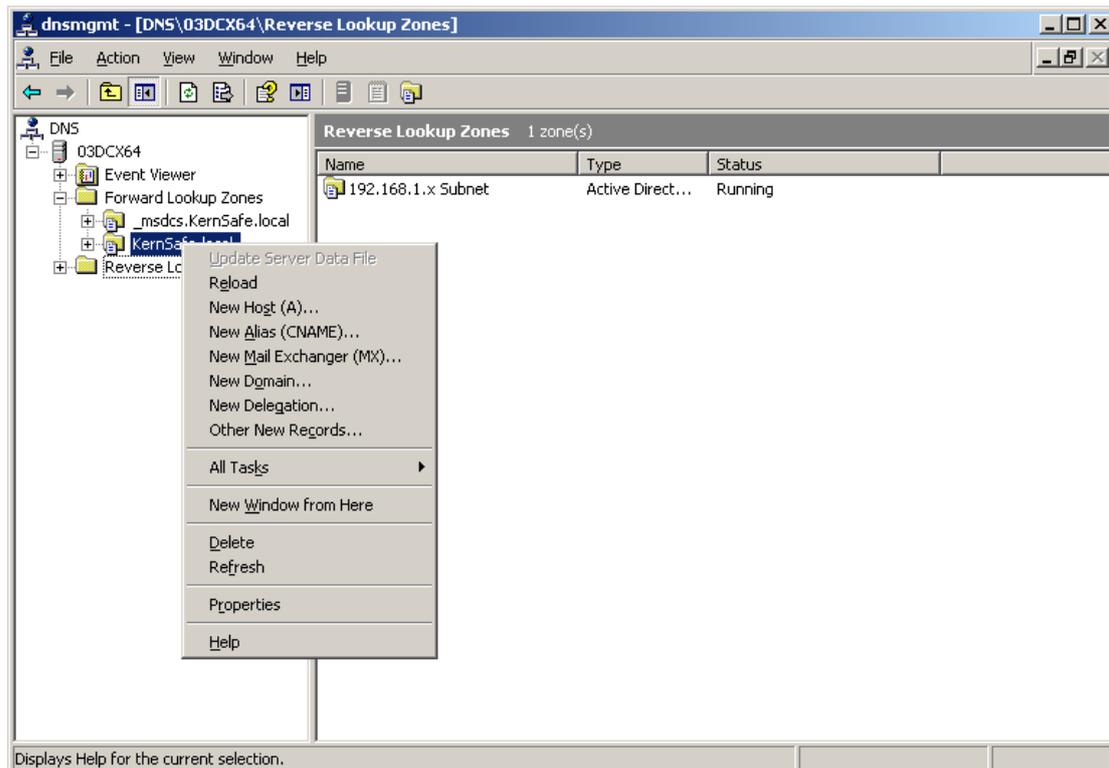
Press the Next button to continue.

Complete the New Zone Wizard

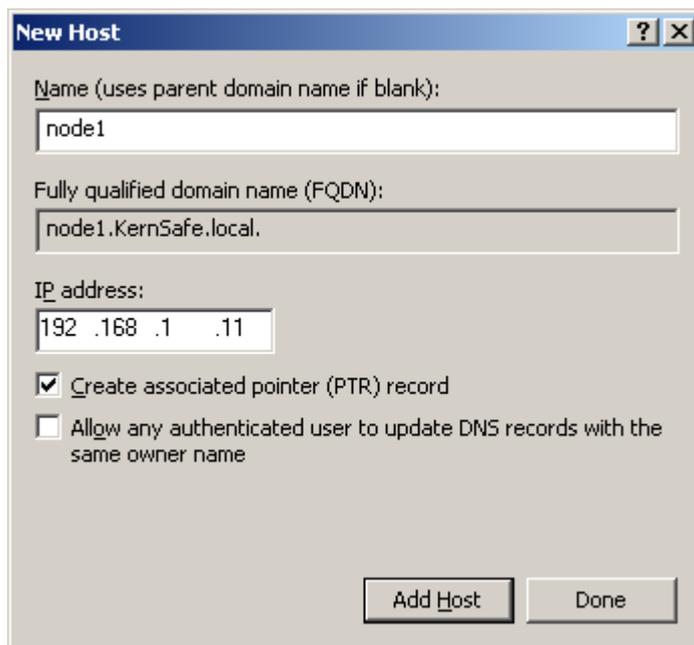


Press the Finish button.

Come back to the domain controller management console.



Right click on KernSafe.local and select New Host (A), the New Host dialog will be 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

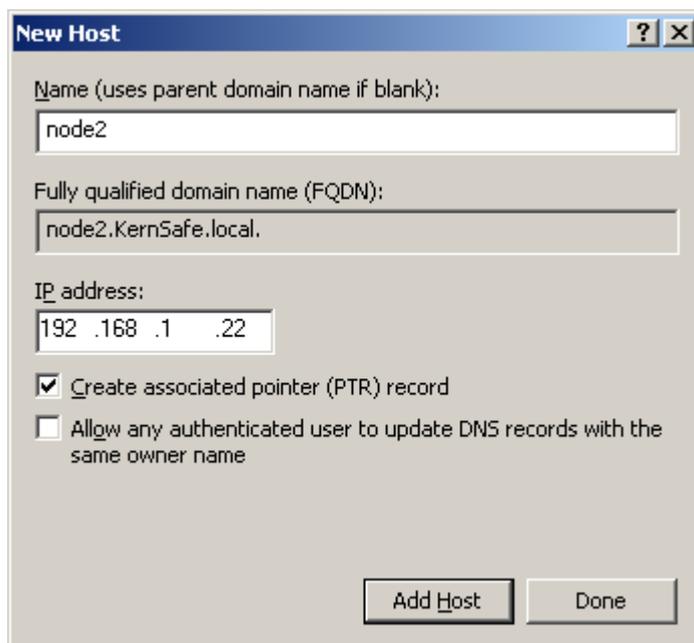
Create associated pointer (PTR) record

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

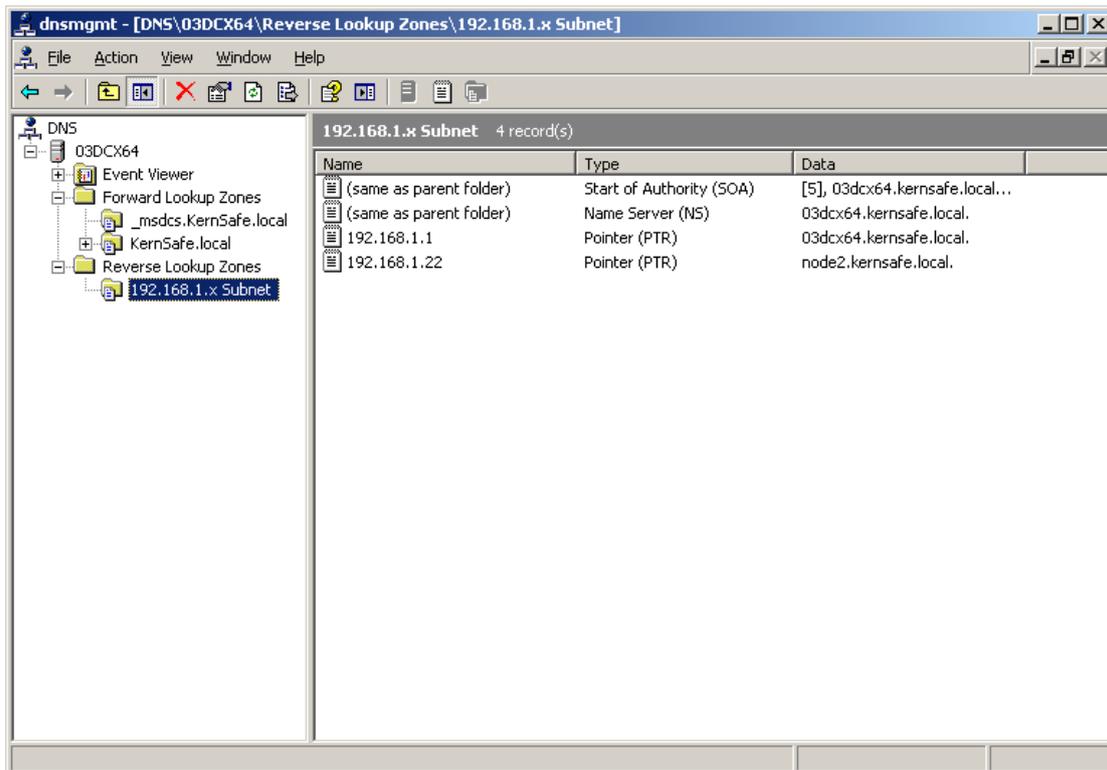
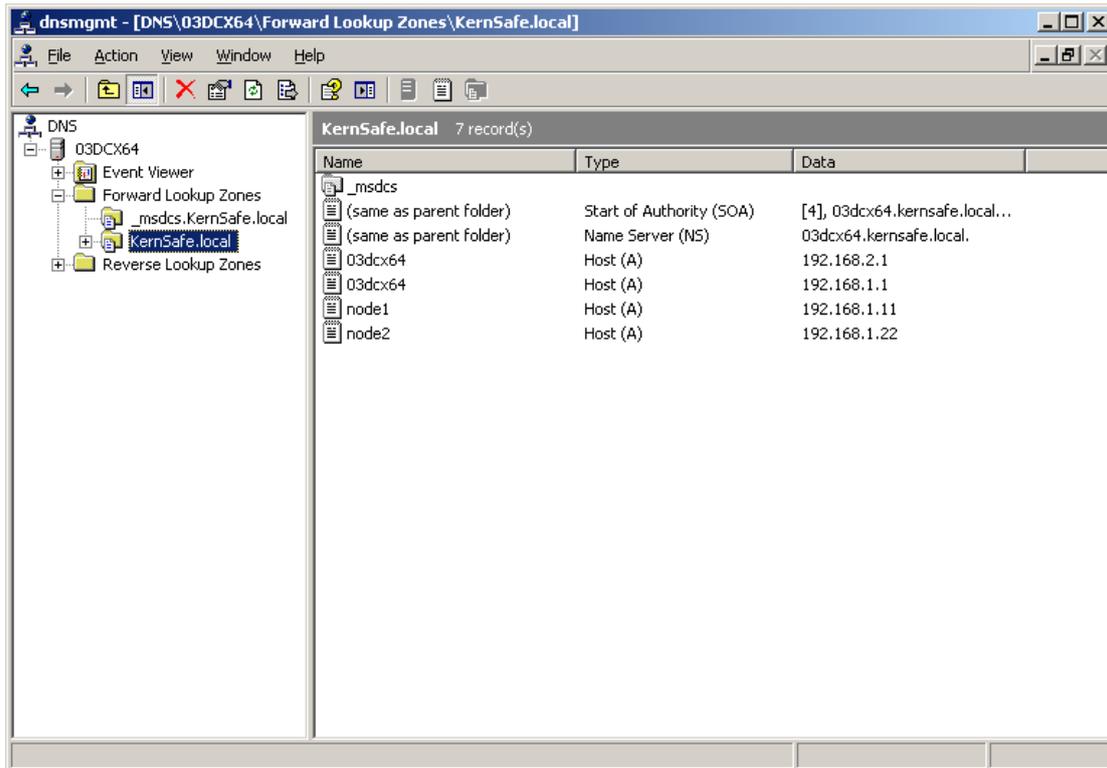
Allow any authenticated user to update DNS records with the same owner name

Add Host Done

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

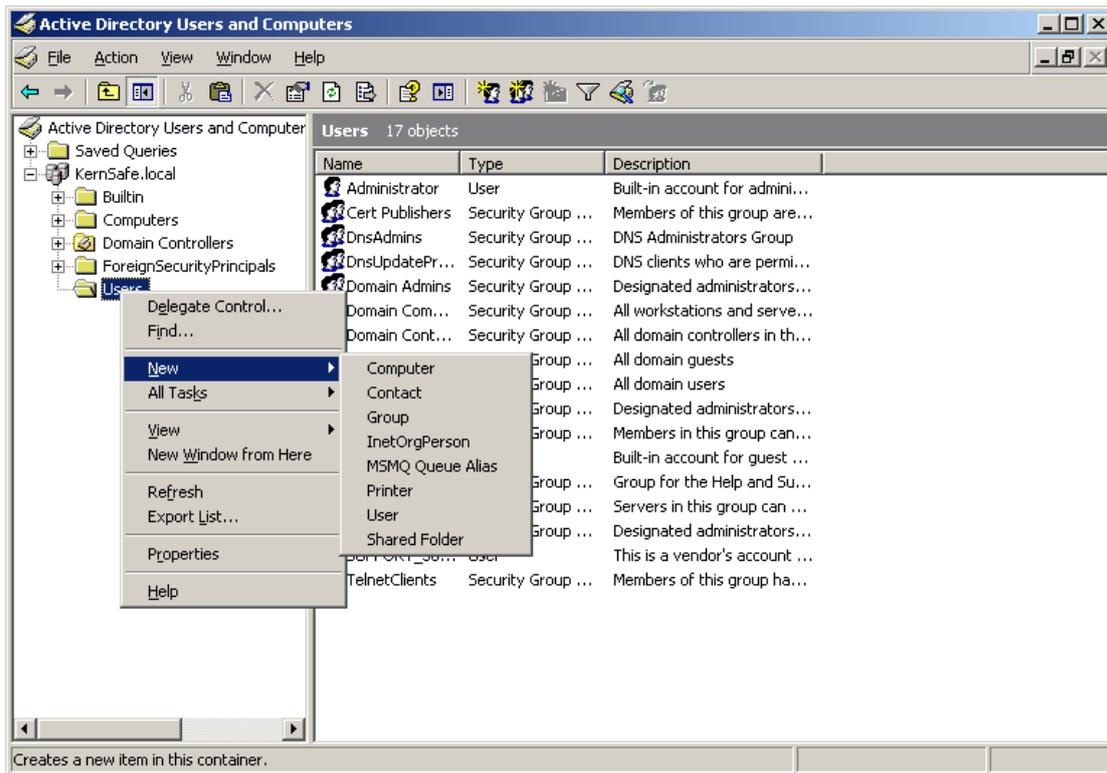
Press the Add Host button to continue.

Come back to the domain controller management console.

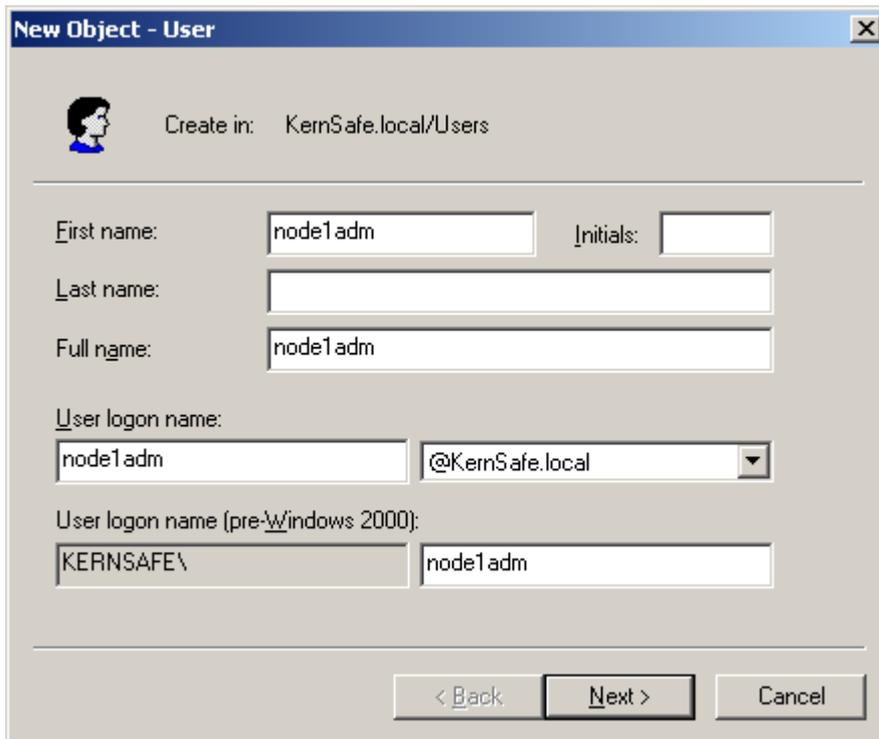


After all the above operations are done successfully, the status of DNS Manager is shown as in the figure below.

Open Active Directory Users and Computers console



Right click on Users and select New -> User, the New Object-User dialog will be shown



Create any user as shown in the picture, take node1adm as a 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

New Object - User

Create in: KernSafe.local/Users

When you click Finish, the following object will be created:

Full name: node1 adm

User logon name: node1 adm@KernSafe.local

The user cannot change the password.

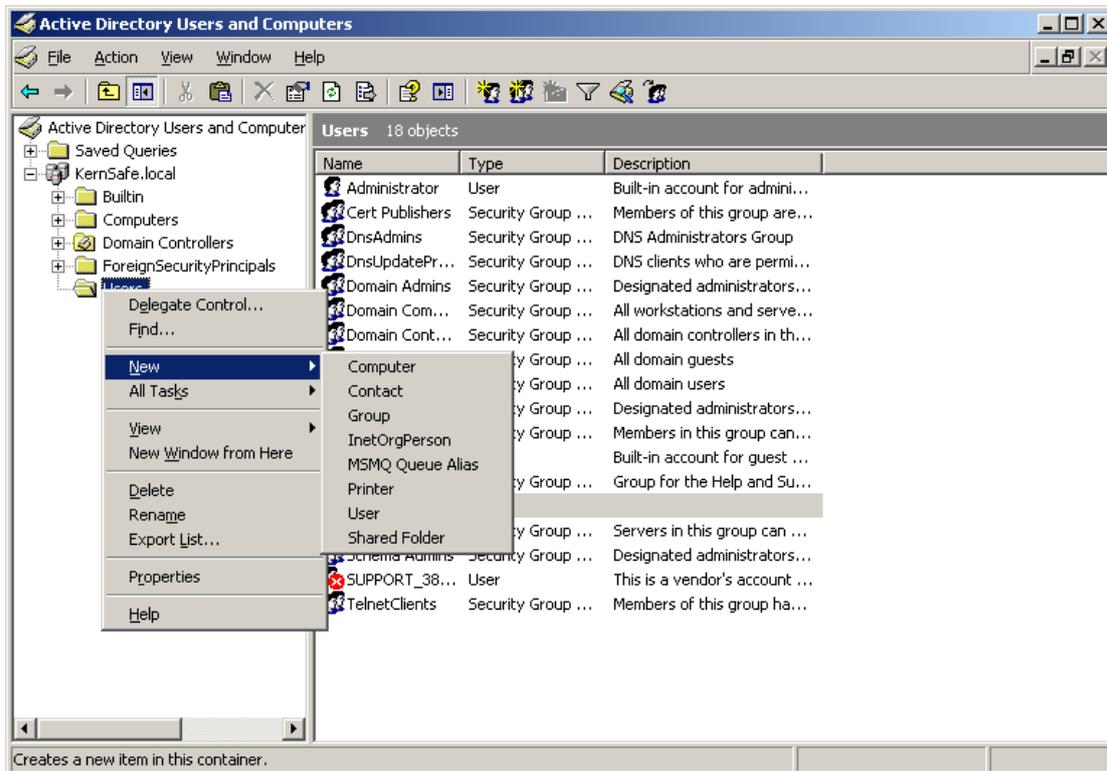
The password never expires.

< Back Finish Cancel

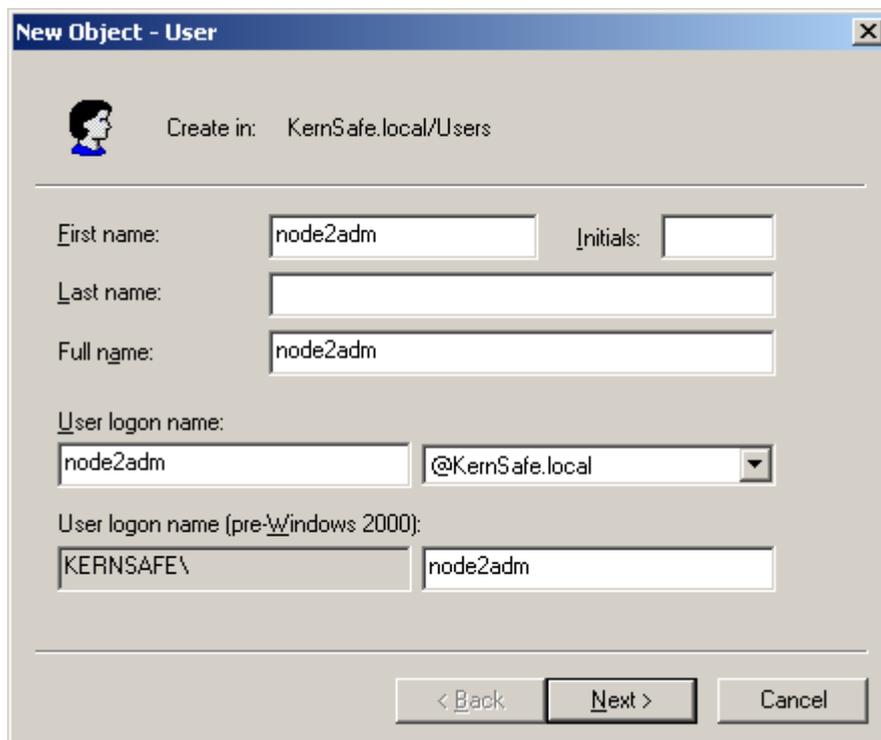
Press the Finish button.

Come back to Active Directory Users and Computers console

Create the second user.



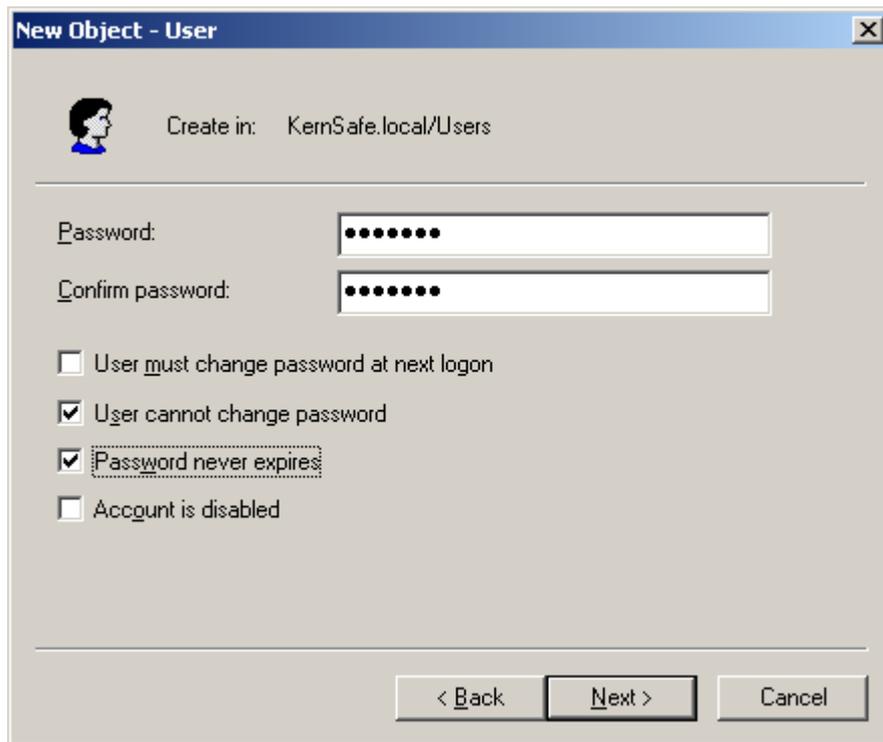
Right click on Users and select New -> User, the New Object-User will be shown.



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

Press the Next button to continue.

Specify user's password

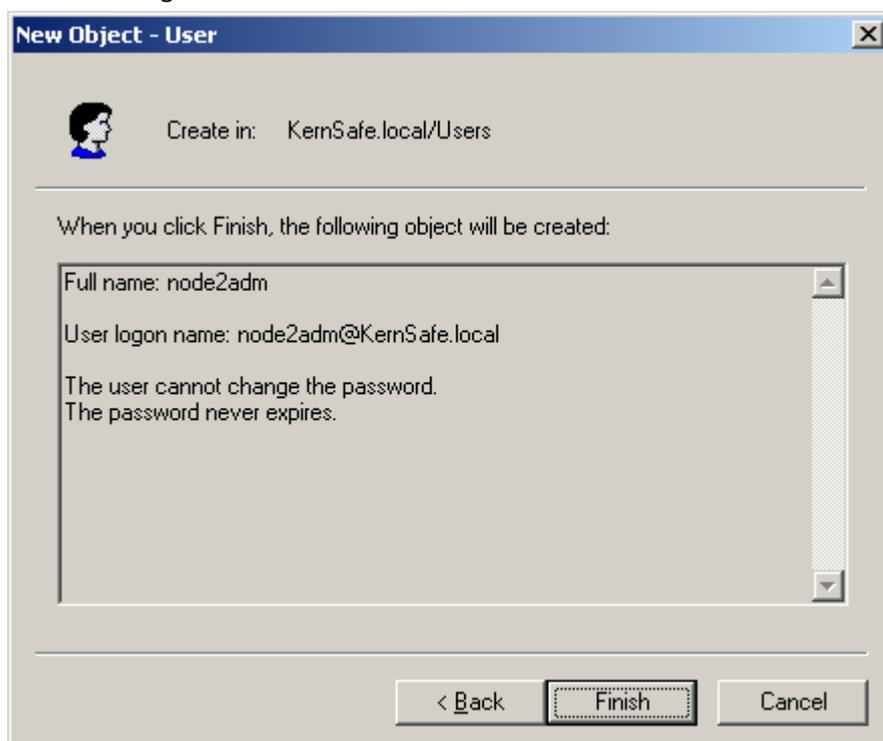


The screenshot shows a dialog box titled "New Object - User" with a close button (X) in the top right corner. Below the title bar, there is a user icon and the text "Create in: KernSafe.local/Users". The main area contains two password input fields: "Password:" and "Confirm password:", both filled with dots. Below these fields are four checkboxes: "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, like abc.123 as an example, check "User cannot change password" and "Password never expires".

Press the Next button to continue.

Finish creating user

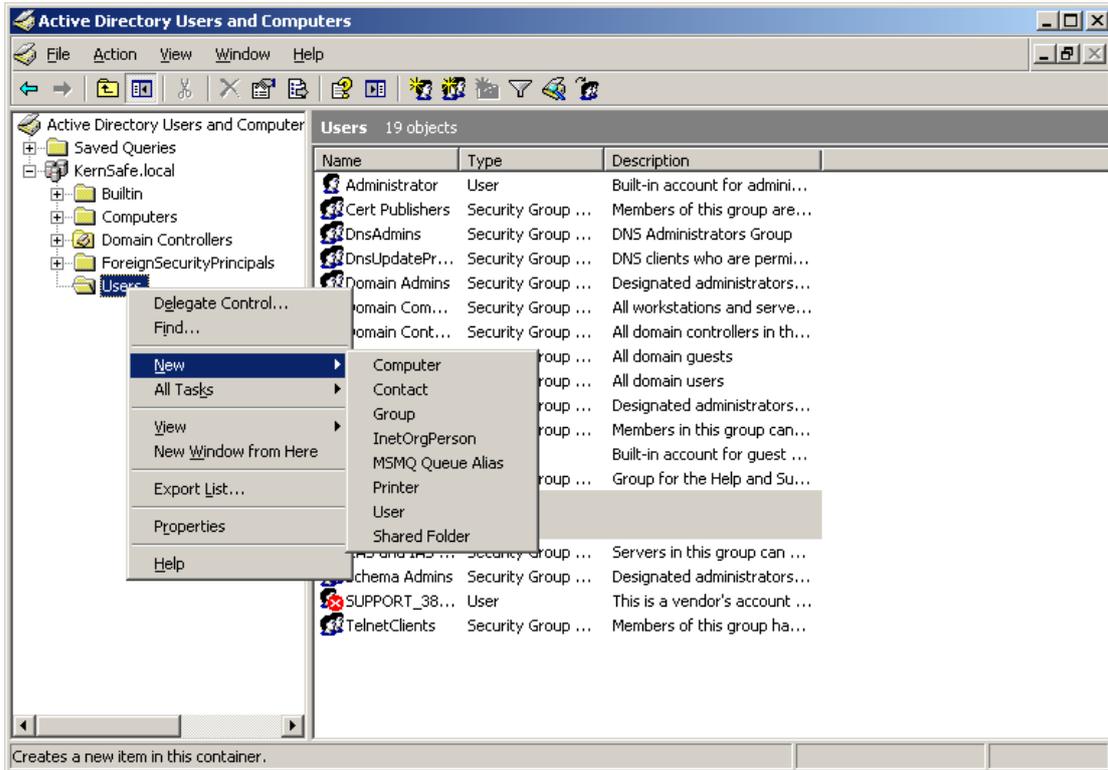


The screenshot shows the same "New Object - User" dialog box, but now it displays a summary of the user being created. The text "When you click Finish, the following object will be created:" is followed by a scrollable text area containing: "Full name: node2adm", "User logon name: node2adm@KernSafe.local", "The user cannot change the password.", and "The password never expires.". At the bottom, the buttons are "< Back", "Finish", and "Cancel".

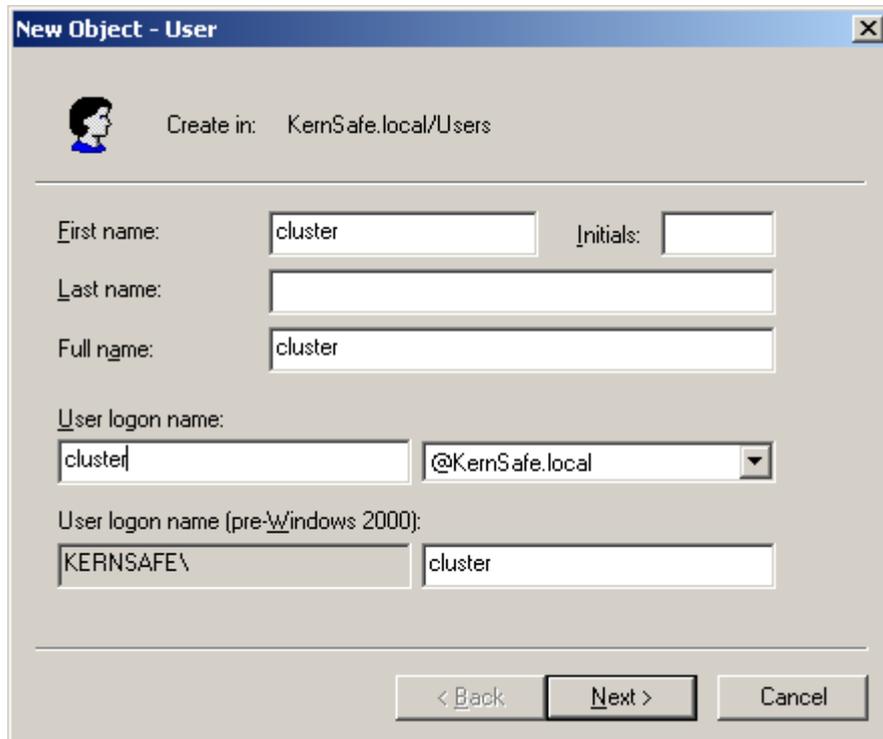
Press the Finish button to finish.

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 will be shown



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

Press the Next button to continue.

Specify user's password

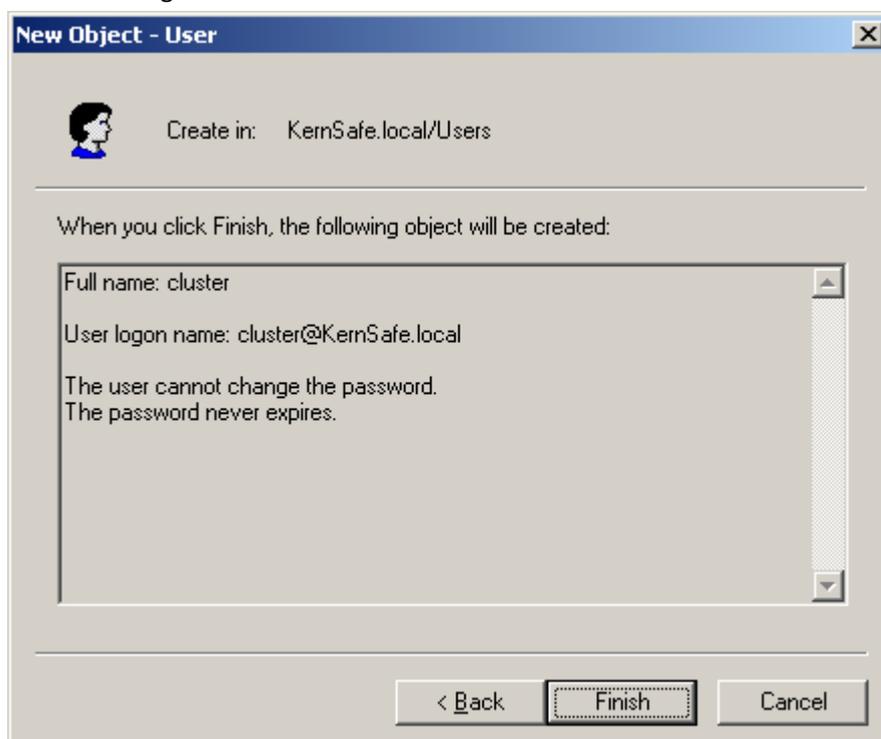


The screenshot shows a dialog box titled "New Object - User" with a close button (X) in the top right corner. Below the title bar, there is a user icon and the text "Create in: KernSafe.local/Users". The main area contains two password input fields: "Password:" and "Confirm password:", both filled with black dots. Below these fields are four checkboxes: "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.

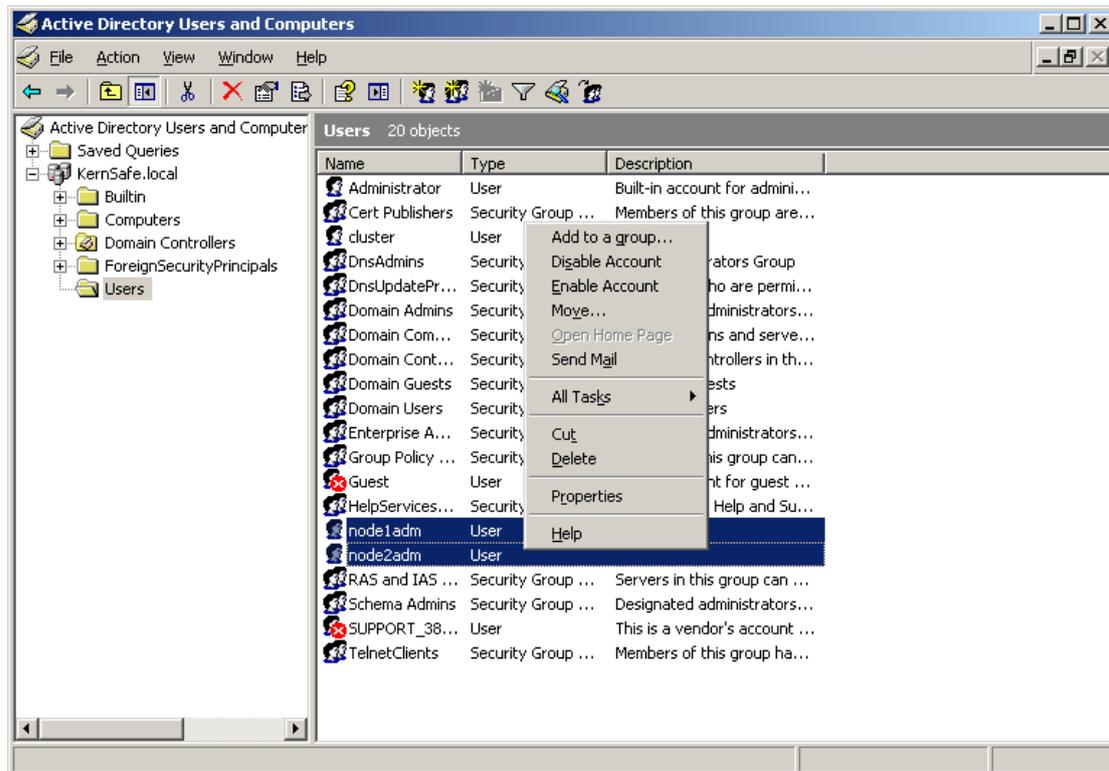
Finish creating user



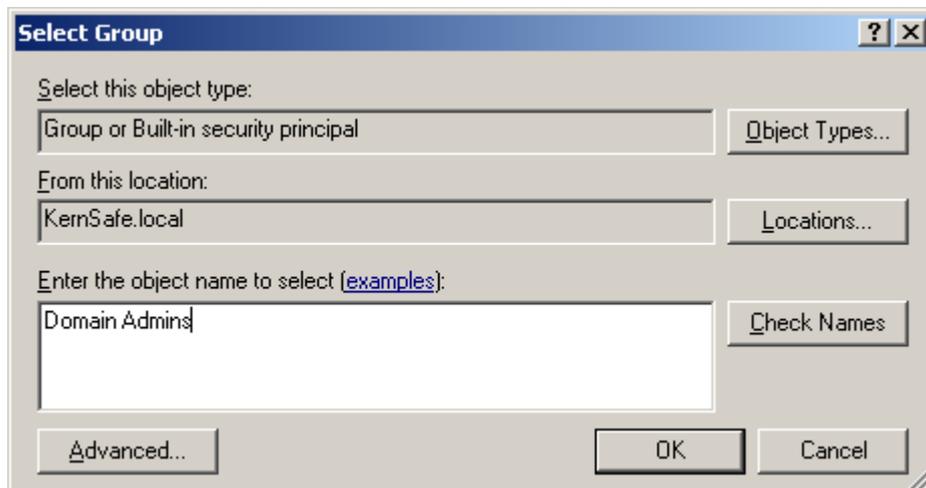
The screenshot shows the same "New Object - User" dialog box, but now with a summary of the user being created. The text "When you click Finish, the following object will be created:" is displayed above a scrollable text area. The text area contains the following information: "Full name: cluster", "User logon name: cluster@KernSafe.local", and "The user cannot change the password. The password never expires." At the bottom, the buttons are "< Back", "Finish", and "Cancel".

Press the Finish button.

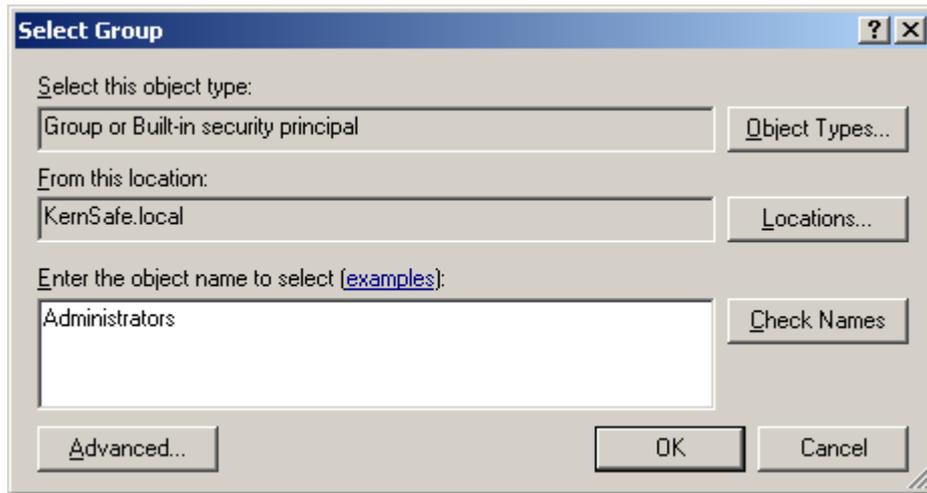
Come back to Active Directory Users and Computers console



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 will be shown.



Enter Domain Admins and press the OK button.

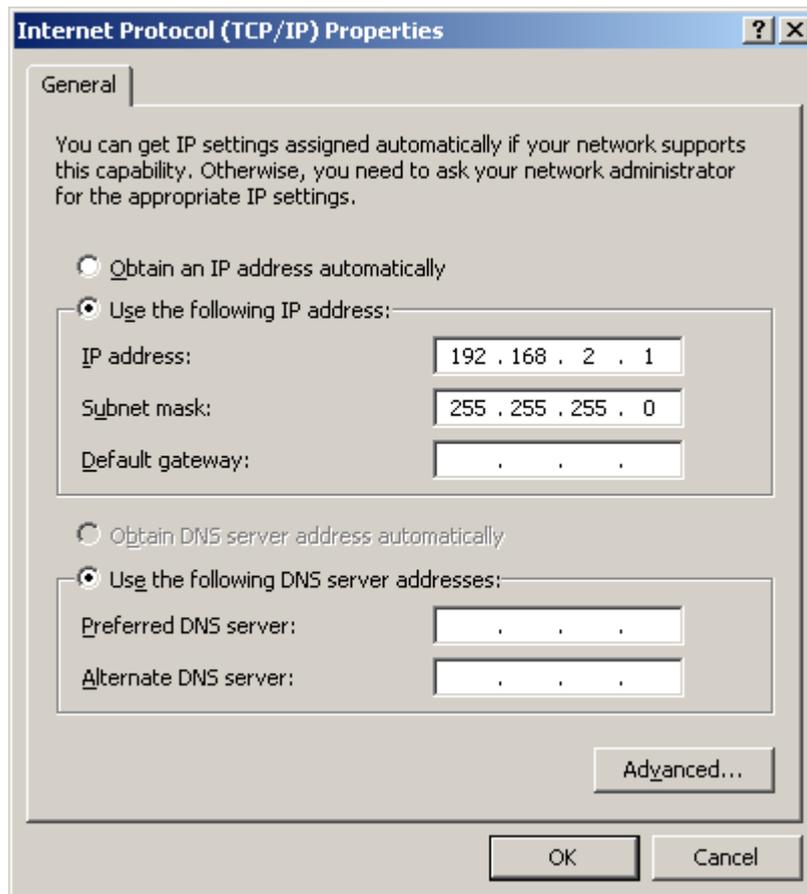


Enter Administrators and press the OK button.

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 operate KernSafe iStorage Server. Taking three computers for example, this article installs KernSafe iStorage Server on the Domain Controller.

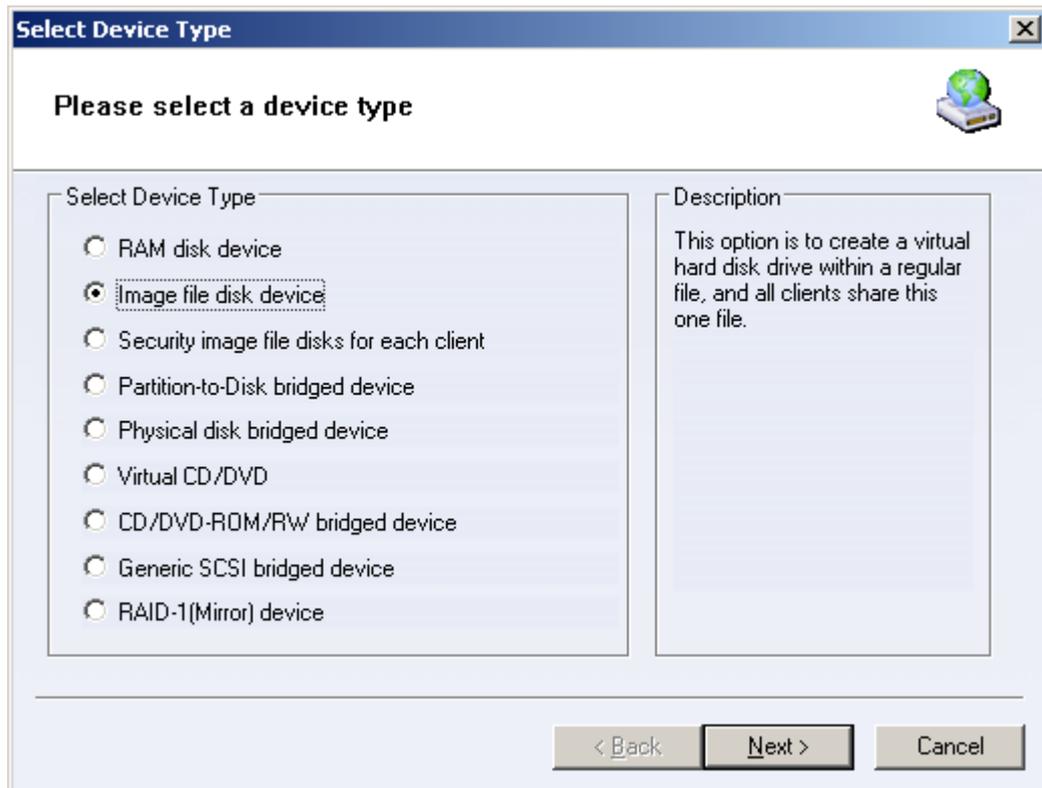
Network setting



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 will be shown.

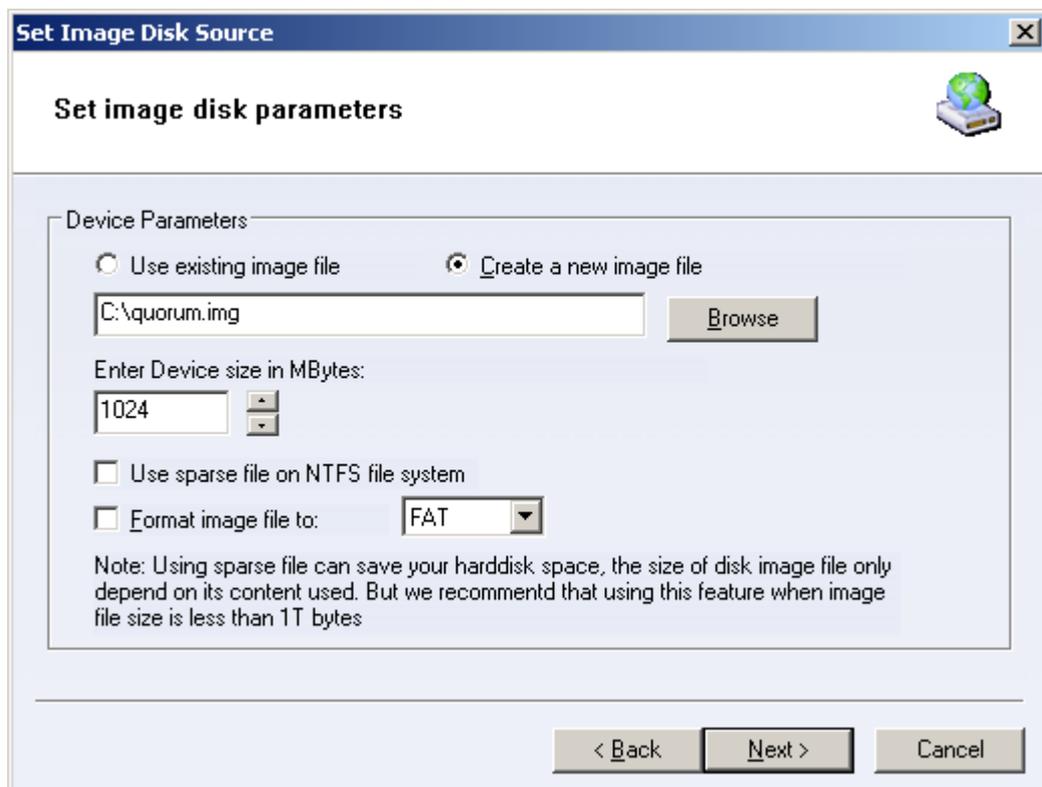
Select a device type



Create an Image file disk device in KernSafe iStorage Server by selecting Image file disk device in Create Target Wizard.

Press the Next button to continue.

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

Finish

Congratulations, the target is being created

Basic Target Information

Enter Target Name:

quorum

Report as readonly device when initiator can not get write access

Enable multiple initiators with full access connected (sharing and clustering)

Note

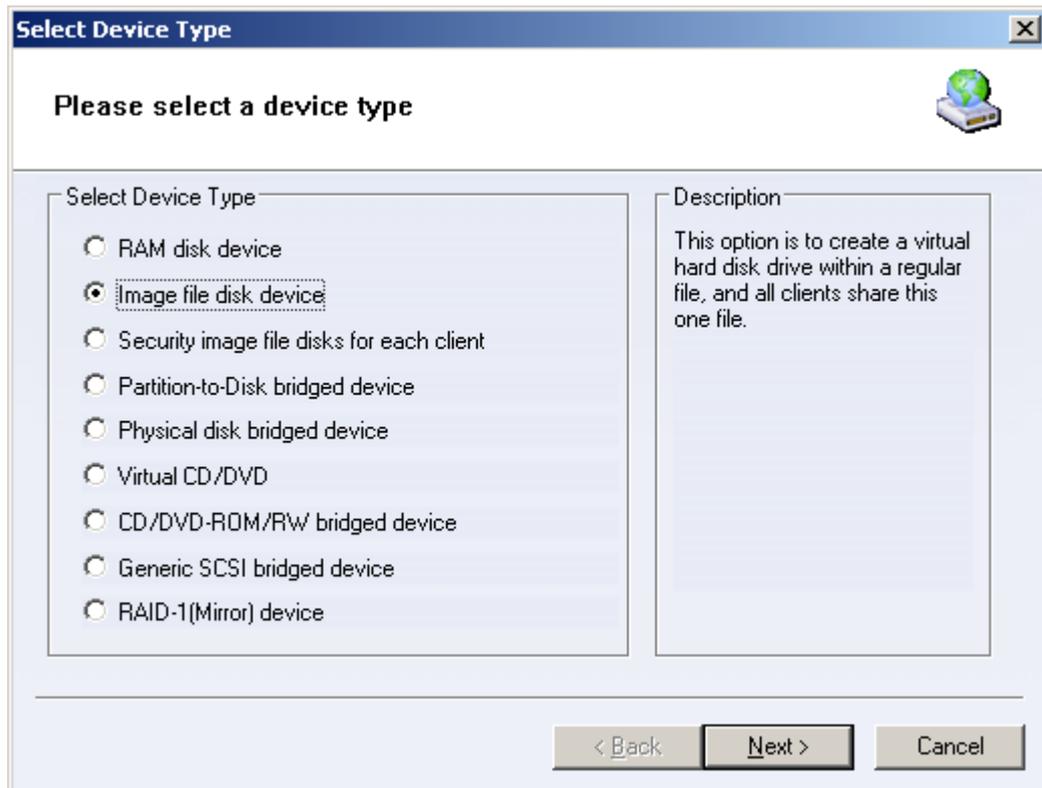
By default, only one client has full access right, when the second initiator log on with full access, it will fail.
But this option is usfull for clustering, disk sharing and NAS.

< Back Finish Cancel

Enter quorum as the name of Target, check Report as readonly device when initiator can not get write access and Enable multiple initiators with full access connected (sharing and clustering).
Press the Finish button.

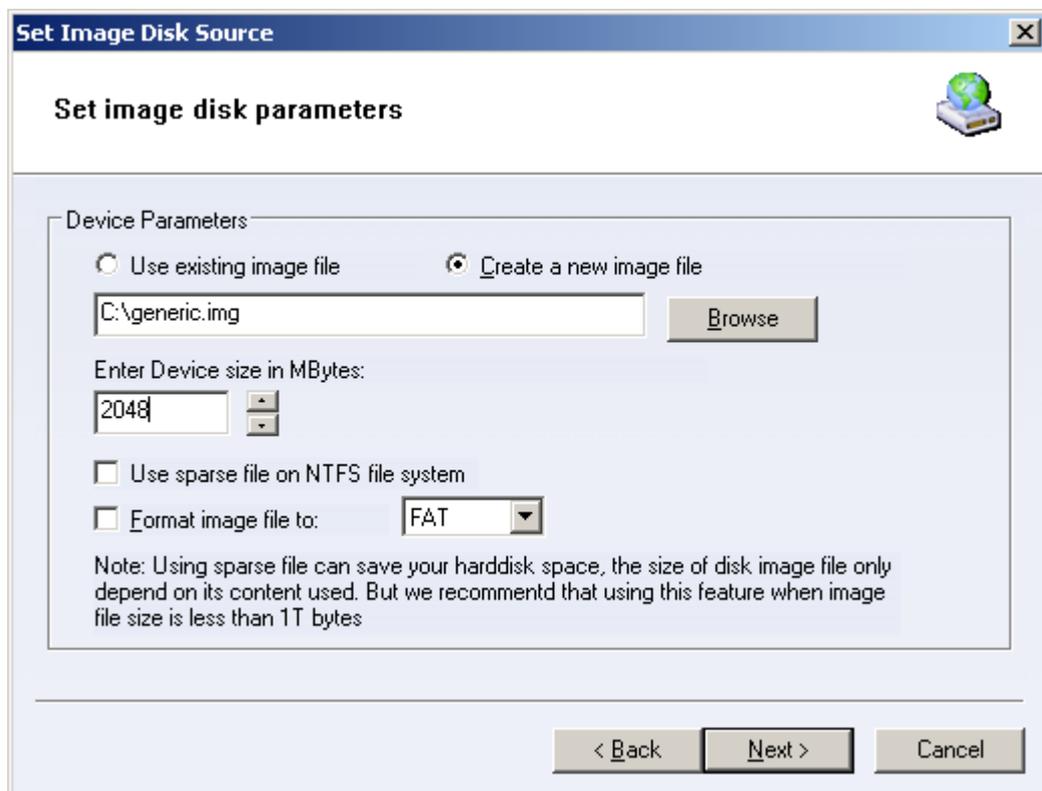
Create the second iSCSI Target.

Select a device type



Create another Image file disk device by selecting Image file disk device in Create Target. Press the Next button to continue.

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

Finish

Congratulations, the target is being created

Basic Target Information

Enter Target Name:
generic

Report as readonly device when initiator can not get write access

Enable multiple initiators with full access connected (sharing and clustering)

Note

By default, only one client has full access right, when the second initiator log on with full access, it will fail.
But this option is usfull for clustering, disk sharing and NAS.

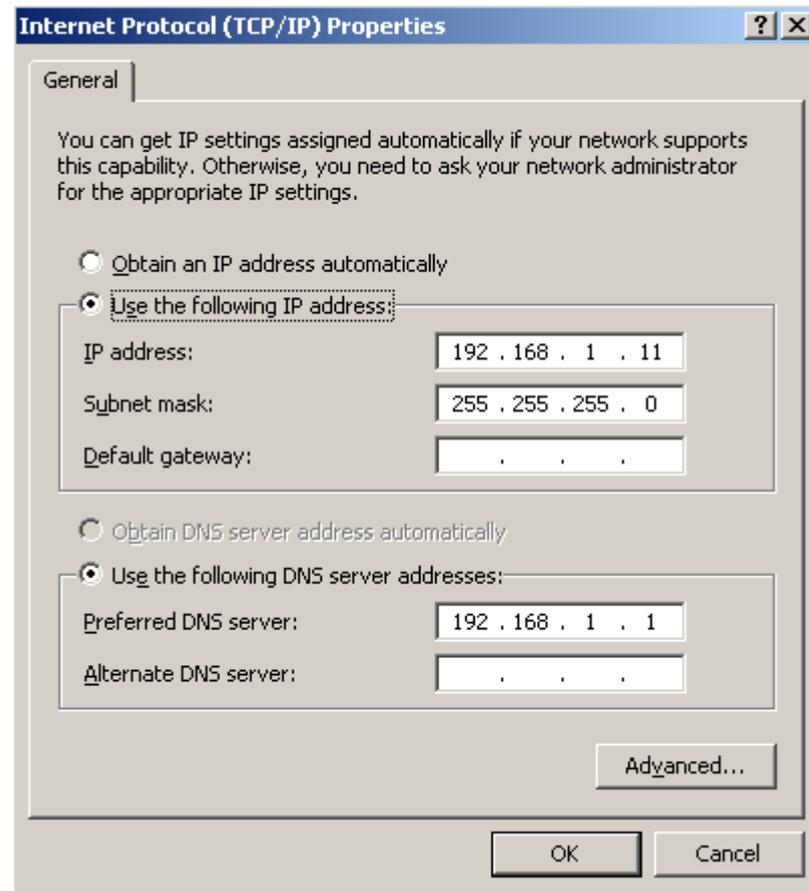
< Back Finish Cancel

Enter generic as the name of Target, check Report as readonly device when initiator can not get write access and Enable multiple initiators with full access connected (sharing and clustering),. Press the Finish button to finish creating iSCSI Targets.

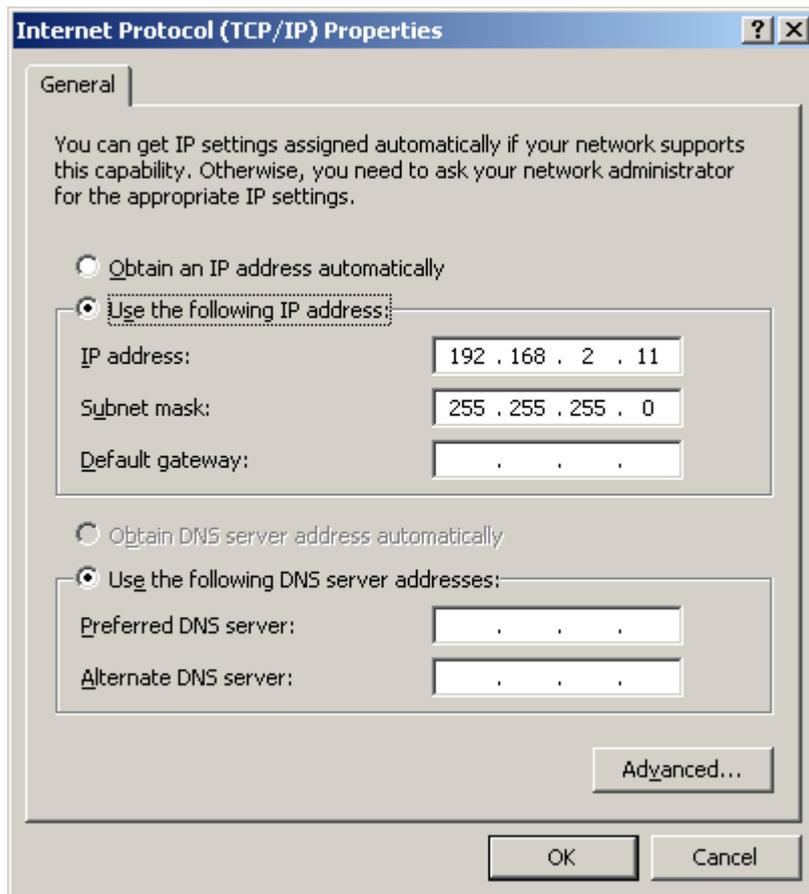
Come back to iStorage Server management console.

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 will be shown.



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

Press the OK button.

Type domain user and password



Enter the username and password of node1.

Press the OK button to continue.

The Computer Name Changes message dialog will be shown



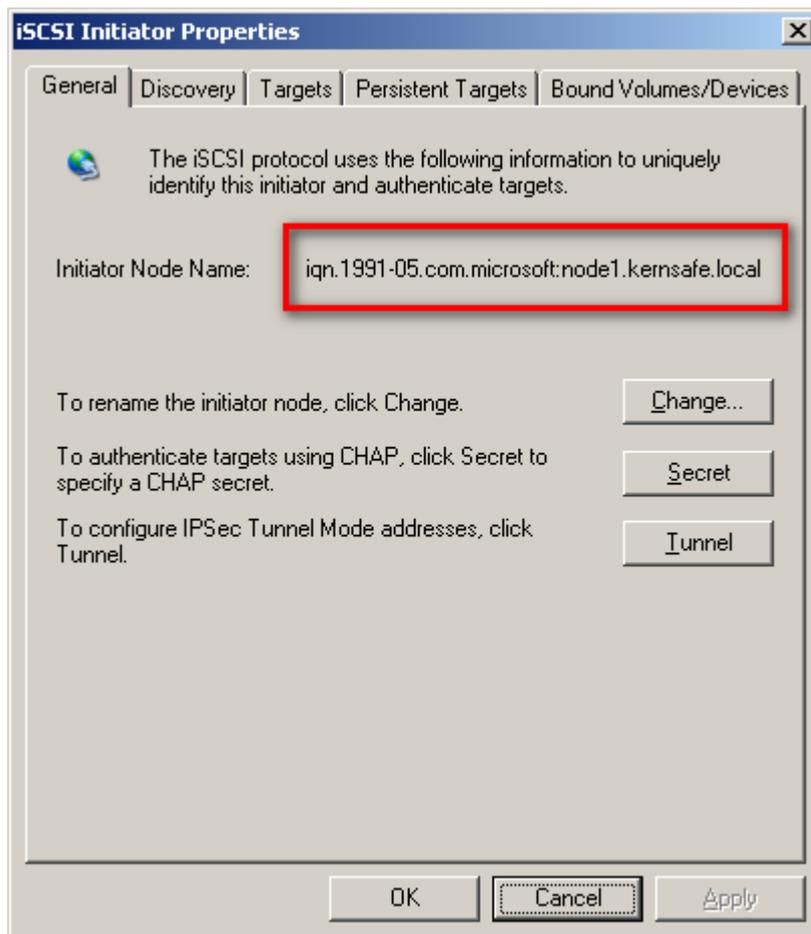
Press the OK button to continue.

Restarting computer is needed.

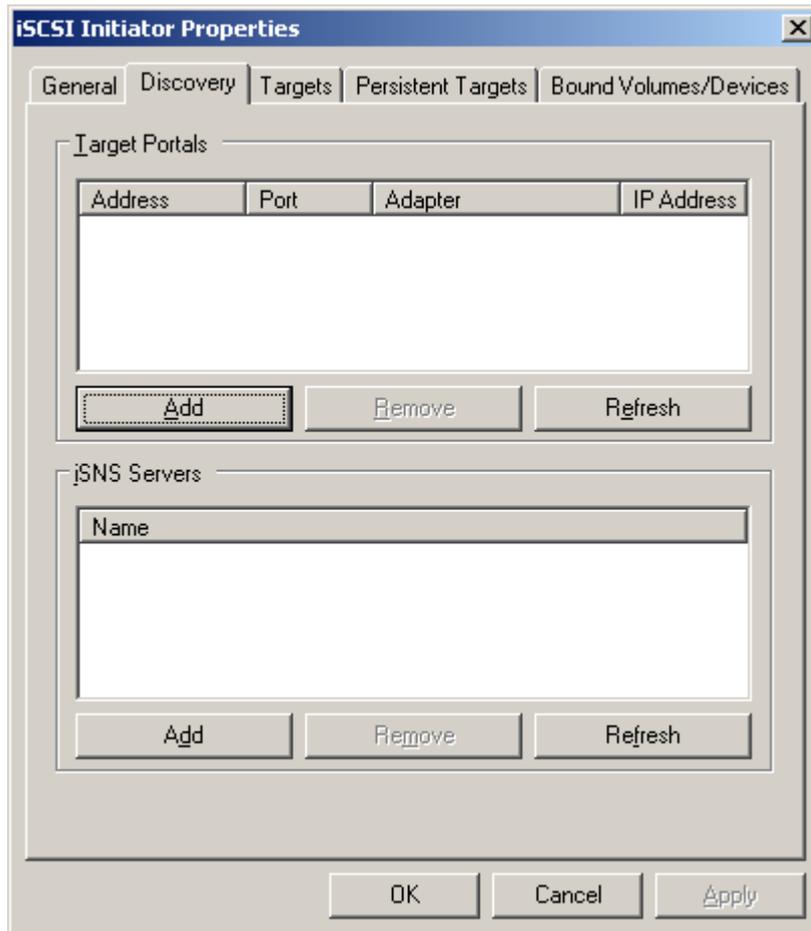


Press the OK button to restart computer.

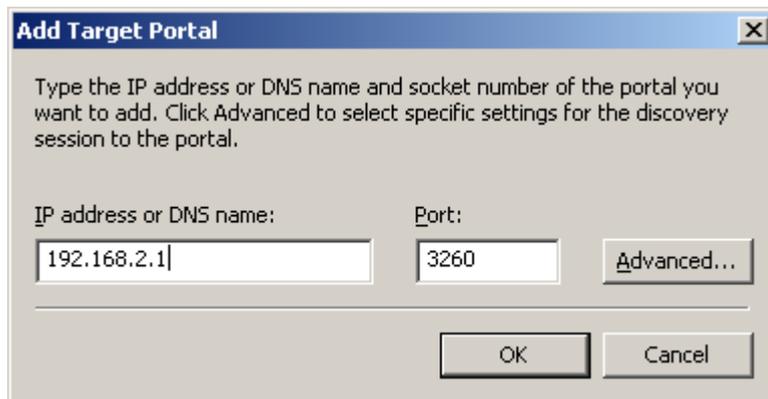
Open iSCSI Initiator.



Change to Discovery page

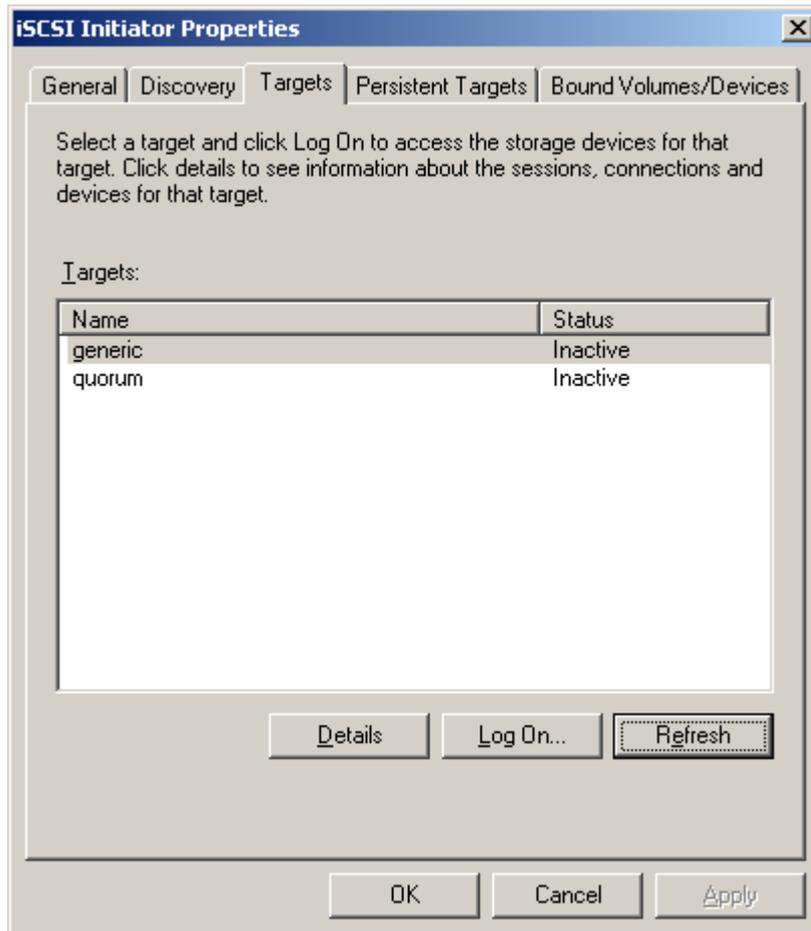


Press the Add button in the Discovery page and then the Add Target Portal dialog will be shown.

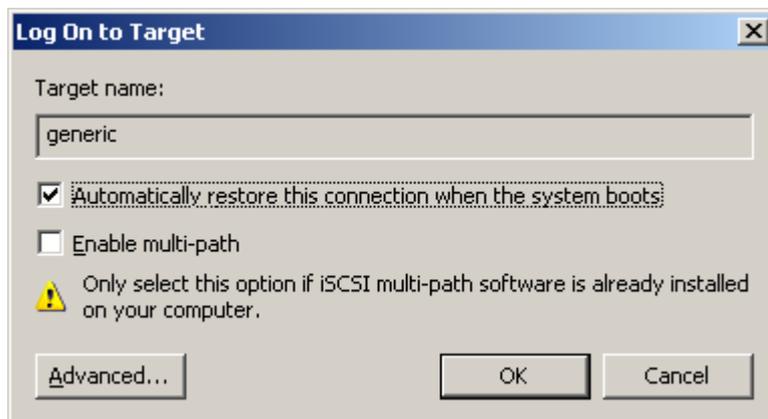


Click Add and enter the IP address of KernSafe iStorage Server, which is 192.168.2.1 here. Press the OK button to continue.

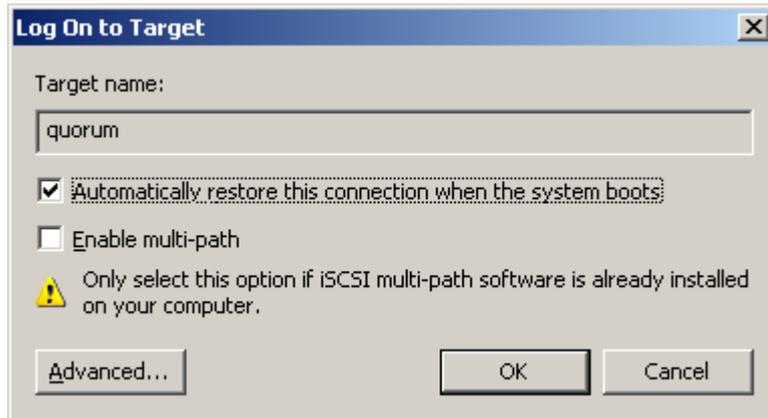
Change to Targets page



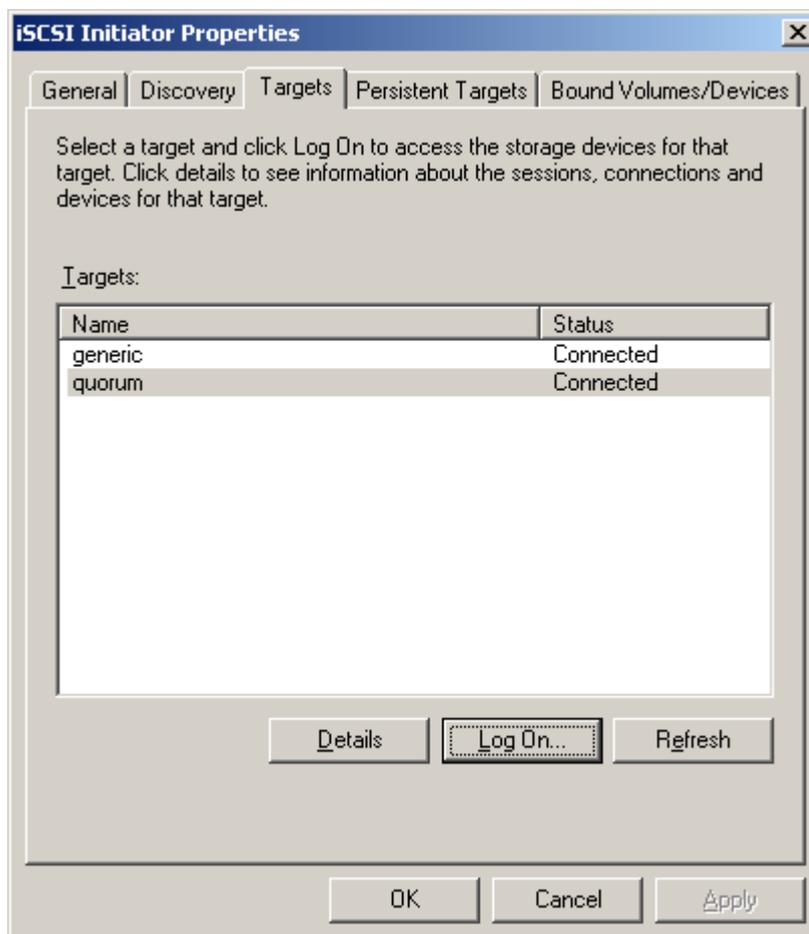
Select one Target and then press the Log On button, the Log On to Target dialog will be shown.



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

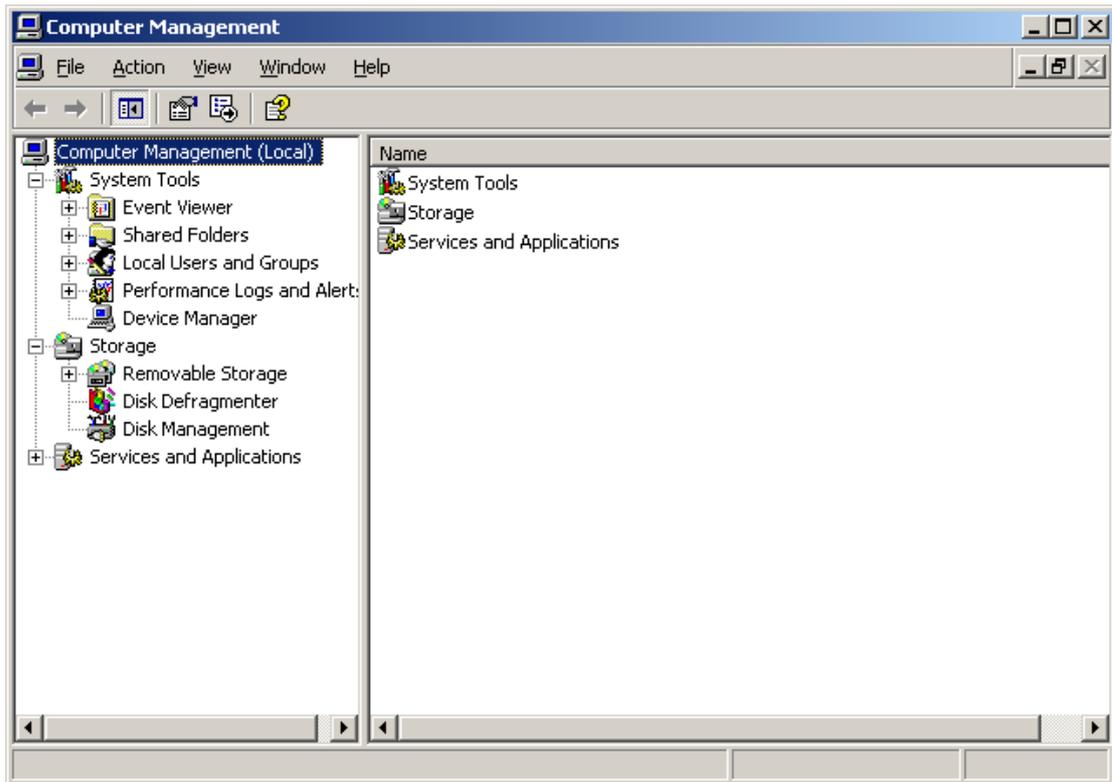


Select quorum and Log On. Check Automatically restore this connection when the system boots and log on.



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

Open Computer Management

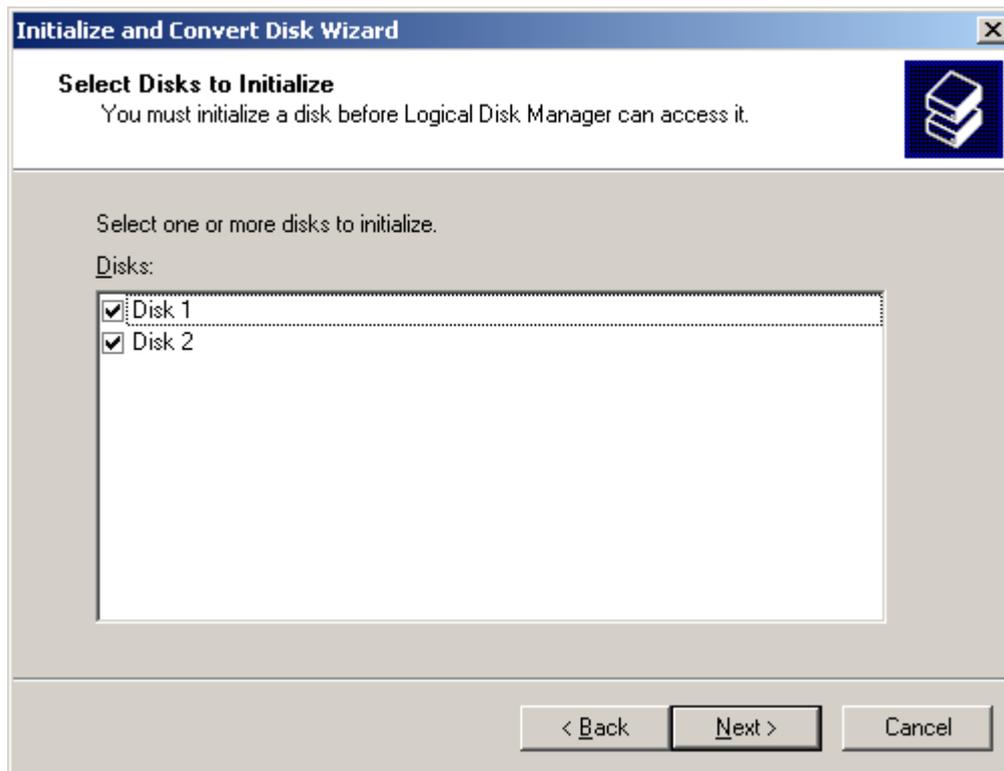


Select Disk Management, the Initialize and Convert Disk Wizard will be shown.



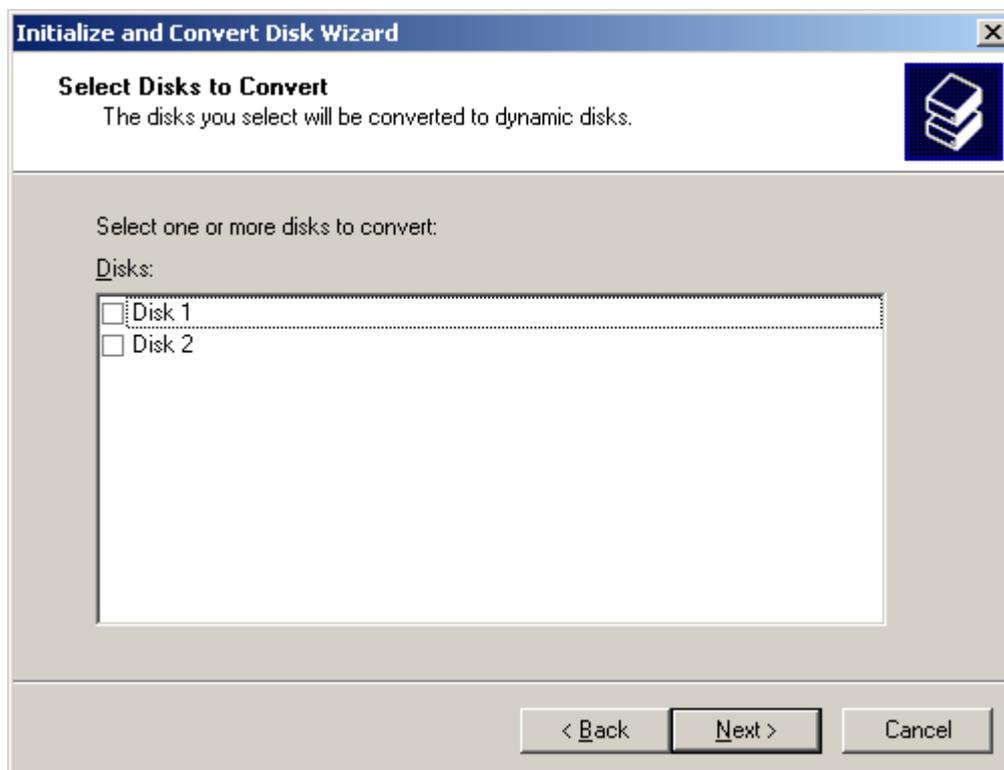
Press the Next button to continue.

Select disks to be initialized



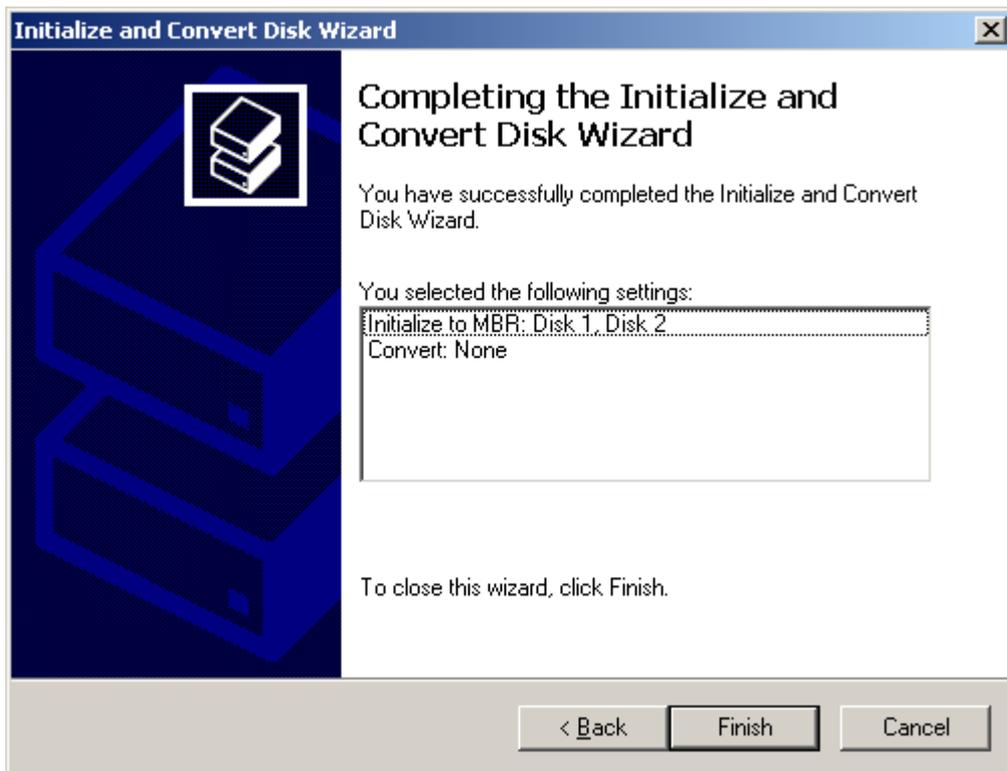
Press the Next button to continue.

Select disks to be converted



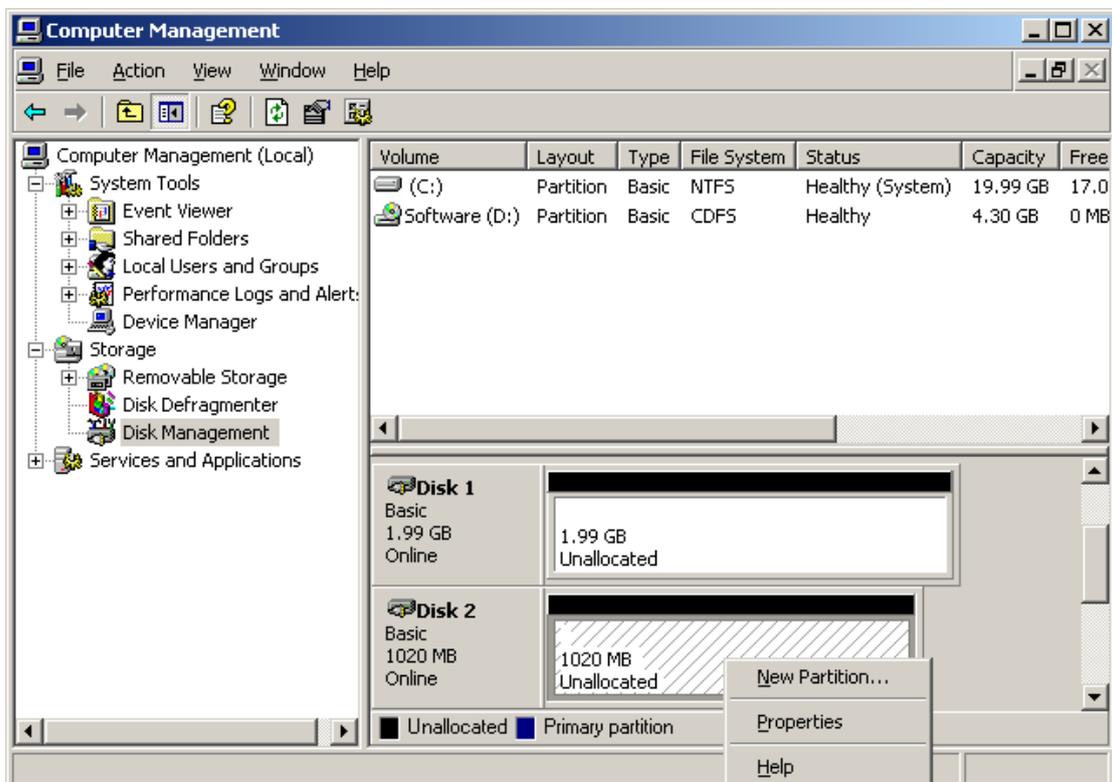
Press the Next button to continue.

Finish disks initialization

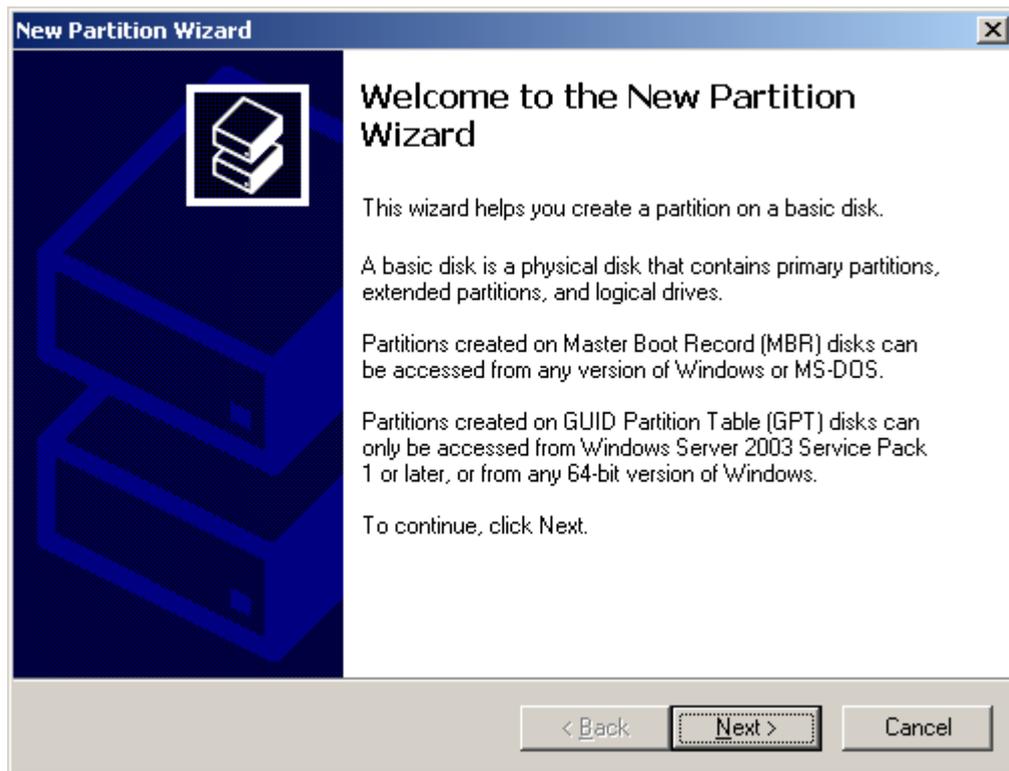


Press the Finish button.

Partition the quorum disk.

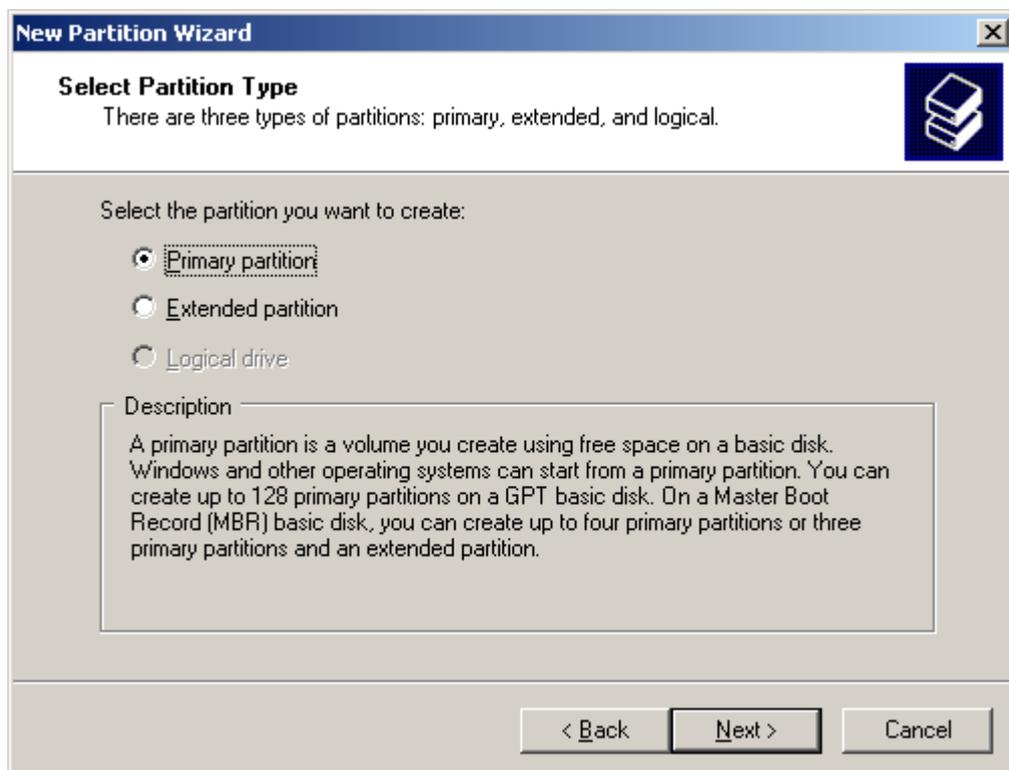


Right click on the disk and select New Partition, the New Partition Wizard will be shown.



Press the Next button to continue.

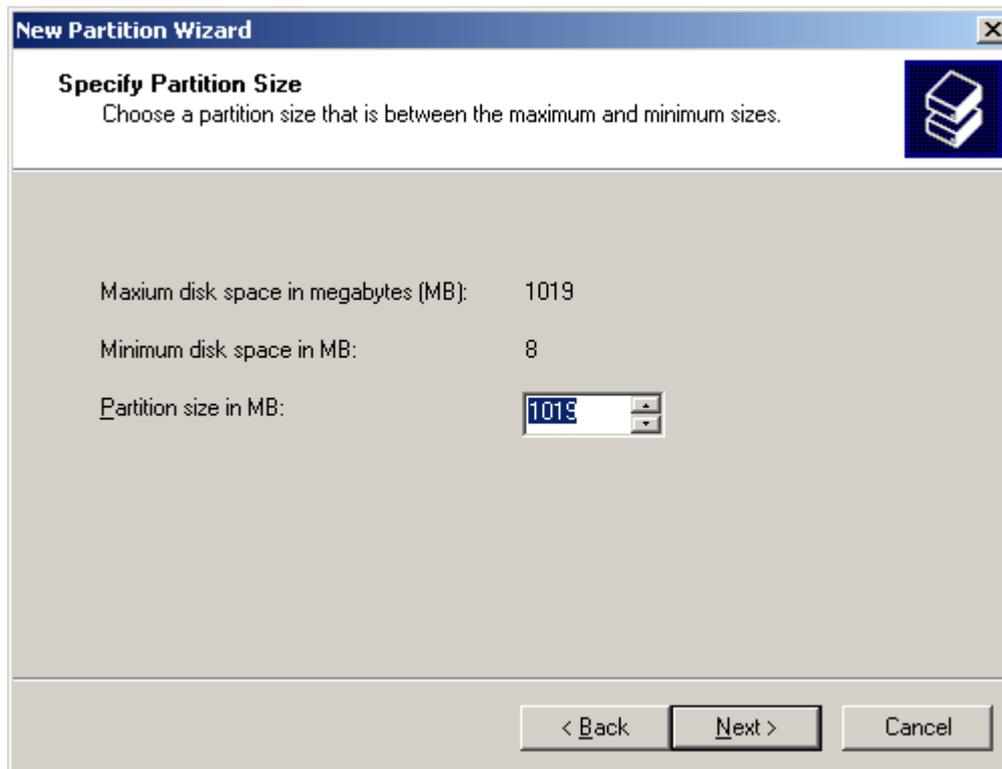
Select Partition Type



Select Primary partition.

Press the Next button to continue.

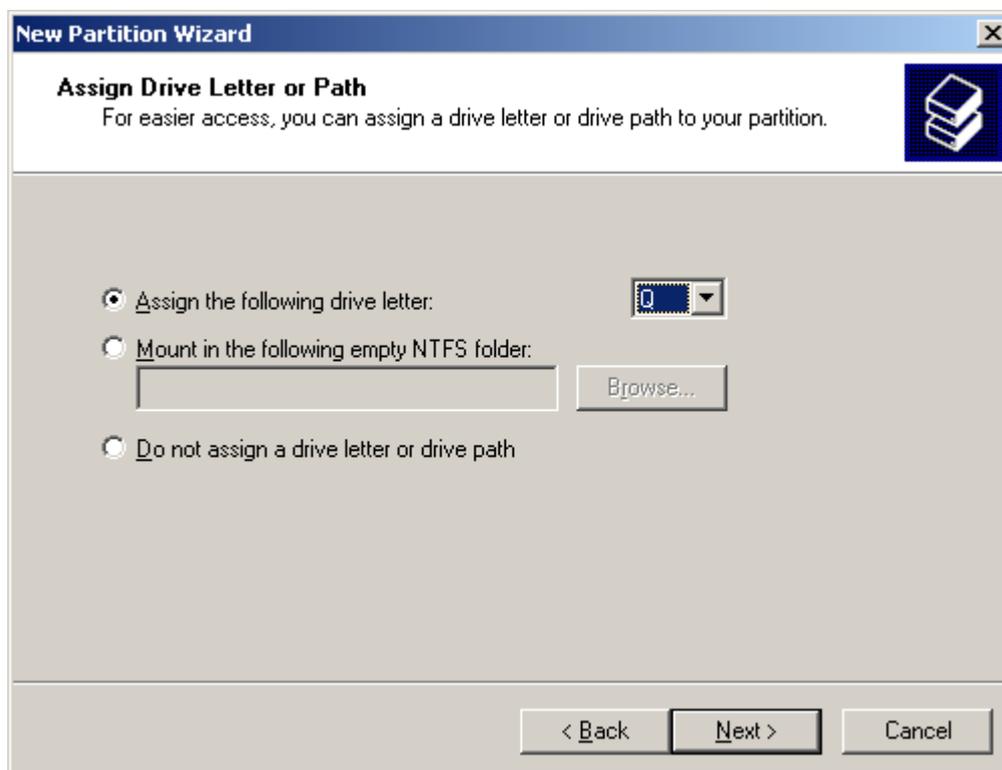
Specify partition size



The screenshot shows the 'New Partition Wizard' window at the 'Specify Partition Size' step. The title bar reads 'New Partition Wizard'. The main heading is 'Specify Partition Size' with a sub-instruction: 'Choose a partition size that is between the maximum and minimum sizes.' Below this, there are three rows of information: 'Maximum disk space in megabytes (MB): 1019', 'Minimum disk space in MB: 8', and 'Partition size in MB: 1019'. The '1019' is entered in a text box with up and down arrows. At the bottom right, there are three buttons: '< Back', 'Next >', and 'Cancel'.

Press the Next button to continue.

Assign drive letter

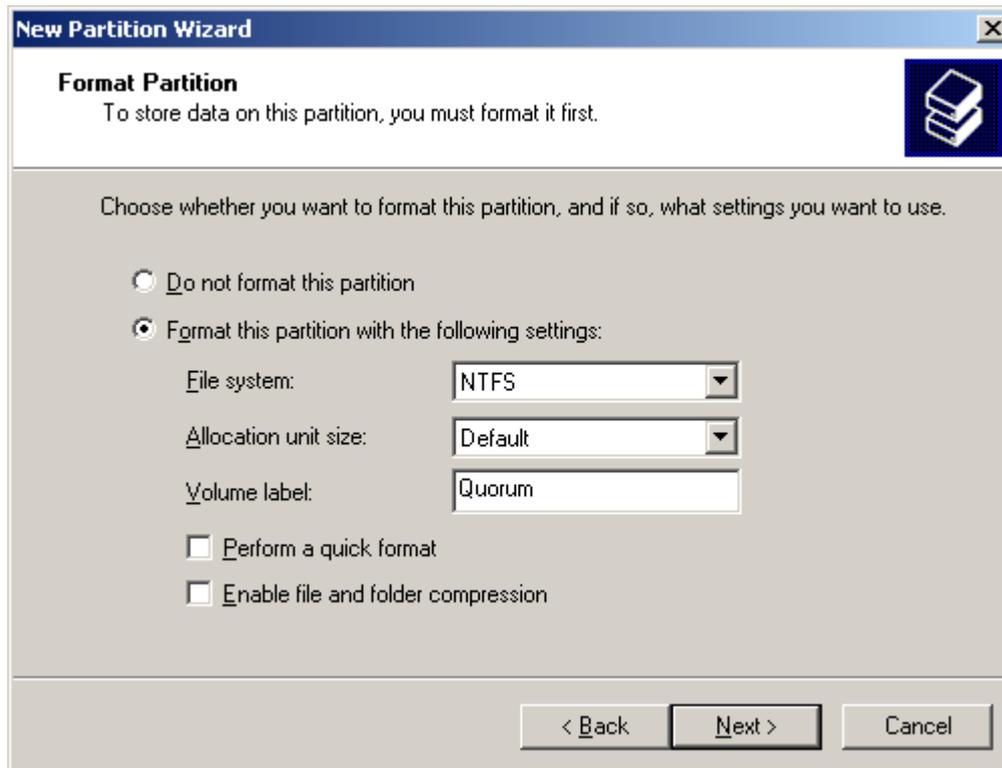


The screenshot shows the 'New Partition Wizard' window at the 'Assign Drive Letter or Path' step. The title bar reads 'New Partition Wizard'. The main heading is 'Assign Drive Letter or Path' with a sub-instruction: 'For easier access, you can assign a drive letter or drive path to your partition.' Below this, there are three radio button options: 1) 'Assign the following drive letter:' with a dropdown menu showing 'Q'; 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 right, there are three buttons: '< Back', 'Next >', and 'Cancel'.

Assign Q as the drive letter.

Press the Next button to continue.

Format disk

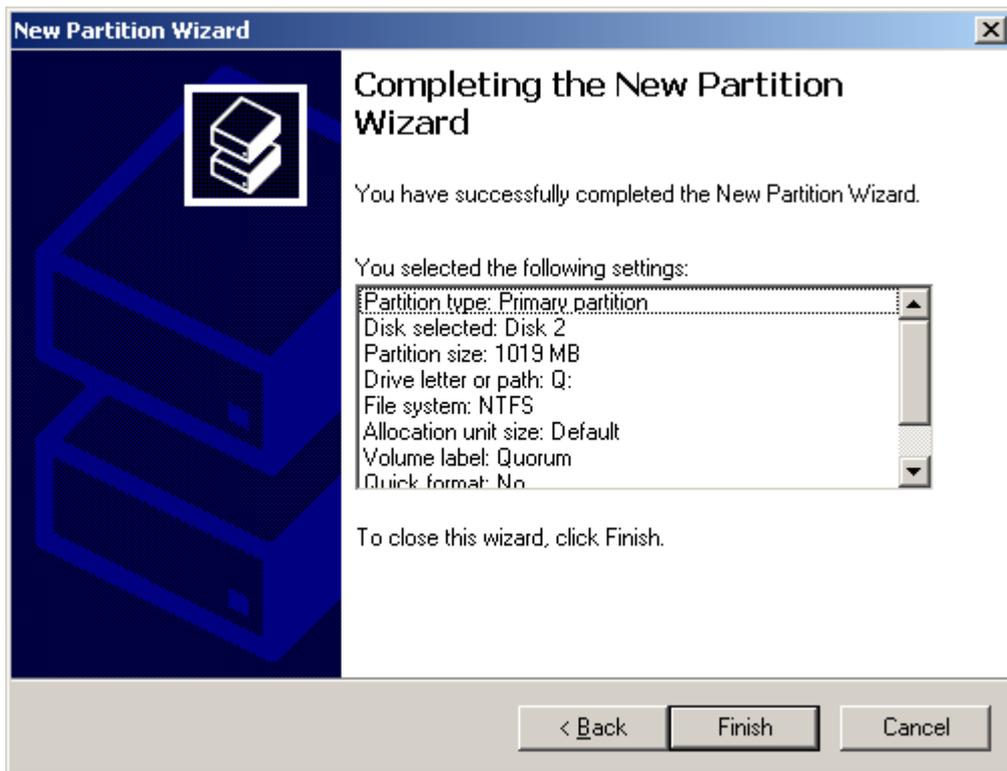


The image shows a screenshot of the 'New Partition Wizard' dialog box, specifically the 'Format Partition' step. The window title is 'New Partition Wizard' and it has a close button (X) in the top right corner. The main heading is 'Format Partition' with a sub-heading 'To store data on this partition, you must format it first.' and a small icon of a floppy disk. Below this, the instruction reads: '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' (which is unselected) and 'Format this partition with the following settings:' (which is 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 of the dialog, there are three buttons: '< Back', 'Next >', and 'Cancel'.

Enter Quorum as Volume label.

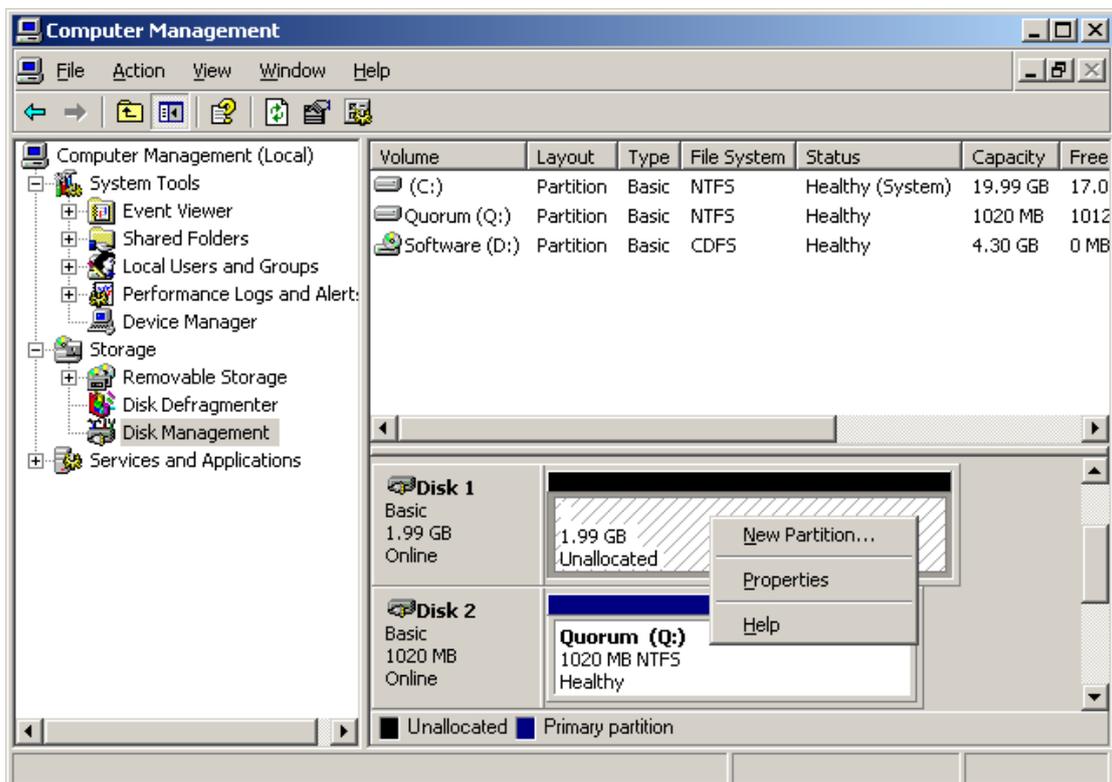
Press the Next button to continue.

Finish disk formatting



Press the Finish button to format the disk.

Partition the generic disk.

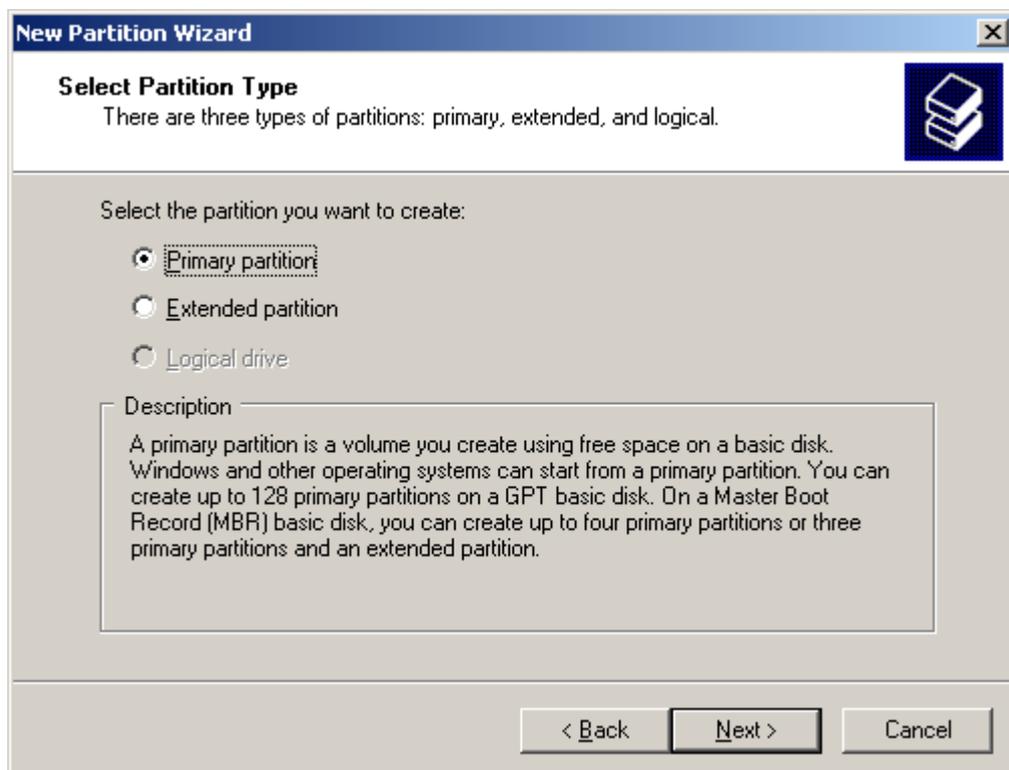


Right click on the disk and select New Partition, the New Partition Wizard will be shown.



Press the Next button to continue.

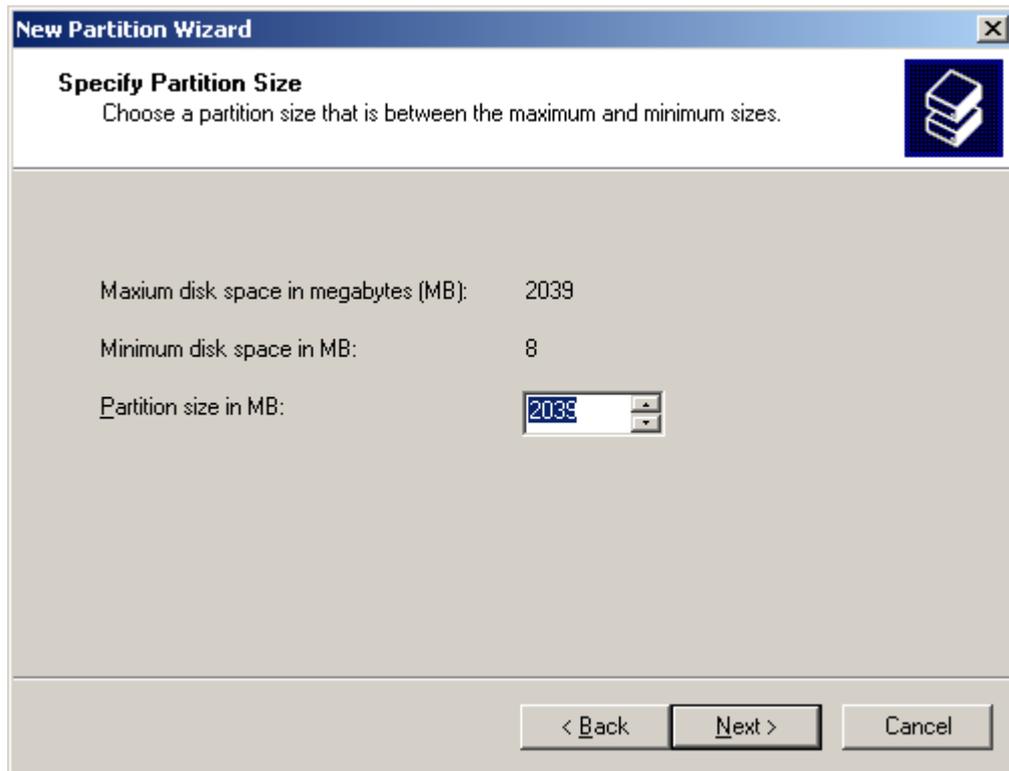
Select partition type



Select Primary partition.

Press the Next button to continue.

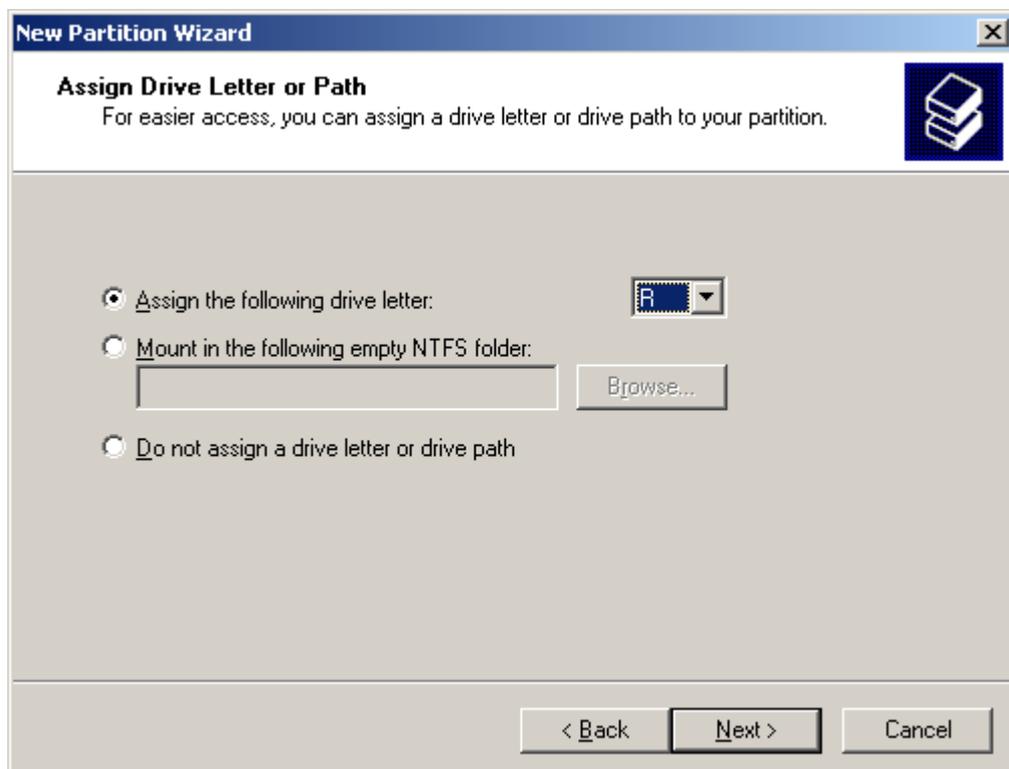
Specify partition size



The screenshot shows the 'New Partition Wizard' window at the 'Specify Partition Size' step. The window title is 'New Partition Wizard' and the subtitle is 'Specify Partition Size'. Below the subtitle, it says 'Choose a partition size that is between the maximum and minimum sizes.' There is a blue icon of a stack of disks in the top right corner. 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 entered in a text box with up and down arrows. At the bottom, there are three buttons: '< Back', 'Next >', and 'Cancel'.

Press the Next button.

Assign a drive letter

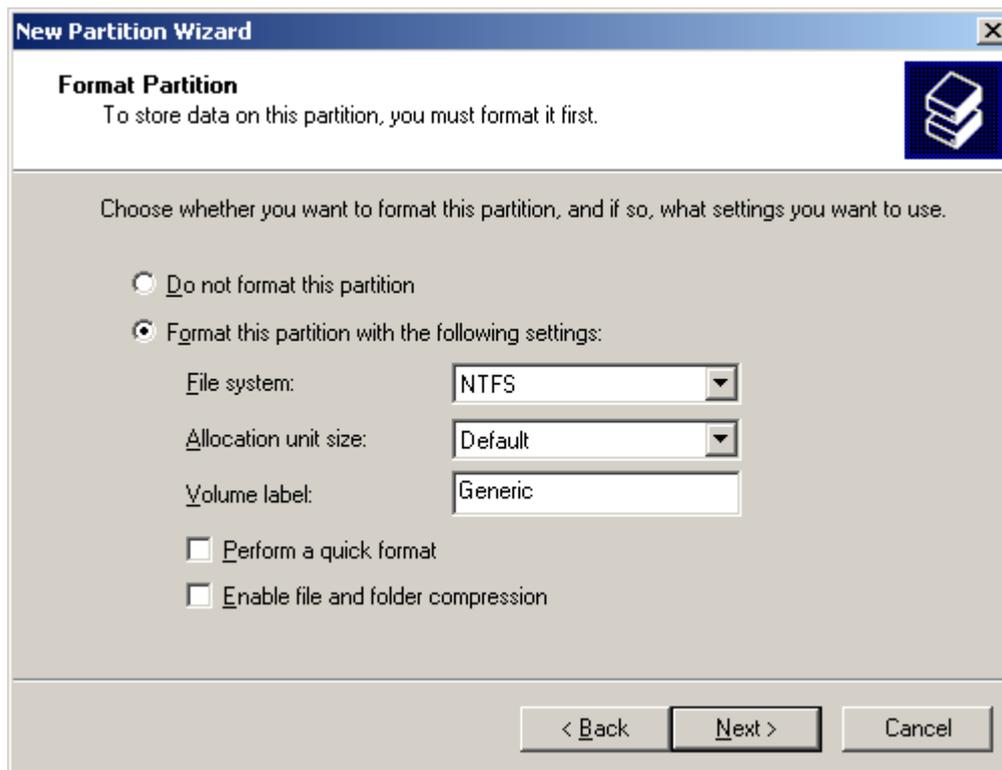


The screenshot shows the 'New Partition Wizard' window at the 'Assign Drive Letter or Path' step. The window title is 'New Partition Wizard' and the subtitle is 'Assign Drive Letter or Path'. Below the subtitle, it says 'For easier access, you can assign a drive letter or drive path to your partition.' There is a blue icon of a stack of disks in the top right corner. The main area contains three radio button options: 'Assign the following drive letter:' with a dropdown menu showing 'R', '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 Q as the drive letter.

Press the Next button to continue.

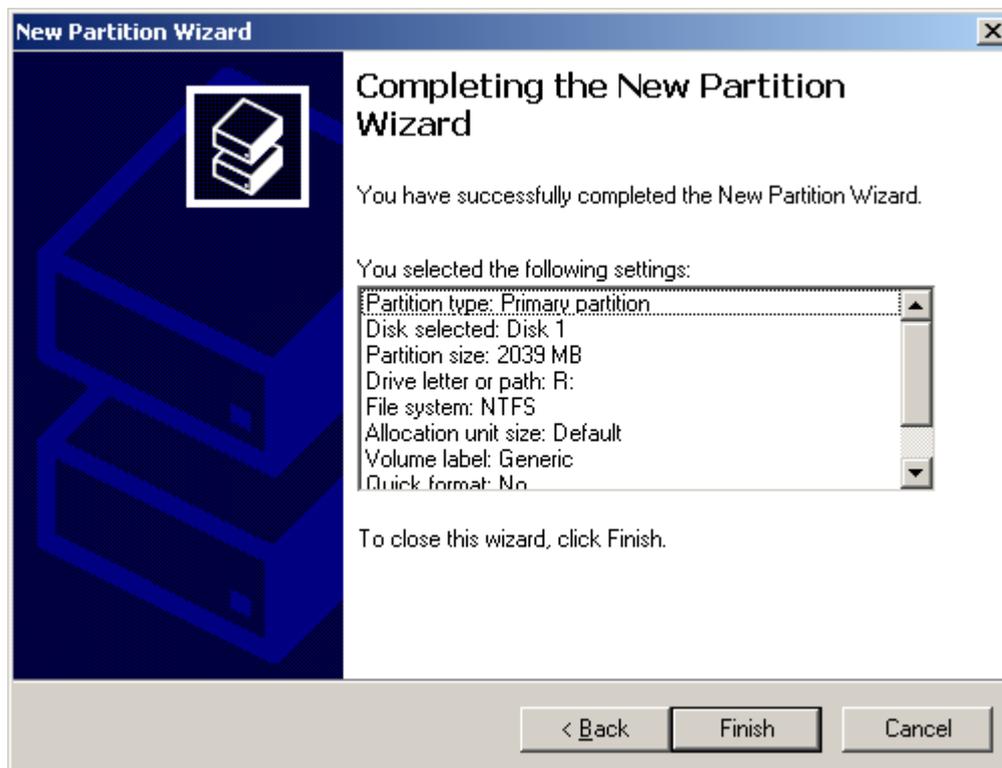
Format the disk



Enter Generic as Volume label.

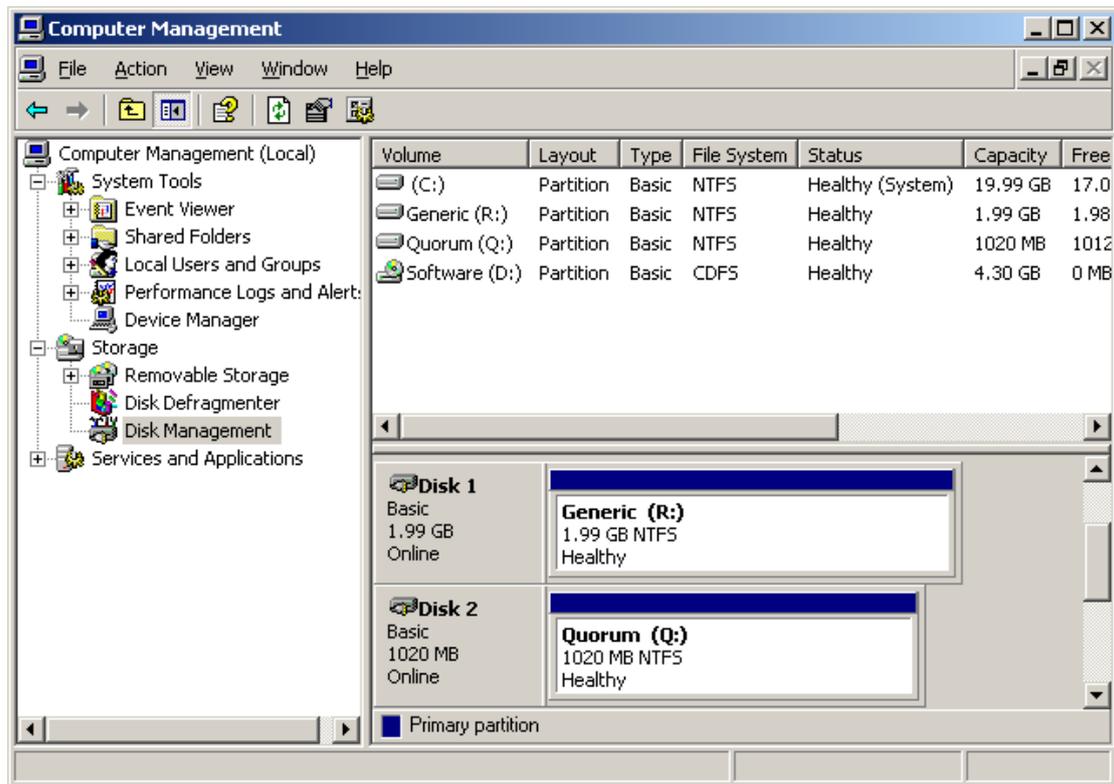
Press the Next button to continue

Finish partition disk.



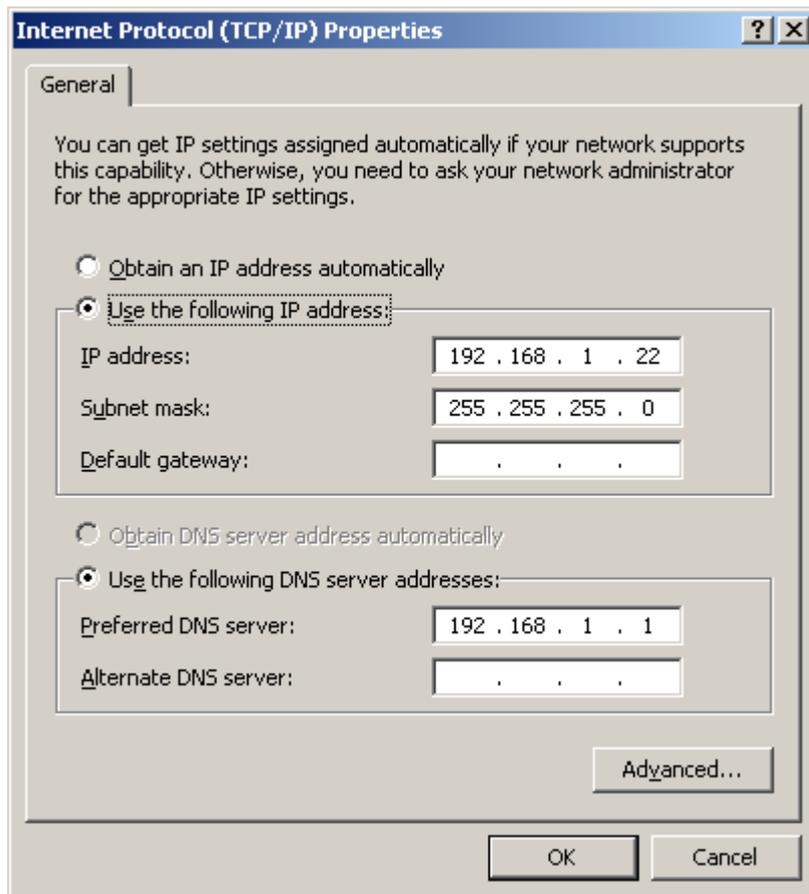
Press the Finish button.

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

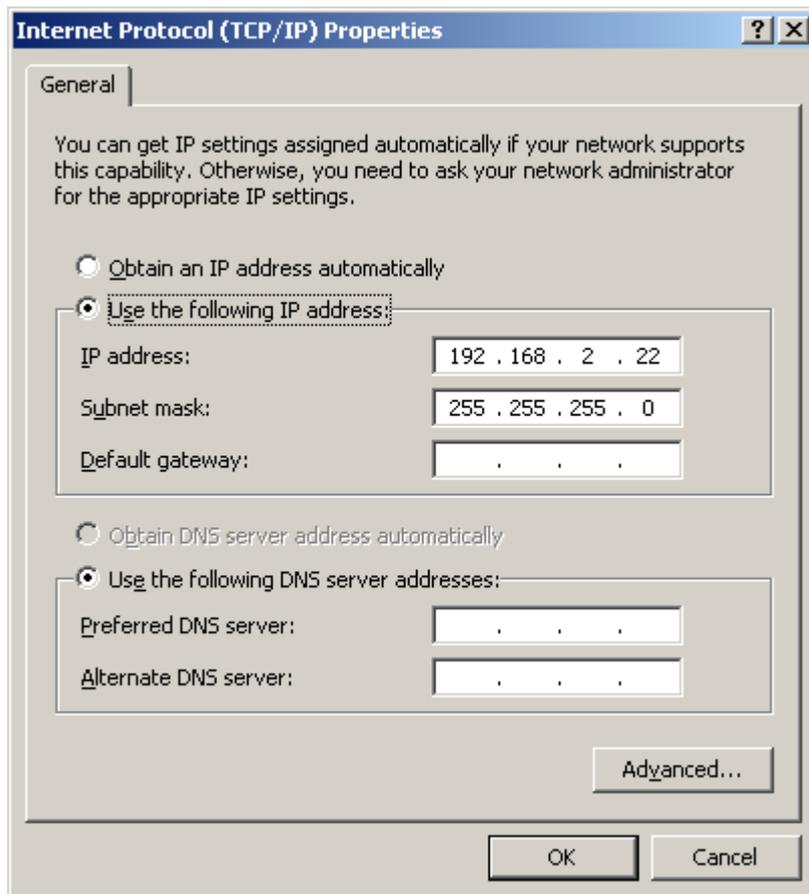


5. Node2 Settings

Networking settings

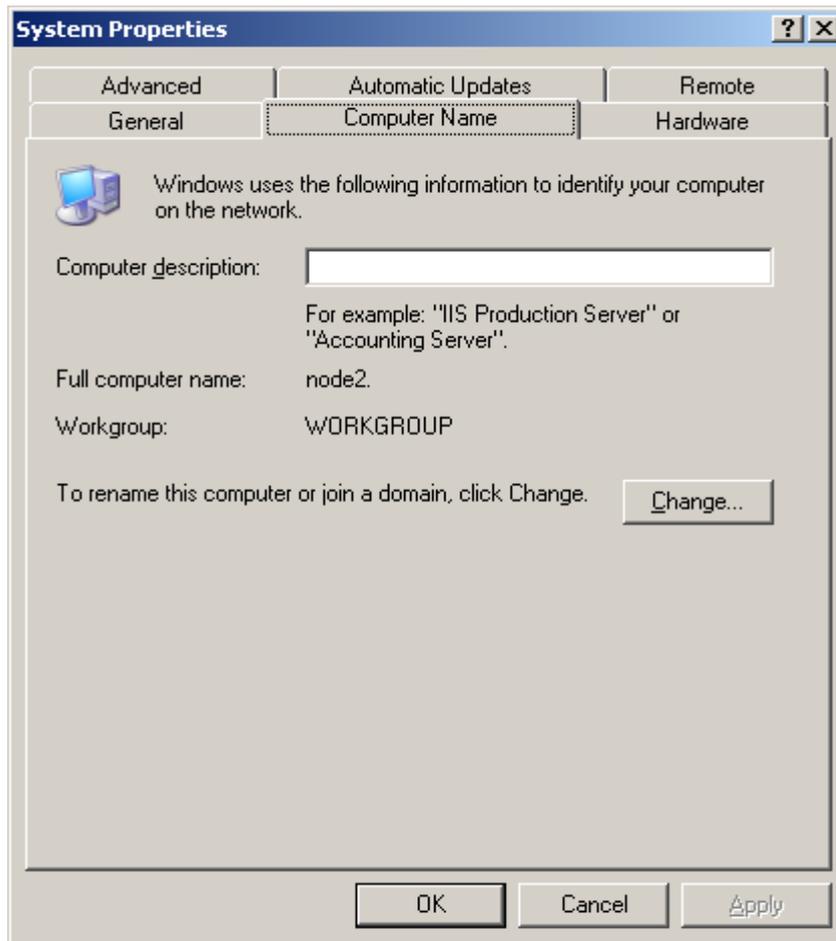


Set the first network adapter of node2 as shown in the picture. IP address is set as 192.168.1.22, Subnet mask is set as 255.255.255.0 and Rrefered DNS Server is set as 192.168.1.1.



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 will be shown.



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

Press the OK button, the Computer Names Changes dialog will be shown.

Specify user and password



Enter the username and password of node2.

Press the OK button, and then the Computer Name Changes message dialog will be shown.

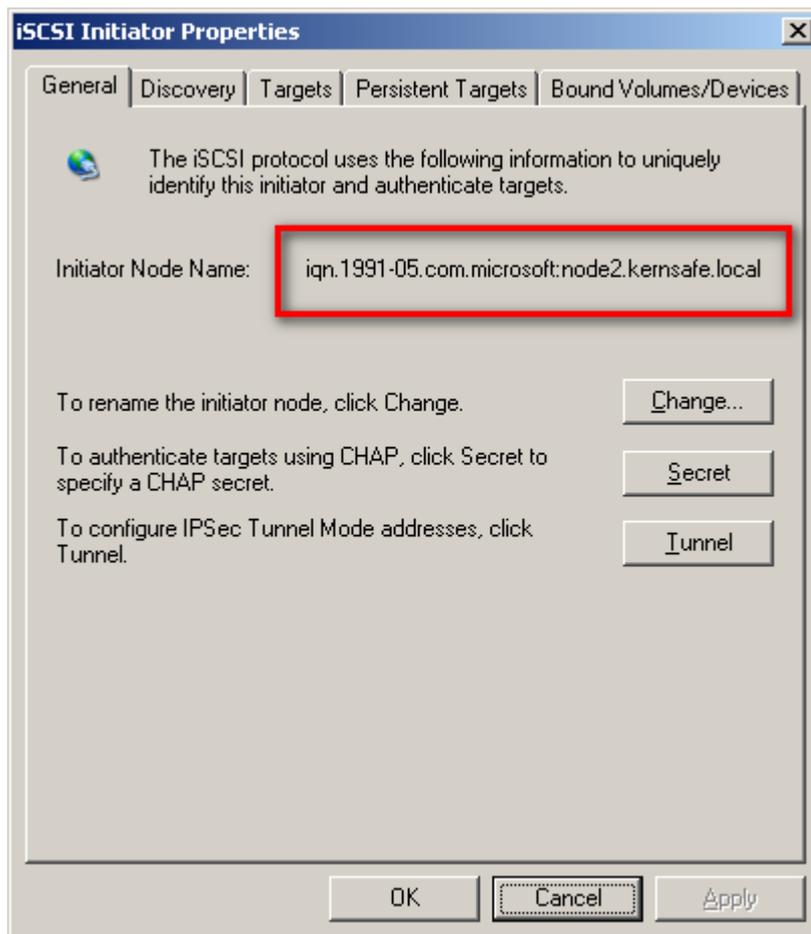


Press the OK button, and then the Computer Name Changes dialog will be shown.

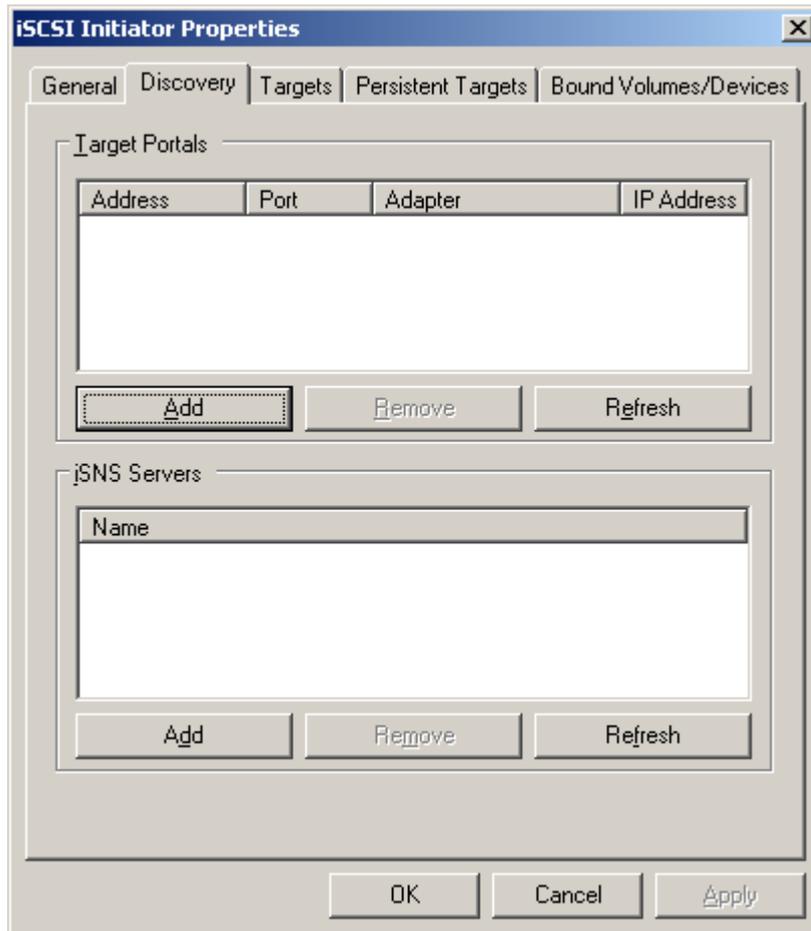


Press the OK button to restart the computer.

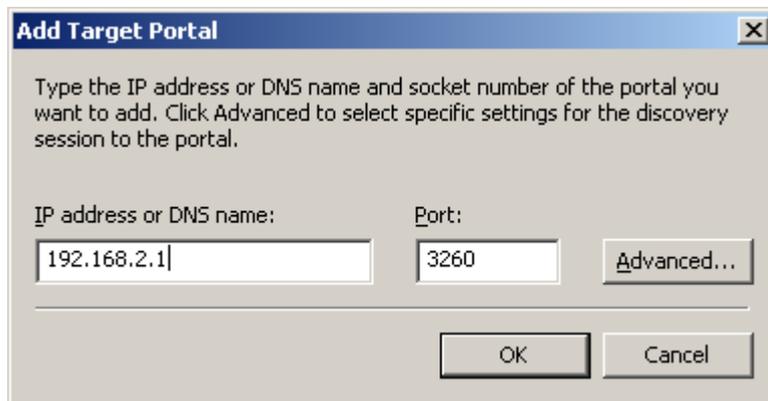
Open iSCSI Initiator.



Change to Discovery page

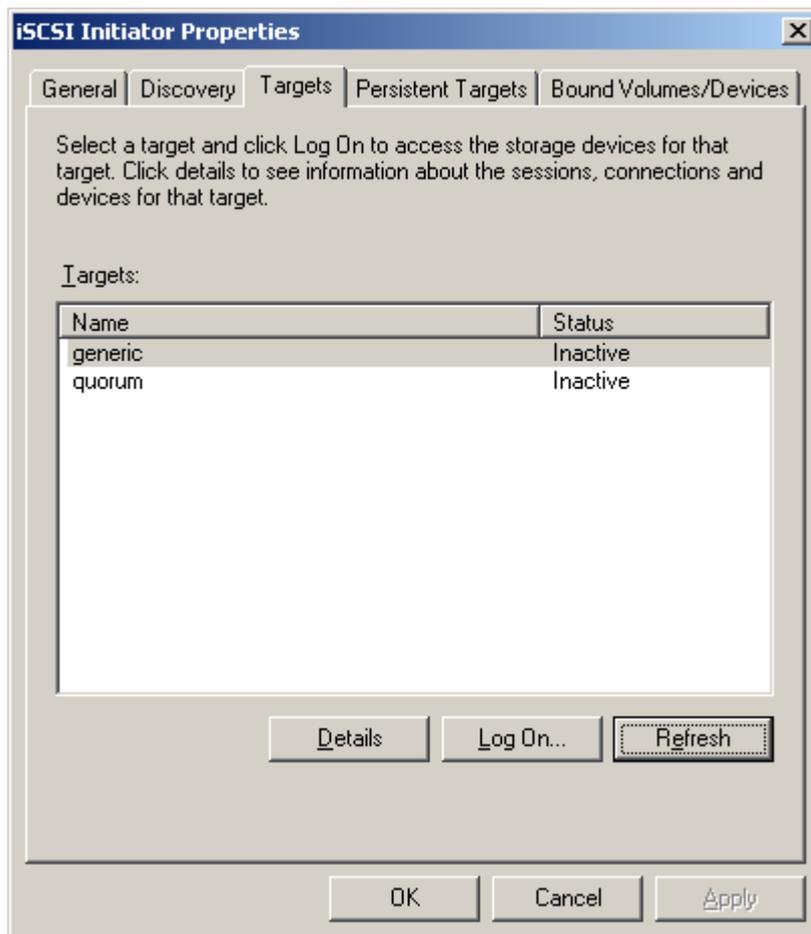


Press the Add button in the Discovery page and then the Add Target Portal dialog will be shown.

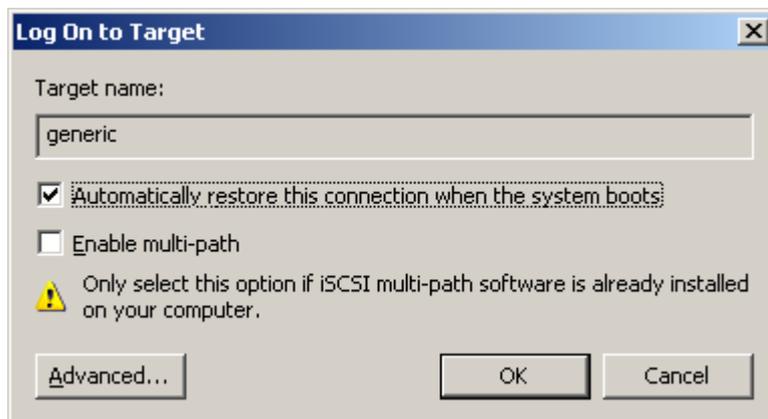


Click Add and enter the IP address of KernSafe iStorage Server, which is 192.168.2.1 here. Press the OK button.

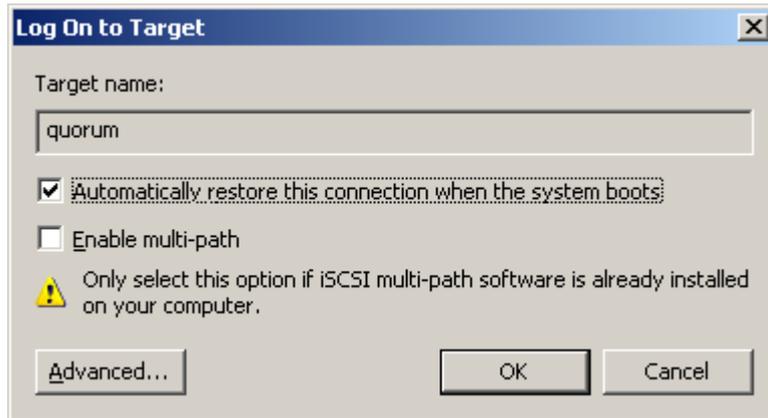
Change to the Targets page



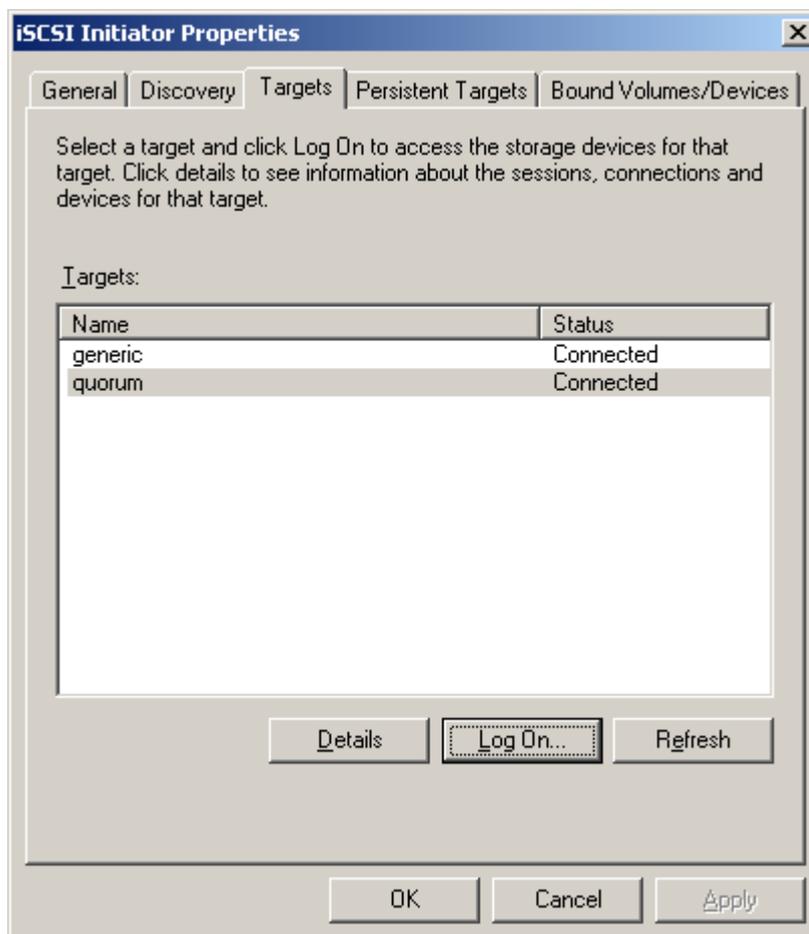
Select a Target and then press the Log On button, then the Log On to Target dialog will be shown.



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

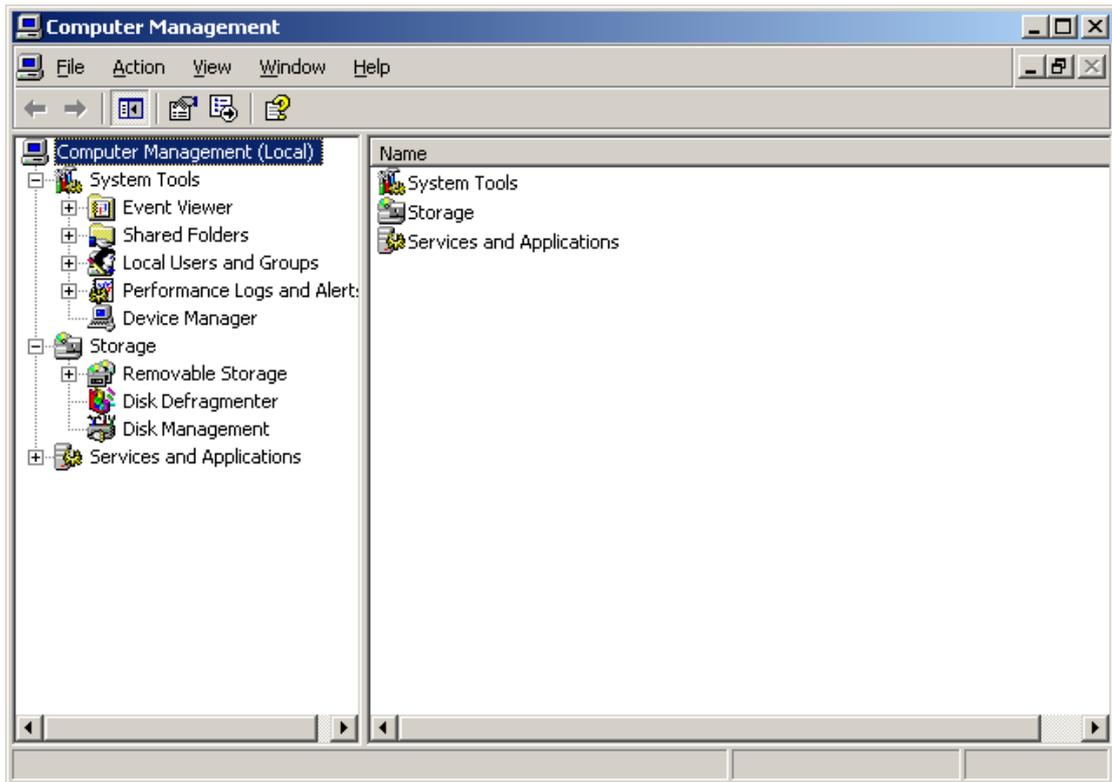


Select quorum and click Log On. Check Automatically restore this connection when the system boots and log on.

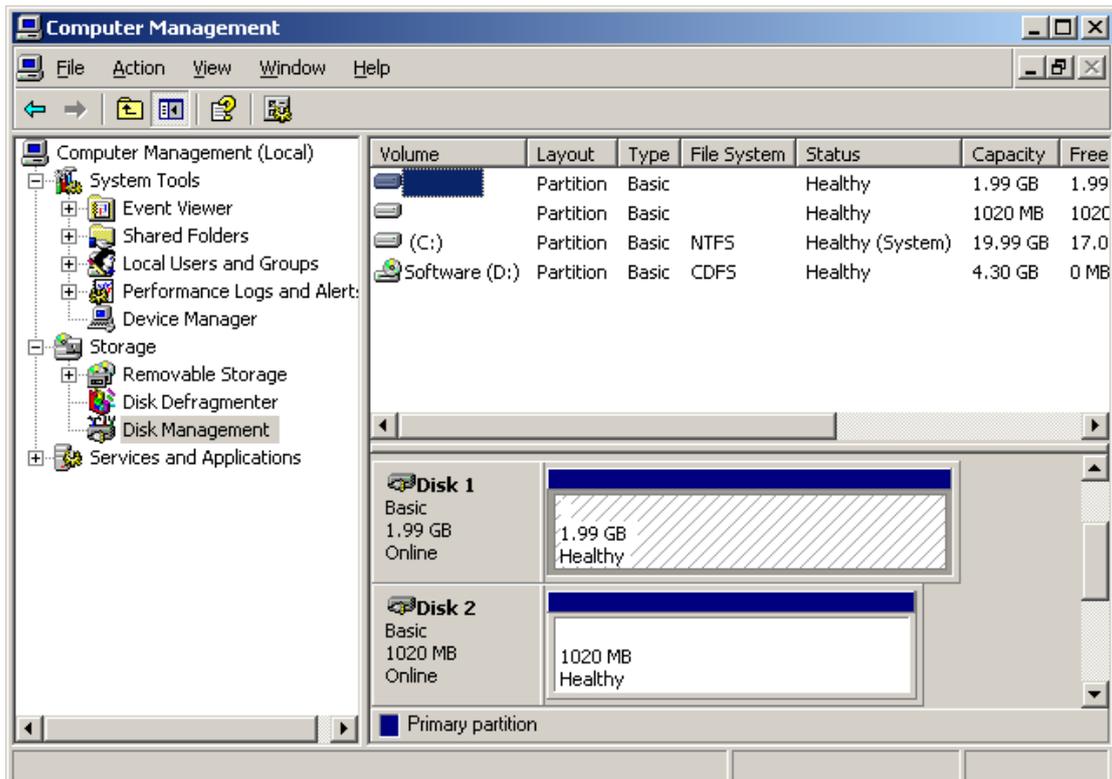


After the successful operation, the status is shown as in the picture.

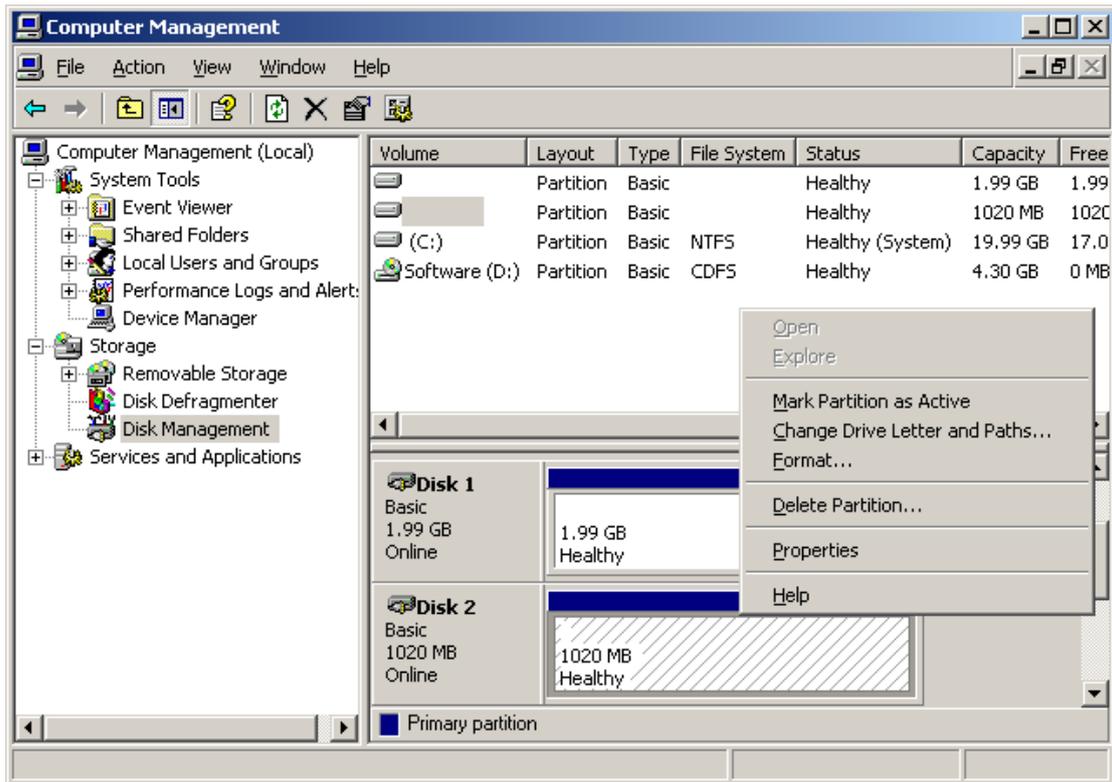
Open Computer Management Console



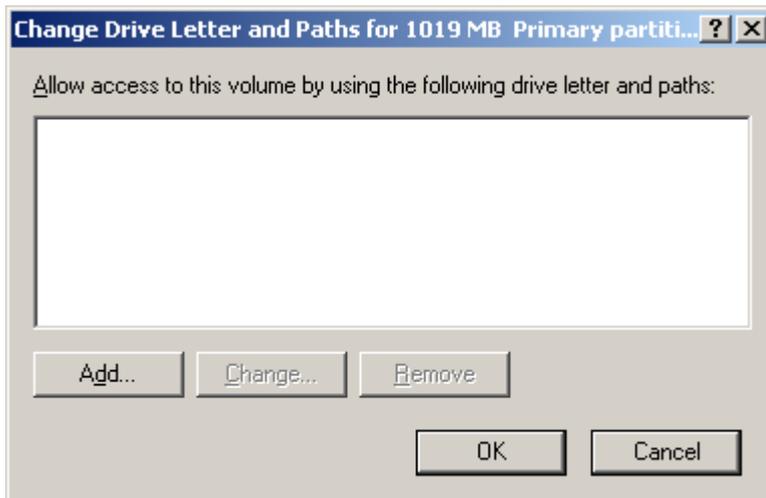
Open Computer Management and select Disk Management.



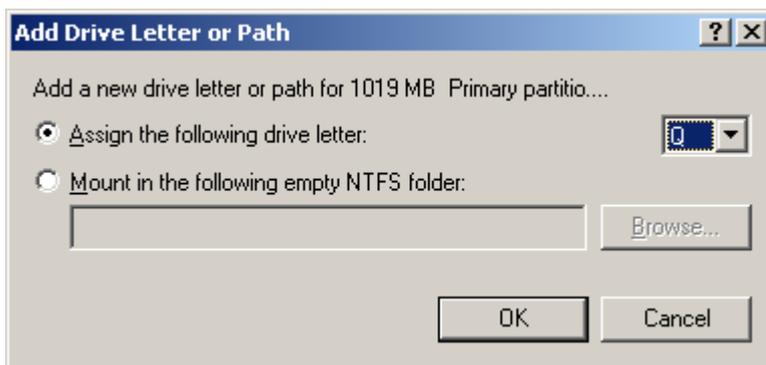
Assign drive letters



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



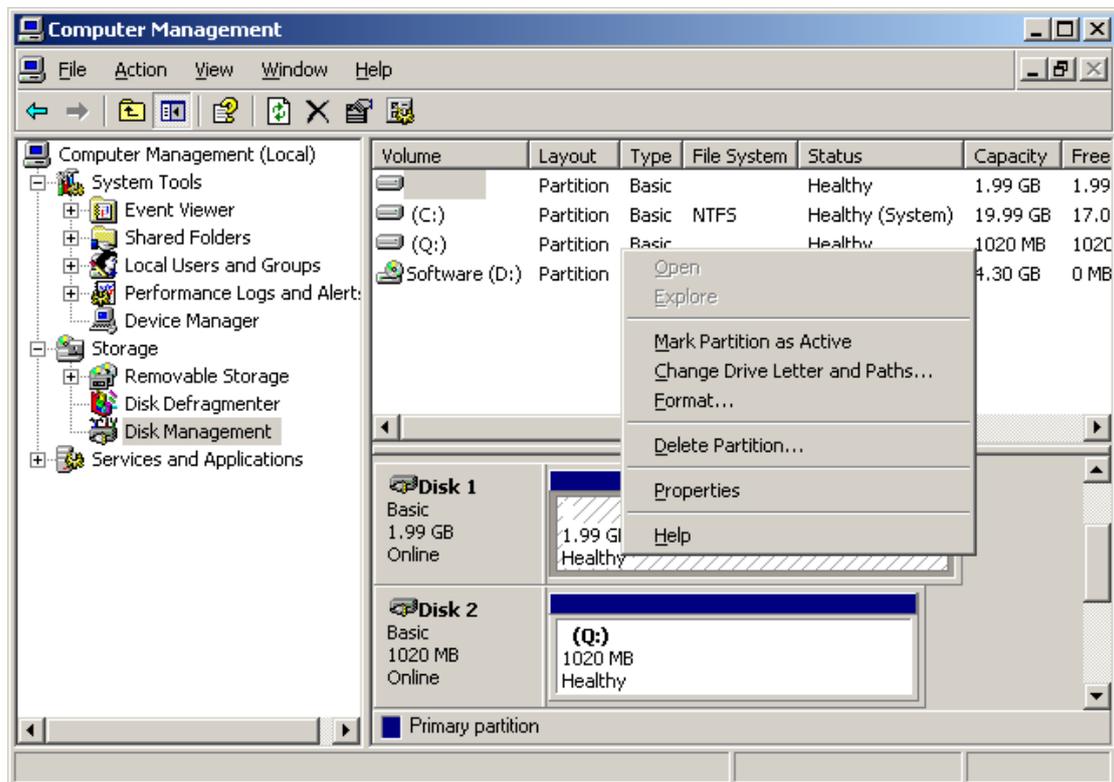
Click the Add button, and the Add Drive Letter or Path dialog will be shown.



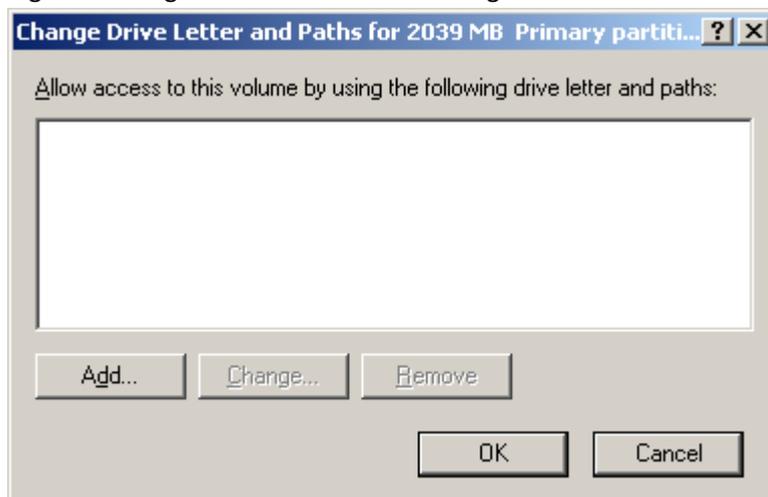
Assign Q as drive letter.

Press the OK button.

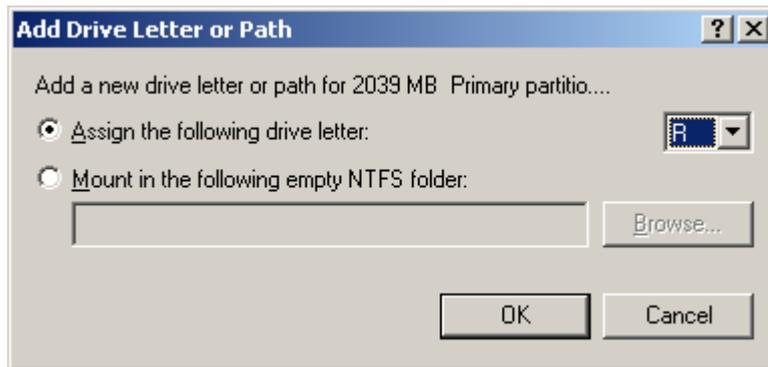
Come back to the Computer Management Console



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



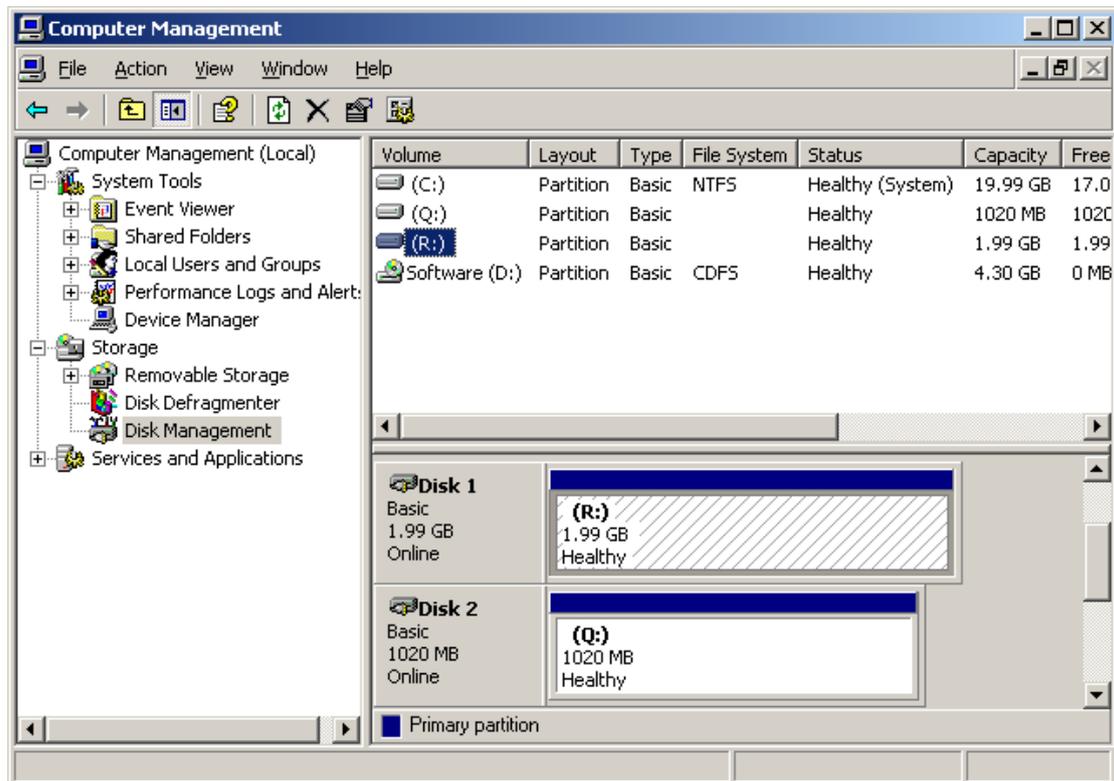
Click the Add button, the Add Drive Letter or Path will be shown.



Assign R as drive letter.

Press the OK button.

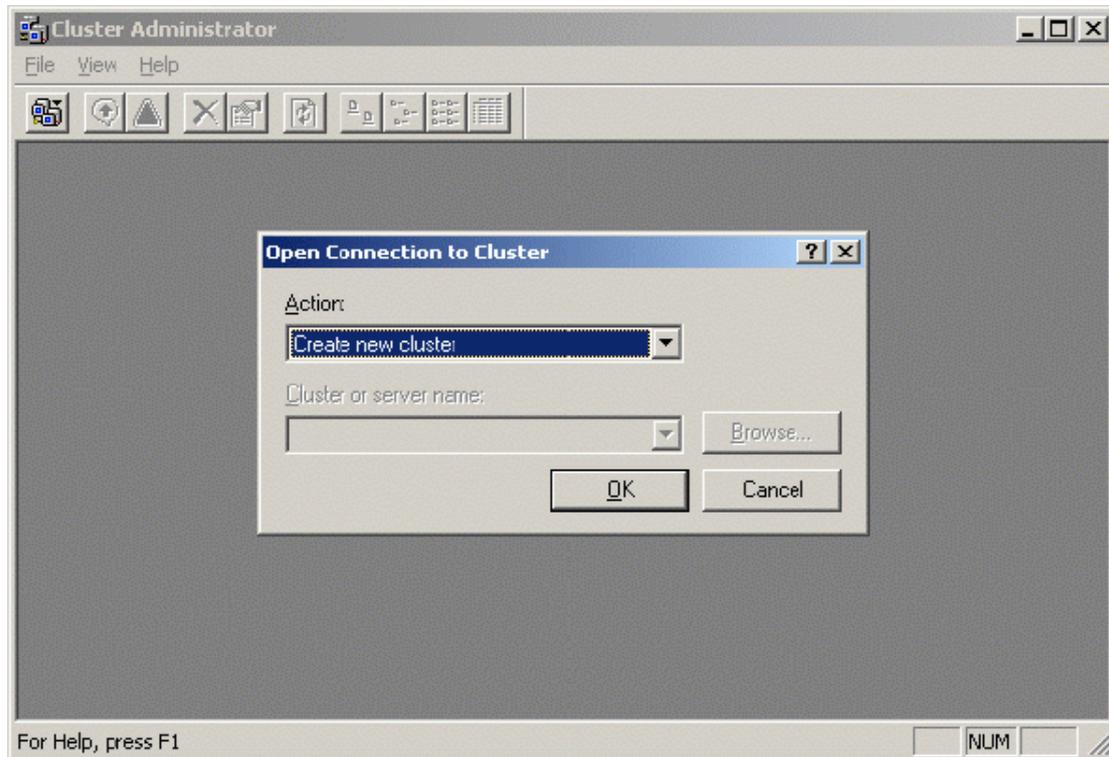
Come back to the Computer Management Console



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

6. Creating Cluster

Open Cluster Administrator on node1.



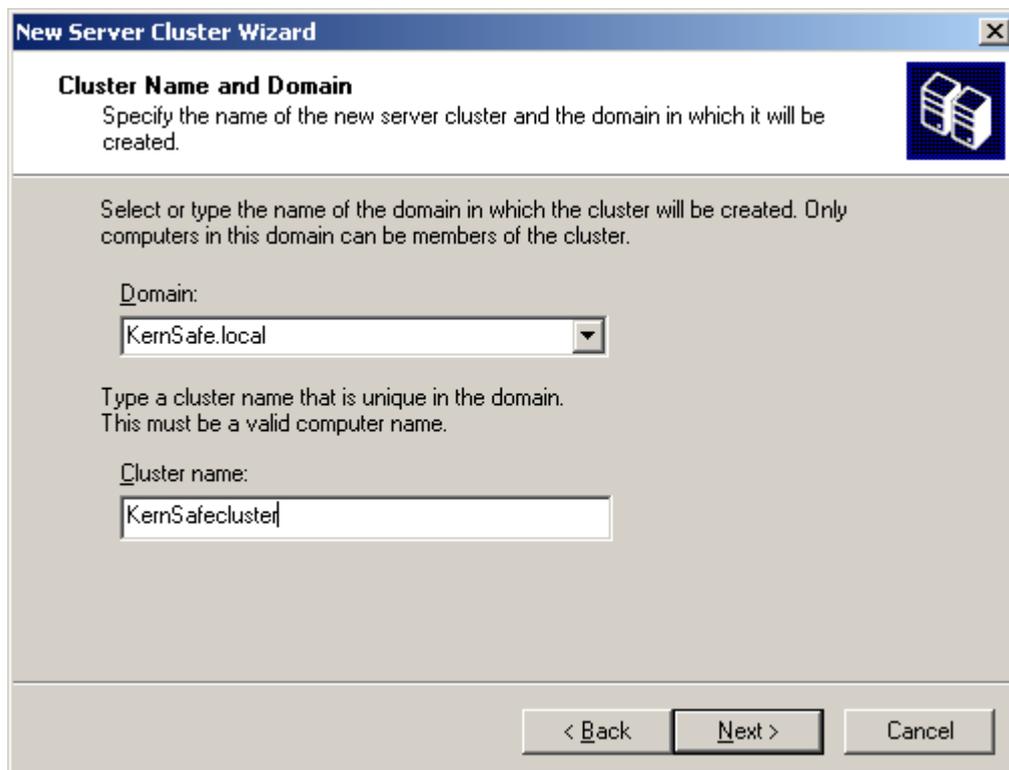
Select Create new cluster.

Press the OK button, the New Server Cluster Wizard will be 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 the 'New Server Cluster Wizard' dialog box. The title bar reads '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, it says 'Enter the name of the computer that will be the first node in the new cluster.' There is a text input field labeled 'Computer name:' containing the text 'node1'. To the right of the input field are two buttons: 'Browse...' and 'Advanced'. At the bottom of the dialog are three buttons: '< Back', 'Next >', and 'Cancel'.

Enter node1.

Press the Next button to continue.

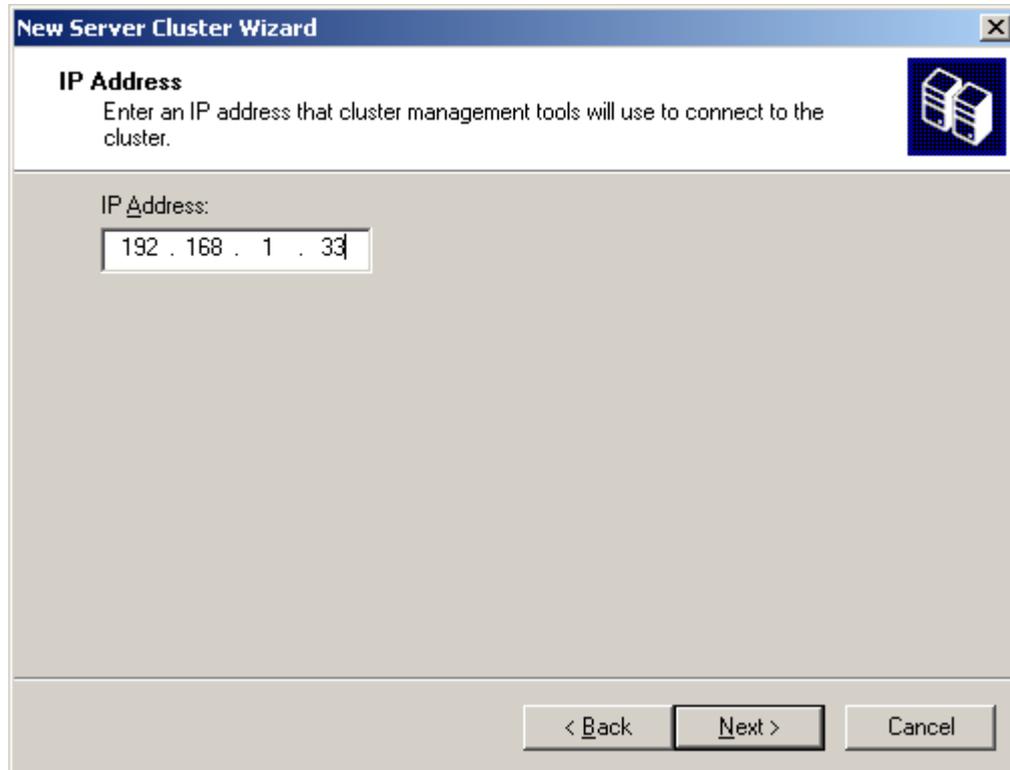
Analyzing configuration

The screenshot shows the 'New Server Cluster Wizard' dialog box in the 'Analyzing Configuration' step. The title bar reads 'New Server Cluster Wizard'. The main heading is 'Analyzing Configuration' with a sub-instruction: 'Please wait while the wizard determines the cluster configuration.' Below this, there is a list of five tasks, each with a plus sign icon and a checkmark: 'Checking for existing cluster', 'Establishing node connection(s)', 'Checking node feasibility', 'Finding common resources on nodes', and 'Checking cluster feasibility'. Below the list, it says 'Tasks completed.' followed by a green progress bar that is nearly full. At the bottom of the main area are three buttons: 'View Log...', 'Details...', and 'Re-analyze'. Below these buttons is the instruction: 'Click Next to continue. Click Back to change the configuration.' At the bottom of the dialog are three buttons: '< Back', 'Next >', and 'Cancel'.

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 a Windows-style dialog box titled "New Server Cluster Wizard". The window has a blue title bar with a close button (X) in the top right corner. The main content area is light gray and contains the following text:

IP Address
Enter an IP address that cluster management tools will use to connect to the cluster.

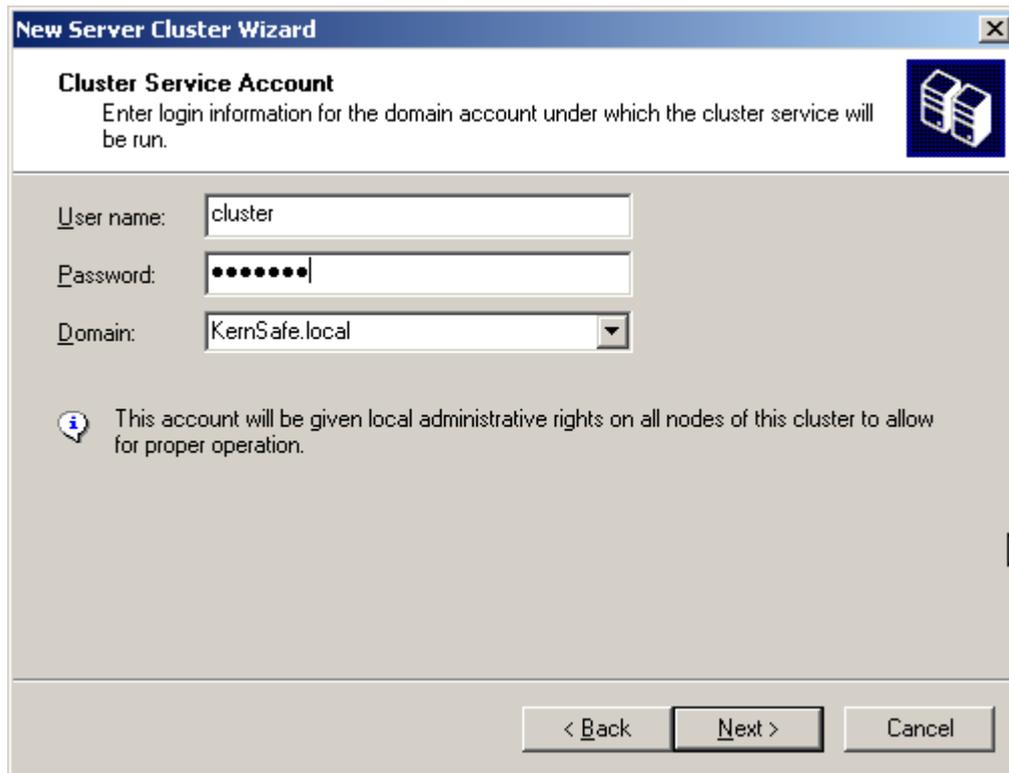
IP Address:
192 . 168 . 1 . 33

At the bottom of the dialog box, there are three buttons: "< Back", "Next >", and "Cancel". A small icon of two server racks is located in the top right corner of the main content area.

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

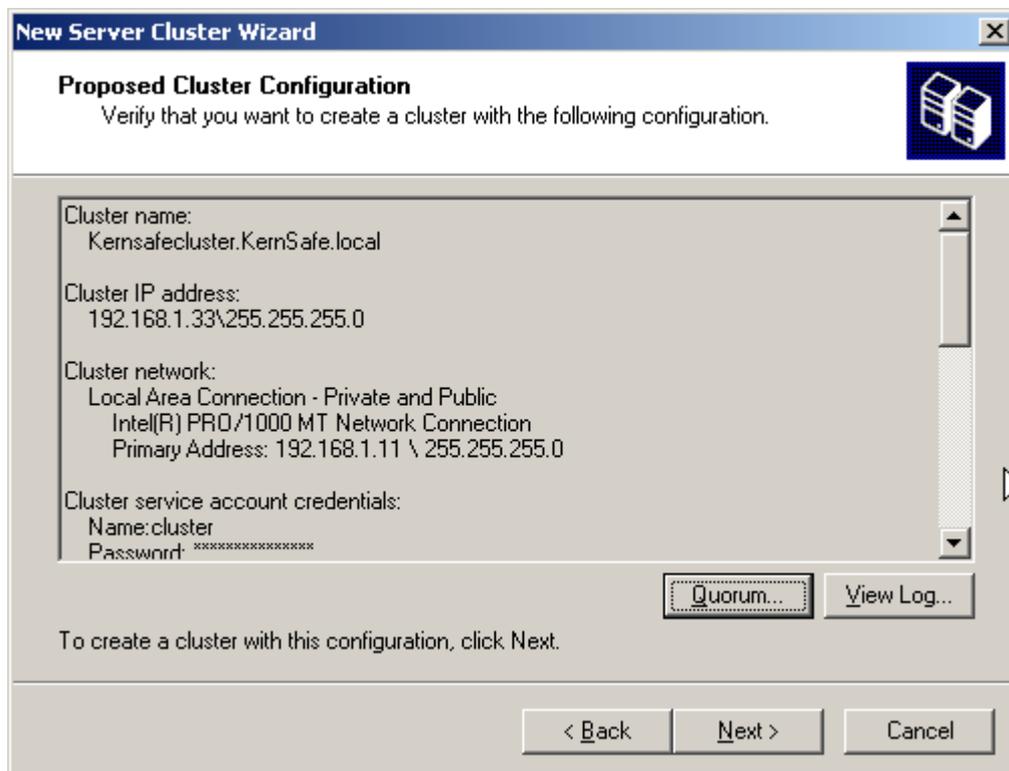
Press the Next button to continue.

Type cluster service account

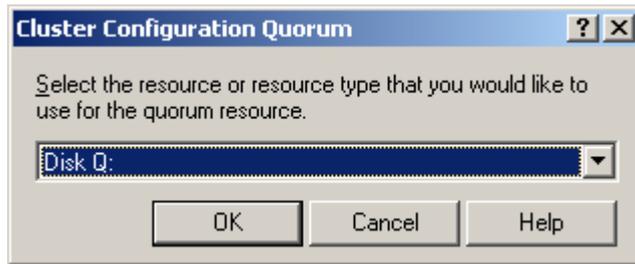


Enter the username and password of cluster.
Press the Next button to continue.

Proposed cluster configuration



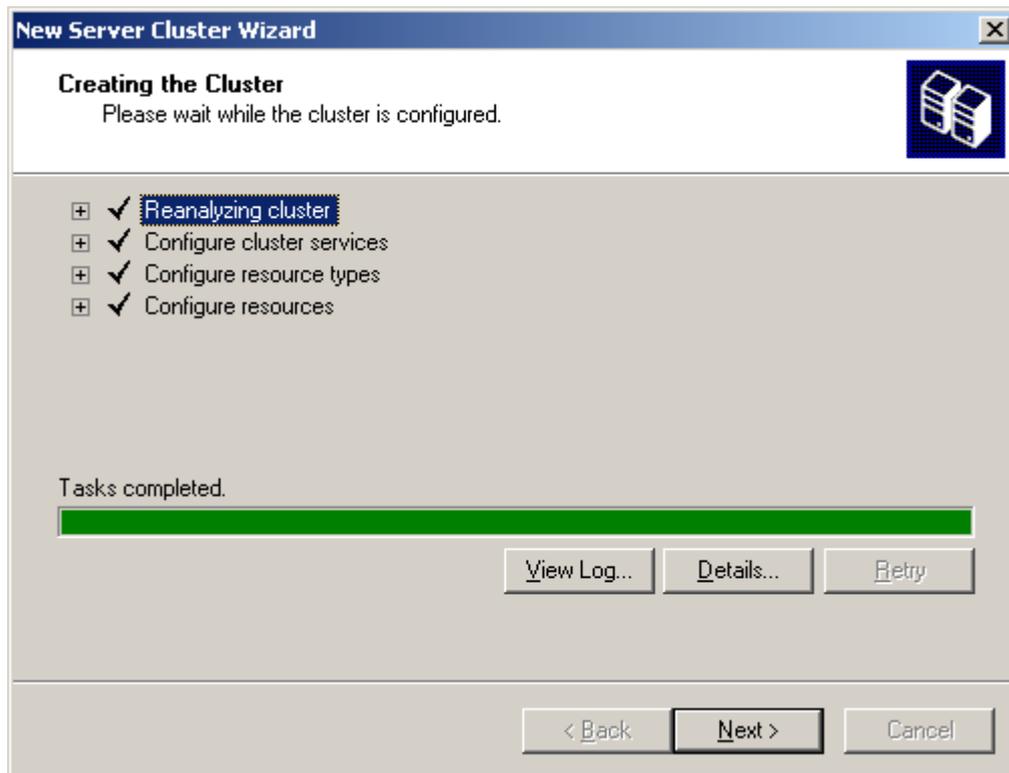
Click the Quorum button, the Cluster Configuration Quorum dialog will be shown.



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.

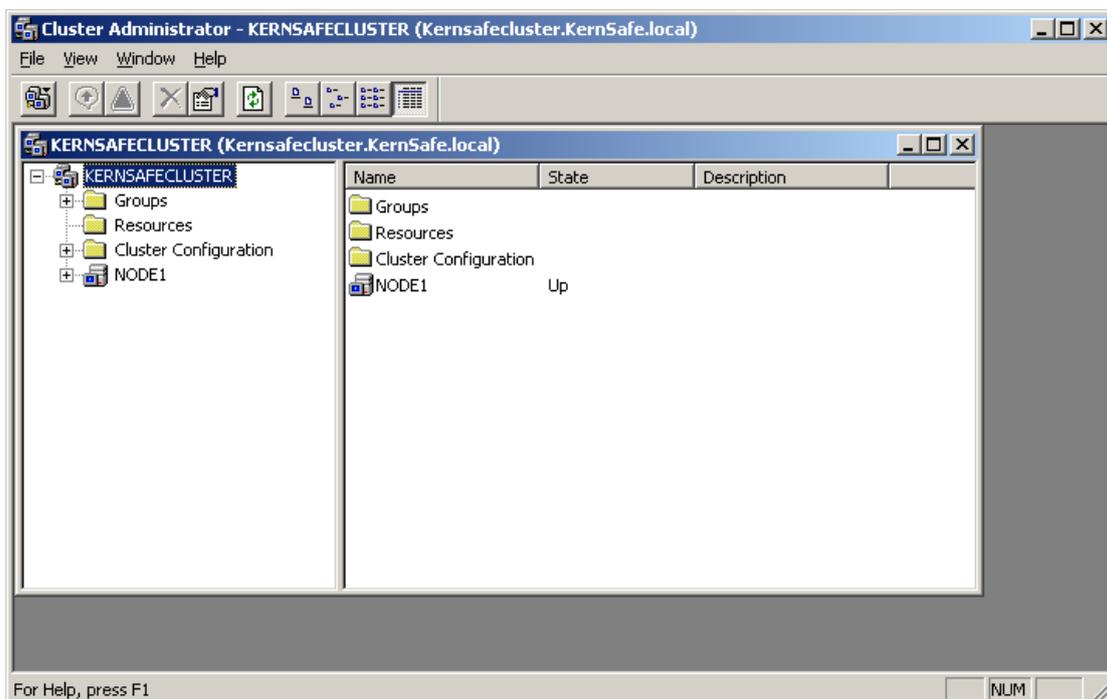
When all the tests are passed, press the Next button to continue.

Completing cluster creating



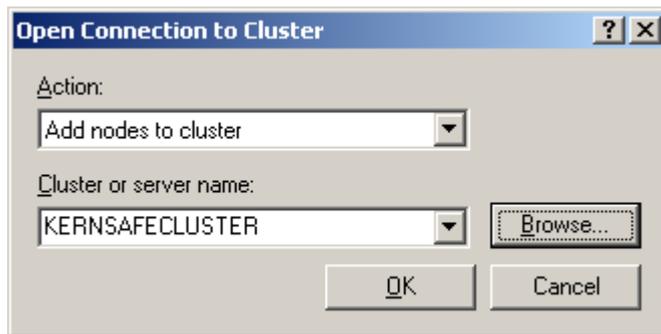
Press the Finish button to finish.

Come back to the Cluster Administrator Console



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

Add node2 to the cluster



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

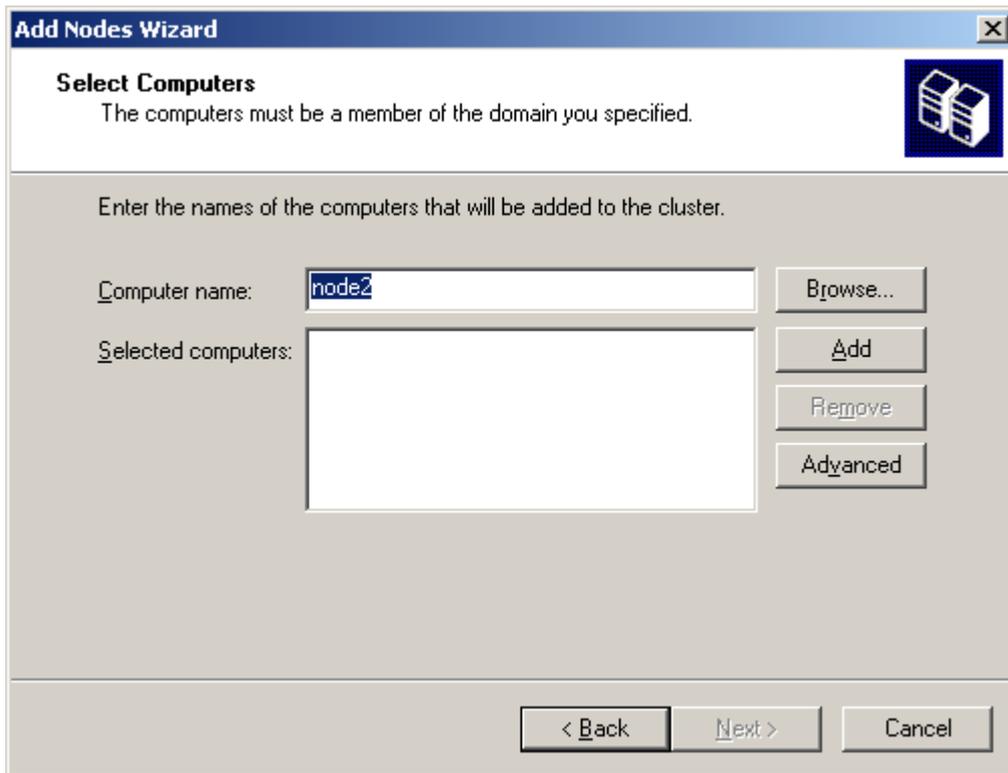
Press the OK button to continue.

The Add Nodes Wizard will be shown

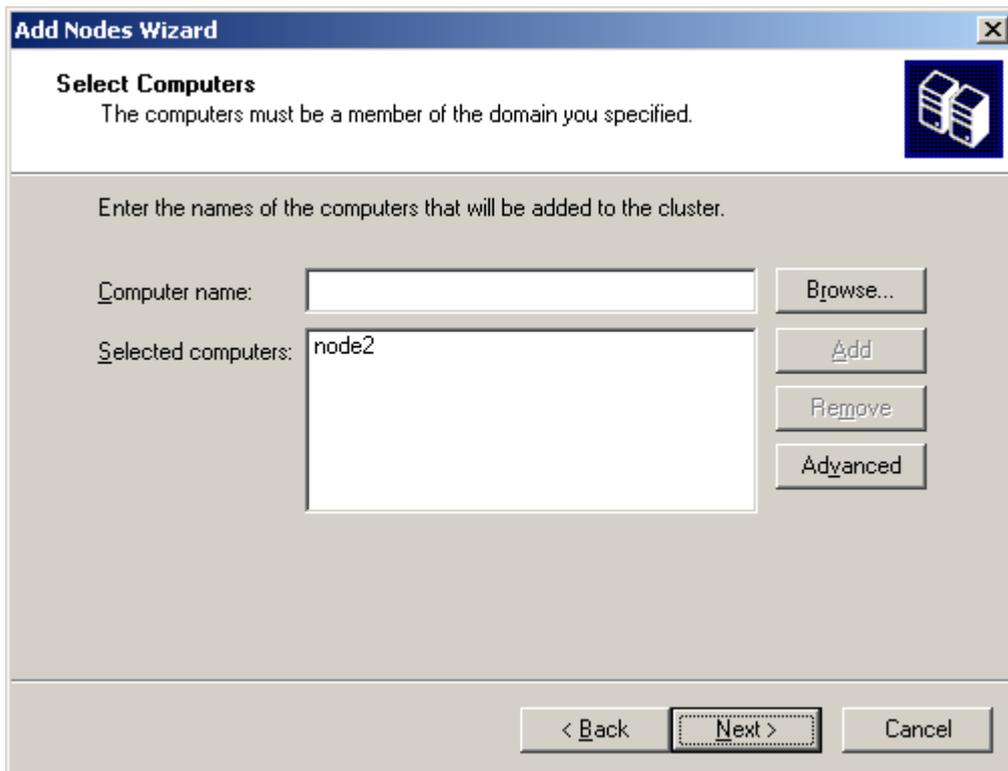


Press the Next button to continue.

Select Computers

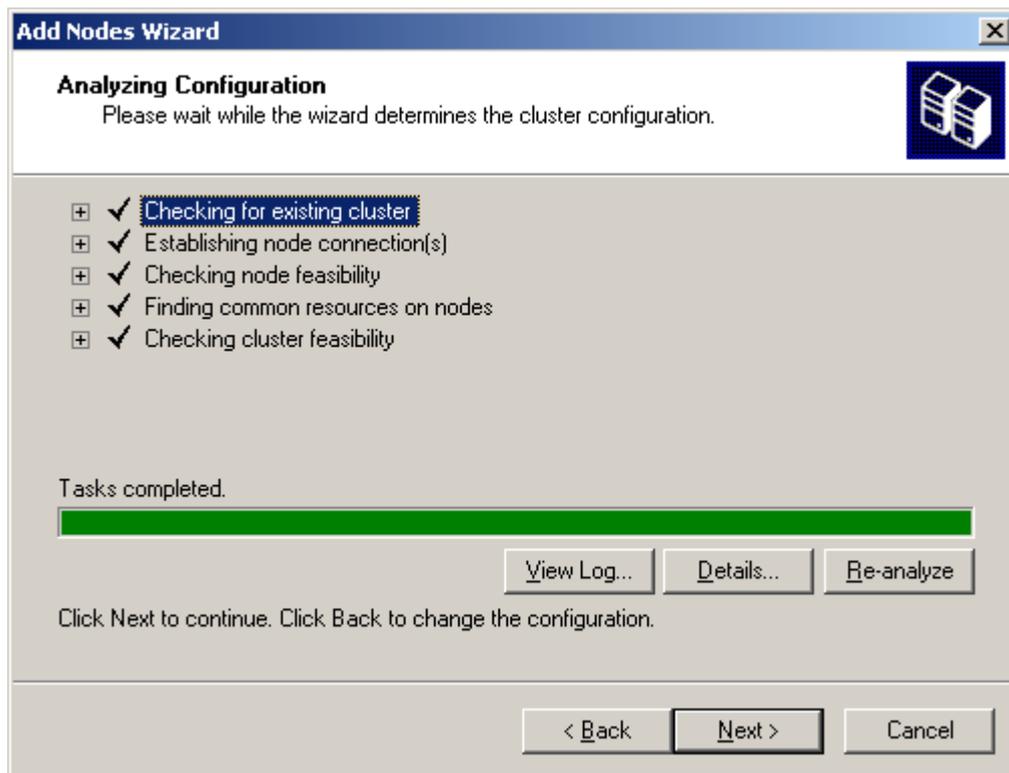


Enter node2 in Computer name and click Add to add node2 into Selected computers.



Press the Next button to continue.

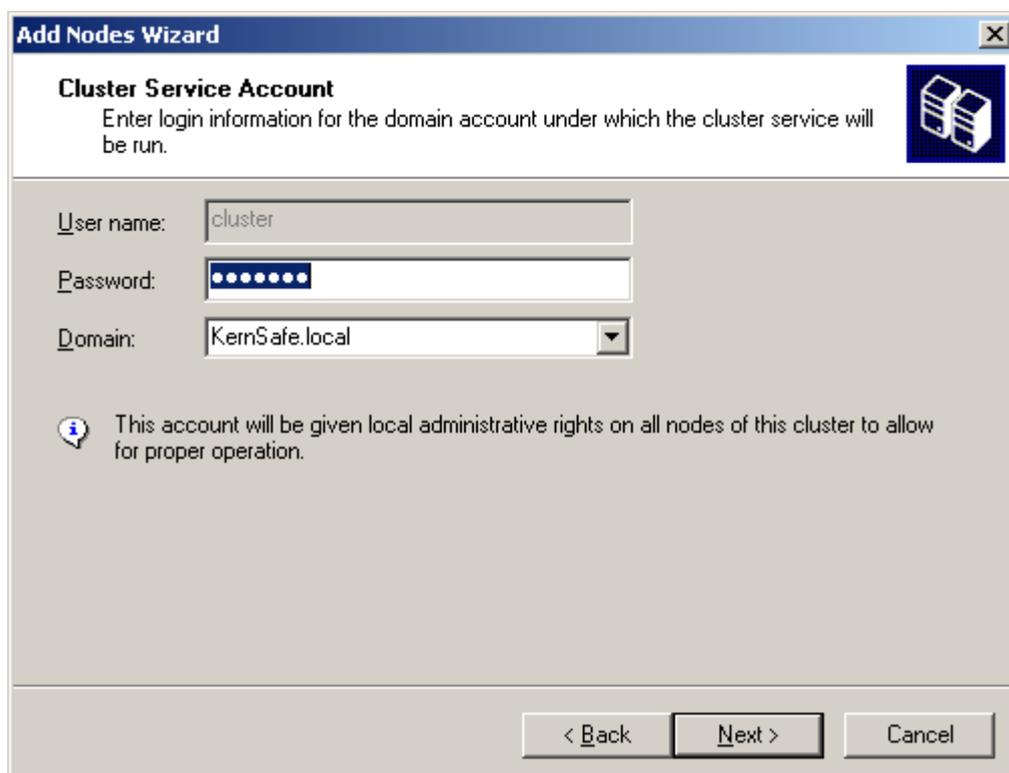
Analyzing configuration



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.

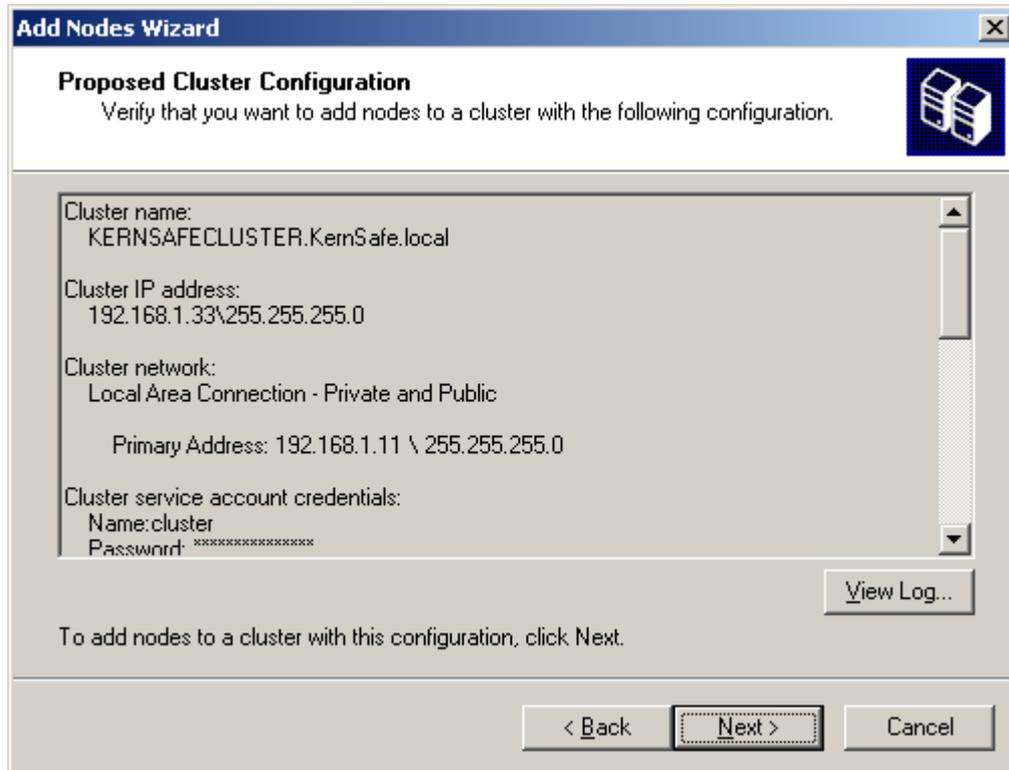
Specify cluster service account



Enter the password of cluster user.

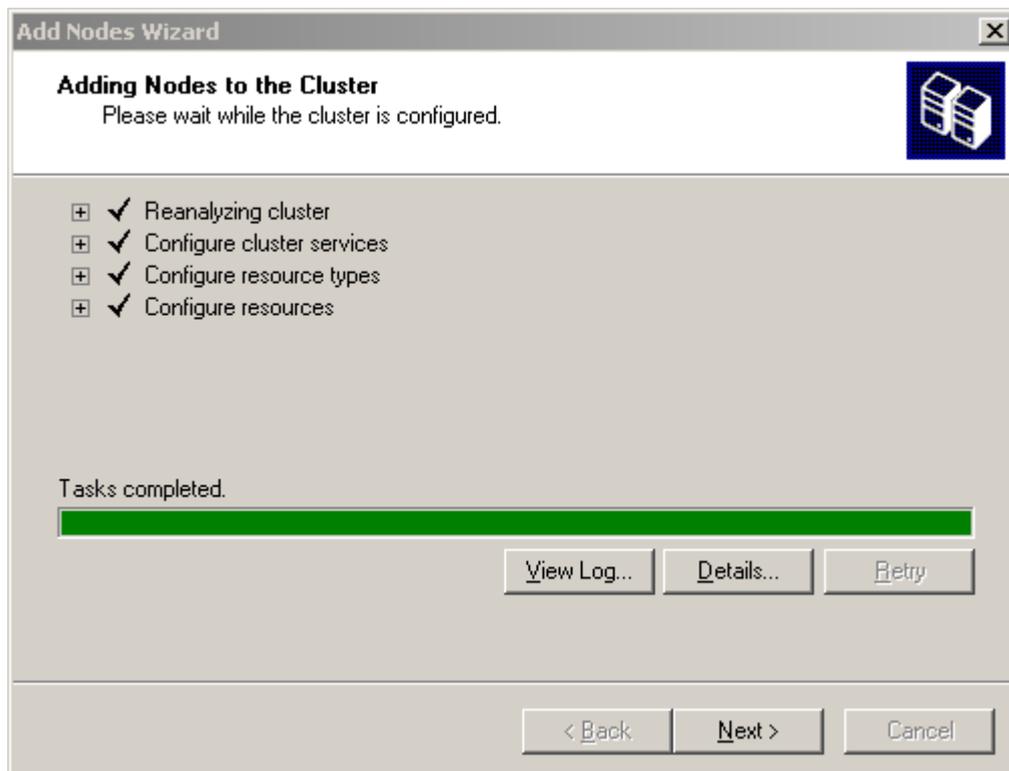
Press the Next button to continue.

Proposed cluster configuration



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.

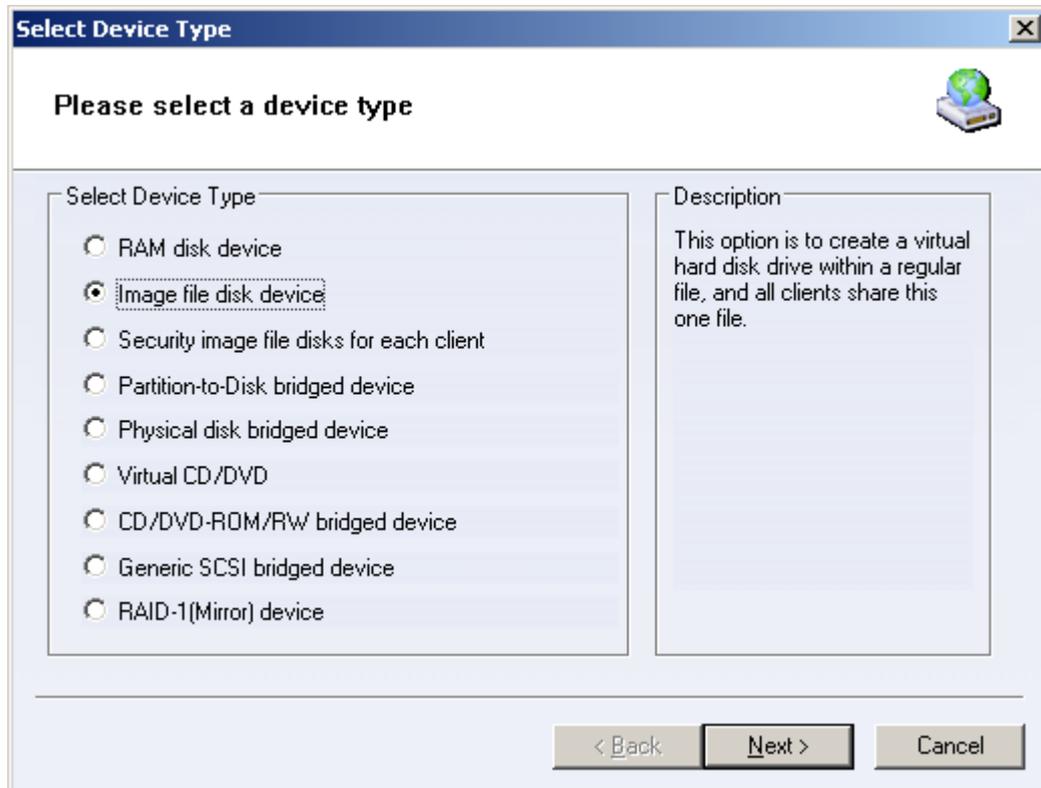
Finish adding node to the cluster.



Press the Finish button.

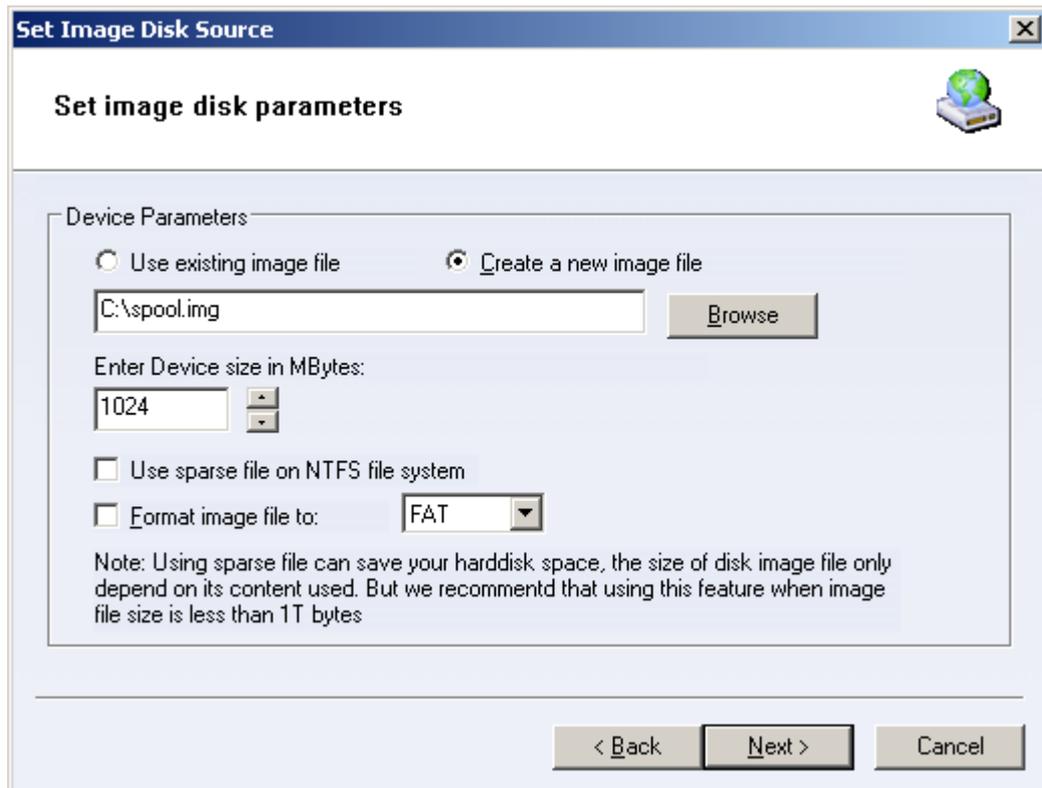
7. Add new shared resources

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



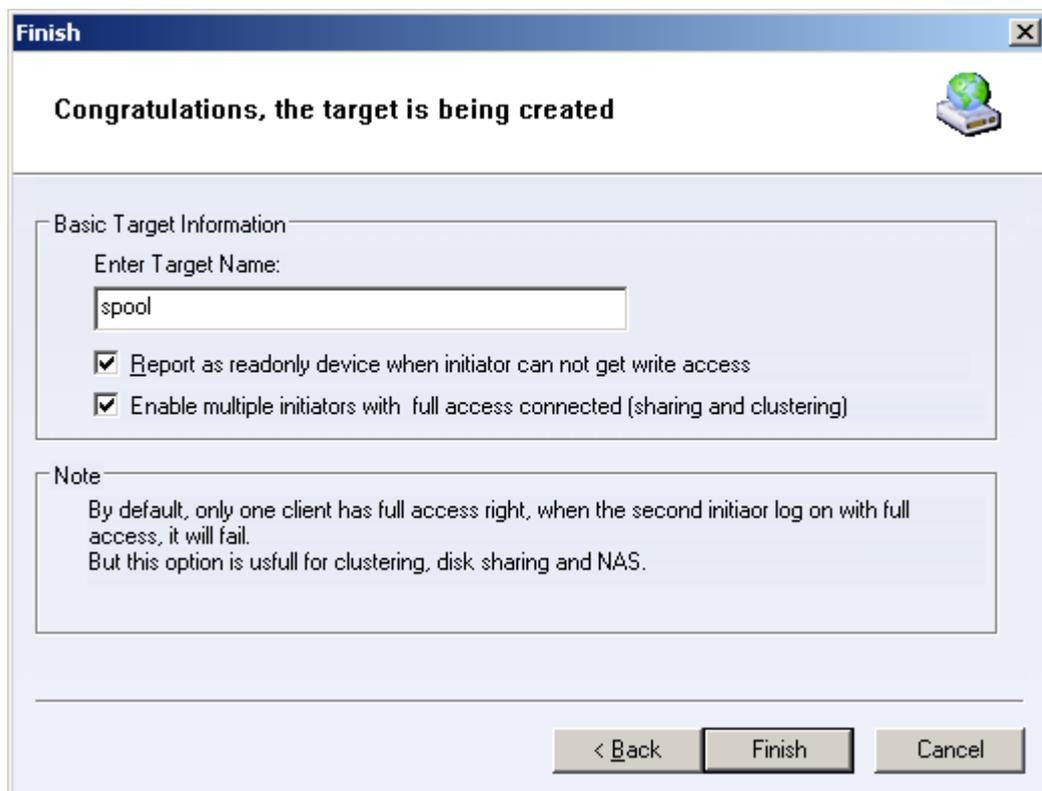
Create an Image file disk device in by selecting Image file disk device in Create Target. Press the Next button to continue.

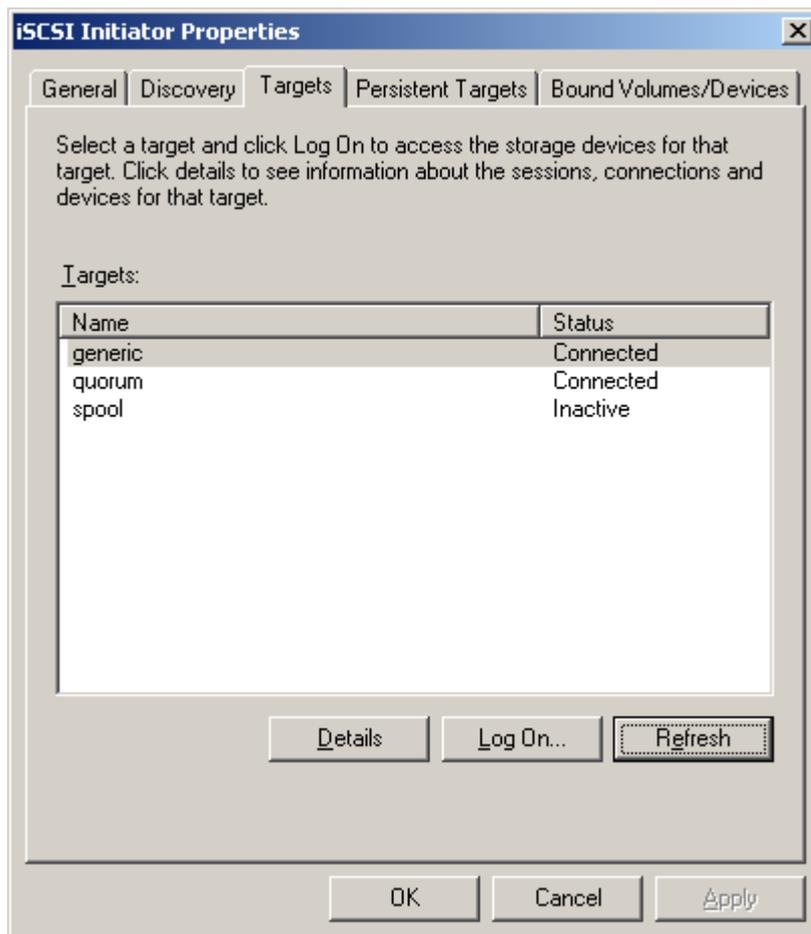
Set image disk parameters



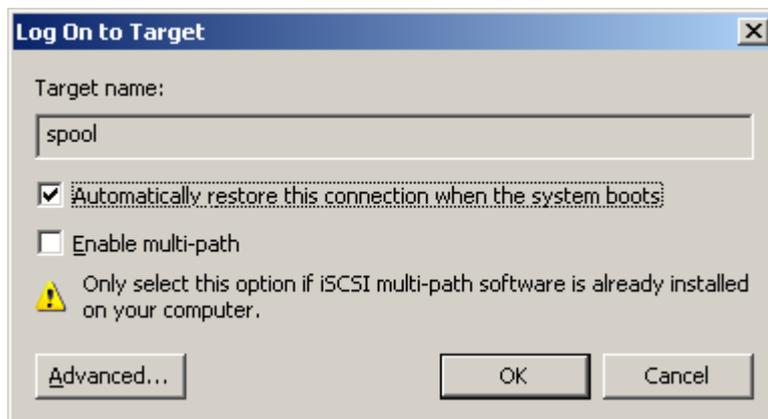
Create an .img file named spool with a size of 1024MB as an example .
Press the Next button to continue.

Finish creating iSCSI Target





Press the Log On button.



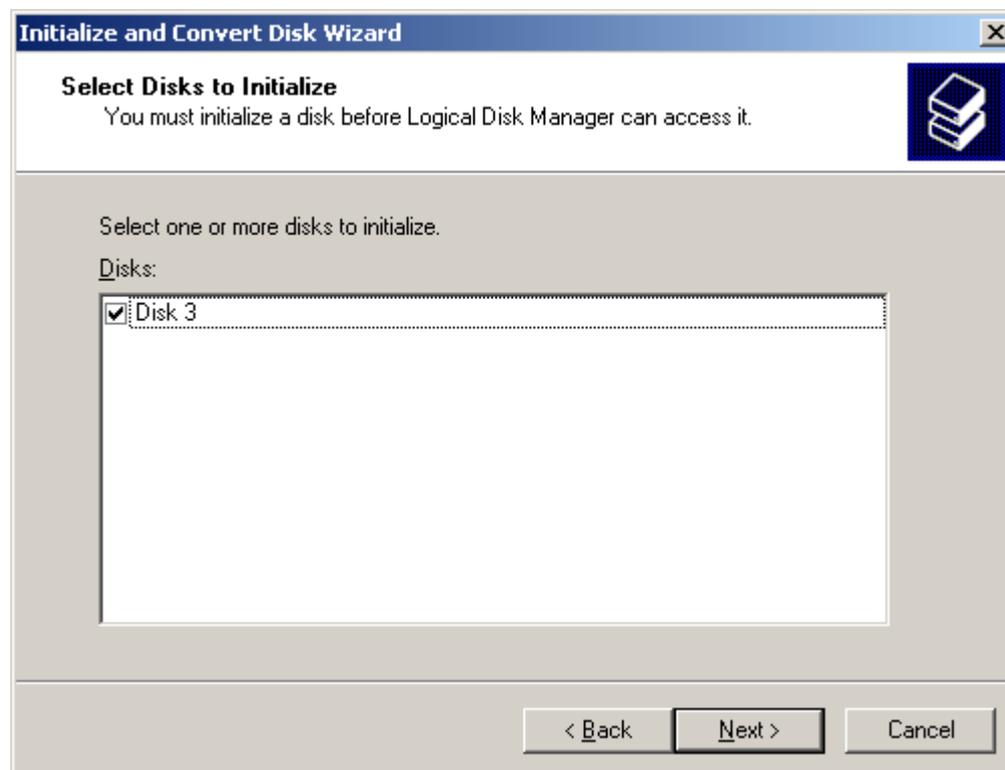
Select spool and click Log On. Check Automatically restore this connection when the system boots and log on.

Open Computer Management, select Disk Management and then the Initialize and Convert Disk Wizard will be shown.



Press the Next button to continue.

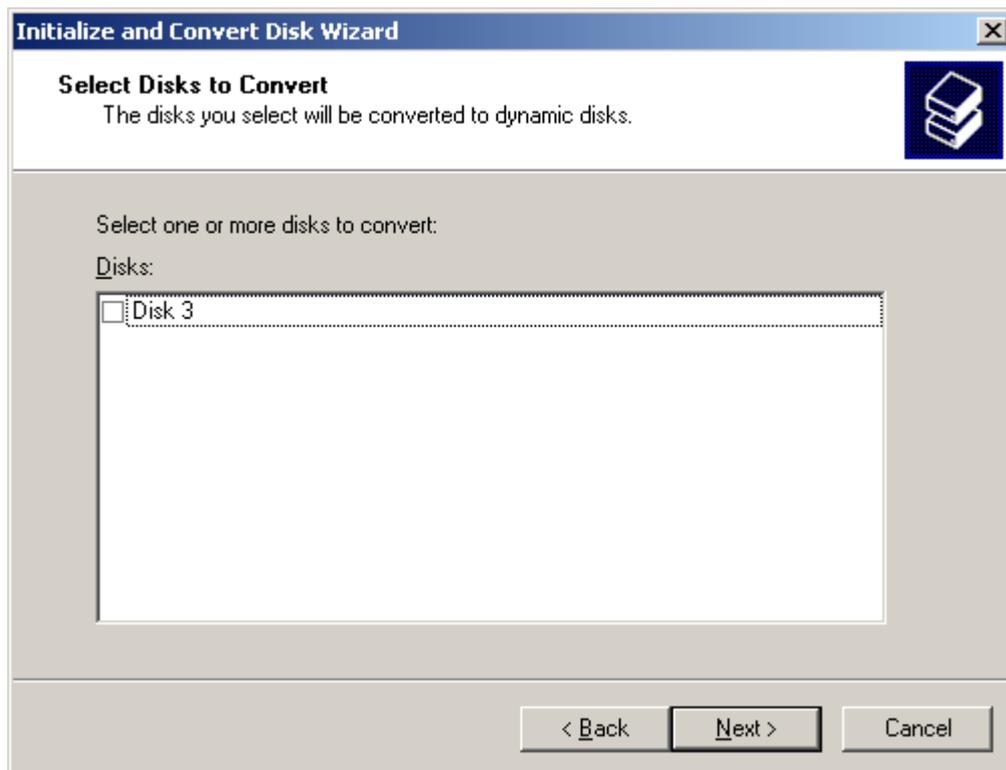
Select disks to be initialized.



Select Disk3.

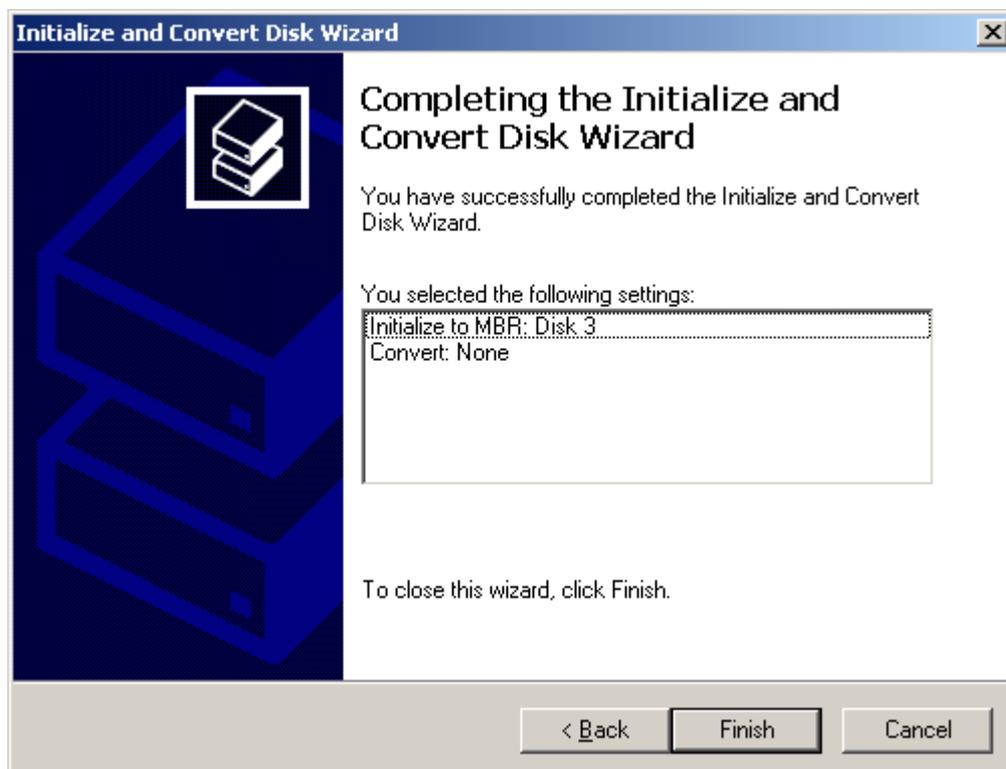
Press the Next button to continue.

Select disks to be converted.



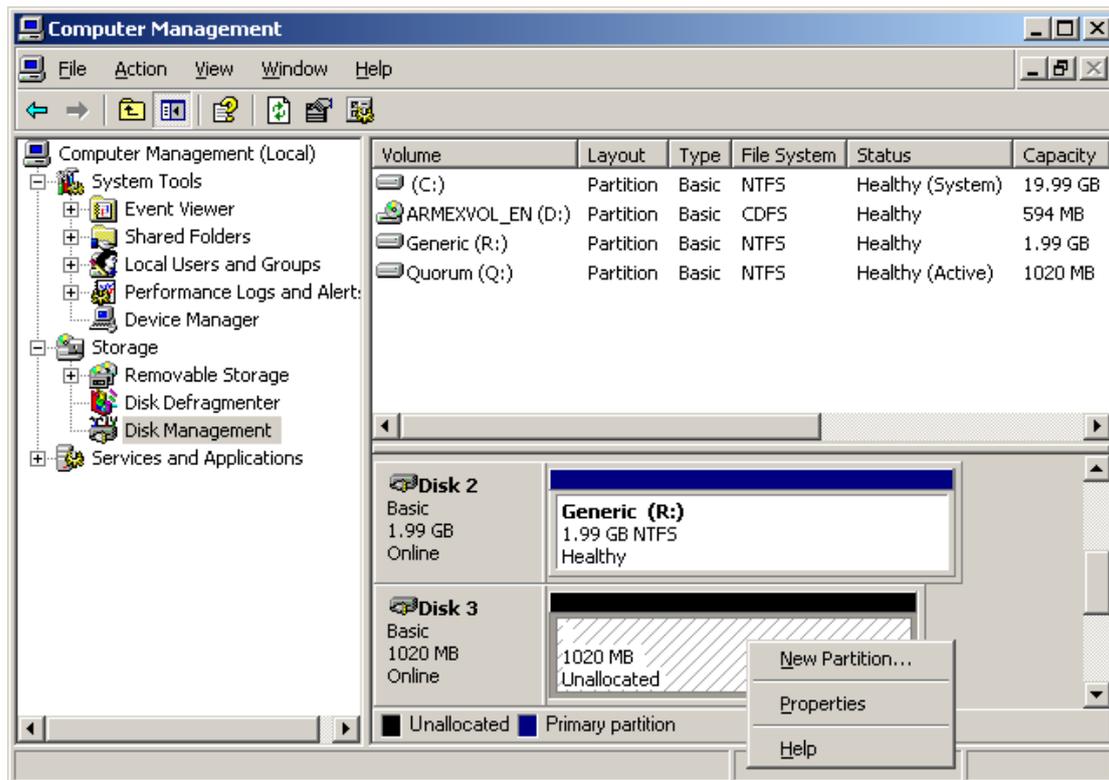
Press the Next button to continue.

Finish initializing disk.



Press the Finish button.

Come back to the Computer Management Console.

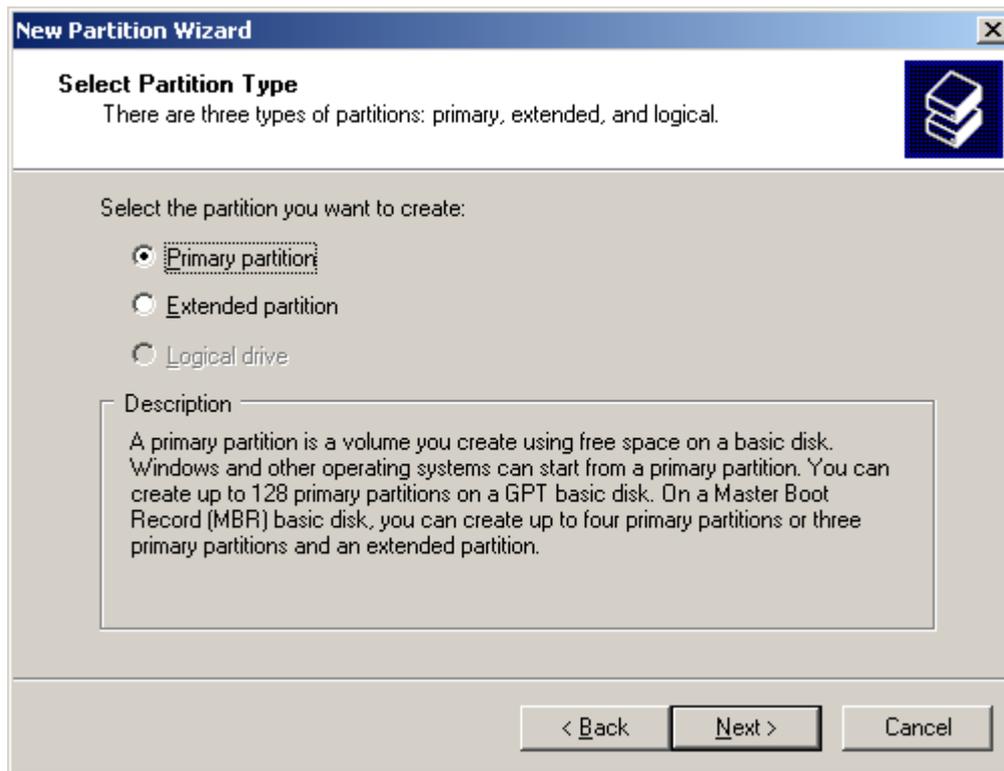


Right click on the disk3 and then select New Partition, the New Partition Wizard will be shown.



Press the Next button to continue.

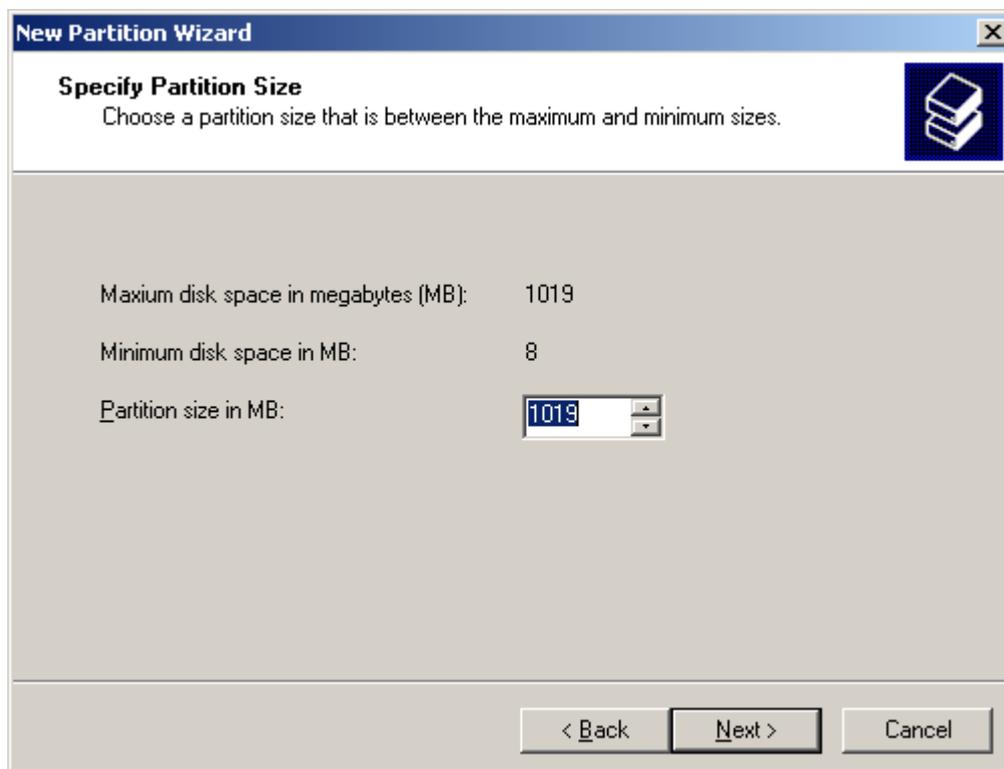
Select partition type.



Select Primary partition

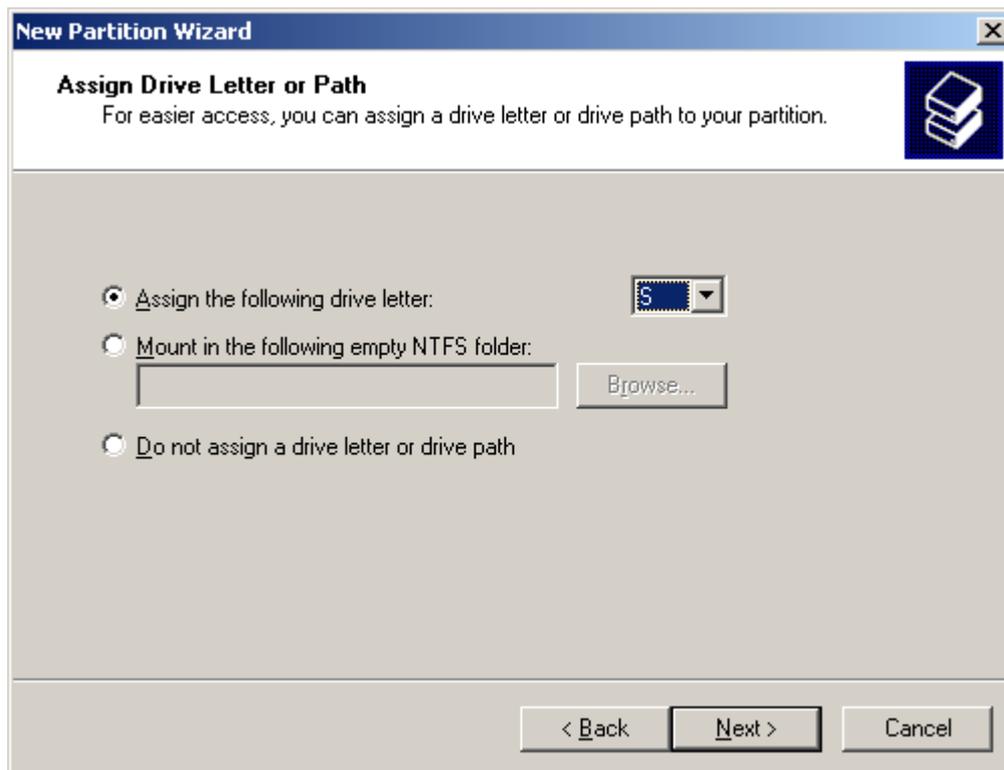
Press the Next button to continue.

Specify partition size



Press the Next button to continue.

Assign drive letter

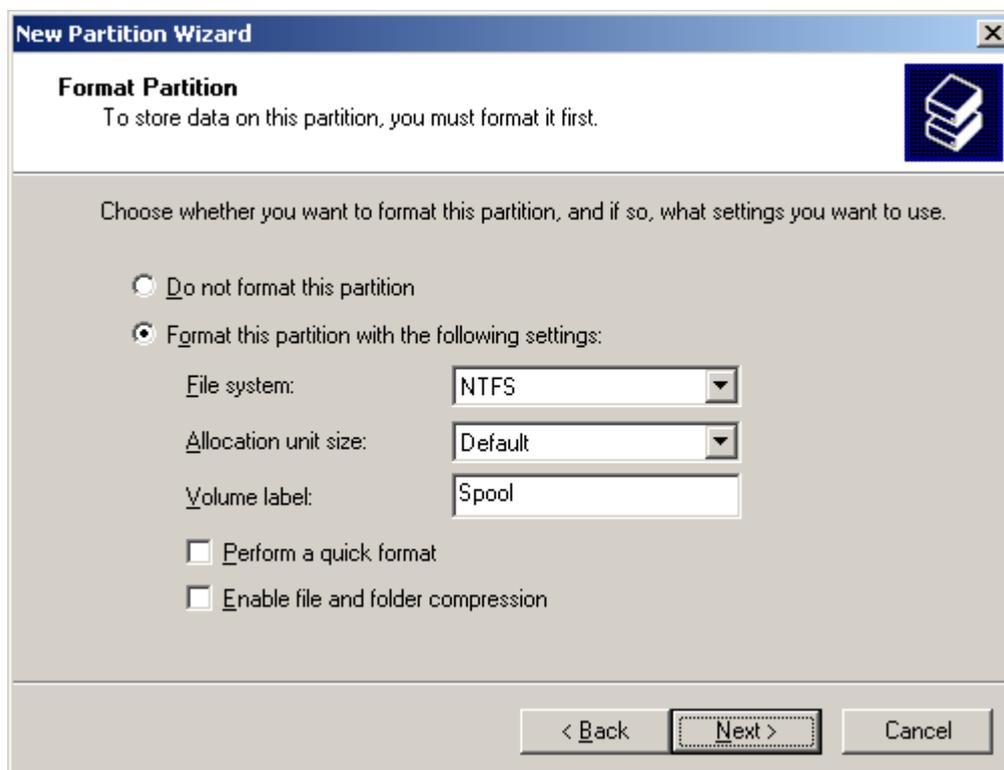


The screenshot shows the 'New Partition Wizard' dialog box with the title bar 'New Partition Wizard' and a close button. The main heading is 'Assign Drive Letter or Path' with a sub-heading 'For easier access, you can assign a drive letter or drive path to your partition.' and a disk icon. There are three radio button options: 'Assign the following drive letter:' 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 are buttons for '< Back', 'Next >', and 'Cancel'.

Assign S as drive letter.

Press the Next button to continue.

Format partition

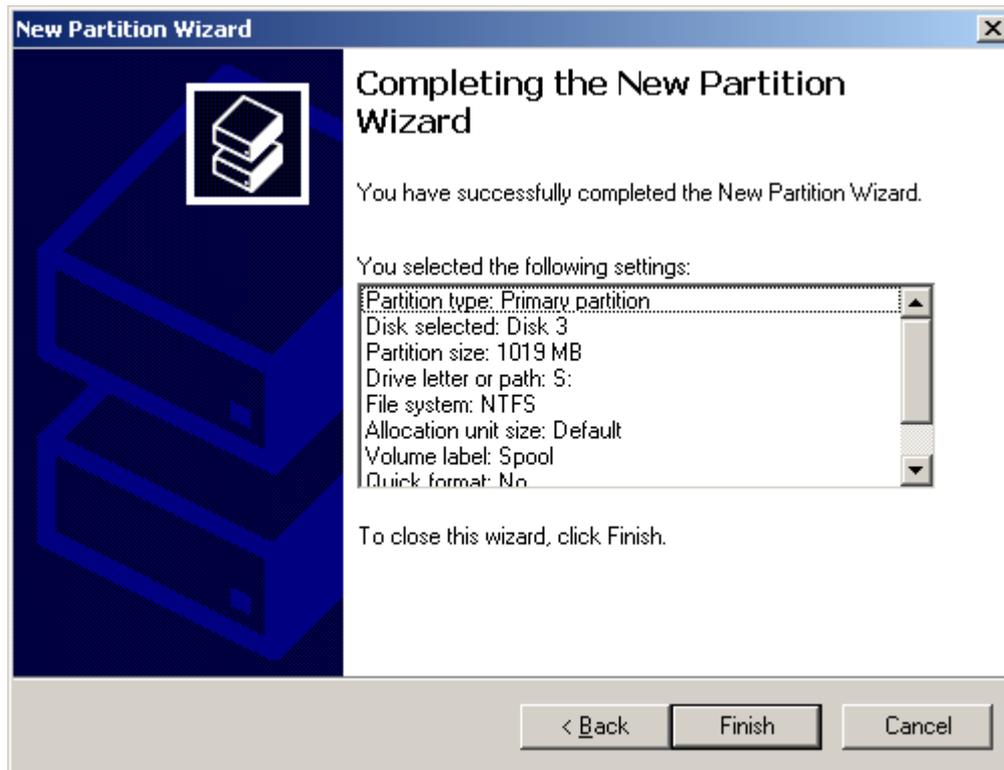


The screenshot shows the 'New Partition Wizard' dialog box with the title bar 'New Partition Wizard' and a close button. The main heading is 'Format Partition' with a sub-heading 'To store data on this partition, you must format it first.' and a disk icon. The text says 'Choose whether you want to format this partition, and if so, what settings you want to use.' There are two radio button options: 'Do not format this partition' and 'Format this partition with the following settings:'. Under the second option, there are three dropdown menus: 'File system:' set to 'NTFS', 'Allocation unit size:' set to 'Default', and 'Volume label:' set to 'Spool'. There are also two checkboxes: 'Perform a quick format' and 'Enable file and folder compression', both of which are unchecked. At the bottom are buttons for '< Back', 'Next >', and 'Cancel'.

Enter Spool as Volume label.

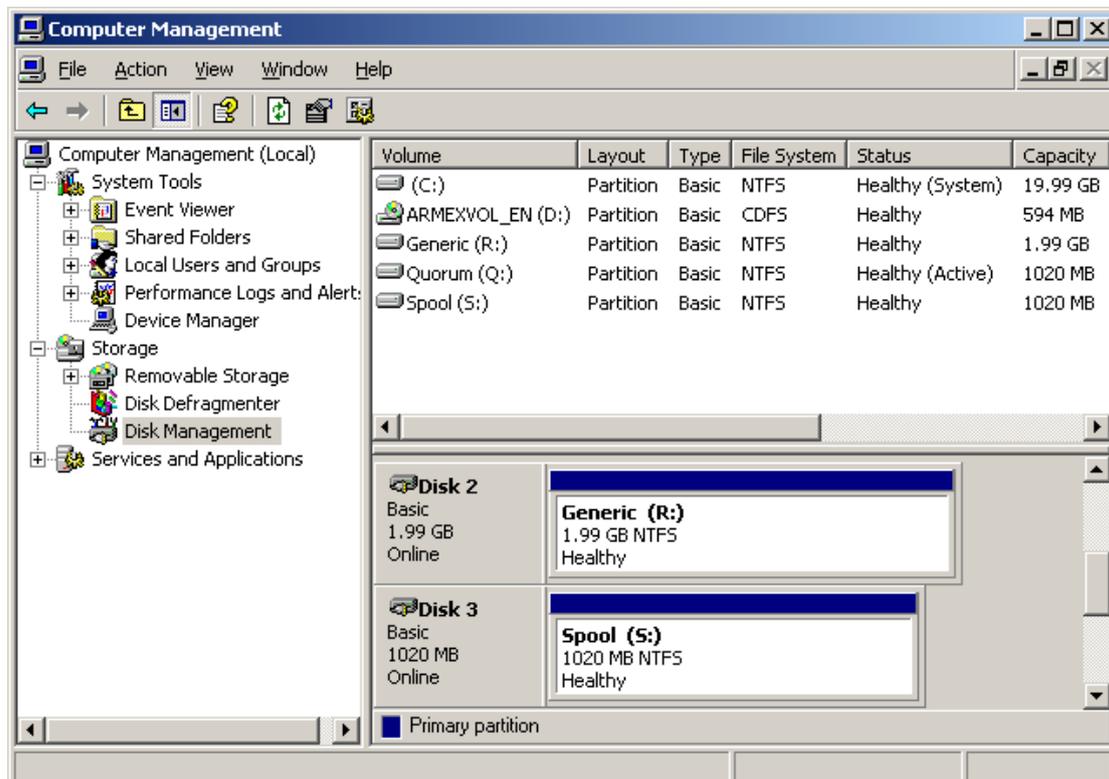
Press the Next button to continue.

Finish disk formatting



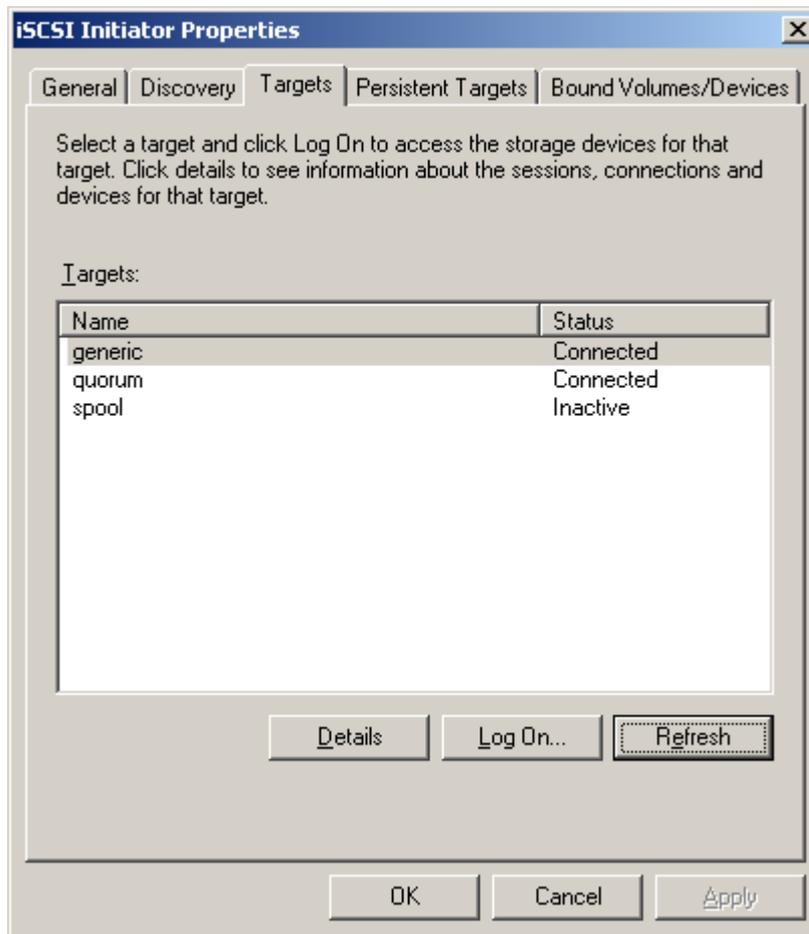
Press the Finish button.

Come back to the Computer Management Console.

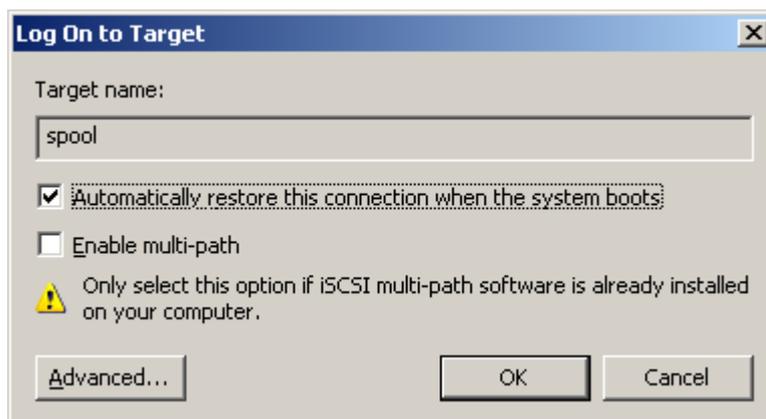


After the successful operation, the status is shown as in the picture.

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

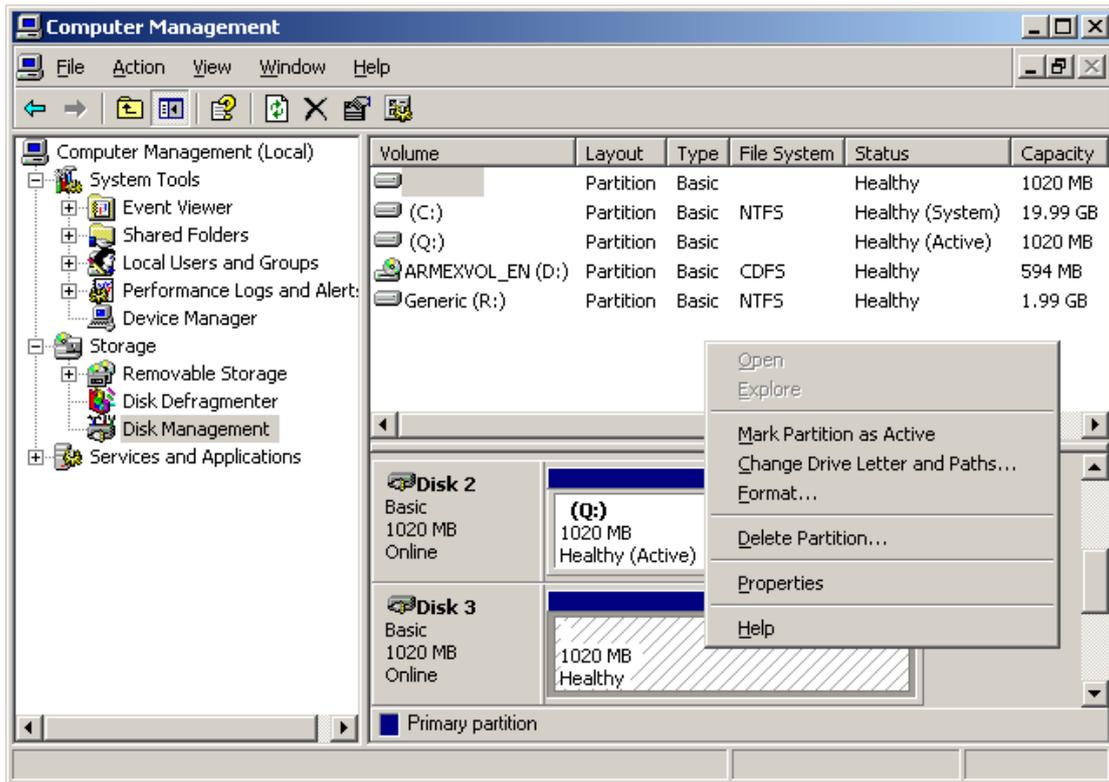


Select spool and then press the Log On button, the Log On to Target dialog will be shown.

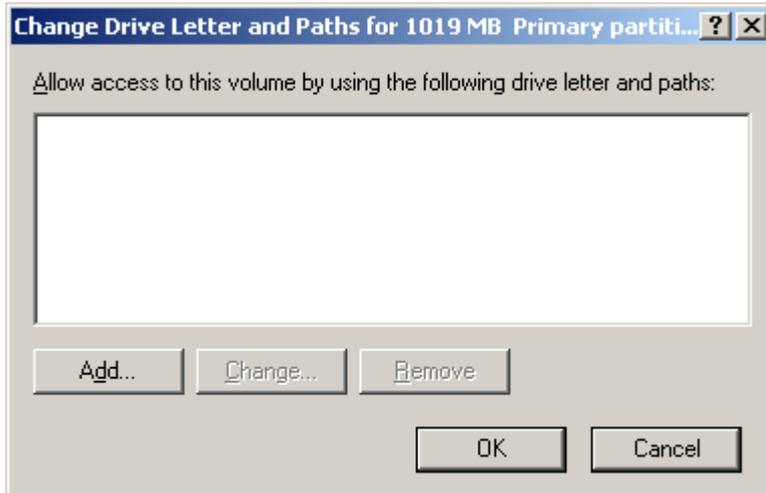


Select spool and click Log On. Check Automatically restore this connection when the system boots and log on.

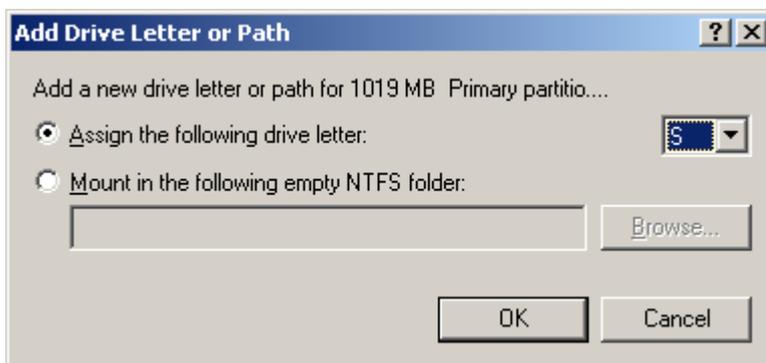
Open Computer Management and select Disk Management.



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

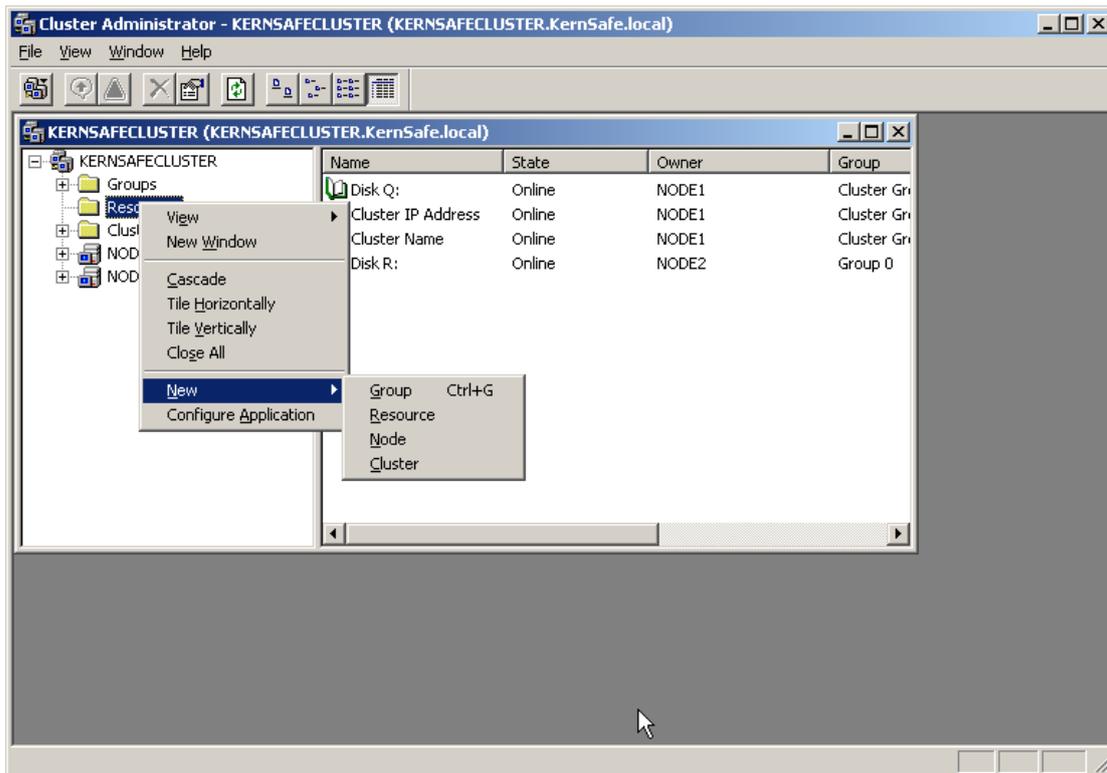


Click the Add button.

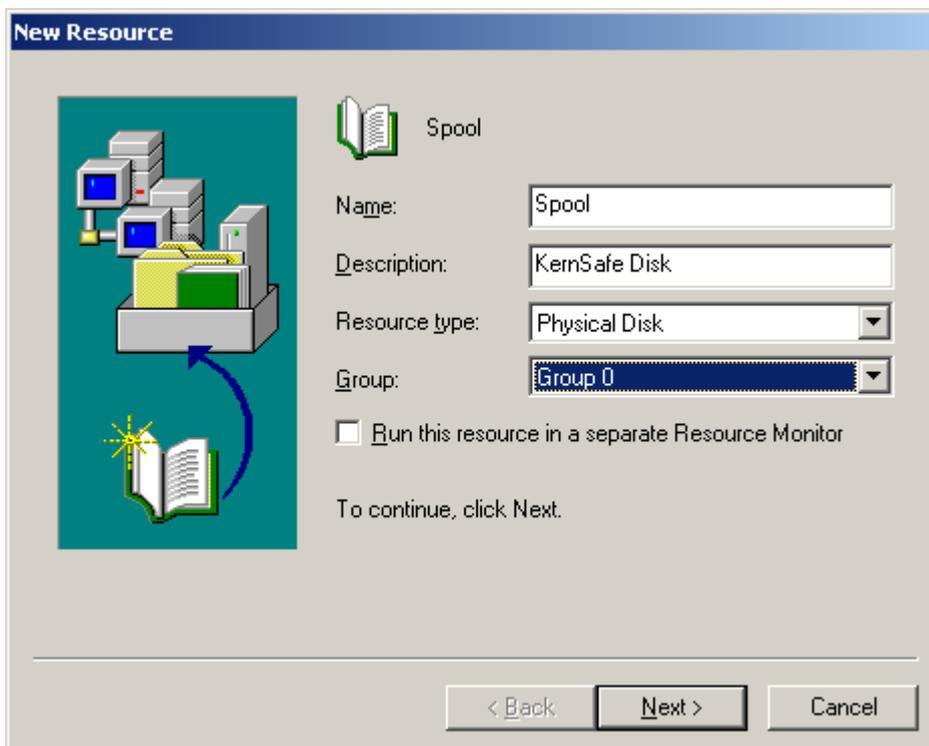


Assign S as drive letter and press the OK button.

Open Cluster Administrator

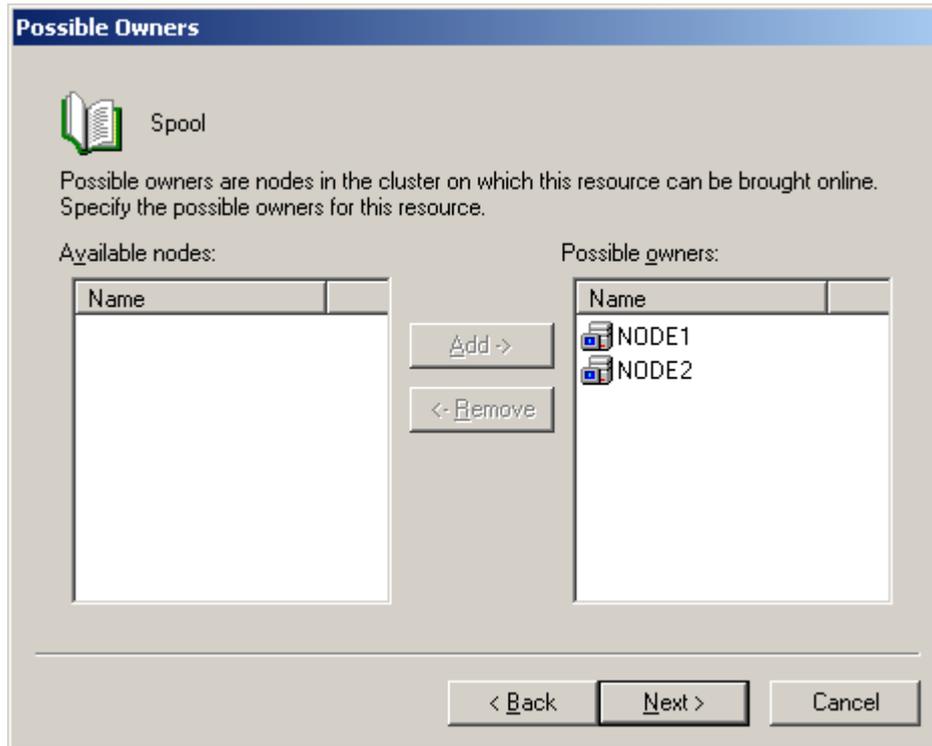


right click on Resources, then select New -> Resource, the New Resource dialog will be shown

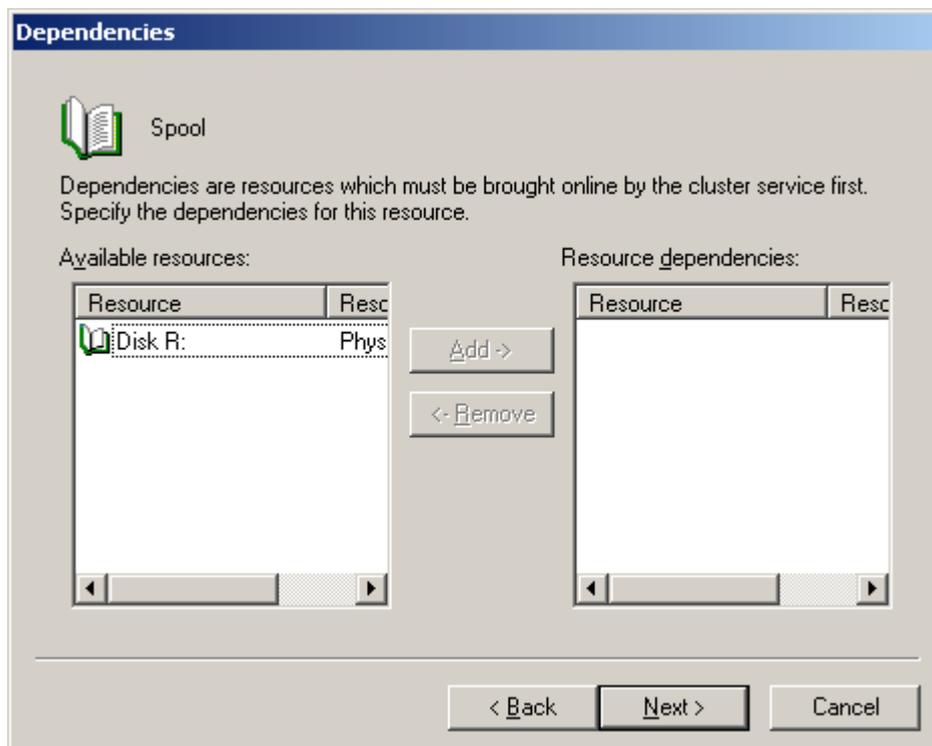


Enter contents for each item. Enter Spool as Name, KernSafe Disk as Description, Physical Disk as Resource type and Group 0 as Group.

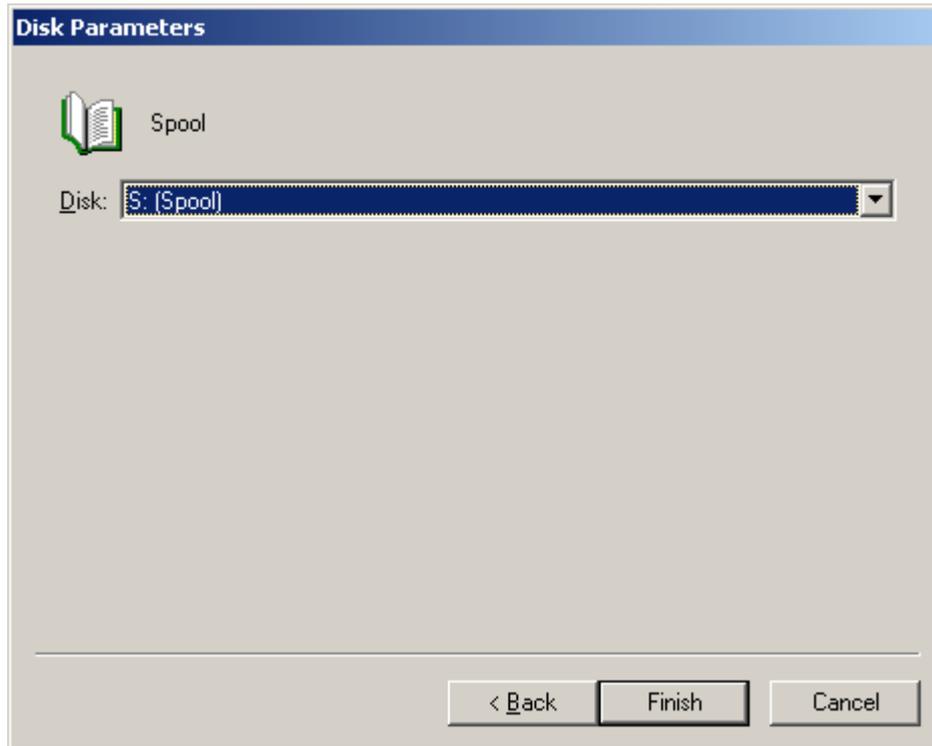
Press the Next button to continue.



Add node1 and node2 to Possible owners.
Press the Next button to continue.



Press the Next button to continue.

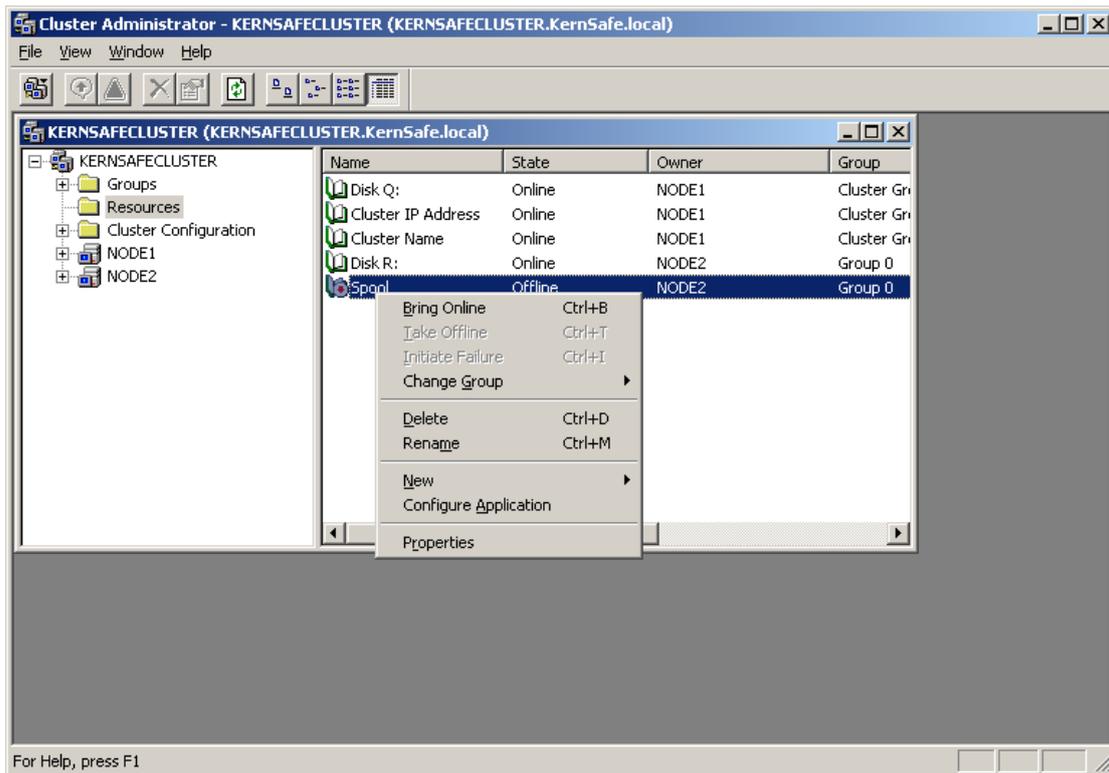


Select S:(Spool) and press the Finish button.

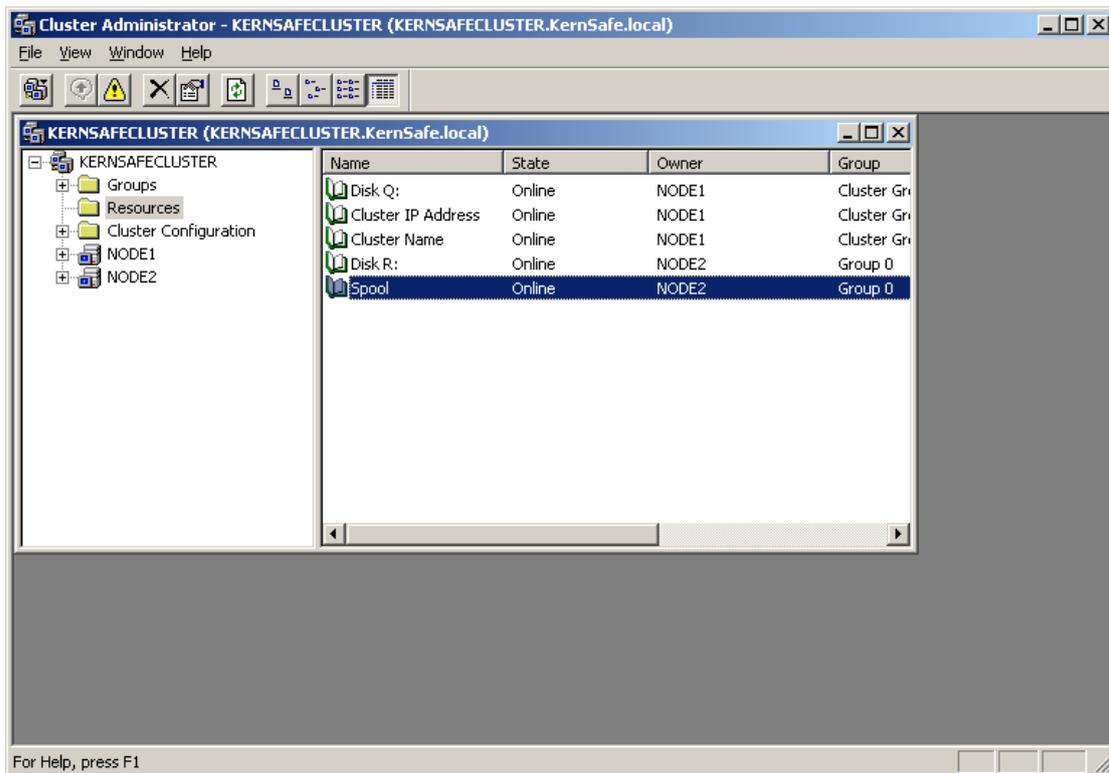


Press the OK button.

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