# iStorage Server: HA SAN for Windows Server 2008

Tuesday, Feb 21<sup>st</sup> 2012

KernSafe Technologies, Inc.

www.kernsafe.com

Copyright © KernSafe Technologies 2006-2012. All right reserved.

#### **Table of Contents**

Overview	3
Configuring on iStorage Server	4
Preparing HA Storage	4
Preparing HApartner Storage	10
Creating Application	17
Configuring on Client	23
Install MPIO Feature	23
Connect Targets	24
Enable Multipath Support	28
Contact	

### Overview

KernSafe iStorage Server is an advanced and powerful, full-featured software-only iSCSI Target that fully conforms to the latest iSCSI Standard 1.0 (former Draft 20). It is an IP SAN solution allowing you to quickly export existing storages such as disk images, VHD files, physical disks, partitions, CD/DVD-ROMs, tapes or any other type of SCSI based devices and even a variety of popular CD/DVD images to the client machines. The software thus delivers immediate benefits, as it allows storage to be consolidated, virtualized and centrally managed. iStorage Server also provides RAID-1 (mirror) feature enabling you to create two iSCSI devices for mirror backup. Furthermore, iStorage Server also supports a lot of features such as: VHD (Virtual Hard Disk) target, snapshots, STPI, RAID-1 and failover, these features are very important and poplar in storage industry world and make iStorage Server is suitable for any size of business.

High availability is the implementation of technology so that if a component fails, another can take over for it. By using highly available platforms, the downtime for a system can be reduced, and, in many cases, it can be reduced to a short enough time that the users of the system do not see the failure.

This document gives you detailed step-by-step instructions on KernSafe iStorage Server configuring for Windows Server 2008. We need at least two servers and one client, in this document we prepare the three computers as follows:

Detail	IP Address	OS
iStorage Server1	192.168.0.199	Windows 2000 SP4 +
iStorage Server2	192.168.0.177	Windows 2000 SP4 +
Client	192.168.0.161	Windows Server 2008

# **Configuring on iStorage Server**

#### **Preparing HA Storage**

We create HA Storage on Server1.

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

Create iSCSI Target Wizard	×
<b>iSCSI Device Type</b> Select which device type of the iSCSI target you want to create.	<u></u>
<ul> <li>Hard Disk Create iSCSI target by using physical disk, partition, standard image file or VHD.</li> <li>CD/ DVD Device Create iSCSI target by using physical optical drive or CD / DVD image file.</li> <li>Generic SCSI Create iSCSI target by using generic SCSI device, such as disk, CD-ROM, tape, printer.</li> </ul>	
< Back Next > C	ancel

Choose Hard Disk.

Press the **Next** button to continue.

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

Choose Image File in iSCSI Medium Type page.

Then press **Next** button to continue.



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

Specify image file path and size.

Device Parameters					
🔘 Use existing image	file	Create a new image im	age file		
H:\newimage.img			Browse		
Device Size in MBs:	4096				
Options					
🔲 Use sparse file on	NTFS file syste	em			
Note: Using sparse file	e can save you	r harddisk space, the	e size of disk image f	ile only	
file size is less than 17	bytes	recommenta that usi	ng this reature when	image	

Select Create a new image file or Use existing image file if you already have 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, Anonymous, CHAP or IP filter.	<u></u>
Anonymous Select this option to disable any authorization.	
CHAP Select this option to use CHAP authorization.	
IP Filter Select this option to use IP address authorization.	
Mixed	
Select this option to use both CHAP and IP address authorization. ☑ Inherit security roles from global settings.	
< Back Next > C	ancel

Specify authorization mode as you required, we take **Anonymous** as an example.

Press the **Next** button to continue.

Finish creating iSCSI Target.

Create iSCSI Target Wizard	×
<b>Completing the Create iSCSI Wizard</b> 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:iStorage.HA I Report as readonly device when initiator can not get write access Enable multiple initiators with full access connected (sharing and clustering)	
Note By default, only one client has full access right, when the second initiaor log on with full access, it will fail. But this option is usfull for clustering, disk sharing and NAS.	
< Back Finish C	Cancel

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

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

Press the **Finish** button to continue.

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

3 iStorage Server Managemer	nt Console		
<u>S</u> torage <u>C</u> lients <u>V</u> iew	<u>T</u> ools <u>H</u> elp		
Create Delete	Start Stop Refresh	Remove View	Access Settings
e	iStorage Server: kernsafe	-PC	
Storage.HA	General Targets Applications IP Filters	Users Groups Logs	
	Target Name	Device Source	Capac Authenticat Status
Users	👒 iqn.2006-03.com.kernsafe:iStorage	Disk Dr H:\newimage.i	4.00G Anonymous Ena
-			
Done		S) Conr	nected: kernsafe-PC (Ultimate License)

### **Preparing HApartner Storage**

We create HApartner Storage on Server2.

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 Hard Disk.

Press the **Next** button to continue.

Create iSCSI Target Wizard	X
<b>iSCSI Medium Type</b> Select medium of the iSCSI disk you want to create.	8
<ul> <li>Image File Create iSCSI disk by using standard image file or Virtual Hard Disk (.VHD).</li> <li>RAM Space</li> </ul>	
Create iSCSI disk by using memory space.	
Create iSCSI disk images for each initiators, any image is individual for each initiator.	
Disk Partition Create iSCSI target by using a disk partition.	
Physical Disk Create iSCSI target by using physical disk.	
< Back Next > Ca	ncel

Choose Image File in iSCSI Medium Type window.

Then press **Next** button to continue.



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

Specify image file path and size.

Create iSCSI Target Wizard	X
Image Disk Configuration You can specify a image file as an iSCSI device.	1
Device Parameters <ul> <li>Use existing image file</li> <li>Create a new image file</li> </ul>	
I:\newimage.img Browse	
Device Size in MBs: 4096	
Options Use sparse file on NTFS file system Note: Using sparse file can save your harddisk space, the size of disk image file only depend on its content used. But we recommentd that using this feature when image file size is less than 1T bytes	
< Back Next >	Cancel

Select Create a new image file or Use existing image file if you already have 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, Anonymous, CHAP or IP filter.	
Anonymous Select this option to disable any authorization.	
CHAP Select this option to use CHAP authorization.	
IP Filter     Select this option to use IP address authorization	
Select this option to use both CHAP and IP address authorization.	
Inherit security roles from global settings.	
< Back Next > Ca	incel

Specify authorization mode as you required, here we use **Anonymous** type.

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.	
Basic Target Information Enter Target Name: iqn.2006-03.com.kemsafe.iStorage.HApartner I Report as readonly device when initiator can not get write access Enable multiple initiators with full access connected (sharing and clustering)	
Note By default, only one client has full access right, when the second initiaor log on with full access, it will fail. But this option is usfull for clustering, disk sharing and NAS.	
< Back Finish Car	ncel

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

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

Press the Finish button.

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

🍓 iStorage Server Managemen	t Console		
<u>Storage</u> <u>Clients</u> <u>V</u> iew <u>T</u>	[ools <u>H</u> elp		
Create Delete	Start Stop Refresh Add	Remove View A	CCCESS Settings Print Ab
E	iStorage Server: General Targets Applications IP Filters Us	ers Groups Logs	
	Target Name	Device T Source	Capacity Authenticat Status
Users	🁒 iqn.2006-03.com.kernsafe:iStorage.HAp	Disk Drive I:\newimage.img	4.00G Anonymous Enabl
۰			
Ready	<u>n</u>	S Conne	ected: (Ultimate License)

# **Creating Application**

On iStorage Server 1, right click **Applications** on the left tree of the main interface, choose **Create Application** on the pop-up menu, the **Create Application Wizard** is shown.



Choose Failover iSCSI SAN Node.

Then press **Next** to continue.

Create Application Wizard	
Fail Over Configuration You can specify two servers to fail over each other.	2
Base Target	
Target Name	Device Type
iqn.2006-03.com.kemsafe.iStorage.HA	Disk
Mirror Target	
	Edit
	< Back Next > Cancel

Check the HA storage and click **Edit** to find the mirror target.

Select iSCSI Target	•	×
Host Name: 19	2.168.0.177 Port: 3260	
	Use CHAP to logon	
User Name:		
Secret:		
Target		
Target: iqr	n.2006-03.com.kernsafe:iStorage.HApartner	•
	Discovery OK Car	cel

Input the IP and port of server2 in **iSCSI Source** tab, then click **Discovery** on the bottom of the window to find the mirror target, choose the **HApartner** in the down-list.

Press **OK** button to continue.

Note: If the target needs CHAP authorization, you should provide User name and secret to logon.

Create Application Wizard		X
Fail Over Configuration You can specify two servers to fail over each other.		<u>&amp;</u>
Base Target		
Target Name	Device Type	
iqn.2006-03.com.kemsafe:iStorage.HA	Disk	
Mirror Target		
Iqn.2006-03.com.kemsare.t3.orage.nApatrier	Back Next > C	ancel

The mirror target will be added to the window, then press the **Next** button to continue.

Mirror Synchronization
Synchronization Type
Create mirror device with full synchronization from base iSCSI target
<ul> <li>Create mirror device without synchronization (Manual Initialization)</li> </ul>
Synchronization Progress
Warning: all data on the mirror device will be destroyed after synchronization.

Now, the mirror target should be synchronized to the base target, if the two targets are both the new one and do not be initialized, we can choose **Create mirror device without synchronization (Manual Initialization)**, otherwise, we must choose **Create mirror device with full synchronization from base iSCSI target**.

Press the **OK** button to continue.

Create Application Wizard	
5	Completing the Create Application Wizard
	Application Name: Cluster
	Cluster Type: iSCSI
	First Node: iqn.2006-03.com.kemsafe:iStorage.HA
	Second Node: iqn.2006-03.com.kemsafe:iStorage.HApartner
	To close this wizard, click Finish.
	< Back Finish Cancel

Click the **Finish** button to complete the application creation.

🍓 iStorage Server Manage	ement Console	
<u>Storage</u> <u>Clients</u> <u>View</u>	v <u>T</u> ools <u>H</u> elp	
Create Delete	Start         Stop         Refresh         Add         Remove         View         Access         Settings         Print	1 About
⊟@ kernsafe-PC Ė@ Targets	iStorage Server: kernsafe-PC	
iStorage.HA	General Targets Applications IP Filters Users Groups Logs	
	Target Name Appli Mirror Device	Status
	iqn.2006-03.com.kernsafe:iStorage.HA Cluster iSCSI: 192.168.0.177:3260:iqn.2006-03.com.kernsafe:iStorag	Running
🛛 🔄 Logs		
۲ III ۲	< III	- F
	S Connected: kernsafe-PC (Ultimate L	icense)

Now the application will be shown in the main interface if successful and the configuration on the server1 is completed. We do the same operations on iStorage Server2 to create an application, choose HA as the mirror target, after the creation, the main interface will be shown as follows:

🤹 iStorage Server Management Console				
<u>S</u> torage <u>C</u> lients <u>V</u> iew	<u>T</u> ools <u>H</u> elp			
Create Delete	Image: Start     I	1 About		
LocalHost     Targets     Storage.HApartne	General Targets Applications IP Filters Users Groups Logs			
	Target Name Appli Mirror Device	Status		
Users	🔊 iqn.2006-03.com.kernsafe:iStorage.HApartner Cluster iSCSI: 192.168.0.177:3260:iqn.2006-03.com.kernsafe	Running		
	< [	•		
Done	😗 Connected: (Ultimate License)			

# **Configuring on Client**

# **Install MPIO Feature**

Launch Start->Administrative Tools->Server Manager, go to Features item, and click Add Features.

An Add Features Wizard will appear. In the features list select Multipath I/O feature and install it.

Add Features Wizard		×
Select Features		
Features Confirmation Progress Results	Select one or more features to install on this server. Eeatures: IMET Framework 3.5.1 Features (Installed)         Background Intelligent Transfer Service (BITS)         BitLocker Drive Encryption         BranchCache         Connection Manager Administration Kit         Desktop Experience         DirectAccess Management Console         Group Policy Management         Internet Printing Client         Internet Storage Name Server         LPR Port Monitor         Message Queuing         Vultipath 1/0         Remote Assistance         Remote Differential Compression         Remote Server Administration Tools	Description: <u>Multipath I/O</u> , along with the Microsoft DeviceSpecific Module (DSM) or a third-party DSM, provides support for using multiple data paths to a storage device on Windows.
	< <u>P</u> revious <u>N</u> ext :	> Install Cancel

#### **Connect Targets**

Lunch the Administrative Tools -> Microsoft iSCSI initiator.

Switch to the **Discovery** tab. Add each IP address of the iStorage servers by clicking the **Discover Portal...** button and specifying server IP address.

The eventeen will be			Refresh
The system will loo	ok for <u>T</u> argets o	on following portals:	
Address	Port	Adapter	IP address
192.168.0.199	3260	Default	Default
192.100.0.177	5200	Derduit	Default
Го add a target p	ortal, click Disco	over Portal.	Discover Portal
To remove a targe then click Remove	et portal, select	the address above and	<u>R</u> emove
Fo add an iSNS se	rver, click Add	Server,	Add Server
Fo remove an iSN then dick Remove	S server, select	the server above and	Remove

Switch to the Targets tab.

argen	J		<u>Q</u>	uick Connect
iscovered t	argets		12	Defrech
Name			Chabus	Refresh
ian 2006-0	3 com kernsaferiStorage H	10	Inactive	
ian 2006-0	3 com kernsaferiStorage H	Anartner	Inactive	
o connect (	using advanced ontionsse	lect a target and then		Canadiat
o connect u	using advanced options, se t.	lect a target and then	1	Connect
To connect u dick Connec To complete hen click Dis	using advanced options, se t. ly disconnect a target, sele sconnect.	elect a target and then	1	Connect Disconnect
To connect u dick Connec To complete hen click Dis For target p relect the ta	using advanced options, se t. ly disconnect a target, sele sconnect. roperties, including configu rget and click Properties.	elect a target and then act the target and iration of sessions,		Connect Disconnect Properties

Connect the targets by clicking the **Connect** button.

A **Connect to Target** dialog is shown.

Check Add this connection to the list of Favorite Targets.

Target 1

Target name:			
iqn.2006-03.com.kernsafe:iSt	orage.HA		-
Add this connection to the li This will make the system au connection every time this of	ist of Favorite Ta itomatically atten computer restarts	rgets. npt to restore the	
Enable multi-path			
Advanced		ОК	Cancel

#### Target 2

Target name:			
iqn.2006-03.com.kernsafe:iSto	orage.HApartner		
Add this connection to the li This will make the system au connection every time this c	st of Favorite Targ tomatically attemp omputer restarts.	ets. t to restore the	
Enable multi-path			

Click the **OK** button to connect the target.

			Quick Connect
iscovered ta	argets		Refresh
Name		Stat	us
ign.2006-03	.com.kernsafe:iStorage.HA	Con	nected
iqn.2006-03	.com.kernsafe:iStorage.HApartner	Con	nected
o connect u	sing advanced options, select a target a	and then	Connect
Fo connect u lick Connect	sing advanced options, select a target a :	and then	Connect
Fo connect u dick Connect Fo completely hen click Dise	sing advanced options, select a target a ; y disconnect a target, select the target connect.	and then and	Connect Disconnect
Fo connect u dick Connect Fo completely hen click Dise For target pr select the tar	sing advanced options, select a target a , y disconnect a target, select the target connect. operties, including configuration of sess rget and click Properties.	and then and ions,	Connect Disconnect Properties

Now, the client is connected to the two targets.

#### **Enable Multipath Support**

Launch MPIO manager by clicking **Start->Administrative Tools->MPIO**. Go to **Discover Multi-Paths** tab, check **Add support for iSCSI devices**.

SPC-3 compliant	
Device Hardware Id	
Add support for iSCSI dev	ices
	<u>A</u> dd
<u>O</u> thers	
Device Hardware Id	
1	Add

Click the **Add** button.

Windows will prompt you to reboot the server.



Click the **Yes** button to restart your server.

We have to initialize the disk before we use it.

Click **Start->Computer->Manage->Disk Management**, the **Initialize and Convert Disk Wizard** window is shown.

Initialize Disk	×
You must initialize a disk before Logical Disk Manager can access it.	
Select disks:	
Disk 2	
Use the following partition style for the selected disks:	
MBR (Master Boot Record)	
C GPT (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 Cance	

Check **Disk 2** and press **OK** to finish the initialization.

Server Manager						
<u>File Action View Help</u>						76
🗢 🔿 🙋 📅 🚺 🔂 🗲	< 🖻 🖻 🔍 📓					
Server Manager (WIN-0C20S40GIM	Disk Managemen	Actions				
Roles     Features	Volume	Layout Type	File System	Status	Disk Management	-
<ul> <li></li></ul>	(C:)     (D:)     (D:)	Simple Basic Simple Basic	NTFS NTFS	Healthy (System, Boot, Page File, Active, Healthy (Primary Partition)	More Actions	•
	Disk 1 Basic 50.00 GB Online	New Volume 50.00 GB NTFS Healthy (Prima	( <b>D:)</b> ry Partition)	<u> </u>		
	Disk 2 Basic 4.00 GB Online	4.00 GB Unallocated				
		Primary par	tition		2	
					1 J	

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.

E Server Manager							_0>
<u>File Action View Help</u>							
🗢 🔿 🙍 🖬 🚺 🖬 🖄 🗡	< 🖻 🖻 🔍 📓						
Server Manager (WIN-0C20S40GIN	Disk Managemen	t Volum	e List +	- Graphical Vie	w	Actions	
E P Roles	Volume	Layout	Type	File System	Status	Disk Manager	ment 🔺
Diagnostics     Diagnostics     Storage     Windows Server Backup     Disk Management	(C:)     New Volume (D:)     New Volume (F:)	Simple Simple Simple	Basic Basic Basic	NTFS NTFS NTFS	Healthy (System, Boot, Page File, Active Healthy (Primary Partition) Healthy (Primary Partition)	/ More Actio	ns 🕨
	Disk 1 Basic 50.00 GB Online	New Vo 50.00 GE Healthy	lume B NTFS (Primary	<b>(D:)</b> y Partition)			
	Disk 2 Basic 4.00 GB Online	New Vo 4.00 GB Healthy	lume NTFS (Primar	<b>(F:)</b> y Partition)			
<u> </u>	Unallocated	Primary	y parti	ition		<u> </u>	

**Note**: Although we connect two targets, there will be only one disk on the client it working on both two active connections.

# Contact

Support:	<u>support@kernsafe.com</u>
Sales:	sales@kernsafe.com
Home Page:	http://www.kernsafe.com/
Product Page:	http://www.kernsafe.com/product/istorage-server.aspx
Licenses	http://www.kernsafe.com/product/istorage-server/license-
	<u>compares.aspx</u>
Forum:	http://www.kernsafe.com/forum/

KernSafe Technologies, Inc.

www.kernsafe.com

Copyright © KernSafe Technologies 2006-2012. All right reserved.