iStorage Server: Working with Windows Cluster

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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 poplar 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

Internet Protocol (TCP/IP) Propertie	es <u>? ×</u>
General	
You can get IP settings assigned autor this capability. Otherwise, you need to for the appropriate IP settings.	natically if your network supports ask your network administrator
🔘 Obtain an IP address automatica	ly
• Use the following IP address:	
IP address:	192.168.1.1
S <u>u</u> bnet mask:	255.255.255.0
Default gateway:	· · ·
C Obtain DNS server address autor	natically
□ Use the following DNS server add	dresses:
Preferred DNS server:	127 . 0 . 0 . 1
<u>A</u> lternate DNS server:	· · ·
	Ad <u>v</u> anced
	OK Cancel

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.

Run	?×
-	Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.
Open:	dcpromo
	OK Cancel <u>B</u> rowse

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 compabibility

Active Directory Installation Wizard		
Operating System Compatibility Improved security settings in Windows Server 2003 affect older versions of Windows.		
Domain controllers running Windows Server 2003 implement security settings that require clients and other servers to communicate with those domain controllers in a more secure way.		
Some older versions of Windows, including Windows 95 and Windows NT 4.0 SP3 or earlier, do not meet these requirements. Similarly, some non-Windows systems, including Apple Mac OS X and SAMBA clients, might not meet these requirements.		
For more information, see <u>Compatibility Help</u> .		
< <u>B</u> ack Next > Cance	el	

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 sho continuing.	uld be exported before	
All encrypted data, such as EFS-encrypted file before continuing or it will be permanently inac	s or e-mail, should be decrypted cessible.	
< <u>B</u> ac	k <u>N</u> ext> 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.		
< <u>B</u> ack <u>N</u> ext > Cancel		

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

Press the **Next** button to continue.

Type new domain name

Active Directory Installation Wizard	×
New Domain Name Specify a name for the new domain.	A
Type the full DNS name for the new domain (for example: headquarters.example.microsoft.com).	
Eull DNS name for new domain:	
KernSafe.local	
< <u>B</u> ack <u>N</u> ext >	Cancel

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

Specify NetBIOS name

Active Directory Installation Wizard	×
NetBIOS Domain Name Specify a NetBIOS name for the new domain.	
This is the name that users of earlier versions domain. Click Next to accept the name shown	of Windows will use to identify the new n, or type a new name.
Domain NetBIOS name: KERNSAFE	
	< <u>B</u> ack <u>N</u> ext > Cancel

Enter the name of NetBIOS, which is KERNSAFE here.

Press the **Next** button to continue.

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

Active Directory Installation Wizard	×
Database and Log Folders Specify the folders to contain the Active Directory database and log file	
For best performance and recoverability, store the database and the log hard disks.	on separate
Where do you want to store the Active Directory database?	
Database folder:	
C:\WINDOWS\NTDS	B <u>r</u> owse
Where do you want to store the Active Directory log?	
C:\windows\ntds	Browse
,	
< <u>B</u> ack <u>N</u> ext >	Cancel

Select the storage location of Database and Log Folders.

Specify the folder to be shared as the system volume

Active Directory Installation Wizard	×
Shared System Volume Specify the folder to be shared as the system volume.	
The SYSVOL folder stores the server's copy of the domain's public files of the SYSVOL folder are replicated to all domain controllers in the dom	. The contents ain.
The SYSVOL folder must be located on an NTFS volume.	
Enter a location for the SYSVOL folder.	
Eolder location:	
C:\WINDOWS\SYSVOL	B <u>r</u> owse
< <u>B</u> ack <u>N</u> ext :	Cancel

Select the storage location of file SYSVOL.

Press the **Next** button to continue.

Diagnostic DNS registration

Active Directory Installation Wizard		
DNS Registration Diagnostics Verify DNS support, or install DNS on this computer.		
Diagnostic Failed	_	
The registration diagnostic has been run 1 time.		
Warning: Domain Controller functions like joining a domain, logging onto a domain, and Active Directory replication will not be available until the DNS infrastructure for Active Directory is correctly configured.		
None of the DNS servers used by this computer responded within the timeout interval.		
For more information, including steps to correct this problem, see Help.	-	
C I have corrected the problem. Perform the DNS diagnostic test again.		
 Install and configure the DNS server on this computer, and set this computer to u this DNS server as its preferred DNS server. 	ise	
\bigcirc I will correct the problem later by configuring DNS manually. (Advanced)		
< <u>B</u> ack <u>N</u> ext > C	ancel	

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

Active Directory Installation Wizard	
Permissions Select default permissions for user and group objects.	
Some server programs, such as Windows NT Remote Access Service, read information stored on domain controllers.	
C Permissions compatible with pre-Windows 2000 server operating systems Select this option if you run server programs on pre-Windows 2000 server operating systems or on Windows 2000 or Windows Server 2003 operating systems that are members of pre-Windows 2000 domains.	
 Permissions compatible only with Windows 2000 or Windows Server 2003 operating systems Select this option if you run server programs only on Windows 2000 or Windows Server 2003 operating systems that are members of Active Directory domains. Only authenticated users can read information on this domain. 	
< <u>B</u> ack <u>N</u> ext > Cancel	

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

Press the **Next** button to continue.

Specify resore mode administrator password

Active Directory Installation Wizard
Directory Services Restore Mode Administrator Password This password is used when you start the computer in Directory Services Restore Mode.
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.
Restore Mode Password:
Confirm password:
For more information about Directory Services Restore Mode, see <u>Active Directory Help</u> .
< <u>B</u> ack <u>N</u> ext > Cancel

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

Press the Next button to continue.

Finish Active Directory installation wizard

Active Directory Installation Wizard	×
Summary Review and confirm the options you selected.	X
You chose to:	
Configure this server as the first domain controller in a new forest of domain trees.	•
The new domain name is KernSafe.local. This is also the name of the new forest.	
The NetBIOS name of the domain is KERNSAFE	
Database folder: C:\WINDOWS\NTDS Log file folder: C:\WINDOWS\NTDS SYSVOL folder: C:\WINDOWS\SYSVOL	
The DNS service will be installed and configured on this computer. This computer will be configured to use this DNS server as its preferred DNS server.	
To change an option, click Back. To begin the operation, click Next.	_
< <u>B</u> ack <u>N</u> ext >	Cancel

Active Directory Installation	Wizard	×
	Completing the Active Directory Installation Wizard	
	< <u>B</u> ack Finish Cancel	

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.



Select zone type

New Zone Wizard X
Zone Type The DNS server supports various types of zones and storage.
Select the type of zone you want to create:
Creates a copy of a zone that exists on another server. This option helps balance the processing load of primary servers and provides fault tolerance.
Stub zone Creates a copy of a zone containing only Name Server (NS), Start of Authority (SOA), and possibly glue Host (A) records. A server containing a stub zone is not authoritative for that zone.
Store the zone in <u>A</u> ctive Directory (available only if DNS server is a domain controller)
< <u>B</u> ack <u>N</u> ext > Cancel Help

Select Primary zone.

Press the Next button to continue.

Select zone data replicated

New Zone Wizard X
Active Directory Zone Replication Scope You can select how you want DNS data replicated throughout your network.
Select how you want zone data replicated:
To all DNS servers in the Active Directory forest Domain.KernSafe.com
● To all DNS servers in the Active Directory domain Domain.KernSafe.com
C To all domain controllers in the Active Directory domain Domain.KernSafe.com
Choose this option if the zone should be loaded by Windows 2000 DNS servers running on the domain controllers in the same domain.
C To all domain controllers specified in the scope of the following application directory partition:
▼
< <u>B</u> ack <u>N</u> ext > Cancel Help

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. 			
C Reverse lookup zone name:			
1.168.192.in-addr.arpa			
For more information on creating a reverse lookup zone, click Help.			
< <u>B</u> ack <u>N</u> ext > Cancel Help			

Select Network ID, enter 192.168.1.

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.
< <u>B</u> ack <u>N</u> ext > Cancel Help

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

Complete the New Zone Wizard

New Zone Wizard			×
	Completing the New Zone Wizard		
	You have successfully completed the New Zone Wizard. You specified the following settings:		
	Name:	1.168.192.in-addr.arpa	
	Туре:	Active Directory-Integrated Primary	
	Lookup type:	Reverse	
Note: You should now add records to the zone or ensure that records are updated dynamically. You can then verify name resolution using nslookup. To close this wizard and create the new zone, click Finish.			
	< <u>B</u> ack	Finish Cancel Help	

Come back to the domain controller management console.

🚊 dnsmgmt - [DNS\03DCX64\Reverse Lookup Zones]	
🚔 File Action View Window Help	_ B ×
Reverse Lookup Zones 1 zone(s)	
Different Viewer Type	Status
Forward Lookup Zones	Running
Reload	
New Alias (CNAME)	
New Mail Exchanger (MX)	
New Domain	
Other New Records	
All Tas <u>k</u> s	
New <u>W</u> indow from Here	
Delete	
Refresh	
Properties	
Help	
Displays Help for the current selection.	

Press the **Finish** button.

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

New Host ? 🗙			
Name (uses parent domain name if blank):			
node1			
Fully qualified domain name (FQDN):			
node1.KernSafe.local.			
I <u>P</u> address: 192 .168 .1 .11			
☑ ⊆reate associated pointer (PTR) record			
Allow any authenticated user to update DNS records with the same owner name			
Add <u>H</u> ost 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 ? 🗙
Name (uses parent domain name if blank):
node2
Fully qualified domain name (FQDN):
node2.KernSafe.local.
I <u>P</u> address: 192 .168 .1 .22
☑ ⊆reate associated pointer (PTR) record
Allow any authenticated user to update DNS records with the same owner name
Add <u>H</u> ost 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.

🚔 dnsmgmt - [DN5\03DCX64\Forward Lookup Zones\KernSafe.local]				_ 🗆 🗙
🚊 File Action View Window Help				_8×
, DNS	KernSafe.local 7 record(s)			
E 03DCX64	Name	Туре	Data	
Hearth Viewer Forward Lookup Zones Image: Second S	I_msdcs (same as parent folder) (same as parent folde	Start of Authority (SOA) Name Server (NS) Host (A) Host (A) Host (A) Host (A)	[4], 03dcx64.kernsafe.local 03dcx64.kernsafe.local. 192.168.2.1 192.168.1.1 192.168.1.1 192.168.1.22	

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.

🚊 dnsmgmt - [DNS\03DCX64\Reve	rse Lookup Zones\192.168.1.x Subnet]		_ 🗆 🗙	
🚊 Eile Action View Window He	elp 📃			
Image: Constraint of the second se	Image: Second state sta	Type Start of Authority (SOA) Name Server (NS) Pointer (PTR) Pointer (PTR)	Data [5], 03dcx64.kernsafe.local 03dcx64.kernsafe.local. 03dcx64.kernsafe.local. node2.kernsafe.local.	

Open Active Directory Users and Computers console

lactive Directory Users and Com	puters	
G Eile Action View Window E	<u>t</u> elp	
	P P R P P I V V V V V V V V V V V V V V V V V	
Image: Action grew window regimes Active Directory Users and Computer Saved Queries Email of the second sec	Image: Second	
Properties	This is a vendor's account	
Help	I elnetClients Security Group Members of this group ha	
Creates a new item in this container.		

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

New Object - User		×
Create in:	KernSafe.local/Users	
<u>F</u> irst name:	node1adm <u>I</u> nitials:	
Last name:		
Full n <u>a</u> me:	node1adm	
User logon name:		
node1adm	@KernSafe.local	
User logon name (pre-⊻	<u>√</u> indows 2000):	
KERNSAFE\	node1adm	
	,	
	< <u>B</u> ack <u>N</u> ext > Cancel	

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

Sepecify 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	
< <u>B</u> ack <u>N</u> ext > Ca	incel

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: node1adm	A
User logon name: node1adm@KernSafe.local	
The user cannot change the password. The password never expires.	
	*
< <u>B</u> ack Finish	Cancel

Press the Finish button.

Come back to Active Directory Users and Computers console

The sector of th 🌍 File Action View <u>W</u>indow <u>H</u>elp <u>- 8 ×</u> ← → 🗈 📧 🐰 🛍 🗙 🗃 🖸 🖻 😫 💷 🦉 🦉 🏜 🖓 🍕 🍺 Active Directory Users and Computer Users 18 objects 📄 Saved Queries ÷ Name Туре Description 🗄 🗊 KernSafe.local 🕵 Administrator User Built-in account for admini... 🤅 💼 Builtin 🕵 Cert Publishers Security Group ... Members of this group are... E--- Computers 🐼 DnsAdmins Security Group ... DNS Administrators Group 🗄 🞯 Domain Controllers 🕵 DnsUpdatePr... Security Group ... DNS clients who are permi... E ForeignSecurityPrincipals <u>a</u> Domain Admins Security Group ... Designated administrators... Domain Com... Security Group ... All workstations and serve... Delegate Control... Find... Domain Cont... Security Group ... All domain controllers in th... y Group ... All domain guests Computer New y Group ... All domain users Contact All Tasks y Group ... Designated administrators... Group • View y Group ... Members in this group can... InetOrgPerson New \underline{W} indow from Here Built-in account for guest ... MSMQ Queue Alias y Group ... Group for the Help and Su... Delete Printer Rena<u>m</u>e User y Group ... Servers in this group can ... Shared Folder Export List... Deconty Group ... Designated administrators... **Properties** SUPPORT_38... User This is a vendor's account ... TelnetClients Security Group ... Members of this group ha... <u>H</u>elp 4 Creates a new item in this container.

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	
<u>F</u> irst name:	node2adm <u>I</u> nitials:	
Last name:		
Full n <u>a</u> me:	node2adm	
<u>U</u> ser logon name:		
node2adm	@KernSafe.local	
User logon name (pre	<u>W</u> indows 2000):	
KERNSAFE\	node2adm	
	< <u>B</u> ack <u>N</u> ext > Cancel	

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

Press the Next button to continue.

New Object - User			×
Create in: KernSafe.I	ocal/Users		
Password:	••••		
User must change password at	: next logon		
 User cannot change password Password never expires 			
Account is disabled			
	< <u>B</u> ack	<u>N</u> ext >	Cancel

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

Sepecify user's password

Finish creating user

New Object - User	×
Create in: KernSafe.local/Users	
When you click Finish, the following object will be created:	
Full name: node2adm	<u>^</u>
User logon name: node2adm@KernSafe.local	
The user cannot change the password. The password never expires.	
	T
< <u>B</u> ack [ancel

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

Come back to Active Directory Users and Computers console

Create a user cluster

lactive Directory Users and Comp	uters			
G Eile Action View Window He	lp			_B×
	🔮 💷 🦉 📆 🖆	i 🝸 🍕 🐮		,
Active Directory Users and Computer	Users 19 objects Name Type	e	Description	
Gomputers Gomputers	Administrator User Cert Publishers Secu DrsAdmins Secu DrsUpdatePr Secu Omain Admins Secu omain Com Secu	r urity Group urity Group urity Group urity Group urity Group	Built-in account for admini Members of this group are DNS Administrators Group DNS clients who are permi Designated administrators All workstations and serve	
<u>New</u> All Tas <u>k</u> s <u>V</u> iew New <u>Wi</u> ndow from Her	Computer Contact Group InetOrgPerson	roup roup roup roup	All domain guests All domain users Designated administrators Members in this group can Built-in account for quest	
Export List Properties	Printer User	roup	Group for the Help and Su	
Help	Shared Folder	ancy Group urity Group r urity Group	Servers in this group can Designated administrators This is a vendor's account Members of this group ha	
Creates a new item in this container.	,			

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

New Object - User			×
Create in: K	ernSafe.local/Users		
<u>F</u> irst name:	ıster	Initials:	
Last name:			
Full n <u>a</u> me: clu	ıster		_
<u>U</u> ser logon name:			
cluster	@KernSafe.lo	ocal	•
User logon name (pre- <u>W</u> i	ndows 2000):		
KERNSAFE\	cluster		_
	< <u>B</u> ack	<u>N</u> ext >	Cancel

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

Press the **Next** button to continue.

Sepecify 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	
Rassword never expires	
C Account is disabled	
< <u>B</u> ack <u>N</u> ext > Can	icel

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

New Object - User	×
Create in: KernSafe.local/Users	
When you click Finish, the following object will be created:	
Full name: cluster	^
User logon name: cluster@KernSafe.local	
The user cannot change the password. The password never expires.	
	T
< <u>B</u> ack [Cancel

Press the Finish button.

lactive Directory Users and Comp	uters				
🌍 Eile Action Yiew Window He	lp				_ 8 ×
← → 🗈 🖪 🐰 🗙 🖻 🖻	😫 💷 🦉 👸	2 👛 🔽	7 🝕 🐻		
Active Directory Users and Computer	Users 20 objects				
🗄 🖳 🚞 Saved Queries	Name	Туре	Description		
E Kernbare, local	🕵 Administrator	User	Built-in acco	unt for admini	
	Cert Publishers	Security	Group Members of	this group are	
Compacers Domain Controllers	🕵 cluster	User	Add to a group		
	💯 DnsAdmins	Security	Di <u>s</u> able Account	rators Group	
	🕵 DnsUpdatePr	Security	Enable Account	ho are permi	
	Domain Admins	Security	Mo <u>v</u> e	dministrators	
	Domain Com	Security	Open Home Page	ns and serve	
	Domain Cont	Security	Send M <u>a</u> il	htrollers in th	
	Domain Guests	Security	All Tasks 🔹 🕨	ests	
	Domain Users	Security		_ers	
	Sterprise A	Security	Cu <u>t</u>	ministrators	
	Group Policy	Security	Delete	his group can	
		Security	P <u>r</u> operties	Help and Su	
	C pode1 adm	Licer		_ Help and Su	
	S node2adm	User	<u>T</u> eib		
	RAS and IAS	Security	Group Servers in th	nis aroun can	·
	Schema Admins	Security	Group Designated	administrators	
	SUPPORT 38	User	This is a ver	dor's account	
	TelnetClients	Security	Group Members of	this group ha	
	-		-	- •	

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.

Select Group	<u>? ×</u>
Select this object type:	
Group or Built-in security principal	Object Types
Erom this location:	
KernSafe.local	Locations
Enter the object name to select (<u>examples</u>):	
Domain Admins	<u>C</u> heck Names
Advanced UK	

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

Select Group		<u>? ×</u>
Select this object type:		
Group or Built-in security principal		<u>O</u> bject Types
Erom this location:		
KernSafe.local		Locations
Enter the object name to select (<u>examples</u>):		
Administrators		<u>C</u> heck Names
		.
Advanced	OK	Cancel

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

Internet Protocol (TCP/IP) Propertie	s <u>? ×</u>		
General			
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.			
O Obtain an IP address automatical	y 📗		
Use the following IP address:			
IP address:	192.168.2.1		
Sybnet mask:	255 . 255 . 255 . 0		
Default gateway:	· · ·		
O Obtain DNS server address autom	natically		
└	resses:		
Preferred DNS server:	· · ·		
<u>A</u> lternate DNS server:			
	Ad <u>v</u> anced		
	OK Cancel		

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.

Create iSCSI Target Wizard	×
iSCSI Medium Type Select medium of the iSCSI disk you want to create.	
 Image File Create iSCSI disk by using standard image file or Virtual Hard Disk (.VHD). RAM Space Create iSCSI disk by using memory space. Security Images Create iSCSI disk images for each initiators, any image is individual for each initiator. Disk Partition Create iSCSI target by using a disk partition. Physical Disk Create iSCSI target by using physical disk. 	
< Back Next > Car	ncel

Choose Image File in iSCSI Medium Type window.

Create iSCSI Target Wizard	×
iSCSI Image Type Select image type of the iSCSI disk you want to create.	
 Standard Image File Create iSCSI disk by using a standard disk image file. Virtual Hard Disk (VHD) Create iSCSI disk by using a Virtual Hard Disk image file. 	
< Back Next > Can	ncel

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

Set image disk parameters

Create iSCSI Target Wizard	×
Image Disk Configuration You can specify a image file as an iSCSI device.	4
Device Parameters Ouse existing image file Create a new image file G:\quorum.img Browse Device Size in MBs: 1024 Options Image file on NTFS file system Note: Using sparse file can save your harddisk space, the size of disk image file only depend on its content used. But we recomment that using this feature when image file size is less than 1T bytes	
< Back Next > (Cancel

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

Finish creating iSCSI Target

Create iSCSI Target Wizard	×
Completing the Create iSCSI Wizard You can specify a target name and other options to complete iSCSI target creating.	4
Basic Target Information Enter Target Name:	
quorum	
Note By default, only one client has full access right, when the second initiaor 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 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.

Create iSCSI Target Wizard	×
iSCSI Medium Type Select medium of the iSCSI disk you want to create.	
 Image File Create iSCSI disk by using standard image file or Virtual Hard Disk (.VHD). RAM Space Create iSCSI disk by using memory space. Security Images Create iSCSI disk images for each initiators, any image is individual for each initiator. Disk Partition Create iSCSI target by using a disk partition. Physical Disk Create iSCSI target by using physical disk. 	
< Back Next > Ca	ancel

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 iSCSI Target Wizard	×
Image Disk Configuration You can specify a image file as an iSCSI device.	<u></u>
Device Parameters	
 Use existing image file Oreate a new image file 	
G:\generic.img Browse	
Device Size in MBs: 2048	
Options	
Use sparse file on NTFS file system	
Note: Using sparse file can save your harddisk space, the size of disk image file only depend on its content used. But we recommentd that using this feature when image file size is less than 1T bytes	
< Back Next > C	Cancel

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

Finish creating iSCSI Target

Create iSCSI Target Wizard	×
Completing the Create iSCSI Wizard You can specify a target name and other options to complete iSCSI target creating.	
Basic Target Information Enter Target Name: generic Image: Report as readonly device when initiator can not get write access Image: Enable multiple initiators with full access connected (sharing and clustering) Note By default, only one client has full access right, when the second initiaor log on with full access, it will fail. But this option is usfull for clustering, disk sharing and NAS.	
< Back Finish Car	icel

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.

🍕 iStorage Server Management Console									
<u>S</u> torage <u>C</u> lients <u>V</u> iew <u>T</u> ools	Help								
Create Delete Start	Stop Refre	sh	Add Remove	Vi	ew -	Access	Settings	Print A	
⊡@ kernsafe-PC ⊖@ Targets	iStorage Server: kernsafe-PC								
	General Targets	General Targets Applications IP Filters Users Groups Logs							
	Target Name	Devi	Source	Ca	Authent	Status			
	🁒 quorum	Disk	G:\quorum.img	1.0	Anony	Enabled			
	Seneric Seneric	Disk	G:\generic.img	2.0	Anony	Enabled			
Done 🚯 Connected: kernsafe-PC (Ultimate License)									
4. Node1 Settings

Network settings

Internet Protocol (TCP/IP) Propertie	s ? ×		
General			
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.			
O Obtain an IP address automatical	ly		
• Use the following IP address:			
IP address:	192.168.1.11		
Subnet mask:	255 . 255 . 255 . 0		
Default gateway:	· · ·		
C Obtain DNS server address autor	natically		
□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	resses:		
Preferred DNS server:	192.168.1.1		
<u>A</u> lternate DNS server:			
Ad <u>v</u> anced			
	OK Cancel		

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.

Internet Protocol (TCP/IP) Propertie	es ? X		
General			
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.			
C Obtain an IP address automatical	lly		
Use the following IP address:			
IP address:	192.168.2.11		
Subnet mask:	255.255.255.0		
Default gateway:	· · ·		
C Obtain DNS server address autor	matically		
─● Use the following DNS server add	tresses:		
Preferred DNS server:	· · ·		
<u>A</u> lternate DNS server:	· · ·		
Ad <u>v</u> anced			
	OK Cancel		

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

System Properties		? ×
Advanced General	Automatic Updates Remote Computer Name Hardware	
Windows uses on the network	the following information to identify your computer 	
Computer <u>d</u> escription:		
	For example: "IIS Production Server" or "Accounting Server".	
Full computer name:	node1.	
Workgroup:	WORKGROUP	
To rename this computer	or join a domain, click Change. <u>C</u> hange]
	OK Cancel App	dy

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

Computer Name Changes ? 🗙
You can change the name and the membership of this computer. Changes may affect access to network resources.
Computer name:
node1
Full computer name: node1.
<u>M</u> ore
Member of
© <u>D</u> omain:
KernSafe.local
○ <u>W</u> orkgroup:
WORKGROUP
OK Cancel

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

Type domain user and password

Computer Name Ch	anges ?X
	G
Enter the name and to join the domain.	password of an account with permission
<u>U</u> ser name:	🖸 nodeladm 💽 🗾
Password:	•••••
	OK Cancel

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.

Compute	r Name Changes 🔀
(j)	You must restart this computer for the changes to take effect.
	OK

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

Open iSCSI Initator.

iSCSI Initiator Propertie	5	×
General Discovery Ta	rgets Persistent Targets Bound	Volumes/Devices
The iSCSI protocol uses the following information to uniquely identify this initiator and authenticate targets.		
Initiator Node Name: iqn.1991-05.com.microsoft:node1.kernsafe.local		
To rename the initiator n	ode, click Change.	<u>C</u> hange
To authenticate targets using CHAP, click Secret to specify a CHAP secret.		
To configure IPSec Tun Tunnel.	nel Mode addresses, click	Iunnel
	OK Cancel	Apply

Change to Discovery page

iSCSI Initi	ator Prope	rties			ļ
General	Discovery	Targets P	ersistent Targ	jets Bound	Volumes/Devices
_ <u>⊺</u> arge	et Portals —				
Add	lress	Port	Adapter		IP Address
				1	
	<u>A</u> dd		<u>R</u> emove	R	<u>e</u> fresh
iSNS	Servers —				
Nar	ne				
		1		1	
	A <u>d</u> d		Remove	R	e <u>f</u> resh
					1
			OK	Cancel	Apply

Press the Add button in the Discovery page.

The Add Target Portal dialog is shown.

Add Target Portal		×
Type the IP address or DNS name ar want to add. Click Advanced to sele session to the portal.	nd socket number of ct specific settings f	^f the portal you or the discovery
IP address or DNS name:	Port:	<u>A</u> dvanced
	ОК	Cancel

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

iSCSI Initiator Prope	rties	×
General Discovery	Targets Persistent Targets	Bound Volumes/Devices
Select a target and o target. Click details to devices for that targe	lick Log On to access the stor o see information about the ses at.	age devices for that ssions, connections and
<u>T</u> argets:		
Name		Status
generic		Inactive
	<u>D</u> etails <u>L</u> og O	n
	ОК	Cancel Apply

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

Log On to Target	×
Target name:	
generic	-
Automatically restore this connection when the system boots	
Enable multi-path	
Only select this option if iSCSI multi-path software is already installe on your computer.	ed
Advanced OK Cancel	

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

Log On to Target		×
Target name:		
quorum		
Automatically restore this connecti	on when the system	boots
🔲 Enable multi-path		
Only select this option if iSCSI mu on your computer.	lti-path software is al	ready installed
<u>A</u> dvanced	ОК	Cancel

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

iSCSI Initiator Prope	erties	×
General Discovery	Targets Persistent Targets	Bound Volumes/Devices
Select a target and target. Click details devices for that targ	click Log On to access the stor to see information about the ses jet.	age devices for that sions, connections and
<u>T</u> argets:		
Name		Status
generic		Connected
quorum		Lonnected
	Detaile	Bafrash
	OK (Cancel <u>Apply</u>

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.

Initialize and Convert Disk W	izard	×
	Welcome to the Initialize and Convert Disk Wizard This wizard helps you to initialize new disks and to convert empty basic disks to dynamic disks. You can use dynamic disks to create software-based volumes that can be mirrored, or they can be striped or spanned across multiple disks. You can also expand single-disk and spanned volumes without having to restart the computer. After you convert a disk to dynamic, you can only use Windows 2000 and later versions of Windows on any volume of that disk. To continue, click Next.	
	< Back [<u>Next</u> >] Cance	9

Press the **Next** button to continue.

Select disks to be initialized

Initialize and Convert Disk Wizard	×
Select Disks to Initialize You must initialize a disk before Logical Disk Manager can access it.	
Select one or more disks to initialize. Disks:	
☑ Disk 1 ☑ Disk 2	
< <u>B</u> ack <u>N</u> ext > C	Cancel

Press the **Next** button to continue.

Select disks to be converted

Initialize and Convert Disk Wizard	×
Select Disks to Convert The disks you select will be converted to dynamic disks.	
Select one or more disks to convert: Disks: Disk 1 Disk 2	
< <u>B</u> ack <u>N</u> ext >	Cancel

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

Finish disks initialization

Initialize and Convert Disk W	izard	×		
	Completing the Initialize and Convert Disk Wizard You have successfully completed the Initialize and Convert Disk Wizard. You selected the following settings: Initialize to MBR: Disk 1, Disk 2 Convert: None			
	To close this wizard, click Finish.			
	< <u>B</u> ack Finish Cancel			

Press the **Finish** button.

Partition the quorum disk.

📮 Computer Management						_ [
📃 Eile Action Yiew Window H	elp						\mathbb{P}^{\times}
	1						
Computer Management (Local)	Volume (C:) Software (D:)	Layout Partition Partition	Type Basic Basic	File System NTFS CDFS	Status Healthy (System) Healthy	Capacity 19.99 GB 4.30 GB	Free 17.0 0 MB
Disk Derraginencer Disk Management Disk Management Services and Applications	Disk 1 Basic 1.99 GB Online Disk 2 Basic 1020 MB Online	1.99 G Unalloc	B cated	New	Partition		-
	Unallocated	Primary p	artition	Prop Help	erties		_

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



Press the **Next** button to continue.

Select Partition Type

New Partition Wizard	×
Select Partition Type There are three types of partitions: primary, extended, and logical.	
Select the partition you want to create:	
Primary partition	
Extended partition	
O Logical drive	
Description	_ ۲
A primary partition is a volume you create using free space on a basic disk. Windows and other operating systems can start from a primary partition. You can create up to 128 primary partitions on a GPT basic disk. On a Master Boot Record (MBR) basic disk, you can create up to four primary partitions or three primary partitions and an extended partition.	
< <u>B</u> ack <u>N</u> ext > Car	ncel

Select Primary partition.

Press the Next button to continue.

Specify partition size

New Partition Wizard	×				
Specify Partition Size Choose a partition size that is between the maximum and minimum sizes.					
Maxium disk space in megabytes (MB):	1019				
Minimum disk space in MB:	8				
Partition size in MB:	1019 -				
	< <u>B</u> ack <u>N</u> ext > Cancel				

Press the **Next** button to continue.

Assign drive letter

New Partition Wizard	×
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: Browse Do not assign a drive letter or drive path 	
< <u>B</u> ack <u>N</u> ext>	Cancel

Assign Q as the drive letter.

Press the **Next** button to continue.

Format disk

New Partition Wizard			
Format Partition To store data on this partition, you must format it first.			
Choose whether you want to format this partition, and if so, what settings you want to use.			
Do not format this partition			
• Format this partition with the following settings:			
Eile system: NTFS			
Allocation unit size: Default			
⊻olume label: Quorum			
Perform a quick format			
Enable file and folder compression			
< <u>B</u> ack <u>N</u> ext > 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.

🖵 Computer Management						IN	
📃 Eile Action View Window E	<u>t</u> elp						P×
	1						
Computer Management (Local) System Tools System Tools Shared Folders Shared Folders Shared Folders Stocal Users and Groups Storage Storage Storage Storage Disk Defragmenter Disk Management Services and Applications	Volume (C:) Quorum (Q:) Software (D:) CDisk 1 Basic 1.99 GB Online CDisk 2 Basic 1020 MB Online	Layout Partition Partition Partition	Type Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic Basic B	File System NTFS CDFS <u>N</u> ew P Prope <u>H</u> elp	Status Healthy (System) Healthy Healthy artition	Capacity 19.99 GB 1020 MB 4.30 GB	Free 17.0 1012 0 MB
	Unallocated	Primary p	artition				

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



Press the **Next** button to continue.

Select partition type

New Partition Wizard	×
Select Partition Type There are three types of partitions: primary, extended, and logical.	ŷ
Select the partition you want to create:	
Primary partition	
Extended partition	
O Logical drive	
Description A primary partition is a volume you create using free space on a basic disk. Windows and other operating systems can start from a primary partition. You can create up to 128 primary partitions on a GPT basic disk. On a Master Boot Record (MBR) basic disk, you can create up to four primary partitions or three primary partitions and an extended partition.	
< <u>B</u> ack <u>N</u> ext > Cance	el

Select Primary partition.

Press the Next button to continue.

Specify partition size

New Partition Wizard	×			
Specify Partition Size Choose a partition size that is between the maximum and minimum sizes.				
Maxium disk space in megabytes (MB):	2039			
Minimum disk space in MB:	8			
Partition size in MB:	2035			
	< <u>B</u> ack <u>N</u> ext > Cancel			

Press the **Next** button to continue.

Assign a drive letter

New Partition Wizard	×
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: Browse Do not assign a drive letter or drive path 	
< <u>B</u> ack <u>N</u> ext >	Cancel

Assign Q as the drive letter.

Press the **Next** button to continue.

Format the disk

New Partition Wizard 🛛 🔀					
Format Partition To store data on this partition, you must format it first.					
Choose whether you want to format this partition, and if so, what settings you want to use.					
\bigcirc <u>D</u> o not format this partition					
• Format this partition with the format the second seco	ollowing settings:				
<u>File</u> system:	NTFS				
Allocation unit size:	Default				
<u>V</u> olume label:	Generic				
Perform a quick format	Perform a quick format				
Enable file and folder compression					
	< <u>B</u> ack <u>N</u> ext > 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.

🖵 Computer Management							
B File Action View Window Help							
Computer Management (Local) System Tools Computer Viewer Computer Viewe	Volume (C:) Generic (R:) Quorum (Q:) Software (D:)	Layout Partition Partition Partition Partition	Type Basic Basic Basic Basic	File System NTFS NTFS NTFS CDFS	Status Healthy (System) Healthy Healthy Healthy	Capacity 19.99 GB 1.99 GB 1020 MB 4.30 GB	Free 17.0 1.98 1012 0 MB
Storage Removable Storage Disk Defragmenter Disk Management Services and Applications	Disk 1 Basic 1.99 GB Online	Gener 1.99 G Health	ic (R:) B NTFS				•
	Disk 2 Basic 1020 MB Online Primary partitio	Quoru 1020 M Health	im (Q:) 18 NTFS 7)			-

5. Node2 Settings

Networking settings

Internet Protocol (TCP/IP) Propertie	s ? 🗙				
General					
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.					
C Obtain an IP address automatical	ly 🔤				
Use the following IP address:					
IP address:	192.168.1.22				
S <u>u</u> bnet mask:	255 . 255 . 255 . 0				
Default gateway:					
C Obtain DNS server address automatically					
• Use the following DNS server addresses:					
Preferred DNS server:	192.168.1.1				
Alternate DNS server:					
	Ad <u>v</u> anced				
	OK Cancel				

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.

Internet Protocol (TCP/IP) Propertie	s ?x				
General					
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.					
C Obtain an IP address automatical	ly				
Use the following IP address:					
IP address:	192.168.2.22				
Subnet mask:	255.255.255.0				
Default gateway:	<u> </u>				
C Obtain DNS server address autor	natically				
	Iresses:				
Preferred DNS server:	· · ·				
<u>A</u> lternate DNS server:	· · ·				
	Ad <u>v</u> anced				
	OK Cancel				

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

System Properties		? ×
Advanced General	Automatic Updates Remote Computer Name Hardware	
Windows uses on the network	the following information to identify your computer	
Computer <u>d</u> escription:		1
	For example: "IIS Production Server" or "Accounting Server".	
Full computer name:	node2.	
Workgroup:	WORKGROUP	
To rename this computer	or join a domain, click Change. <u>C</u> hange]
	OK Cancel App	dy

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

Computer Name Changes
You can change the name and the membership of this computer. Changes may affect access to network resources.
Computer name:
node2
Full computer name: node2.
<u>M</u> ore
Member of
⊙ <u>D</u> omain:
KernSafe.local
© <u>₩</u> orkgroup:
WORKGROUP
OK Cancel

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

Computer Name Ch	anges ?X
	G
Enter the name and p to join the domain.	password of an account with permission
<u>U</u> ser name:	🖸 node2adm 💽 🗾
Password:	•••••
	OK Cancel

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 Initator.

iSCSI Initiator Properties	X			
General Discovery Targets Persistent Targets Bound	Volumes/Devices			
The iSCSI protocol uses the following information to uniquely identify this initiator and authenticate targets.				
Initiator Node Name: iqn.1991-05.com.microsoft:node2	kernsafe.local?			
To rename the initiator node, click Change.	<u>C</u> hange			
To authenticate targets using CHAP, click Secret to <u>S</u> ecret <u>S</u> ecret				
To configure IPSec Tunnel Mode addresses, click Tunnel.	Iunnel			
OK Cancel	Apply			

Change to **Discovery** page

iSCSI Ini	tiator Prope	rties				X
Genera	Discovery	Targets F	ersistent Targ	gets Bound	Volumes/Devic	es
	jet Portals —					
A	ldress	Port	Adapter		IP Address	
			_	1 -		
	Add		<u>H</u> emove	F	l <u>e</u> fresh	
_iSN:	6 Servers —					1
N	ame					
	A <u>d</u> d		Remove	F	le <u>f</u> resh	
					-	
			OK	Cancel	Apply	

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

Add Target Portal		×
Type the IP address or DNS name a want to add. Click Advanced to sele session to the portal.	nd socket number of ct specific settings f	[:] the portal you or the discovery
IP address or DNS name:	<u>P</u> ort: 3260	<u>A</u> dvanced
	ОК	Cancel

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

iSCSI Initiator Properties			×
General Discovery Targets	Persistent Targets	Bound Volumes/Devices	I,
Select a target and click Log I target. Click details to see info devices for that target.	On to access the stor rmation about the ses	age devices for that ssions, connections and	
Targets:			
Name		Status	L
generic		Inactive	L
<u></u>	etails Log O	n R <u>e</u> fresh	
	ОК	Cancel <u>Apply</u>	

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

Log On to Target	×
Target name:	
generic	
Automatically restore this conr	nection when the system boots
🔲 Enable multi-path	
Only select this option if iSCS: on your computer.	I multi-path software is already installed
<u>A</u> dvanced	OK Cancel

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

Log On to Target		×
Target name:		
quorum		
Automatically restore this cor	nnection when the system boots	3
🔲 Enable multi-path		
Only select this option if iSC on your computer.	SI multi-path software is alread	y installed
<u>A</u> dvanced	ОК С	ancel

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

iSCSI Initiator Propert	ies	×
General Discovery T	argets Persistent Targets Bound Volumes/Devices	1
Select a target and clin target. Click details to devices for that target.	ck Log On to access the storage devices for that see information about the sessions, connections and	
<u>T</u> argets:		
Name	Status	
generic	Connected	
	Details Log On Refresh	
	OK Cancel Apply	

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

Open Computer Management Console

📙 Computer Management		
📃 File Action View Window Hel	þ	_ - - - - - - - -
Computer Management (Local)	Name	
⊕ I Event Viewer ⊕ Shared Folders Folders	Storage Services and Applications	
Performance Logs and Alert:		
Storage General Storage		
Disk Detragmenter		
	•	Þ

Open Computer Management and select Disk Management.

📮 Computer Management						_ [
📃 Eile Action <u>V</u> iew <u>W</u> indow <u>k</u>	<u>t</u> elp						P×
Computer Management (Local) System Tools Event Viewer Shared Folders Local Users and Groups Performance Logs and Alerts Device Manager Storage Storage Disk Defragmenter Disk Management Services and Applications	Volume (C:) Software (D:) C:) C:) Software (D:) C:) Software (D:)	Layout Partition Partition Partition Partition	Type Basic Basic Basic Basic	File System	Status Healthy Healthy (System) Healthy	Capacity 1.99 GB 1020 MB 19.99 GB 4.30 GB	Free 1.99 1020 17.0 0 MB
	Disk 2 Basic 1020 MB Online	1020 M Health	16 /				₹
	Primary partitio	'n					

Assign drive letters

📮 Computer Management						_1	IX
클, File Action View Window Help _ 트립 ×							
⇔ → 🗈 🖬 😫 🕅 🗙 🖆	² 😼						
Computer Management (Local)	Volume	Layout Partition	Type	File Sys	stem Status Healthy	Capacity	Free 1 99
Event Viewer		Partition	Basic		Healthy	1020 MB	1020
E - Shared Folders E - Stared Folders E - Stared Folders Local Users and Groups E - Stared Folders	(C:) Software (D:)	Partition Partition	Basic Basic	NTFS CDFS	Healthy (System) Healthy	19.99 GB 4.30 GB	17.0 0 MB
Device Manager Storage Storage Disk Defragmenter Disk Management	<u>د</u>				Open Explore Mark Partition as Activ Change Drive Letter a	'e nd Paths	_
	Contraction Disk 1 Basic 1.99 GB	1.99 G	в	-	Eormat Delete Partition		
	Online	Health	/	_	Properties Help		_[]
	Basic 1020 MB Online	1020 M Health	1B Y				-
▼	Primary partitio	n					

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

Change Drive Letter and Paths for 1019 MB Primary partiti? 🗙
Allow access to this volume by using the following drive letter and paths:
Add Change <u>R</u> emove
OK Cancel

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



Assign **Q** as drive letter.

Press the **OK** button.

📙 Computer Management							그즤
🗐 Eile Action Yiew Window H	elp						P ×
← → 1 € ■ 2 2 4 ≤	4 🙀						
📙 Computer Management (Local)	Volume	Layout	Туре	File System	Status	Capacity	Free
🖻 📆 System Tools	8	Partition	Basic		Healthy	1.99 GB	1.99
🕀 😥 Event Viewer	🗐 (C:)	Partition	Basic	NTFS	Healthy (System)	19.99 GB	17.0
E Shared Folders	💷 (Q:)	Partition	Basic		Healthy	1020 MB	1020
E Series and Groups	Software (D:)	Partition	Op	en		4.30 GB	0 MB
Performance Logs and Alert:			Exp	olore			
Device Manager			Mar	rk Partition as	Active		
E Storage			Cha	ande Drive Lel	tter and Paths		
			Eor	mat			
	•					-	
F Services and Applications			Del	ete Partition			
	🗇Disk 1		Pro	perties			
	Basic			por 0.05		-	
	1.99 GB	1.99 G	Hel	p			
	Online	Health	C777				
	Pick 2				1		
	Basic	(0;)					
	1020 MB	1020 M	1B				
	Online	Health	/				_
	Primary partitio	n					
			_				
				J.		1	

Come back to the Computer Management Console

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

Change Drive Letter and Paths for 2039 MB Primary partiti? 🗙
Allow access to this volume by using the following drive letter and paths:
Add Change <u>R</u> emove
UK Cancel

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

Add Drive Letter or Path	<u>?×</u>
Add a new drive letter or path for 2039 MB Primary partitio	
 Assign the following drive letter: 	R 🗖
\bigcirc <u>M</u> ount in the following empty NTFS folder:	
	Browse
ОК	Cancel

Assign **R** as drive letter.

Press the **OK** button to continue.

Come back to the Computer Management Console

📙 Computer Management						_ [
🗐 Eile Action Yiew Window H	elp						P×
⇔ → 🗈 🖬 😫 🐼 🗙 🖆	* 🛃						
Computer Management (Local)	Volume	Layout	Туре	File System	Status	Capacity	Free
🗇 🌇 System Tools	💷 (C:)	Partition	Basic	NTFS	Healthy (System)	19.99 GB	17.0
	(Q:)	Partition	Basic		Healthy	1020 MB	1020
	🔍 (R:)	Partition	Basic		Healthy	1.99 GB	1.99
Eocal Users and Groups Berformance Logs and Olerty	Software (D:)	Partition	Basic	CDFS	Healthy	4.30 GB	0 MB
Device Manager							
🕀 🎲 Removable Storage							
Disk Defragmenter							
Disk Management	▲						<u> </u>
	Basic	(0.5)	7777				
	1.99 GB	1.99 G	в ///				
	Online	Health	////				
	@Dick 2						
	Basic	(0:)					
	1020 MB	1020 M	IB				
	Online	Health	/				_
< •	Primary partitio	n					_
	,						
,				J.		1	

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

6. Creating Cluster

Open Cluster Administrator on node1.

🛱 Cluster Administrator	
Eile View Help	
Open Connection to Cluster	
Action	
Create new cluster	
Gluster or server name:	
Browse	
<u>O</u> K Cancel	
For Help, press F1	NUM //.

Select Create new cluster.

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



Press the **Next** button to continue.

Specify cluster name

New Server Cluster Wizard	×
Cluster Name and Domain Specify the name of the new server cluster and the domain in which it will be created.	
Select or type the name of the domain in which the cluster will be created. Only computers in this domain can be members of the cluster.	
Domain:	
KernSafe.local	
Type a cluster name that is unique in the domain. This must be a valid computer name. <u>C</u> luster name:	
KernSafecluster	
< <u>B</u> ack <u>N</u> ext>	Cancel

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

New Server Cluster Wizard	×
Select Computer The computer must be a member of the domain you specified.	
Enter the name of the computer that will be the first node in the new cluster.	
Computer name:	
node1 Browse	
Advanced	
< <u>B</u> ack <u>N</u> ext >	Cancel

Enter node1.

Press the **Next** button to continue.

Analyzing configuration

New Server Cluster Wizard	×
Analyzing Configuration Please wait while the wizard determines the cluster configuration.	Î
 Image: Checking for existing cluster Image: Vertical stability 	
Tasks completed.	
<u>V</u> iew Log <u>D</u> etails <u>R</u> e-and Click Next to continue. Click Back to change the configuration.	alyze
< <u>B</u> ack <u>Next</u> > Ca	ncel

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
New Server Cluster Wizard	×
IP Address Enter an IP address that cluster management tools will use to connect to the cluster.	
IP <u>A</u> ddress: 192 . 168 . 1 . 33	
< <u>B</u> ack <u>N</u> ext >	Cancel

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

Type cluster service account

New Server Clus	ter Wizard	×
Cluster Servi Enter login be run.	ice Account n information for the domain account under which the cluster service will	
<u>U</u> ser name: <u>P</u> assword: <u>D</u> omain:	cluster	
This acc for prope	ount will be given local administrative rights on all nodes of this cluster to al r operation.	low C
	< <u>B</u> ack <u>N</u> ext > C	ancel

Enter the username and password of cluster.

Proposed cluster configuration

Server Cluster Wizard	×
Proposed Cluster Configuration Verify that you want to create 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 Intel(R) PRO/1000 MT Network Connection Primary Address: 192.168.1.11 \ 255.255.255.0 Cluster service account credentials: Name:cluster Password: *****	
To create a cluster with this configuration, click Next.	View Log

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

Cluster Co	nfiguration Quo	rum	?×
Select the resource or resource type that you would like to use for the quorum resource.			
Disk Q:			-
	ОК	Cancel	Help

Select Disk Q.

Press the **OK** button to continue.

Creating cluster

New Server Cluster Wizard			×
Creating the Cluster Please wait while the cluster is configured.			
 ✓ Reanalyzing cluster ✓ Configure cluster services ✓ Configure resource types ✓ Configure resources 			
Tasks completed.			
	⊻iew Log	<u>D</u> etails	<u>R</u> etry
	< <u>B</u> ack	<u>N</u> ext >	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.

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 Connection to Cluster	<u>? ×</u>
Action:	
Add nodes to cluster	•
<u>C</u> luster or server name:	
KERNSAFECLUSTER	Browse
	<u>O</u> K Cancel

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

Add Nodes Wizard		×
Add Nodes Wizard	Welcome to the Add Nodes Wizard This wizard helps you add additional nodes to an existing server cluster. Using this wizard, you specify the computers that will be added to a cluster. You can add one computer at a time, or you can add multiple computers at the same time. This wizard requires that you provide the following information: • The names of the computers to be added to the cluster • The password for the cluster service account	×
	To continue, click Next.	1

Press the Next button to continue.

Select Computers

Add Nodes Wizard		×
Select Computers The computers must	be a member of the domain you specified.	
Enter the names of th	e computers that will be added to the cluster.	
<u>C</u> omputer name:	node2	B <u>r</u> owse
Selected computers:		Add
		Remove
		Advanced
	< <u>B</u> ack <u>N</u> ext	Cancel

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

Add Nodes Wizard		×
Select Computers The computers must	be a member of the domain you specified.	
Enter the names of th	e computers that will be added to the cluster.	
<u>C</u> omputer name:		Browse
Selected computers:	node2	Add
		Remove
		Advanced
	,	
	< <u>B</u> ack (<u>N</u> e>	t> Cancel

Press the **Next** button to continue.

Analyzing configuration

Add Nodes Wizard	×
Analyzing Configuration Please wait while the wizard determines the cluster configuration.	
 Checking for existing cluster ✓ Establishing node connection(s) ✓ Checking node feasibility ✓ Finding common resources on nodes ✓ Checking cluster feasibility 	
View Log Details B Click Next to continue. Click Back to change the configuration.	e-analyze
< <u>B</u> ack <u>N</u> ext >	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.

Specify cluster service account

Add Nodes Wizar	d d	×
Cluster Servi Enter login be run.	ice Account information for the domain account under which the cluster service will	
<u>U</u> ser name:	cluster	
<u>P</u> assword:	•••••	
Domain:	KernSafe.local	
This according to the second secon	ount will be given local administrative rights on all nodes of this cluster to all r operation.	ow
	< <u>B</u> ack <u>N</u> ext > Ca	ancel

Enter the password of cluster user.

Press the **Next** button to continue.

Proposed cluster configuration

d Nodes Wizard	x
Proposed Cluster Configuration Verify that you want to add nodes to a cluster with the following o	configuration.
Cluster name: KERNSAFECLUSTER.KernSafe.local	<u>*</u>
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: ******	_
To add podes to a cluster with this configuration, click Next	⊻iew Log
I o add nodes to a cluster with this configuration, click Next.	
< <u>B</u> ack	Next > Cancel

Adding nodes to the cluster

Add Nodes Wizard			×
Adding Nodes to the Cluster Please wait while the cluster is configured.			
 ✓ Reanalyzing cluster ✓ Configure cluster services ✓ Configure resource types ✓ Configure resources 			
Tasks completed.			
	⊻iew Log	<u>D</u> etails	<u>R</u> etry
	< <u>B</u> ack	<u>N</u> ext >	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.

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.

Create iSCSI Target Wizard	
iSCSI Medium Type Select medium of the iSCSI disk you want to create.	
 Image File Create iSCSI disk by using standard image file or Virtual Hard Disk (.VHD). RAM Space Create iSCSI disk by using memory space. Security Images Create iSCSI disk images for each initiators, any image is individual for each initiator. Disk Partition Create iSCSI target by using a disk partition. Physical Disk Create iSCSI target by using physical disk. 	
< Back Next > C	ancel

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

inage disk parameters	~
eate iSCSI Target Wizard	_
Image Disk Configuration You can specify a image file as an iSCSI device.	
Device Parameters	
Use existing image file Oreate a new image file	
C:\spool.img Browse	
Device Size in MBs: 1024	
Ontions	
Use sparse file on NTES file system	
Note: Using sparse file can save your harddisk space, the size of disk image file only depend on its content used. But we recommentd that using this feature when image file size is less than 1T bytes	
< Back Next >	Cancel

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

Press the **Next** button to continue.

Finish creating iSCSI Target

Create iSCSI Target Wizard	×
Completing the Create iSCSI Wizard You can specify a target name and other options to complete iSCSI target creating.	<u></u>
Basic Target Information Enter Target Name:	
spool 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 initiaor log on with full access, it will fail. But this option is usfull for clustering, disk sharing and NAS.	
< Back Finish	Cancel

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.

🍓 iStorage Server Manage	ment Console						
<u>Storage</u> <u>Clients</u> <u>V</u> iew	/ <u>T</u> ools <u>H</u> elp						
Create Delete	Start Stop	p Re	Image: State Sta	Remove	View -	Access	Settings Print
E@ kernsafe-PC E@ Targets > quorum	iStorage General Targets	e Server: Applicatio	kernsafe-PC ns IP Filters Users	Groups Lo	gs		
spool	Target Name	Devic	Source	Capa	Authentic	Status	
	🁒 quorum	Disk	G:\quorum.img	1.00G	Anonymo	Ena	
IPFilters	🁒 generic	Disk	G:\generic.img	2.00G	Anonymo	Ena	
Groups	🁒 spool	Disk	C:\spool.img	1.00G	Anonymo	Ena	
🐌 Logs							
Done					S Conne	cted: kernsafe	e-PC (Ultimate License)

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.

iSCSI Initiator Prope	erties	×
General Discovery	Targets Persistent Targets Bound Volumes/Devices	s
Select a target and target. Click details devices for that targ	click Log On to access the storage devices for that to see information about the sessions, connections and jet.	
<u>I</u> argets.	Status	
aeneric	Connected	
quorum	Connected	
spool	Inactive	
	Details Log On Refresh	
	OK Cancel Apply	

Press the **Log On** button.

Log On to Target	×
Target name:	
spool	
Automatically restore this connection when the system	boots
Enable multi-path	
Only select this option if iSCSI multi-path software is a on your computer.	already installed
Advanced OK	Cancel

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.

Initialize and Convert Disk Wizard	×
Select Disks to Initialize You must initialize a disk before Logical Disk Manager can access it.	
Select one or more disks to initialize. Disks:	
☑ Disk 3	
< <u>B</u> ack <u>N</u> ext >	Cancel

Select Disk3.

Select disks to be converted.

Initialize and Convert Disk Wizard	×
Select Disks to Convert The disks you select will be converted to dynamic disks.	
Select one or more disks to convert: Disks:	
< <u>B</u> ack <u>N</u> ext > C	ancel

Press the **Next** button to continue.

Finish initializing disk.

Initialize and Convert Disk W	izard	×
	Completing the Initialize and Convert Disk Wizard You have successfully completed the Initialize and Convert Disk Wizard. You selected the following settings: Initialize to MBR: Disk 3 Convert: None	
	To close this wizard, click Finish.	
	< <u>B</u> ack Finish Cancel	

Press the **Finish** button.

Come back to the Computer Management Console.

📙 Computer Management						
🗐 Eile Action View Window H	elp					_ Ð ×
	1					
Computer Management (Local) System Tools Event Viewer Shared Folders Cocal Users and Groups Performance Logs and Alert: Device Manager Storage Removable Storage Disk Defragmenter Disk Management Services and Applications	Volume Volume (C:) ARMEXVOL_EN (D:) Generic (R:) Quorum (Q:) Volume Colored Generic (R:) Quorum (Q:) Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored Colored	Layout Partition Partition Partition Partition Partition	Type Basic Basic Basic Basic	File System NTFS CDFS NTFS NTFS NTFS	Status Healthy (System) Healthy Healthy Healthy (Active)	Capacity 19.99 GB 594 MB 1.99 GB 1020 MB
		nary partitio	n	Help		

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



Select partition type.

New Partition Wizard	×
Select Partition Type There are three types of partitions: primary, extended, and logical.	
Select the partition you want to create:	
Primary partition	
Extended partition	
O Logical drive	
Description	7
A primary partition is a volume you create using free space on a basic disk. Windows and other operating systems can start from a primary partition. You can create up to 128 primary partitions on a GPT basic disk. On a Master Boot Record (MBR) basic disk, you can create up to four primary partitions or three primary partitions and an extended partition.	
< <u>B</u> ack <u>N</u> ext > Ca	ncel

Select Primary partition

Specify partition size

New Partition Wizard	×
Specify Partition Size Choose a partition size that is between the	e maximum and minimum sizes.
Mauium diek opaop in mogabutes (MP):	1019
maxium usk space in megabytes (mb).	1013
Minimum disk space in MB:	8
Partition size in MB:	
	< <u>B</u> ack <u>N</u> ext > Cancel

Press the **Next** button to continue.

Assign drive letter

New Partition Wizard	×
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: Browse Do not assign a drive letter or drive path 	
< <u>B</u> ack <u>N</u> ext >	Cancel

Assign S as drive letter.

Press the **Next** button to continue.

Format partition

New Partition Wizard
Format Partition To store data on this partition, you must format it first.
Choose whether you want to format this partition, and if so, what settings you want to use.
O Do not format this partition
• Format this partition with the following settings:
File system: NTFS
Allocation unit size: Default
⊻olume label: Spool
Perform a quick format
Enable file and folder compression
< <u>B</u> ack <u>Next</u> > 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.

📮 Computer Management						
🗐 Eile Action View Window H	elp					_ Ð ×
	1					
Computer Management (Local) System Tools System Tools Shared Folders Shared Folders Shared Folders Shared Folders Storage Storage Device Manager Storage Device Defragmenter	Volume C(:) C(:) C(:) C(:) C(:) C(:) C(:) C(:)	Layout Partition Partition Partition Partition	Type Basic Basic Basic Basic Basic	File System NTFS CDFS NTFS NTFS NTFS	Status Healthy (System) Healthy Healthy Healthy (Active) Healthy	Capacity 19.99 GB 594 MB 1.99 GB 1020 MB 1020 MB
Disk Derraginenter Disk Management Total Applications	Disk 2 Basic 1.99 GB Online Disk 3 Basic 1020 MB Online Disk 3	ieneric (R .99 GB NTF ealthy pool (S:) 020 MB NTF ealthy	::) 5 =5			×
	Primary partition					

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

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

iSCSI Initiator Prope	rties	×
General Discovery	Targets Persistent Targets	Bound Volumes/Devices
Select a target and target. Click details t devices for that targ	click Log On to access the stor o see information about the ses et.	age devices for that ssions, connections and
<u>T</u> argets:		
Name		<u>Status</u>
quorum		Connected
spool		Inactive
	Detaile	
	<u>D</u> etails <u>L</u> og U	n
	ОК	Cancel Apply

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

Log On to Target	×
Target name:	
spool	_
Automatically restore this connection when the system boots	
🔲 Enable multi-path	
Only select this option if iSCSI multi-path software is already instal on your computer.	ed
Advanced OK Cancel	

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

Open Computer Management and select Disk Management.

📮 Computer Management						
🗐 Eile Action View Window H	lelp					_ ð ×
⇔ → 🗈 🖬 😫 🐼 🗙 🖆	1 😼					,
Computer Management (Local)	Volume	Layout	Туре	File System	Status	Capacity
🖻 🌇 System Tools		Partition	Basic		Healthy	1020 MB
Event Viewer	🖃 (C:)	Partition	Basic	NTES	Healthy (System)	19.99 GB
	💷 (Q;)	Partition	Basic		Healthy (Active)	1020 MB
Eccal Users and Groups	ARMEXVOL_EN (D:)	Partition	Basic	CDFS	Healthy	594 MB
Device Manager	Generic (R:)	Partition	Basic	NTFS	Healthy	1.99 GB
🗄 🎒 Removable Storage				Open		
Disk Defragmenter				Explore		
Disk Management	•			Mark Partitio	n as Active	•
🗄 🐝 Services and Applications				Change Driv	e Letter and Paths	
	Disk 2	(0)	-	Eormat		
	1020 MB	(U:) 120 MB		Doloto Dartit	iae	
	Online	ealthy (Act	ive) 🗕	<u>D</u> elete Partit	1011	
				Properties		
	Basic	//////	777	Help		
	1020 MB	020 MB				
	Online H	ealthy 🥢				_
	Primary partition					<u> </u>
J						

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

Change Drive Letter and Paths for 1019 MB Primary partiti 🎦 🗙
Allow access to this volume by using the following drive letter and paths:
Add Change <u>R</u> emove
OK Cancel

Click the Add button.

Add Drive Letter or Path	? ×
Add a new drive letter or path for 1019 MB. Primary partitio	
Assign the following drive letter:	S 🔽
Mount in the following empty NTFS folder:	
	<u>B</u> rowse
ОК	Cancel

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

New Resource		
	Image: Description: Description: Resource type: Group: Description: To continue, click	Spool KernSafe Disk Physical Disk Group 0 Troce in a separate Resource Monitor Next.
	<	Back Next > Cancel

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 cl Specify the possible owners for this	luster on which this resource can be brought online.
Available nodes:	Possible <u>o</u> wners:
Name	Add → Name <- Bemove
	< <u>B</u> ack <u>N</u> ext > Cancel

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

Press the **Next** button to continue.

Dependencies Spool Dependencies are resources which Specify the dependencies for this re	must be brought online by the cluster service first. source.
Available resources:	Resource <u>d</u> ependencies:
Resource Resc	Resource Resc
Disk R: Phys	Add ->
	< <u>B</u> ack <u>N</u> ext > Cancel

Press the **Next** button to continue.

Disk Parameters	
Spool	
Disk: S: (Spool)	
	< <u>B</u> ack Finish Cancel

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

Cluster A	dministrator 🗙
(į)	Cluster resource 'Spool' created successfully.
	ОК

Press the **OK** button.

Come back to the Cluster Administrator Console

🚰 Cluster Administrator - KERNSAFECLUSTER (KERNSAFECLUSTER.KernSafe.local)										
<u> Eile View Window H</u> elp										
skernsafecluster (Kernsafecluster.Kernsafe.local)										
	Name		State		Ow	Iner		Group		
Groups	💯 Disk Q		Online		NO	DE1		Cluster Gri		
Resources	🛄 Cluster	IP Address	Online		NO	DE1		Cluster Gri		
	Cluster	Name	Online		NO	DE1		Cluster Gri		
	Disk R:		Online		NO	DE2		Group 0		
	Spool	Bring Opline	Offline	Сытв		DE2		Group 0		
		Take Offline		Chrl+T						
		Initiate Failure		Ctrl+I						
		Change Group			•					
		Delete		cial un						
		Rename		Chrl+M						
		Kond <u>m</u> o		contra	-					
		New			•					
		Configure App	lication							
<u> </u>		P <u>r</u> operties			Ľ			<u> </u>		
For Help, press F1										

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

🔓 Cluster Administrator - KERNSAFECLUSTER (KERNSAFECLUSTER.KernSafe.local)									
<u>File View Window H</u> elp									
🚳 👁 🔺 😭 🔮 🛍 :	B-B- B-B- - B-B-								
Image: Second									
	Name	State	Owner	Group					
Groups	🛄 Disk Q:	Online	NODE1	Cluster Gri					
Resources	Cluster IP Address	Online	NODE1	Cluster Gri					
	💭 Cluster Name	Online	NODE1	Cluster Gri					
	Disk R:	Online	NODE2	Group 0					
	D Spool	Online	NODE2	Group 0					
	•			Þ					
For Help, press F1									

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.