iStorage Server: Working with Windows Cluster

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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

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.			
C Obtain an IP address automatical	ly 📗		
• Use the following IP address			
IP address:	192.168.1.1		
Subnet mask:	255 . 255 . 255 . 0		
Default gateway:	· · ·		
C Obtain DNS server address auton	natically		
□ Use the following DNS server add	resses:		
Preferred DNS server:	127.0.0.1		
Alternate 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 will be 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 <u>Next</u> > Cance		

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.			
C Additional domain controller for an existing domain			
🔥 Proceeding with this option will delete all local accounts on this server.			
All cryptographic keys will be deleted and should be exported before continuing.			
All encrypted data, such as EFS-encrypted files or e-mail, should be decrypted before continuing or it will be permanently inaccessible.			
< <u>B</u> ack <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.	S.
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 n domain to be completely independent of your current forest.	ew
C 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.	
O 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 > C	ancel

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.	X
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 > 0	Cancel

Enter the name of DNS. Take KernSafe.local as a 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 of Windows will use to identify the new domain. Click Next to accept the name shown, 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 th	e Active Direcorty	database and log f	ile
-----------------------------------	--------------------	--------------------	-----

Active Directory Installation Wizard	×
Database and Log Folders Specify the folders to contain the Active Directory database and log files.	
For best performance and recoverability, store the database and the log on se hard disks.	eparate
Where do you want to store the Active Directory database?	
Database folder:	
C:\WINDOWS\NTDS B	jowse
Where do you want to store the Active Directory log?	
Log folder:	
C:\WINDOWS\NTDS B	r <u>o</u> wse
< <u>B</u> ack <u>N</u> ext >	Cancel

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

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. The contents of the SYSVOL folder are replicated to all domain controllers in the domain.
The SYSVOL folder must be located on an NTFS volume.
Enter a location for the SYSVOL folder.
Eolder location:
C:\WINDOWS\SYSVOL Browse
< <u>B</u> ack <u>N</u> ext > Cancel

Select the storage location of file SYSVOL.

Press the Next button to continue.

Diagnostric DNS registration

Active Directory Installation Wizard	×	
DNS Registration Diagnostics Verify DNS support, or install DNS on this computer.	X	
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.	-	
 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 use this DNS server as its preferred DNS server. 		
< <u>B</u> ack <u>N</u> ext > (Cancel	

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. Anonymous users can read information on this domain.
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

ctive 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

Press the Next button to continue.



Press the Finish button.

Restart operation system

Active Directory Installation Wizard	
Windows must be restarted before the changes made by the Active Directory Installation wizard take effect.	
<u>Bestart Now</u> Don't Restart Now	

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.

🚊 dnsmgmt - [DNS\03DCX64\Reverse Lookup Zones]
🚊 File Action View Window Help
Image: Second
Opens a new window rooted at this node.

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

New Zone Wizard	×
Zone Type The DNS server supports various types of zones and storage.	
Select the type of zone you want to create:	
 Primary zone Creates a copy of a zone that can be updated directly on this server. 	
Secondary zone 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
Active Directory Zone Replication Scope You can select how you want DNS data replicated throughout your network.
Select how you want zone data replicated:
C To all DNS servers in the Active Directory forest Domain.KernSafe.com
To all DNS servers in the Active Directory domain Domain.KernSafe.com
O 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.
 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
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.

Press the Next button to continue.

Set Dynamic update types

New Zone Wizard
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).

Press the Next button to continue.

Complete the New Zone Wizard

New Zone Wizard			×
	Completin	g the New Zone Wizard	
	You have successi specified the follow	ully completed the New Zone Wizard. You wing settings:	
	Name:	1.168.192.in-addr.arpa	
	Туре:	Active Directory-Integrated Primary	
	Lookup type:	Reverse	
	Note: You should (that records are u name resolution u: To close this wizar	now add records to the zone or ensure pdated dynamically. You can then verify sing nslookup. d and create the new zone, click Finish.	
	< <u>B</u> ack	Finish Cancel Help	

Press the Finish button.

Come back to the domain controller management console.

🚊 dnsmgmt - [DNS\03DCX64\Reverse Lookup Zones]	Ľ
🚊 File Action View Window Help	I ×
Name Type Status Image: Status Image: Status Image: Status Image: Status Image: Stat	
New Hogt (A) New Alias (CNAME) New Mail Exchanger (MX) New Degmain New Delegation Other New Regords	
New Window from Here	
Delete Refresh	
Properties	
Help	
Displays Help for the current selection.	

Right click on KernSafe.local and select New Host (A), the New Host dialog will be 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	<u>?</u> ×
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	
🔽 <u>C</u> reate associated pointer (PTR) record	
Allow any authenticated user to update DI same owner name	NS records with the
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.

Come back to the domain controller management console.

🚊 dnsmgmt - [DNS\03DCX64\Forwa	ard Lookup Zones\KernSafe.loca]		- D ×
🚊 Eile Action <u>V</u> iew <u>W</u> indow <u>H</u>	elp			_ B ×
二, DNS 戸一目 03DCX64	KernSafe.local 7 record(s)		1	
Event Viewer	Name	Туре	Data	
□ □ □ msdcs.KernSafe.local □ □ KernSafe.local □ □ Reverse Lookup Zones	Linsocs (same as parent folder) (same as parent folder	Start of Authority (SOA) Name Server (NS) Host (A) Host (A) Host (A)	[4], 03dcx64.kernsafe.local 03dcx64.kernsafe.local. 192.168.2.1 192.168.1.1 192.168.1.11 192.168.1.22	
	<u> </u>			
Answert - [DNS\03DCX64\Revel	rse Lookup Zopes\ 192 168 1 v S	ubnet]		
🚔 dnsmgmt - [DNS\03DCX64\Reve Reve	rse Lookup Zones\192.168.1.x 5 elp	ubnet]		_ 🗆 🗙
	rse Lookup Zones\192.168.1.x 5 elp 😰 💵 🗐 🗒 👘	ubnet]		
image: answer - [DNS\03DCX64\Rever image: answer	rse Lookup Zones\192.168.1.x 5 ep 29 III III IIII IIII 192.168.1.x Subnet 4 record(s	ubnet]		
image: answight - [DNS\03DCX64\Rever image: answight - [DNS\03DCX64\Rever image: answight - [DNS\03DCX64	rse Lookup Zones\192.168.1.x 5 elp 23 19 2.168.1.x Subnet 4 record(s	ubnet]	Data	
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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

literation and Com	puters		
ile Action View Window §	<u>H</u> elp		_8×
	7 🖻 🗈 😫 🔟 🦉 🦉 🐚 7	7 🍕 🗑	
Active Directory Users and Compute	Users 17 objects		
🗄 🚞 Saved Queries	Name Type	Description	
E-100 KernSafe.local	Administrator User	Built-in account for admini	
	Gert Publishers Security Group	. Members of this group are	
Domain Controllers	DnsAdmins Security Group	. DNS Administrators Group	
	DnsUpdatePr Security Group	. DNS clients who are permi	
Delegate Control	Domain Admins Security Group	Designated administrators	
Find	Domain Cont Security Group	. All domain controllers in th	
New All Tasks View New Window from He Refresh Export List Properties Help	Computer Contact Group InetOrgPerson Printer User Shared Folder TelnetClients Security Group From John State From John State Fr	 All domain guests All domain users Designated administrators Members in this group can Built-in account for guest Group for the Help and Su 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 will be shown

New Object - User				×
Create in:	KernSafe.loc	al/Users		
<u>F</u> irst name:	node1adm		<u>I</u> nitials:	
Last name:				
Full n <u>a</u> me:	node1adm			
<u>U</u> ser logon name:				
node1adm		@KernSafe	.local	•
User logon name (pre-	<u>W</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 a 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	
Password never expires	
Account is disabled	
< <u>B</u> ack <u>N</u> ext>	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	X
Create in: KernSafe.local/Users	
When you click Finish, the following object will be created:	
Full name: node1adm	
User logon name: node1adm@KernSafe.local The user cannot change the password. The password never expires.	Ţ
< <u>B</u> ack [Finish]	Cancel

Press the Finish button.

Come back to Active Directory Users and Computers console

Create the second user.

🍜 Active Directory Users and Comp	outers				_ 🗆 ×
Gile Action View Window H	elp				_ 8 ×
← → 🗈 🖬 🐰 🛍 🗡 🖆	' 🖻 🗈 😰 💵 🦉	💆 👛 💎	l 🖗 🐌		
Active Directory Users and Computer	Users 18 objects				
E- A KernSafe, local	Name Type	•	Description		
📋 📋 Builtin	🛛 💆 Administrator User		Built-in account for admini		
Computers	Cert Publishers Secu	rity Group	Members of this group are	,	
🗄 🧭 Domain Controllers	f 💯 DnsAdmins Secu	irity Group	DNS Administrators Group		
🗄 💼 ForeignSecurityPrincipals	🛛 💯 DnsUpdatePr Secu	rity Group	DNS clients who are permi		
	Domain Admins Secu	rity Group	Designated administrators		
Delegate Control	Domain Com Secu	rity Group	All workstations and serve		
Find	🖉 Domain Cont Secu	rity Group	All domain controllers in th		
New	Computer	y Group	All domain guests		
All Tasks	 Contact 	y Group	All domain users		
	Group	y Group	Designated administrators		
View	InetOrgPerson	y Group	Members in this group can		
New Window from Here	MSMQ Queue Alias		Built-in account for guest		
Delete	Printer	y Group	Group for the Help and Su		
Rename	User				
Export List	Shared Folder	y Group	Servers in this group can		
		nty Group	Designated administrators		
Properties	SUPPORT_38 User		This is a vendor's account		
Help	TelnetClients Secu	rity Group	Members of this group ha		
	<u> </u>				
Creates a new item in this container.					

Right click on Users and select New - > User, the New Object-User will be 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	
User logon name:		
node2adm	@KernSafe.local	
User logon name (pre-)	<u>//</u> indows 2000):	
KERNSAFE\	node2adm	
	< Back Next > Cancel	

Create any user as shown in the figure, take node2adm as a 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	
Password never expires	
Account is disabled	
< <u>B</u> ack <u>N</u> ext > Ca	incel

Enter password, ake abc.123 as a 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: node2adm	A
User logon name: node2adm@KernSafe.local	
The user cannot change the password. The password never expires.	Y
< <u>B</u> ack (Finish)	Cancel

Press the Finish button to finish.

Come back to Active Directory Users and Computers console

Create a user cluster

<i>á</i> Active Directory Users and Comp	uters			
Sile Action View Window He	lp			_ 8 ×
← → 🗈 🖪 🐰 🗡 📽 😫	😰 💷 🦉 🖉 🐚 🤊	7 🍕 🙍		
Active Directory Users and Computer	Users 19 objects			
E Saved Queries	Name Type		Description	
	🕵 Administrator User		Built-in account for admini	
E Computers	Cert Publishers Securit	y Group	Members of this group are	
🕀 🔯 Domain Controllers	2 DnsAdmins Securit	y Group	DNS Administrators Group	
🗄 🧰 ForeignSecurityPrincipals	DnsUpdatePr Securit	y Group	DNS clients who are permi	
	1 C32 Domain Admins Securit	y Group	Designated administrators	
Find	iomain Com Securit	y Group	All workstations and serve	
		koup	All domain quests	
New	Computer	roup	All domain users	
	Contact	roup	Designated administrators	
⊻iew	InetOrgPerson	roup	Members in this group can	
New <u>W</u> indow from Her	e MSMO Oueue Alias		Built-in account for guest	
Export List	Printer	roup	Group for the Help and Su	
	User			
Properties	Shared Folder		Company in this array and	
Help	champ Admine Securit	y a roup	Servers in this group can Decignated administrators	
		y aroup	This is a vendor's account	
	TelnetClients Securit	y Group	Members of this group ha	
	-			
	<u> </u>			
Creates a new item in this container.				

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

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

Create any user as shown in the figure., take cluster as a 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	
Password never expires	
Account is disabled	
< <u>B</u> ack <u>N</u> ext > Ca	ancel

Enter password, take abc.123 as a 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	<u>^</u>
User logon name: cluster@KernSafe.local The user cannot change the password. The password never expires.	¥
< <u>B</u> ack [Finish]	Cancel

Press the Finish button.

<i>ৰ্ব্ব</i> Active Directory Users and Comp	uters					_ 🗆 🗡
🥪 Eile Action View Window He	lp					_ - - - ×
← → 🖻 🖬 👗 🗙 😭 🗟	😭 💵 🧞 👸	2 👛 🔽	² 🍕 🐌			
Active Directory Users and Computer	Users 20 objects	_				
E Saved Queries	Osers 20 objects	-			1	
🗄 🖓 KernSafe.local	Name	Type	Description	16 1.1.1		
🗄 🖷 Builtin		User	Built-in acco	unt for admini		
🗄 💼 Computers		Security	Group Members of	this group are		
Domain Controllers		User	Add to a group	Labora Consum		
ForeignSecurityPrincipals	2 Documents	Security	Disable Account	racors Group		
		Security		no are permi		
	Domain Aumins	Security	Mo <u>ve</u> Open Heres Rege	printinistrators		
	Bomain Cont	Security	Open Home Page Sood Moil	hts and serve		
	Domain Cuests	Security	Seria Mali	- bete		
	Bomain Guescs	Socurity	All Tas <u>k</u> s 🕨 🕨	bro		
		Security	C. 1	_ pro Hministrators		
	Group Policy	Security	Delete	bis group cap		
	Guest	Licer 1	Delete	- of for quest		
	HelpServices	Security	Properties	Help and Su		
	C pode1adm	Licer		_ Theip and Som	1	
	C node2adm	Hser	Teih	_		
	RAS and IAS	Security	Group Servers in t	his group cap		
		Security	Group Designated	administrators		
	SUPPORT 38	Liser	This is a ver	dor's account		
		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 will be shown.

Select Group		? ×
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>):		
Domain Admins		<u>C</u> heck Names
Advanced	ОК	Cancel
Advanced	OK	Cancel

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 Typ	es
Erom this location:		
KernSafe.local	Location	s
Enter the object name to select (<u>examples</u>):		
Administrators	<u>C</u> heck Na	mes
Advanced	OK Cano	el

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

Internet Protocol (TCP/IP) Propertie	es <u>?x</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
O Obtain an IP address automatica	lly
\square Use the following IP address:—	
IP address:	192.168.2.1
S <u>u</u> bnet mask:	255.255.255.0
Default gateway:	· · ·
C Obtain DNS server address autor	matically
┌	tresses:
Preferred DNS server:	· · ·
<u>A</u> lternate DNS server:	<u> </u>
	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 will be shown.

Select a device type

- Select Device Type	
C RAM disk device	hard disk drive within a regular
Image file disk device	file, and all clients share this
C Security image file disks for each client	one nie.
O Partition-to-Disk bridged device	
O Physical disk bridged device	
O Virtual CD/DVD	
C CD/DVD-ROM/RW bridged device	
C Generic SCSI bridged device	
O RAID-1(Mirror) device	

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

Set Image Disk Source	×
Set image disk parameters	4
Device Parameters	
O. Use existing image file 💿 <u>C</u> reate a new image file	
C:\quorum.img Browse	
Enter Device size in MBytes:	
1024	
Use sparse file on NTFS file system	
Eormat image file to:	
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	
< <u>B</u> ack <u>N</u> ext > 0	Cancel

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	3	
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 initiaor log on with full access, it will fail. But this option is usfull for clustering, disk sharing and NAS.		
< <u>B</u> ack Finish	Cancel]

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

Create the second iSCSI Target.

Select a device type

Select Device Type	X
Please select a device type	2
Select Device Type	Description
 RAM disk device Image file disk device Security image file disks for each client Partition-to-Disk bridged device Physical disk bridged device Virtual CD/DVD CD/DVD-ROM/RW bridged device Generic SCSI bridged device RAID-1(Mirror) device 	This option is to create a virtual hard disk drive within a regular file, and all clients share this one file.
	< Back <u>N</u> ext > Cancel

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

Set Image Disk Source	×
Set image disk parameters	4
Device Parameters	
O Use existing image file O Create a new image file	
C:\generic.img Browse	
Enter Device size in MBytes:	
Use sparse file on NTFS file system	
☐ Format image file to: FAT ▼	
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	
< <u>B</u> ack <u>N</u> ext > 0	Cancel

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	۵
Basic Target Information	
generic	
 <u>Report as readonly device when initiator can not get write access</u> 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.	
< <u>B</u> ack Finish	Cancel

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

Come back to iStorage Server management console.

鵗 KernSafe	e iStora	je Serv	ver - 1	Targets	List									_ 🗆 🗵
<u>S</u> ervice	⊆lients	⊻iew	Tools	s <u>H</u> elp										
1	X				2	4	23				. 🍪	2	4	
Create	Delete	Sta	art	Stop	Refresh	Add	Remove	Clie	ent	Access	Settings	Print	About	
	SI Target	03DCv6	7 1		Target Na	me			Devic	Source		Cap	Authentic	Sta
	auorum	00D CAL			📚 quorun	1			Disk	C:\quoru	ım.img	1.00G	IP Filter	Ena
	generic				🁒 generia	:			Disk	C:\gene	ric.img	2.00G	IP Filter	Ena
🛛 😓 Use	ers													
📃 🛄 🤮 Gro	ups													
Ready										🔇 Co	nnected:03D(Ix64(Stan	dard License)	

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

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 automatically					
• Use the following IP address					
IP address:	192.168.1.11				
S <u>u</u> bnet mask:	255 . 255 . 255 . 0				
Default gateway:	· · ·				
C Obtain DN5 server address automatically					
• Use the following DNS server addresses:					
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	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.					
O Obtain an IP address automatically					
Use the following IP address:					
IP address:	192.168.2.11				
S <u>u</u> bnet mask:	255.255.255.0				
Default gateway:	· · ·				
C O <u>b</u> tain DNS server address autor	natically				
Use the following DNS server addresses:					
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		<u>?</u> ×			
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 will be 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					
O Workgroup:					
WORKGROUP					
OK Cancel					

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

Press the OK button.

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 will be shown



Press the OK button to continue.

Restarting computer is needed.



Press the OK button to restart computer.

Open iSCSI Initator.
iSCSI Initiator Propertie	s	×			
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 <u>S</u> ecret <u>S</u> ecret					
To configure IPSec Tun Tunnel.	nel Mode addresses, click	Tunnel			
	OK Cancel	Apply			

Change to Discovery page

iSCSI Initi	iator Prope	rties				x
General	Discovery	Targets F	Persistent Tar	gets Bound	Volumes/Devic	ces
<u> </u>	et Portals —					۱ ۱
Add	dress	Port	Adapter		IP Address	
				1 -		
	Add		<u>R</u> emove	R	l <u>e</u> fresh	
_ <u>i</u> SNS	Servers —					1
Na	me					
		1	_	1 -		
	A <u>d</u> d		Re <u>m</u> ove	R	le <u>f</u> resh	
					1	
			OK	Cancel	Apply	

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

Add Target Portal		×
Type the IP address or DNS name a want to add. Click Advanced to sele session to the portal.	and socket number o ect specific settings	of the portal you for the discovery
IP address or DNS name:	<u>P</u> ort: 3260	<u>A</u> dvanced
	OK	Cancel

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

iSCSI Initiator Proper	ties	×
General Discovery	Targets Persistent Targets	Bound Volumes/Devices
Select a target and c target. Click details to devices for that targe	ick Log On to access the stor see information about the ses t.	age devices for that ssions, connections and
Targets:		
Name		Status
generic		Inactive
	<u>D</u> etails <u>L</u> og Or	n
	ОК	Cancel Apply

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

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

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

Log On to Target		×
Target name:		
quorum		
Automatically restore this conn	ection when the system boots	
🔲 Enable multi-path		
Only select this option if iSCSI on your computer.	multi-path software is already in	nstalled
<u>A</u> dvanced	OK Can	cel

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

iSCSI Initiator Properties	×
General Discovery Targets Persistent Targets	Bound Volumes/Devices
Select a target and click Log On to access the sto target. Click details to see information about the se devices for that target.	rage devices for that ssions, connections and
Iargets:	
Name	Status
generic	Connected
quorum	Lonnected
Details Log Ö	n R <u>e</u> fresh
ОК	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 Convery Disk Wizard will be shown.

Initialize and Convert Disk W	izard	x
	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 Next > Cancel	

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.	
Disk 1 ✓ Disk 2	
< <u>B</u> ack <u>N</u> ext >	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

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 View Window E	<u>t</u> elp						\mathbb{N}
	1						
Computer Management (Local) System Tools System Tools Shared Folders Shared Folders Shared Folders Shared Folders Shared Folders Storage Storage Storage Storage Storage Dick Defragmenter	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 Management	1						•
	CPDisk 1 Basic 1.99 GB Online	1.99 G Unalloc	B :ated				
	Cisk 2 Basic 1020 MB Online	1020 M Unalloc	1B ated	New	Partition		·
•	Unallocated	Primary p	artition	Prop	erties		
				Help			

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

New Partition Wizard	×
Select Partition Type There are three types of partitions: primary, extended, and logical.	2
Select the partition you want to create:	
Primary partition	
C Extended partition	
C 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 > Cancel	

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:				
	< <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	X
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:	
File 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 formating



Press the Finish button to format the disk.

📙 Computer Management						_ [L
📃 Eile Action Yiew Window H	elp						P×
	l						
Computer Management (Local) System Tools Computer Viewer Shared Folders Cocal Users and Groups Cocal Users and Alert: Cocal Users and Alert: Cocal Users and Alert: Cocal Users and Alert: Cocal Users Cocal Users and Alert: Cocal Users Cocal Users and Alert: Cocal Users Cocal Users and Alert: Cocal Users Cocal Users	Volume (C:) Quorum (Q:) Software (D:) Volume Volume C: Software (D:) Software (D:) Soft	Layout Partition Partition Partition 1.99 G Unalloc Unalloc	Type Basic Basic Basic Basic Basic Basic	File System NTFS CDFS <u>N</u> ew P Proper <u>H</u> elp	Status Healthy (System) Healthy Healthy	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 will be shown.



Press the Next button to contine.

Select partition type

New Partition Wizard	X
Select Partition Type There are three types of partitions: primary, extended, and logical.	
Select the partition you want to create:	
Primary partition	
C Extended partition	
O Logical drive	
Description	1
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 > Can	cel

Select Primary partition.

Press the Next button to continue.

Sepecify 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:	2032				
	< <u>B</u> ack <u>N</u> ext > Cancel				

Press the Next button.

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 pa	artition.
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 m	ust format it first.			
Choose whether you want to format t	his partition, and if so, what settings you want to use.			
C Do not format this partition				
• Format this partition with the format the second seco	ollowing settings:			
<u>F</u> ile system:	NTFS 💌			
Allocation unit size:	Default			
⊻olume label:	Generic			
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.

New Partition Wizard		×
	Completing the New Partition Wizard You have successfully completed the New Partition Wizard. You selected the following settings: Partition type: Primary partition Disk selected: Disk 1 Partition size: 2039 MB Drive letter or path: R: File system: NTFS Allocation unit size: Default Volume label: Generic Duick format: No To close this wizard, click Finish.	
	< <u>B</u> ack Finish Cancel	

Press the Finish button.

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

💻 Computer Management						_ [IJŇ
📃 Eile Action <u>V</u> iew <u>W</u> indow H	elp						\mathbb{N}
	l						
Computer Management (Local)		Layout Partition	Type	File System	Status Healthy (System)	Capacity	Free
Event Viewer	Generic (R:)	Partition	Basic	NTFS	Healthy	1.99 GB	1.98
🗄 🕞 Shared Folders	💷 Quorum (Q:)	Partition	Basic	NTES	Healthy	1020 MB	1012
⊕	Software (D:)	Partition	Basic	CDFS	Healthy	4.30 GB	0 MB
Device Manager							
🗇 🚵 Storage							
Disk Defragmenter							
Disk Management	•						►
🕀 🚱 Services and Applications	Pick 1						•
	Basic	Gener	ic (R:))			
	1.99 GB Online	1.99 G Health	B NTFS				
		Thoulan	,				
	Basic	Quoru	m (0·	<u></u>			
	1020 MB	1020 N	IB NTFS				
		Health	Y				-
	Primary partition						

5. Node2 Settings

Networking settings

Internet Protocol (TCP/IP) Propertie	s ?x
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
O Obtain an IP address automatica	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 autor	natically
Use the following DNS server add	Iresses:
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 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 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.			
O Obtain an IP address automatical	ly 📗		
Use the following IP address:			
IP address:	192.168.2.22		
S <u>u</u> bnet mask:	255.255.255.0		
Default gateway:	· · ·		
C O <u>b</u> tain DNS server address autor	natically		
□ ● Use the following DNS server add	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	ly.

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

Computer Name Changes	?×
You can change the name and the membership of this computer. Changes may affect access to network resou	rces.
Computer name:	
node2	
Full computer name: node2.	
<u>M</u> or	e
Member of	
• Domain:	
KernSafe.local	
© <u>W</u> orkgroup:	
WORKGROUP	
OK Can	icel

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

Computer Name Ch	nanges ? 🗙
	G
Enter the name and 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 Chnages message dialog will be shown.

Compute	r Name Changes 🛛 🗙	I
i	Welcome to the KernSafe.local domain.	
	ОК	

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



Press the OK button to restart the 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:node2	kernsafe.local.	
To rename the initiator n	iode, click Change.	<u>C</u> hange	
To authenticate targets specify a CHAP secret.	using CHAP, click Secret to	Secret	
To configure IPSec Tun Tunnel.	nel Mode addresses, click	<u>I</u> unnel	
	OK Cancel	Apply	

Change to Discovery page

iSCSI Init	iator Prope	rties				X
General	Discovery	Targets P	ersistent Tar	gets Bound	Volumes/Devic	es
	et Portals —					1
Ad	dress	Port	Adapter		IP Address	
[[B	1 .		
<u> </u>	Add		<u>H</u> emove		H <u>e</u> tresh	
iSNS	Servers —					1
Na	me					
	A <u>d</u> d		Re <u>m</u> ove	F	Re <u>f</u> resh	
						1
			ОК	Cancel	Apply	

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

	×
socket number of the specific settings for	ne portal you the discovery
<u>P</u> ort:	
3260	<u>A</u> dvanced
ОК	Cancel
	socket number of th specific settings for <u>P</u> ort: 3260 OK

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

iSCSI Initiator Prope	rties	×
General Discovery	Targets Persistent Targets Bound Volumes/Devices	I,
Select a target and o target. Click details to devices for that targe	slick Log On to access the storage devices for that o see information about the sessions, connections and at.	
<u>n</u> argets.	Status	
generic	Inactive	
quorum	Inactive	
	<u>D</u> etails <u>L</u> og On <u>Refresh</u>	
	OK Cancel Apply	

Select a Target and then press the Log On button, then the Log On to Target dialog will be 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 installed on your computer.	d
Advanced OK Cancel	

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

Log On to Target		×
Target name:		
quorum		
Automatically restore this conn	ection when the system boots	
🔲 Enable multi-path		
Only select this option if iSCSI on your computer.	multi-path software is already in	nstalled
<u>A</u> dvanced	OK Can	cel

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

iSCSI Initiator Properties	×
General Discovery Targets Persistent Targets Bound Volumes/Device	es
Select a target and click Log On to access the storage devices for that target. Click details to see information about the sessions, connections and devices for that target.	
Name Status	
aeneric Connected	
quorum Connected	
<u>D</u> etails <u>Log On</u> R <u>e</u> fresh	
OK Cancel Apply	

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

Open Computer Management Console

📮 Computer Management		
📃 File Action View Window He	þ	_ 8 ×
Computer Management (Local)	Name System Tools Storage Services and Applications	
Local Users and Groups Groups Groups Groups Performance Logs and Alert: Groups Device Manager Storage		
Removable Storage Disk Defragmenter Disk Management		
Services and Applications		
	•	

Open Computer Management and select Disk Management.

📃 Computer Management							
🗐 Eile Action View Window H	lelp						\mathbf{N}
📙 Computer Management (Local)	Volume	Layout	Туре	File System	Status	Capacity	Free
🖻 🌇 System Tools		Partition	Basic		Healthy	1.99 GB	1.99
Event Viewer		Partition	Basic		Healthy	1020 MB	1020
	(C:)	Partition	Basic	NTFS	Healthy (System)	19.99 GB	17.0
Euclar Osers and Groups Euclar Osers and Groups Euclar Osers and Alerty	Software (D:)	Partition	Basic	CDFS	Healthy	4.30 GB	0 MB
Device Manager							
🖃 🚵 Storage							
🕀 🎡 Removable Storage							
Disk Management							
	Pisk 1						
	Basic		7///				
	1.99 GB Opline	1.99 G	B. ///				
		rieauri	07777				
	🗇 Disk 2						
	Basic 1020 MB	1020 M	ND.				
	Online	Health	ир У				
	Primaru partitia				1		-
		n					

Assign drive letters

📮 Computer Management							IX
📃 File Action View Window H	elp						$\mathbb{P} \times \mathbb{P}$
⇔ → 🗈 🖪 😫 🕅 🗙 🖆	1 😼						
Computer Management (Local) System Tools Superior Content Viewer Su	Volume	Layout Partition Partition Partition Partition	Type Basic Basic Basic Basic	File Sys NTFS CDFS	stem Status Healthy Healthy Healthy (System) Healthy	Capacity 1.99 GB 1020 MB 19.99 GB 4.30 GB	Free 1.99 1020 17.0 0 MB
Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage					Open Explore Mark Partition as Activ Change Drive Letter a Format	re nd Paths	-
	CPDISK 1 Basic 1.99 GB Online	1.99 G Healthy	B /		Delete Partition Properties		
	Cisk 2 Basic 1020 MB Online	1020 M Health	1B				
۲	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 Remove
OK Cancel

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

<u>?</u> ×
Q 💌
frowse
Cancel

Assign Q as drive letter.

Press the OK button.

📙 Computer Management							
📃 Eile Action View Window H	elp						P ×
← → 🗈 🖬 😫 🕄 🗙 🖆	1 👪						
Computer Management (Local)	Volume	Layout	Туре	File System	Status	Capacity	Free
🖹 🎬 System Tools		Partition	Basic		Healthy	1.99 GB	1.99
Event Viewer	🖃 (C:)	Partition	Basic	NTES	Healthy (System)	19.99 GB	17.0
	🗐 (Q:)	Partition	Basic		Healthy	1020 MB	1020
Local Users and Groups	Software (D:)	Partition	Op	en		4.30 GB	0 MB
Performance Logs and Alerce Device Mapager			EXP	olore		_	
			Mar	rk Partition as	Active		
🕂 📑 Removable Storage			⊆ha	ange Drive Lei	tter and Paths		
Disk Defragmenter			Eor	mat			
Disk Management	•		Del	oto Dortition		-	
🗄 🕵 Services and Applications			E	ete Partition	•		
	🗇 Disk 1		Pro	perties			
	L Basic 1.99 GB	1.00 0	Hal			-	
	Online	Health		P			
		l					
	🗇 Disk 2						
	Basic 1020 MB	(Q:)	D				
	Online	Health	10 /				
		1]		-
	Primary partitio	n					

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
OK Cancel

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.

🔄 Cluster Administrator			_ 🗆 🗵
Eile <u>V</u> iew <u>H</u> elp			
Open Connection	n to Cluster	?×	
Action			
Create new clus	tei 🔽		
<u>Cluster or server</u>	name:		
	T	Browse	
	<u>0</u> K	Cancel	
For Help, press F1			NUM //

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

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.	
 ✓ Checking for existing cluster ✓ Establishing node connection(s) ✓ Checking node feasibility ✓ Finding common resources on nodes ✓ Checking cluster feasibility 	
Tasks completed.	
View Log Details <u>P</u> etails <u>P</u> etails <u>F</u> Click Next to continue. Click Back to change the configuration.	<u>}</u> e-analyze
< <u>B</u> ack	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 add	dress of the	e 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. Press the Next button to continue.

Type cluster service account

New Server Clus	ter Wizard	×
Cluster Servi Enter login be run.	ice Account information for the domain account under which the cluster service will	Ê
<u>U</u> ser name:	cluster	
<u>P</u> assword:	•••••	
<u>D</u> omain:	KernSafe.local	
This acc for prope	ount will be given local administrative rights on all nodes of this cluster to a r operation.	llow
	< <u>B</u> ack <u>N</u> ext > 0	Cancel

Enter the username and password of cluster.

Press the Next button to continue.

Proposed cluster configuration

Proposed Cluster Configuration Verify that you want to create a cluster with the following configuration.	v Server Cluster Wizard		×
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) PR0/1000 MT Network Connection Primary Address: 192.168.1.11 \ 255.255.255.0 Cluster service account credentials: Name:cluster Password: ************************************	Proposed Cluster Configuration Verify that you want to create a cluster with	h the following configuration.	
Ta analia a dudaa ulii kii aanGaunian aliah Mart	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 Connecti Primary Address: 192.168.1.11 \ 255.255. Cluster service account credentials: Name:cluster Password: **********	tion 5.255.0 Uuorum View Log	

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



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.			Ê
 ✓ Reanalyzing cluster ✓ Configure cluster services ✓ Configure resource types ✓ Configure resources 			
	⊻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.

Complet cluster creating



Press the Finish button to finish.

Come back to the Cluster Adminisrator Console

🛱 Cluster Administrator - KERNSAFECLUSTER (Kernsafecluster.KernSafe.local)					
<u>File View Window H</u> elp					
<u>8 (A ×8 0 - :</u>	- == ==				
🖷 KERNSAFECLUSTER (Kernsafeclust	er.KernSafe.local)				
	Name	State	Description		
Groups Resources Cluster Configuration ⊕ - ∰ NODE1	Groups Resources Cluster Configuration RoDE1	Up			
For Help, press F1					

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

Add node2 to the cluser

Open Connection to Cluste	? X
Action:	
Add nodes to cluster	•
<u>C</u> luster or server name:	
KERNSAFECLUSTER	▼ <u>B</u> rowse
	<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 will be shown

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.	
	< Back Next > Cancel	

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:		B <u>r</u> owse
Selected computers:	node2	<u>A</u> dd
		Remove
		Advanced
	,	
	< <u>B</u> ack	xt> 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 	
Tasks completed.	
<u>V</u> iew Log <u>D</u> etails <u>R</u> e-analyze Click Next to continue. Click Back to change the configuration.	1
< <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	×
Cluster Servi Enter login be run.	ce Account information for the domain account under which the cluster service will	
<u>U</u> ser name: <u>P</u> assword:	cluster	
<u>D</u> omain:	KernSafe.local	
This according for proper	ount will be given local administrative rights on all nodes of this cluster to a operation.	low
	< <u>B</u> ack <u>N</u> ext > C	ancel

Enter the password of cluster user.

Press the Next button to continue.

Proposed cluster configuration

Nodes Wizard		>
Proposed Cluster Configuration Verify that you want to add nodes to a clus	ster with the following configuration	
Cluster name:		_
KERNSAFECLUSTER.KernSafe.local		
Cluster IP address:		
192.168.1.33\255.255.255.0		
Cluster network: Local Area Connection - Private and Public		
Primary Address: 192.168.1.11 \ 255.255	.255.0	
Cluster service account credentials:		
Name:cluster Password: **********************		-
		⊻iew Log
To add nodes to a cluster with this configuratio	n, click Next.	
	< <u>B</u> ack <u>N</u> ext >	Cancel

Press the Next button to continue.

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 	
	<u>V</u> iew Log <u>D</u> etails <u>R</u> etry
	< Back Next > 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.

 Add Nodes Wizard

 Image: Completing the Add Nodes Wizard

 You have successfully completed the Add Nodes Wizard.

 Image: Wiew Log...

 To close this wizard, click Finish.

 Image: Back

 Image: Finish

 Cancel

Finish adding node to the cluster.

Press the Finish button.

7. Add new shared resources

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

Select Device Type	×
Please select a device type	4
Select Device Type	Description
C RAM disk device	This option is to create a virtual
• Image file disk device	file, and all clients share this
O Security image file disks for each client	one file.
O Partition-to-Disk bridged device	
C Physical disk bridged device	
C Virtual CD/DVD	
C CD/DVD-ROM/RW bridged device	
C Generic SCSI bridged device	
C RAID-1(Mirror) device	
	< <u>B</u> ack <u>N</u> ext > Cancel

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

Set Image Disk Source	×
Set image disk parameters	4
Device Parameters	
O Use existing image file O Create a new image file	
C:\spool.img Browse	
Enter Device size in MBytes:	
Use sparse file on NTFS file system	
☐ Format image file to: FAT ▼	
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	
< <u>B</u> ack <u>N</u> ext > C	ancel

Create an .img file named spool 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	4	
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.		
		_
< <u>B</u> ack Finish	Cancel	

Enter spool as the Target name, check Report as readonly device when initator can not get write access and Enable multiple initators with full access connected (sharing and clustering). Press the Finish button to complete iSCSI Target creation.

& KernSafe iStorage Server - Targets I	ist					
Service Clients View Tools Help						
Create Delete Start Stop	Refresh Add Remove C	ilient -	Access Settings	Print	About	
In- iscsi Target 03DCx64	Target Name	Devic	Source	Cap	Authentic	Sta
quorum	🥯 quorum	Disk	C:\quorum.img	1.00G	IP Filter	Ena
	🁒 generic	Disk	C:\generic.img	2.00G	IP Filter	Ena
spool	🁒 spool	Disk	C:\spool.img	1.00G	IP Filter	Ena
- 🔒 Users						
J]					
Ready			S) Connected:03D(Ex64(20-Da	ays Trial)	11.

Come back to iStorage Server Console.

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

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

iSCSI Initiator Prope	rties	×
General Discovery	Targets Persistent Target	s [Bound Volumes/Devices]
Select a target and o target. Click details to devices for that targe <u>T</u> argets:	click Log On to access the st o see information about the s et.	orage devices for that essions, connections and
Name		Status
generic		Connected
spool		Inactive
	<u>D</u> etails <u>L</u> og	On <u>Re</u> fresh
	ОК	Cancel Apply

Press the Log On button.

Log On to Target	X	J
Target name:		
spool		
Automatically restore this connection	n when the system boots	
🔲 Enable multi-path		
Only select this option if iSCSI multi on your computer.	-path software is already installed	
<u>A</u> dvanced	OK Cancel	

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.

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. <u>D</u> isks:	
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:	
Disk 3	
< <u>B</u> ack <u>N</u> ext > 0	Cancel

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					_ 8 ×
	ł					
Computer Management (Local)	Volume	Layout	Туре	File System	Status	Capacity
Event Viewer		Partition	Basic	NTFS	Healthy (System)	19.99 GB
	ARMEXVOL_EN (D:)	Partition	Basic	CDF5 NTEC	Healthy	594 MB
E Cocal Users and Groups		Partition	Basic	NTES	Healthy (Active)	1.99 GD 1020 MB
🕀 🐺 Performance Logs and Alert:		Farticion	Dasic	1411 5	fieldiny (Active)	1020100
🚬 🔜 Device Manager						
E- 🛅 Storage						
Disk Management	•					Þ
🗄 🔂 Services and Applications						-
	Basic C	i- (D				
	1.99 GB 1.	99 GB NTF	s.			
	Online H	ealthy				
	🗇 Disk 3					
	Basic	//////	////	////////		
	1020 MB 10	020 MB 🥢		<u>N</u> ew Pa	rtition	
		nanocateu		 Properti	es	-
	Unallocated Prin	hary partitio	n			

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

New Partition Wizard		X
	Welcome to the New Partition Wizard	
	This wizard helps you create a partition on a basic disk.	
	A basic disk is a physical disk that contains primary partitions, extended partitions, and logical drives.	
	Partitions created on Master Boot Record (MBR) disks can be accessed from any version of Windows or MS-DOS.	
	Partitions created on GUID Partition Table (GPT) disks can only be accessed from Windows Server 2003 Service Pack 1 or later, or from any 64-bit version of Windows.	
	To continue, click Next.	
	< Back Next > Cancel	

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
C Extended partition
C 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 > Cancel

Select Primary partition

Press the Next button to continue.

Specify partition size	Specify	partition	size
------------------------	---------	-----------	------

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

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:
Eile system: NTFS
Allocation unit size:
⊻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

New Partition Wizard		×
	Completing the New Partition Wizard You have successfully completed the New Partition Wizard.	
	You selected the following settings: Partition type: Primary partition Disk selected: Disk 3 Partition size: 1019 MB Drive letter or path: S: File system: NTFS Allocation unit size: Default Volume label: Spool Ouick format: No 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						- D ×
🗐 Eile <u>A</u> ction <u>V</u> iew <u>W</u> indow <u>H</u>	įelp					_ Ð ×
	1					
Computer Management (Local) System Tools System Tools Shared Folders Cocal Users and Groups Cocal Users Cocal Use	Volume (C:) ARMEXVOL_EN (D:) Generic (R:) Quorum (Q:) Spool (S:)	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
	Colline	Generic (R .99 GB NTF Healthy	::) 5			_
	Colline	i pool (S:) 020 MB NTR lealthy	=5			
	Primary partition					

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

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

iSCSI Initiator Properties	×
General Discovery Targets Pe	rsistent Targets Bound Volumes/Devices
Select a target and click Log On to target. Click details to see informati devices for that target.	access the storage devices for that on about the sessions, connections and
Name	Status
generic	Connected
quorum	Lonnected
Details	Log On Refresh
	OK Cancel Apply

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

Log On to Target	×
Target name:	
spool	
Automatically restore this connection when th	e system boots
🔲 Enable multi-path	
Only select this option if iSCSI multi-path soft on your computer.	ware is already installed
Advanced O	K Cancel

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.

■ Elle Action Wiew Window Help ■ <th>📮 Computer Management</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	📮 Computer Management							
Image: Computer Management (Local) Yolume Layout Type File System Status Capacity Image: Computer Management (Local) Image: Computer Management (Local) Partition Basic Healthy 1020 MB Image: Computer Management (Local) Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Management Image: Computer Manageme	Eile Action View Window Help							
Computer Management (Local) Volume Layout Type File System Status Capacity System Tools Performance Logs and Alert Performance Logs and Alert Partition Basic Healthy 1020 MB Performance Logs and Alert Performance Logs and Alert Partition Basic CDF5 Healthy 1.99 GB Performance Logs and Alert Performance Logs and Alert Partition Basic CDF5 Healthy 1.99 GB Storage Performance Logs and Alert Partition Basic CDF5 Healthy 1.99 GB Storage Performance Logs and Alert Partition Basic CDF5 Healthy 1.99 GB Storage Performance Logs and Alert Partition Basic CDF5 Healthy 1.99 GB Storage Performance Logs and Applications Performance (R:) Partition Basic CDF5 Healthy 1.99 GB Storage Disk Defragmenter Disk 2 Mark Partition as Active Change Drive Letter and Paths Eormat Dool MB Online Poperties Healthy Poperties Help	⇔ → 🗈 🖬 😫 🕅 🗙 🖆	' 😼						
Image: Construct of Construction Image: Construct of Construction Image: Con	Computer Management (Local) ⊡-∰ System Tools ⊡- Event Viewer ⊡- Shared Folders	Volume (C:) (Q:)	Layout Partition Partition Partition	Type Basic Basic Basic	File System	Status Healthy Healthy (System) Healthy (Active)	Capacity 1020 MB 19.99 GB 1020 MB	
Disk Defragmenter Disk Management Services and Applications Disk 2 Basic 1020 MB Online Disk 3 Basic 1020 MB Disk 3 Basic 1020 MB Disk 3 Basic Disk 4 Disk 4 Disk 2 Basic 1020 MB Disk 3 Basic Disk 4 Disk 4 Dis	E - S Local Users and Groups E - S Performance Logs and Alert: Device Manager E - S Storage E - S Removable Storage	ARMEXVOL_EN (D:)	Partition Partition	Basic Basic	CDFS NTFS	Healthy Healthy	594 MB 1.99 GB	
1020 MB 1020 MB Online 1020 MB Healthy (Active) Properties Basic Help 1020 MB 1020 MB Disk 3 Help Basic Help 1020 MB Help	Disk Defragmenter Disk Management ⊡- ∰ Services and Applications	Basic	(Q:)		<u>Mark Partitio</u> Change Drive Format	n as Active e Letter and Paths		
1020 MB 1020 MB		Online	D20 MB ealthy (Act	ive)	Delete Partit Properties Help	ion		
Primary partition		1020 MB Online Primary partition	020 MB ealthy					

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

Change Drive Letter and Paths for 1019 MB Primary	partiti <mark>?</mark> X
Allow access to this volume by using the following drive lette	r and paths:
Add Change <u>R</u> emove	
ОК	Cancel
Click the Add button	
Lick the Add Button.	
Add Drive Letter or Path	ŶX
Add a new drive letter or path for 1019 MB. Primary partitio	
Assign the following drive letter:	S 🔽
O Mount in the following empty NTFS folder:	
	Browse
ΟΚ	Cancel
ОК	Cancel

Assign S as drive letter and press the OK button.

Open Cluster Administrator

Image: Serie Diversify Image: State Owner Groups Image: State Owner Groups Image: Owner Groups Image: State Owner Owner Groups Image: Owner Image: State Owner Groups Owner Groups Image: State Owner Owner Groups Image: Owner Image: State Owner Owner Groups Image: Owner Image: State Owner Owner Owner Groups Image: State Owner Owner Owner Group Owner Image: State Owner Owner Owner	Cluster Administrator - KERNSAFEO	LUSTER (KERNSAFECLU	JSTER.KernSal	fe.local)		
Image: State Cluster (KERNSAFECLUSTER, KernSafe.local) Image: State Owner Image: Groups I		- ::: :				
Groups Cluster IP Address Online NODE1 Cluster Gr Cluster IP Address Online NODE1 Cluster Gr Cluster Name Online NODE1 Cluster Gr Disk R: Online NODE2 Group 0 Disk R: Online NODE2 Group 0 Node Cluster All Configure Application Resource Node Cluster Cluster Cluster Cluster Gr Node Cluster Cluster Cluster Gr Node Cluster Cluster Cluster Cluster Gr Node Cluster Cluster Cluster Cluster Cluster Cluster Gr Cluster Cluster Cluster Cluster Gr Cluster Cluster Cluster Cluster Gr Cluster Cluster Cl	SKERNSAFECLUSTER (KERNSAFECLU Gradien KERNSAFECLUSTER	JSTER.KernSafe.local) Name	State	Owner		
	Image: Second state sta		Online Online Online Online	NODE1 NODE1 NODE1 NODE2	Cluster Gri Cluster Gri Cluster Gri Group 0	
		•		►.		

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

New Resource		
	Image: Description: Description: Resource type: Group: Description: To continue, click	Spool KernSafe Disk Physical Disk Group 0 urce in a separate Resource Monitor
	<	Back <u>N</u> ext > Cancel

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

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. resource.
Available nodes:	Possible <u>o</u> wners:
Name	Add -> <- <u>R</u> emove
	< <u>B</u> ack <u>N</u> ext > Cancel

Add node1 and node2 to Possible owners.

Press the Next button to continue.

Dependencies				
Dependencies are resource: Specify the dependencies fo	s which or this re	must be brought o source.	nline by the cluster s	ervice first.
Available resources:		R	esource <u>d</u> ependenc	ies:
Resource	Resc		Resource	Resc
Disk R:	Phys	<u>A</u> dd -> <- <u>R</u> emove	•	
		< <u>B</u> ack	<u>N</u> ext >	Cancel

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

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

Cluster A	dministrator 🛛 🗙
i	Cluster resource 'Spool' created successfully.
	ОК

Press the OK button.

Come back to the Cluster Administrator Console

🚰 Cluster Administrator - KERNSAFECLUSTER (KERNSAFECLUSTER.KernSafe.local)						
<u>File View Window H</u> elp						
5 () () () () () () () () () () () () ()						
KERNSAFECLUSTER (KERNSAFECLUSTER.KernSafe.local)						
	Name	State	Owner	Group		
Groups	🛄 Disk Q:	Online	NODE1	Cluster Gri		
Resources	Cluster IP Addres	ss Online	NODE1	Cluster Gri		
	🛄 Cluster Name	Online	NODE1	Cluster Gri		
	🛄 Disk R:	Online	NODE2	Group 0		
	Spool Bring Opli	Offline De Chri±B	NODE2	Group 0		
	Take Offi	ine Ctrl+T				
	Initiate Fa	ailure Ctrl+I				
	Change G	iroup 🕨				
	Delete	culup.				
	Delete	Ctrl+D Ctrl+M				
		Curren				
	New	•				
	Configure	Application				
<u> </u>	Properties	s	<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						
S (A × 🗗 🗗 😐 :	b- b- b-b-					
🛱 KERNSAFECLUSTER (KERNSAFECLUSTER.KernSafe.local)						
E- 🗐 KERNSAFECLUSTER	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		
	🛄 Spool	Online	NODE2	Group 0		
<u> </u>				<u> </u>		
For Help, press F1						

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.