iStorage Server: iSCSI SAN for Windows Server 2008 Clustering

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KernSafe Technologies, Inc.

www.kernsafe.com

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Overview

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

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



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

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

Configuring on Domain Controller

Network Adapter

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

Internet Protocol Version 4 (TCP/IP)	/4) Properties	? ×
General		
You can get IP settings assigned auton this capability. Otherwise, you need to for the appropriate IP settings.	natically if your network suppor ask your network administrato	ts r
C Obtain an IP address automatical	ly	
• Use the following IP address:		
IP address:	192.168.1.2	
Subnet mask:	255 . 255 . 255 . 0	
Default gateway:	192.168.1.2	
C Obtain DNS server address autor	natically	
□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	lresses:	_
Preferred DNS server:	192 . 168 . 1 . 2	
Alternate DNS server:		
Validate settings upon exit	Ad <u>v</u> anced.	
	OK Can	icel

Type the IP address and DNS server address.

Press the OK button to continue.

Install Active Directory

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

🖅 Run		×
	Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.	
Open:	dcpromo	
	🛞 This task will be created with administrative privileges.	
	OK Cancel <u>B</u> rowse	

Press the OK button to continue.

The Active Directory Domain Services Installation Wizard is shown.



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

The sector of th	×I
Operating System Compatibility Improved security settings in Windows Server 2008 and Windows Server 2008 R2 affect older versions of Windows	
Windows Server 2008 and "Windows Server 2008 R2" domain controllers have a new more secure default for the security setting named "Allow cryptography algorithms compatible with Windows NT 4.0." This setting prevents Microsoft Windows and non-Microsoft SMB "clients" from using weaker NT 4.0 style cryptography algorithms when establishing security channel sessions against Windows Server 2008 or "Windows Server 2008 R2" domain controllers. As a result of this new default, operations or applications that require a security channel serviced by Windows Server 2008 or "Windows Server 2008 R2" domain controllers might fail. Platforms impacted by this change include Windows NT 4.0, as well as non-Microsoft SMB "clients" and network-attached storage (NAS) devices that do not support stronger cryptography algorithms. Some operations on clients running versions of Windows earlier than Windows Vista with Service Pack 1 are also impacted, including domain join operations performed by the Active Directory Migration Tool or Windows Deployment Services. For more information about this setting, see Knowledge Base atticle 942564 (http://go.microsoft.com/fwlink/?LinkId=104751).	
< <u>B</u> ack <u>N</u> ext > Cancel	

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

Active Directory Domain Services Installation Wizard	×
Choose a Deployment Configuration You can create a domain controller for an existing forest or for a new forest.	
◯ <u>E</u> xisting forest	
C ≙dd a domain controller to an existing domain	
C <u>C</u> reate a new domain in an existing forest This server will become the first domain controller in the new domain.	
Create a new domain in a new forest	
More about possible deployment configurations	
< <u>B</u> ack <u>N</u> ext >	Cancel

Specify the name of Forest Root Domain.

Active Directory Domain Services Installation Wizard	×
Name the Forest Root Domain The first domain in the forest is the forest root domain. Its name is also the name of the forest.	
Type the fully qualified domain name (FQDN) of the new forest root domain.	
EQDN of the forest root domain:	
Evample: com contoso com	-
Example, corp.com/oso.com	
< <u>B</u> ack <u>N</u> ext > Car	ncel

Select the Forest functional level.

active Directory Domain Services Installation Wizard	×
Set Forest Functional Level Select the forest functional level.	
Forest functional level:	
Windows Server 2008 R2	
<u>D</u> etails:	
The Windows Server 2008 R2 forest functional level provides all the features that are available in the Windows Server 2008 forest functional level, plus the following additional feature: - Recycle Bin, which, when it is enabled, provides the ability to restore deleted objects in their entirety while Active Directory Domain Services is running. Any new domains that are created in this forest will operate by default at the Windows Server 2008 R2 domain functional level.	
You will be able to add only domain controllers that are running Windows Server 2008 R2 or later to this forest.	
More about <u>domain and forest functional levels</u>	
< <u>B</u> ack <u>N</u> ext > Can	cel

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

Press the **Next** button to continue.

Select the additional options for this domain controller.

Active Directory Domain Services Installation Wizard	X
Additional Domain Controller Options	
Select additional options for this domain controller.	
DNS server	
🔽 Global catalog	
<u><u><u>R</u>ead-only domain controller (RODC)</u></u>	
Additional information:	
We recommend that you install the DNS Server service on the first domain controller.	V
More about additional domain controller options	
< <u>B</u> ack <u>N</u> ext >	Cancel

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

Press the **Next** button to continue.

The Active Directory Domain Services Installation Wizard is shown.

active	Directory Domain Services Installation Wizard	×
<u>^</u>	A delegation for this DNS server cannot be created because the authoritative parent zone cannot be found or it does not run Windows DNS server. If you are integrating with an existing DNS infrastructure, you should manually create a delegation to this DNS server in the parent zone to ensure reliable name resolution from outside the domain "KernSafe.Local". Otherwise, no action is required. Do you want to continue?	
	<u>Y</u> es	

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

Active Directory Domain Services Installation Wizard	×
Location for Database, Log Files, and SYSVOL Specify the folders that will contain the Active Directory domain contro database, log files, and SYSVOL.	ller
For better performance and recoverability, store the database and log volumes.	files on separate
Database folder:	
C:\Windows\NTDS	B <u>r</u> owse
Log files folder:	
C:\Windows\NTDS	Br <u>o</u> wse
SYSVOL folder:	
C:\Windows\SYSVOL	Bro <u>w</u> se
More about <u>placing Active Directory Domain Services files</u>	
< <u>B</u> ack <u>N</u> ext	> Cancel

Press the **Next** button to continue.

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

Active Directory Domain Services Installation Wizard	×
Directory Services Restore Mode Administrator Password	
The Directory Services Restore Mode Administrator account is different from the domain Administrator account.	
Assign a password for the Administrator account that will be used when this domain controller is started in Directory Services Restore Mode. We recommend that you choose a strong password.	
Password:	
Confirm password:	
More about Directory Services Restore Mode password	
< <u>B</u> ack <u>N</u> ext > Cancel	

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

a Active Directory Domain Services Installation Wizard	×
Summary	
Review your selections: Configure this server as the first Active Directory domain controller in a new forest. The new domain name is "KemSafe.Local". This is also the name of the new fore The NetBIOS name of the domain is "KERNSAFE". Forest Functional Level: Windows Server 2008 R2 Domain Functional Level: Windows Server 2008 R2 Site: Default-First-Site-Name Additional Options: To change an option, click Back. To begin the operation, click Next. These settings can be exported to an answer file for use with attent unattended exportions	st.
More about <u>using an answer file</u> < <u>B</u> ack <u>N</u> ext >	Cancel

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



Press the Finish Button to close the wizard.

Restart is required.



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

Install DNS

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



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

The New Zone Wizard is shown.



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 balan the processing load of primary servers and provides fault tolerance.	ce
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 no authoritative for that zone.	ot
Store the zone in Active Directory (available only if DNS server is a writeable do controller)	main
< Back Next > Ca	ancel

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

Press the **Next** button to continue.

Select zone replication scope.

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:	
\bigcirc To all DNS servers running on domain controllers in this forest: KernSafe.Local	
To all DNS servers running on domain controllers in this domain: KernSafe.Local	
C To all domain controllers in this domain (for Windows 2000 compatibility): KernSafe.Local	
$oldsymbol{O}$ To all domain controllers specified in the scope of this directory partition:	
	Y
< Back Next > Ca	incel

Keep the default selection.

Press the **Next** button to continue.

Choose reverse lookup zone name.

New Zone Wizard	×
Reverse Lookup Zone Name A reverse lookup zone translates IP addresses into DNS names.	
Choose whether you want to create a reverse lookup zone for IPv4 addresses or addresses.	IPv6
IPv4 Reverse Lookup Zone	
C IPv6 Reverse Lookup Zone	
< Back Next >	Cancel

Select IPv4 Reverse Lookup Zone.

Press the **Next** button to continue.

Type the network ID or zone name.

New Zone Wizard			×
Reverse Lookup Zone Name A reverse lookup zone translates IP addres	ses into DNS nar	mes.	
To identify the reverse lookup zone, type the Network ID: 192 .168 .1	ne network ID or addresses that b order. vill appear in the addr.arpa, and i	r the name of the belongs to this zo zone name. For network ID 10.0	e zone. one. Enter the example, would create
	< Back	Next >	Cancel

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

Press the **Next** button to continue.

Specify dynamic update options.

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 resource records with a DNS server whenever changes occur. Select the type of dynamic updates you want to allow:	their
 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. 	
O not allow dynamic updates Dynamic updates of resource records are not accepted by this zone. You must these records manually.	update
< Back Next >	Cancel

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



Press the Finish button to close the New Zone Wizard.

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

File Action View Help
ONS Name Type Data Timestamp Image: Start of Start of Authority (SOA) Global Logs
Create a new host resource record.

The **New Host** dialog is shown.



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

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

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

New Host
Name (uses parent domain name if blank):
08Node2
Fully qualified domain name (FQDN):
08Node2.KernSafe.Local.
IP address:
192.168.1.102
Create associated pointer (PTR) record
Allow any authenticated user to update DNS records with the same owner name
Add Host Done

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

Check the Create associated pointer (PTR) record checkbox.

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

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

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

🚊 DNS Manager				
File Action View Help				
🗢 🔿 🗾 🖬 🗙 🗔 🤒				
DNS 08DC Global Logs Forward Lookup Zones Conditional Forward Lockup Zones Reverse Lookup Zones Conditional Forwarders	Name msdcs sites tcp DomainDnsZones ForestDnsZones (same as parent folder) (same as parent folder) 08dc win-ak3i2gk1360 08Node 1 08Node 2	Type Start of Authority (SOA) Name Server (NS) Host (A) Host (A) Host (A) Host (A) Host (A)	[47], 08dc.kernsafe.local., 08dc.kernsafe.local. 192.168.0.197 192.168.0.197 192.168.0.197 192.168.1.101 192.168.1.102	Timestamp static static 1/12/2010 9: static static
	 			•

🚊 DNS Manager				
<u>File Action View H</u> elp				
🗢 🔿 🗾 🖬 💢 🖬 🔒				
 DNS OBDC Global Logs Forward Lookup Zones Forward Lookup Zones KernSafe.Local KernSafe.Local KernSafe.Local KernSafe.Local Conditional Forwarders 	Name (same as parent folder) (same as parent folder) 192.168.1.101 192.168.1.102	Type Start of Authority (SOA) Name Server (NS) Pointer (PTR) Pointer (PTR)	Data [3], 08dc.kernsafe.local., h 08dc.kernsafe.local. 08node1.kernsafe.local. 08node2.kernsafe.local.	Timestamp static static static static
				•

Configuring on iStorage Server

Network Adapter

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

Internet Protocol Version 4 (TCP/IPv4) Properties				
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:	192.168.0.6			
Subnet mask:	255.255.255.0			
Default gateway:	192.168.0.1			
C Obtain DNS server address autor	natically			
Use the following DNS server add	resses:			
Preferred DNS server:	192.168.0.1			
Alternate DNS server:	· · ·			
Validate settings upon exit	Advanced			
	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.

Preparing Quorum Volume

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

Select a device type



Choose Image file disk device.

Press the **Next** button to continue.

Specify image file path and size.

Create iSCSI Target Wizard		×
Image Disk Configuration You can specify a image file as an iSCSI device.	3	
Device Parameters		1
O Use existing image file O Create a new image file		
E:\Quorum.img Browse		
Enter Device size in MBytes:		
Use sparse file on NTFS file system		
Format 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		
< Back Next > 0	Cancel	

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

Specify the device size.

Press the **Next** button to continue.

Set authorization mode.

Create iSCSI Target Wizard		×
Authorization You can select an authorization mode, CHAP	or IP filter.	3
Authorization Mode		
Authorization Type:		
Specific users has read and write access right	, the others only have read access	
Authorization Mode (Who has "write" access)		_
C CHAP User Authorization		
Select a group has read and write access:	v	
Select a group has read only access:	v	
IP address authorization, first IP:	0.0.0.0	
	< Back Next > (Cancel

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: iqn.2006-03.com.kemsafe.KemStorage.Quorum Image: Report as readonly device when initiator can not get write access Image: Report as readonly device when initiator can not get write access Image: Report as readonly device when initiator can not get write access Image: Report as readonly device when initiator can not get write access Image: Report as readonly device when initiator can not get write access Image: Report as readonly device when initiator can not get write access Image: Report as readonly device when initiator can not get write access Image: Report as readonly device when initiator can not get write access Image: Report as readonly device when initiator can not get write access Image: Report as readonly device when initiator can not get write access Image: Report as readonly device when initiator can not get write access Image: Report as readonly device when initiator can not get write access Image: Report as readonly device when initiator can not get write access Image: Report as readonly device when initiator can not get write access Image: Report as readonly device when initiator can not get write access Image: Report as readonly device when initiator can not get write access Image: Report as readonly device when initiator can not get write access Image:	
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.	Cancel

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

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

Press the **Finish** button to continue.

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

🎄 KernSafe iStorage Server - IP Filters			
Service Clients View Tools Help			
Create Delete Start Stop	Refresh Add Remove Client	Access Settings Print About	
	IP Address	Computer Name	Ac
KernStorage.Quorum	0.0.0.0 Refresh	Any Address	Re
Groups	Add to IP Filter		
	Access	Readonly	
	Remove from IP filter	Full Access	
		Refuse	
Make clients have have read and write privilege	s	Connected:KernStorage(Ultimate Licens	e)

Right click on the 0.0.0.0 item, and then select Access -> Full Access.

Preparing Generic Volume

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

Select a device type



Choose Image file disk device.

Press the **Next** button to continue.

Specify image file path and size.

Create iSCSI Target Wizard		×
Image Disk Configuration You can specify a image file as an iSCSI device.		
Device Parameters O Use existing image file E:\Generic.img Browse Enter Device size in MBytes: 4096 • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •		
< Back Next > Can	cel	

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

Specify the device size.

Press the **Next** button to continue.

Set authorization mode.
Create iSCSI Target Wizard		×
Authorization You can select an authorization mode, CHAP	or IP filter.	3
Authorization Mode		
Authorization Type:		
Specific users has read and write access right,	, the others only have read access	
Authorization Mode (Who has "write" access)		_
C CHAP User Authorization		
Select a group has read and write access:	7	
Select a group has read only access:	V	
IP address authorization, first IP:	0.0.0.0	
	< Back Next > (Cancel

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:	
iqn.2006-03.com.kemsafe.KemStorage.Generic ✓ Report as readonly device when initiator can not get write access	
I 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

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

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

Press the **Finish** button.

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

KernSafe iStorage Server - IP Filters			
Service Clients View Tools Help			
Create Delete Start Stop	Refresh Add Remove Client	Constant Access Settings Print	About
		Computer Name	
iSCSI Target:KernStorage	0.0.0.0	Computer Name	I Re
KernStorage.Generic		Refresh	
Users		Add to IP Filter	
Groups		Access >	Readonly
		Remove from IP filter	Full Access
			Refuse
	•		F
Make clients have have read and write privilege	25	🔇 Connected:KernStorage(Ulti	mate License)

Right click on the **0.0.0.0** item, and then select **Access -> Full Access**.

Now the sample images is shown in the iStorage Server management console if successful.

🌯 KernSafe iS	torage Ser	ver - Targ	ets List							<u>_ </u>
∫ <u>S</u> ervice <u>C</u> lie	nts <u>V</u> iew	<u>T</u> ools <u>H</u>	<u>t</u> elp							
1 👶 🖇	X		2		22.3		A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A	2	i	
Create De	lete Sta	art Sto	p Refre	sh Add	Remove	Client	Access Settings	Print	About	
	arget:03DCxl	54	Targe	t Name		Devic	Source	Cap	Authentic	Sta
🗍 T 🏹 🎯 qua	rum		😒 qu	iorum		Disk	C:\quorum.img	1.00G	IP Filter	Ena
🔜 🍛 ger	ieric		😒 ge	neric		Disk	C:\generic.img	2.00G	IP Filter	Ena
🔜 😓 Users										
Groups										
<u> </u>										
Ready							S Connected:03D	x64(Star	ndard License)	1

Configuring on Cluster Node 1

Network Adapter

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

Version 4 (TCP/IPv4) dialog is shown.

Internet Protocol Version 4 (TCP/IP	v4) Properties
General	
You can get IP settings assigned autor this capability. Otherwise, you need to for the appropriate IP settings.	matically if your network supports ask your network administrator
O Obtain an IP address automatica	lly
• Use the following IP address:	
IP address:	192.168.1.101
S <u>u</u> bnet mask:	255.255.255.0
Default gateway:	192.168.1.2
${f C}$ Obtain DNS server address auto	matically
□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	dresses:
Preferred DNS server:	192.168.1.2
<u>A</u> lternate DNS server:	· · ·
Vaļidate settings upon exit	Ad <u>v</u> anced
	OK Cancel

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

Set the second network adapter of 08Node.

Internet Protocol Version 4 (TCP/IPv	(4) Properties	? ×
General		
You can get IP settings assigned autor this capability. Otherwise, you need to for the appropriate IP settings.	natically if your network suppo ask your network administrat	orts or
Obtain an IP address automatical	ly	
Use the following IP address:		
IP address:	192.168.2.101	
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:		
Alternate DNS server:		
Validate settings upon exit	Advanced	ł
	ОК Са	ancel

Type in the IP address and Subnet mask.

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

Join to the domain

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

Open System Properties page.

⊈ System				_ [] >
🕞 💽 💌 👻 Control Panel 🗸	System and Security 🝷 System	-	Search Control Panel	۶.
Control Panel Home	View basic information abo	ut your computer		
🛞 Device Manager	Windows edition			
Remote settings	Windows Server 2008 R2 Er	nterprise		\frown
Advanced system settings	Copyright © 2009 Microsoft	Corporation. All rights reserve	ed.	7
	System			
	Processor:	Intel(R) Core(TM)2 CPU	6320 @ 1.86GHz 1.87 GHz	
	Installed memory (RAM):	512 MB (512 MB usable)		
	System type:	64-bit Operating System		
	Pen and Touch:	No Pen or Touch Input is av	ailable for this Display	
	Computer name, domain, and w	orkgroup settings		
	Computer name:	WIN-761UGR36DM5	1	Change settings
	Full computer name:	WIN-761UGR36DM5	_	
	Computer description:			
	Workgroup:	WORKGROUP		
See also	Windows activation			
Action Center	ጺ 23 days to activate. Ac	tivate Windows now		
Windows Update	Product ID: 00486-109-000	0007-84128 Change produc	t key	

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

System Properties				×
Computer Name Hardwa	re Advanced Rer	note		
Windows uses on the network	the following informa	tion to identify y	our computer	
Computer description:				
	For example: "IIS Pr "Accounting Server	roduction Server '''.	r" or	
Full computer name:	WIN-761UGR36DM	15		
Workgroup:	WORKGROUP			
To rename this computer workgroup, click Change	or change its domain	or	<u>Q</u> hange	
	ОК	Cancel	Apply	

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

Computer Name/Domain Changes	×
You can change the name and the membership of this computer. Changes might affect access to network resources <u>More information</u>	
Computer name:	
USNODE I	
Full computer name: 08Node1	
<u>M</u> ore	
Member of	
• Domain:	
kemsafe.local	
O Workgroup:	
WORKGROUP	
OK Cancel	

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

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

Domain controller account is required to join the domain.

Windows Securit	Y	×
Computer Nar Enter the name	ne/Domain Changes and password of an account with permission to join the domain.	_
	User name Password Domain: kernsafe	
	OK Cancel	

Type your user name and password.

Press the OK button to continue.

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



Press the **OK** button to continue.

Restart is required.



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

Log in to iSCSI disks

Lunch the Administrative Tools -> Microsoft iSCSI initiator.

Discovered target			
	ts		<u>R</u> efresh
Name		Statu	IS
To connect using	advanced options, select a target and t	nen	Connect
To completely dia	connects target select the target and		
then click Disconn	nect.		Disconnect
	rties, including configuration of sessions,		Properties
For largel proper			Dobeldopill
select the target	and click Properties.		
select the target For configuration	and dick Properties. of devices associated with a target, sele	ect	De <u>v</u> ices
For configuration he target and th	and click Properties. of devices associated with a target, sele nen click Devices.	ect	De <u>v</u> ices,

Select the **Discovery** page.

arnets	Discovery	Eavorite Targets	Volumes and Devices	RADIUS Configuration	. 1
argeta	,	I avonce raigets [volumes and bevices	CADIOS Comigarado	
Targe	t portals				_
The s	system will lo	ok for <u>T</u> argets on fol	lowing portals:	R <u>e</u> fresh	
Addr	ess	Port	Adapter	IP address	
To ar	ld a target n	ortal, dick Discover I	Portal.	Discover Portal	
10 00	a a target p	or cary called bible veri		Discover <u>Fo</u> rdam	
To re then	move a targ click Remove	et portal, select the 2.	address above and	<u>R</u> emove	
-iSNS s	ervers				
The s	system is reg	istered on the follow	ing iSNS servers:	Refresh	
Nam	e				ī
To ac	ld an iSNS se	erver, dick Add Serve	er.	A <u>d</u> d Server	
To ac To re then	ld an iSNS se move an iSN click Remove	erver, dick Add Serve IS server, select the e.	er. server above and	Add Server Remove	
To ac To re then	dd an iSNS se move an iSN click Remove <u>e about Disc</u>	erver, dick Add Serve IS server, select the 2. <u>overy and iSNS</u>	er. server above and	Add Server Remove	

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

Discover Target Portal	×
Enter the IP address or DNS name and p want to add.	oort number of the portal you
To change the default settings of the dis the Advanced button.	covery of the target portal, click
IP address or DNS name:	Port: (Default is 3260.)
192.168.0.2	3260
<u>A</u> dvanced	QK <u>C</u> ancel

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

Press the **OK** button to add.

Select the Targets page.

[arget:			Quick Connect
iscovered ta	argets		<u>R</u> efresh
Name iqn.2006-03 iqn.2006-03	3.com.kernsafe.KernStorage.Generic 3.com.kernsafe.KernStorage.Quorum	Stat Inac Inac	ctive
To connect u	ising advanced options, select a target and t	then	Connect
Γο connect u click Connect Γο completel then click Dis	using advanced options, select a target and t t. y disconnect a target, select the target and connect.	then	Co <u>n</u> nect Disconnect
Fo connect u click Connect Fo completel then click Dis For target pr select the tar	using advanced options, select a target and t t. y disconnect a target, select the target and connect. operties, including configuration of sessions, rget and click Properties.	then	Connect Disconnect Properties

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

Connect To Target			×
Target name:			
iqn.2006-03.com.kernsafe.KernStorage.Gener	ic		
Add this connection to the list of Favorite Ta This will make the system automatically atten connection every time this computer restarts	rgets. npt to restore the s.		
🔲 Enable multi-path			
<u>A</u> dvanced	ОК	Cancel	
Connect To Target			×

connect to ranget	
Target name: jqn.2006-03.com.kernsafe.KernStorage.Quorum	
Add this connection to the list of Favorite Targe This will make the system automatically attempt connection every time this computer restarts.	ets. t to restore the
🔲 Enable multi-path	
<u>A</u> dvanced	OK Cancel

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

Press the **OK** button to continue.

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

arget:			Quick Connect,
iscovered ta	argets		<u>R</u> efresh
Name		Stat	tus
iqn.2006-03 iqn.2006-03	3.com.kernsafe.KernStorage.Generic 3.com.kernsafe.KernStorage.Quorum	Con Con	nected nected
To connect u lick Connect	using advanced options, select a target and t	then	Connect
To connect u dick Connect To completel hen dick Dis	ising advanced options, select a target and t t. y disconnect a target, select the target and connect.	then	Connect Disconnect
Fo connect u lick Connect fo completel then click Dis For target pr select the ta	ising advanced options, select a target and t t. y disconnect a target, select the target and connect. roperties, including configuration of sessions, rget and click Properties.	then	Connect Disconnect

Launch the Windows Computer Management Console.

An Initialize Disk dialog is shown.

Initialize Disk
You must initialize a disk before Logical Disk Manager can access it.
<u>S</u> elect disks:
☑ Disk 1
✓ Disk 2
Use the following partition style for the selected disks:
MBR (Master Boot Record)
© <u>G</u> PT (GUID Partition Table)
Note: The GPT partition style is not recognized by all previous versions of Windows. It is recommended for disks larger than 2TB, or disks used on Itanium-based computers.
OK Cancel

Keep the selection of the tow disks.

Select partition style for the selected disks.

Press the **OK** button to continue.

🚇 Computer Management								_ 🗆 🗙
<u>File Action View H</u> elp								
🗢 🔿 🔰 🖬 👔 😥	r 15							
Computer Management (Local)	Volume	Layout	Туре	File System	Status	Capacity F	Actions	
□ [¥] System Tools ● Task Scheduler ■ Event Viewer ■ Event V	G (C:) System Reserved	Simple Simple	Basic Basic	NTFS NTFS	Healthy (Boot, Page File, Crash Dump, Primary Partition) Healthy (System, Active, Primary Partition)	39.90 GB : 100 MB :	Disk Management More Actions	÷
	Disk 1 Basic 4.00 GB Online Basic 1023 MB Online Concentration Conc	4.00 GB Unallocat 1023 MB Unallocat	ed			*		
	CD-ROM 0 DVD (D:) No Media	Primary	partit	tion				

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

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

🚰 Computer Management								a ×
<u>File Action View H</u> elp								
🗢 🔿 🔰 🖬 👔 🛃	X 📽 🖻 🔍 😼							
Computer Management (Local)	Volume	Layout T	/pe File System	Status	Capacity	Free Sp	Actions	
System Tools Task Scheduler Task Scheduler Schedule	Generic (G:) Guorum (Q:) System Reserved	Simple B Simple B Simple B Simple B	ssic NTFS ssic NTFS ssic NTFS ssic NTFS ssic NTFS	Healthy (Boot, Page File, Crash Dump, Primary Partition) Healthy (Primary Partition) Healthy (Primary Partition) Healthy (System, Active, Primary Partition)	39.90 GB 4.00 GB 1021 MB 100 MB	32.47 (3.95 GE 988 MB 72 MB	Disk Management More Actions	F
	Disk 1 Basic 4.00 GB Online	Generic ((4.00 GB NTF Healthy (Pri	5:) S nary Partition)			<u> </u>		
	Disk 2 Basic 1023 MB Online	Quorum (1021 MB NT Healthy (Pri	Q:) FS mary Partition)			_		
	No Media	Primary p	artition					

Installing Failover Clustering Service

Launch the Windows Server manager Console.

En Server Manager			_ [8] ×
<u>File Action View H</u> elp			
	•		
Server Manager (08NODE1) Composition Features Configuration Storage	Server Manager (08NODE1) Get an overview of the status of t	his server, perform top management tasks, and add or remo	we server roles and features.
	Server Summary		Server Summary Help
	Computer Information		🎋 Activate Windows
	Full Computer Name:	08Node 1.KernSafe.Local	Change System Properties View Network Connections
	Domain:	KernSafe.Local	Configure Remote Desktop
	Local Area Connection:	IPv4 address assigned by DHCP, IPv6 enabled	Configure Server Manager Remote Management
	Local Area Connection 2:	192. 168. 1. 102, IPv6 enabled	
	Remote Desktop:	Disabled	
	Server Manager Remote Management:	Disabled	
	Product ID:	Not activated	_
	Do not show me this console at logo	n	
	Security Information		🗑 Go to Windows Firewall
	Windows Firewall:	Domain: On, Public: On	Configure Updates
	Windows Updates:	Not configured	Run Security Configuration Wizard
	Last checked for updates:	Never	🏀 Configure IE ESC
	Last installed updates:	Never	
	IE Enhanced Security Configuration (ESC):	Off for Administrators Off for Users	•
	Last Refresh: Today at 10:57 PM Configur	e refresh	

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



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

Add Features Wizard		×
Select Features		
Features Confirmation Progress Results	Select one or more features to install on this server. Eeatures: NET Framework 3.5.1 Features Background Intelligent Transfer Service (BITS) BitLocker Drive Encryption BranchCache Connection Manager Administration Kit Desktop Experience DirectAccess Management Console Failover Clustering Group Policy Management Internet Printing Client Internet Storage Name Server LPR Port Monitor Message Queuing Multipath I/O Network Load Balancing Peer Name Resolution Protocol Quality Windows Audio Video Experience Remote Differential Compression More about features	> Install Cancel

Select the Failover Clustering.

Press the **Next** button to continue.

Add Features Wizard		X
Confirm Installa	tion Selections	
Features Confirmation Progress Results	To install the following roles, role services, or features, dick Install. Informational message below This server might need to be restarted after the installation completes. Failover Clustering Print, e-mail, or save this information	
	< Previous Next > Install Cancel]

Press the Install button to install the Failover Clustering feature.

The installation of the Failover Clustering is going on.

Add Features Wizard	
Installation Progr	ress
Features Confirmation Progress Results	The following roles, role services, or features are being installed: Failover Clustering
	Installing < Previous Next > Install Cancel

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



Press the Close button.

Configuring on Cluster Node 2

Network Adapter

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

Version 4 (TCP/IPv4) dialog is shown.

Internet Protocol Version 4 (TCP/IP	v4) Properties			
General				
You can get IP settings assigned autor this capability. Otherwise, you need to for the appropriate IP settings.	matically if your network supports o ask your network administrator			
C Obtain an IP address automatically				
─● Use the following IP address:				
IP address:	192.168.1.102			
S <u>u</u> bnet mask:	255.255.255.0			
Default gateway:	192.168.1.2			
C Obtain DN5 server address auto	matically			
☐ Use the following DNS server ad	dresses:			
Preferred DNS server:	192.168.1.2			
<u>A</u> lternate DNS server:	· · ·			
Vaļidate settings upon exit	Ad <u>v</u> anced			
	OK Cancel			

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

Set the second network adapter of 08Node.

Internet Protocol Version 4 (TCP/IPv	Properties	? ×		
General				
You can get IP settings assigned autor this capability. Otherwise, you need to for the appropriate IP settings.	atically if your network suppor ask your network administrato	ts r		
O Obtain an IP address automatically				
Use the following IP address:				
IP address:	192.168.2.102			
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:				
<u>A</u> lternate DNS server:				
Validate settings upon exit	Ad <u>v</u> anced.			
	OK Car	ncel		

Type in the IP address and Subnet mask.

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

Join to the domain

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

Open System Properties page.

🕎 System			
🕞 💮 🖳 🕶 Control Panel 👻	System and Security 👻 System	-	Search Control Panel
Control Panel Home	View basic information abo	ut your computer	
🛞 Device Manager	Windows edition		
Remote settings	Windows Server 2008 R2 Er	iterprise	
💱 Advanced system settings	Copyright © 2009 Microsoft	Corporation. All rights reserve	ed.
	System		
	Processor:	Intel(R) Core(TM)2 CPU	6320 @ 1.86GHz 1.87 GHz
	Installed memory (RAM):	512 MB (512 MB usable)	
	System type:	64-bit Operating System	
	Pen and Touch:	No Pen or Touch Input is av	ailable for this Display
	Computer name, domain, and w	orkgroup settings	
	Computer name:	WIN-1SKQN4PN90I	Change settings
	Full computer name:	WIN-1SKQN4PN90I	-
	Computer description:		
	Workgroup:	WORKGROUP	
See also	Windows activation		
Action Center	ጺ 21 days to activate. Ac	tivate Windows now	
Windows Update	Product ID: 00486-109-000	0007-84863 Change produc	t key

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

System Properties				X
Computer Name Hardwa	re Advanced Rer	note		
Windows uses on the network	the following informa	tion to identify y	our computer	
Computer description:				
	For example: "IIS Pr "Accounting Server	roduction Server '''.	r" or	
Full computer name:	WIN-1SKQN4PN90)		
Workgroup:	WORKGROUP			
To rename this computer workgroup, click Change	or change its domain	or	<u>Q</u> hange	
	ОК	Cancel	Apply	

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

Computer Name/Domain Changes	×
You can change the name and the membership of this computer. Changes might affect access to network resources. <u>More information</u>	
Computer name:	
U8Node2	
Full computer name: 08Node2	
<u>M</u> ore	
Member of	
<u>D</u> omain:	
KemSafe	
O Workgroup:	
WORKGROUP	
OK Cancel	

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

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

Domain controller account is required to join the domain.

Windows Securit	Y	×
Computer Nar Enter the name	ne/Domain Changes and password of an account with permission to join the domain.	_
	User name Password Domain: kernsafe	
	OK Cancel	

Type your user name and password.

Press the OK button to continue.

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



Press the **OK** button to continue.

Restart is required.



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

Log in to iSCSI disks

Lunch the Administrative Tools -> Microsoft iSCSI initiator.

Discovered target			
	ts		<u>R</u> efresh
Name		Statu	IS
To connect using	advanced options, select a target and t	nen	Connect
To completely dia	connect a target select the target and		
then click Disconn	nect.		Disconnect
	rties, including configuration of sessions,		Properties
For largel proper			Dobeldopill
select the target	and click Properties.		
select the target For configuration	and dick Properties. of devices associated with a target, sele	ect	De <u>v</u> ices
For configuration he target and th	and click Properties. of devices associated with a target, sele nen click Devices.	ect	De <u>v</u> ices,

Select the **Discovery** page.

arnets	Discovery	Eavorite Targets	Volumes and Devices	RADIUS Configuration	. 1
argeta	,	I avonce raigets [volumes and bevices	CADIOS Comigarado	
Targe	t portals				_
The s	system will lo	ok for <u>T</u> argets on fol	lowing portals:	R <u>e</u> fresh	
Addr	ess	Port	Adapter	IP address	
To ar	ld a target n	ortal, dick Discover I	Portal.	Discover Portal	
10 00	a a target p	or cary called bible veri		Discover <u>Fo</u> rdam	
To re then	move a targ click Remove	et portal, select the 2.	address above and	<u>R</u> emove	
-iSNS s	ervers				
The s	system is reg	istered on the follow	ing iSNS servers:	Refresh	
Nam	e				ī
To ac	ld an iSNS se	erver, dick Add Serve	er.	A <u>d</u> d Server	
To ac To re then	ld an iSNS se move an iSN click Remove	erver, dick Add Serve IS server, select the e.	er. server above and	Add Server Remove	
To ac To re then	dd an iSNS se move an iSN click Remove <u>e about Disc</u>	erver, dick Add Serve IS server, select the 2. <u>overy and iSNS</u>	er. server above and	Add Server Remove	

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

Discover Target Portal	×
Enter the IP address or DNS name and p want to add.	oort number of the portal you
To change the default settings of the dis the Advanced button.	covery of the target portal, click
IP address or DNS name:	Port: (Default is 3260.)
192.168.0.2	3260
<u>A</u> dvanced	QK <u>C</u> ancel

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

Press the **OK** button to add.

Select the Targets page.

[arget:			Quick Connect
iscovered ta	argets		<u>R</u> efresh
Name iqn.2006-03 iqn.2006-03	3.com.kernsafe.KernStorage.Generic 3.com.kernsafe.KernStorage.Quorum	Stat Inac Inac	ctive
To connect u	ising advanced options, select a target and t	then	Connect
Γο connect u click Connect Γο completel then click Dis	using advanced options, select a target and t t. y disconnect a target, select the target and connect.	then	Co <u>n</u> nect Disconnect
Fo connect u click Connect Fo completel then click Dis For target pr select the tar	using advanced options, select a target and t t. y disconnect a target, select the target and connect. operties, including configuration of sessions, rget and click Properties.	then	Connect Disconnect Properties

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

Connect To Target			×
Target name:			
iqn.2006-03.com.kernsafe.KernStorage.Gener	ic		
Add this connection to the list of Favorite Ta This will make the system automatically atten connection every time this computer restarts	rgets. npt to restore the s.		
Enable multi-path			
<u>A</u> dvanced	ОК	Cancel	
Connect To Target			×

Target name: iqn.2006-03.com.kernsafe.KernStorage.Quor	um
Add this connection to the list of Favorite Ta This will make the system automatically atte connection every time this computer restart	argets. empt to restore the ts.
🔲 Enable multi-path	
<u>A</u> dvanced	OK Cancel

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

Press the **OK** button to continue.

If successful, the logged on targets are shown in the figure.
Larget:	1			<u>Q</u> uick Co	nnect,.,
iscovered ta	argets			<u>R</u> efi	resh
Name			Statu	JS	
iqn.2006-03 iqn.2006-03	.com.kernsafe.KernStorage.Gene .com.kernsafe.KernStorage.Quo	eric 'um	Conr	nected nected	
To connect u click Connect	sing advanced options, select a t	arget and ther	ı	Con	nect
To connect u click Connect To completel then click Dis	ising advanced options, select a t : y disconnect a target, select the t connect.	arget and ther arget and	١	Con	nect
To connect u click Connect To completel then click Dis For target pr select the tar	ising advanced options, select a t : y disconnect a target, select the t connect. operties, including configuration o rget and click Properties.	arget and ther arget and f sessions,	١	Con Disco Proper	nect nnect rties

Launch the Windows Computer Management Console.

Server Manager						_	
Eile Action View Help							
(= -) 2 📰 🛛 🖬 😫	7 😼						
Server Manager (08NODE2)	Disk Management	: Volume List +	Graphical Viev	v		Actions	
Roles Features	Volume	Layout Type	File System	Status	Ca	Disk Management	-
Diagnostics	(C:)	Simple Basic	NTES	Healthy (Boot, Page File, Crash Dump, Primary Partition)	39	More Actions	•
the Ulagnostics Configuration Windows Server Backup Windows Server Backup Disk Management	System Reserved	Simple Basic	NTFS	Healthy (System, Active, Primary Partition)	10		
	•				Þ		
	GDisk 1 Basic 4.00 GB Offline (1) Help	4.00 GB					
	GDisk 2 Basic 1023 MB Offline (1) Help	1021 MB					
	CD-ROM 0 DVD (D:) No Media						
	Unallocated	Primary parti	tion				

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

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

E Server Manager					
<u>File Action View H</u> elp					
🗢 🔿 🞽 📅 📝 🖬	9 B				
Server Manager (08NODE2)	Disk Management	: Volume List + Graphical V	iew		Actions
Roles Features Diagnostics	Volume	Layout Type File System Simple Basic NTFS	m Status Healthy (Boot, Page File, Crash Dump, Primary Partition)	Ca 39	Disk Management More Actions
Configuration Storage	Quorum (F:)	Simple Basic NTFS	Healthy (Primary Partition) Healthy (Primary Partition)	10	
Windows Server Backup	G System Reserved	Simple Basic NTFS	Healthy (System, Active, Primary Partition)	10	
	•			₽	
	Disk 1 Basic 4.00 GB Online	Generic (E:) 4.00 GB NTFS Healthy (Primary Partition)		•	
	Disk 2 Basic 1023 MB Online	Quorum (F:) 1021 MB NTFS Healthy (Primary Partition)			
	CD-ROM 0 DVD (D:) No Media				
	Unallocated	Primary partition		-	

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

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

Installing Failover Clustering Service

Launch the Windows Server manager Console.

En Server Manager			_ [8] ×
<u>File Action View H</u> elp			
	•		
Server Manager (08NODE1) Composition Features Configuration Storage	Server Manager (08NODE1) Get an overview of the status of t	his server, perform top management tasks, and add or remo	we server roles and features.
	Server Summary		Server Summary Help
	Computer Information		🎋 Activate Windows
	Full Computer Name:	08Node 1.KernSafe.Local	Change System Properties View Network Connections
	Domain:	KernSafe.Local	Configure Remote Desktop
	Local Area Connection:	IPv4 address assigned by DHCP, IPv6 enabled	Configure Server Manager Remote Management
	Local Area Connection 2:	192. 168. 1. 102, IPv6 enabled	
	Remote Desktop:	Disabled	
	Server Manager Remote Management:	Disabled	
	Product ID:	Not activated	_
	Do not show me this console at logo	n	
	Security Information		🗑 Go to Windows Firewall
	Windows Firewall:	Domain: On, Public: On	Configure Updates
	Windows Updates:	Not configured	Run Security Configuration Wizard
	Last checked for updates:	Never	🏀 Configure IE ESC
	Last installed updates:	Never	
	IE Enhanced Security Configuration (ESC):	Off for Administrators Off for Users	•
	Last Refresh: Today at 10:57 PM Configur	e refresh	

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



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

Add Features Wizard		×
Select Features		
Features Confirmation Progress Results	Select one or more features to install on this server. Eeatures: NET Framework 3.5.1 Features Background Intelligent Transfer Service (BITS) BitLocker Drive Encryption BranchCache Connection Manager Administration Kit Desktop Experience DirectAccess Management Console Failover Clustering Group Policy Management Internet Printing Client Internet Storage Name Server LPR Port Monitor Message Queuing Multipath I/O Network Load Balancing Peer Name Resolution Protocol Quality Windows Audio Video Experience Remote Differential Compression More about features	> Install Cancel

Select the Failover Clustering.

Press the **Next** button to continue.

Add Features Wizard		X
Confirm Installa	tion Selections	
Features Confirmation Progress Results	To install the following roles, role services, or features, dick Install. Informational message below This server might need to be restarted after the installation completes. Failover Clustering Print, e-mail, or save this information	
	< Previous Next > Install Cancel]

Press the Install button to install the Failover Clustering feature.

The installation of the Failover Clustering is going on.

Add Features Wizard	
Installation Progr	ress
Features Confirmation Progress Results	The following roles, role services, or features are being installed: Failover Clustering
	Installing < Previous Next > Install Cancel

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



Press the **Close** button.

Configuring Failover Clustering

Validate a Configuration

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

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



Click on the Validate a Configuration... link.

The Validate a Configuration Wizard is shown.

👹 Validate a Configu	ration Wizard	x
Before Yo	ou Begin	
Before You Begin Select Servers or a Cluster Testing Options Confirmation Validating Summary	This wizard runs validation tests to determine whether this configuration of servers and attached storage is set up correctly to support failover. A cluster solution is supported by Microsoft only if the complete configuration (servers, network, and storage) passes all tests in this wizard. In addition, all hardware components in the cluster solution must be "Certified for Windows Server 2008 R2". If you want to validate a set of unclustered servers, you need to know the names of the servers. Important: the storage connected to the selected servers will be unavailable during validation tests. If you want to validate an existing failover cluster, you need to know the name of the cluster or one of its nodes. You must be a local administrator on each of the servers you want to validate. To continue, click Next. More about preparing your hardware for validation More about cluster validation tests. Image again	
	Next > Cancel]

Press the **Next** button to continue.

Add nodes to the cluster.

👹 Validate a Configu	iration Wizard		X
Select Se	ervers or a Cluster		
Before You Begin Select Servers or a Cluster	To validate a set of server To test an existing cluster,	rs, add the names of all the servers. , add the name of the cluster or one of its nodes.	
Testing Options Confirmation Validating Summary	<u>E</u> nter name: <u>S</u> elected servers:		<u>B</u> rowse Add <u>R</u> emove
		< Previous	Cancel

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

Select Computers	?×
Select this object type:	
Computers	Object Types
From this location:	
KemSafe.Local	Locations
Enter the object names to select (<u>examples</u>):	
	<u>C</u> heck Names
Advanced OK	Cancel

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

Select Computer	5				? ×
Select this object t	ype:				
Computers				0	bject Types
From this location:					
KemSafe.Local					Locations
Common Queries	•				1
N <u>a</u> me:	Starts with 💌				<u>C</u> olumns
Description:	Starts with 💌 🛛				Find <u>N</u> ow
Disa <u>b</u> led ad	counts a password				Stop
Days since last	logon:	•			<i>9</i> 7
Search res <u>u</u> lts:			[ОК	Cancel
Name (RDN)	In Folder				
08DC	KemSafe.Local/	·			
	KemSate.Local/				
USNODE2	KemSare.Local/				

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

Select Computers		<u>? x</u>
Select this object type:		
Computers		Object Types
From this location:		
KemSafe.Local		Locations
Enter the object names to select (examples):		
08NODE1		Check Names
		J
<u>A</u> dvanced	ОК	Cancel

Press the **OK** button.

👹 Validate a Configu	ration Wizard	×
Select Se	ervers or a Cluster	
Before You Begin Select Servers or a Cluster Testing Options Confirmation	To validate a set of servers, add the names of all the servers. To test an existing cluster, add the name of the cluster or one of its nodes. Enter name: Browse Selected servers: 0800de1 kemsafe local	
Validating Summary		
	< <u>P</u> revious <u>N</u> ext > Cancel]

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

👹 Validate a Configu	ration Wizard		×
Select Se	ervers or a Cluste	r	
Before You Begin Select Servers or a Cluster	To validate a set of ser To test an existing clus	rvers, add the names of all the servers. ster, add the name of the cluster or one of its nodes.	
Testing Options Confirmation Validating Summary	<u>E</u> nter name: <u>S</u> elected servers:	08node1.kemsafe.local 08node2.kemsafe.local	<u>A</u> dd <u>R</u> emove
		< <u>P</u> revious <u>N</u> ext >	Cancel

Press the **Next** button to continue.

👹 Validate a Configu	ration Wizard	×
Testing C	Options	
Before You Begin	Choose between running all tests or running selected tests.	
Select Servers or a Cluster	The tests include Inventory tasks, Network tests, Storage tests, and System Configuration tests.	
Testing Options Confirmation	Microsoft supports a cluster solution only if the complete configuration (servers, network, and storage) can pass all tests in this wizard. In addition, all hardware components in the cluster solution must be "Certified for Windows Server 2008 R2".	
Validating		
Summary		
	Run <u>all</u> tests (recommended)	
	C Run only tests I select	
	More about cluster validation tests	
	< <u>P</u> revious <u>N</u> ext > Cancel]

Select Run all tests (recommended).

Press the **Next** button to continue.

👹 Validate a Configu	ration Wizard		×
Confirmat	tion		
Before You Begin Select Servers or a Cluster	You are ready to start validation. Please confirm that the following settings are correct:		
Testing Options	Servers to Test		
Confirmation	08node1.kernsafe.local		
Validating	08node2.kernsafe.local		
Summary			
	Tests Selected by the User	Category	
	List BIOS Information	Inventory	
	List Environment Variables	Inventory	
	List Fibre Channel Host Bus Adapters	Inventory	-
	To continue, click Next. More about cluster validation tests		
		< <u>P</u> revious <u>N</u> ext > C	Cancel

Press the **Next** button to continue.

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

👹 Validate a Configu	ration Wizard			×
Summary				
Before You Begin	Testing has completed successfully and the config	uration is suitable for	clustering.	
Select Servers or a Cluster				
Testing Options	Validate Microsoft MPTO Dased disks		Juccess	•
Confirmation	Validate Multiple Arbitration		Success	
Validating				
Summary	Validate SCSI device Vital Product Data (VPD)	1	Success	
	Validate SCSI-3 Persistent Reservation		Success .	
	Validate Simultaneous Failover		Success	-
	To view the report created by the wizard, click View Report		View Report	
	To close this wizard, click Finish.	ate the cluster now u	sing the validated nodes	<u></u>
	More about cluster validation tests			
			<u>F</u> inish	

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

Create a Failover Cluster

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



The Create Cluster Wizard is shown.



Press the Next button to continue.

Create Cluster Wi	zard ervers			×
Before You Begin Select Servers Validation Warning Access Point for	Add the names of all the se	ervers that you want to have in the	cluster. You must add at leas	t one server.
Administering the Cluster Confirmation Creating New Cluster Summary	Selected servers:			<u>A</u> dd <u>R</u> emove
		<	Previous Next >	Cancel

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

🚏 Create Cluster Wi	zard		×
Select Se	ervers		
Before You Begin Select Servers Access Point for Administering the Cluster Confirmation Creating New Cluster Summary	Add the names of all t <u>E</u> nter server name: <u>S</u> elected servers:	the servers that you want to have in the cluster. You must add at least one server. Browse 08node1 kemsafe local 08node2 kemsafe local Remove]
		< <u>P</u> revious <u>N</u> ext > Cancel]

Press the **Next** button to continue.

Specify IP address for the cluster.

ot

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

Press the **Next** button to continue.

🚏 Create Cluster Wiz	zard		×
Confirma	tion		
Before You Begin Select Servers	You are ready to create a The wizard will create you	a cluster. ur cluster with the following settings:	
Select Servers Access Point for Administering the Cluster Confirmation Creating New Cluster Summary	Cluster: Node: Node: IP Address: IP Address: To continue, click Next.	KernSafeCluster 08node1.kernsafe.local 08node2.kernsafe.local DHCP address on 192.168.0.0/24 192.168.1.20	×
		< Previous Next >	Cancel

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

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

🚏 Create Cluster Wiz	zard		x
Summary	t.		
Before You Begin Select Servers	You have suc	cessfully completed the Create Cluster Wizard.	
Administering the Cluster Confirmation		Create Cluster	-
Creating New Cluster Summary	Cluster: Node: Node: Quorum:	KernSafeCluster 08node1.kernsafe.local 08node2.kernsafe.local Node and Disk Majority (Cluster Disk 2)	
	To view the report crea To close this wizard, c	ated by the wizard, click View Report. lick Finish.	<u>V</u> iew Report
			<u>F</u> inish

Press the **Finish** button to continue.

🗟 Failover Cluster Manager				
File Action View Help				
🗢 🔿 🔰 📅 🛛 🖬				
Failover Cluster Manager	Storage		Recent Cluster Events:	Actions
KernSafeCluster.KernSafe.Loc Services and applications	Summary of Stor	-900		Storage 🔺
E 🍯 Nodes		uye		📫 Add a disk
08Node1		T. 10		View 🕨
C Storage	2 Total Disks - 2 online	Total: 4,99 GB	Available Capacity: Total: 4 GB	Q Refresh
Networks	1 Available Disks - 1 online	Free Space: 4.9 GB	Free Space: 3.95 GB	? Help
Egi cluster Events	1 In Use Disks - 1 online	Percent Free: 98.2%	Percent Free: 98.8%	Cluster Disk 2
				Bring this resource online
	Diek	Statue	Current Owner	Take this resource offline
	Disk Witness in Quorum	- Childo	Canon onnoi	Change drive letter
	🗆 📼 Cluster Disk 2	(Online	08Node1	B Show the critical events f
	Volume: (Q)	File System: NTFS	1,021 MB (95.7% free)	Show Dependency Report
	Available Storage			
	E Custer Disk 1	Online	08Node1	More Actions
	Volume: (G)	File System: NTFS	4 GB (98.8% free)	Properties
				P Help
I F				

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

Contact

Support:	support@kernsafe.com
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