iStorage Server: High Availability iSCSI SAN for Windows Server 2012

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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 which is fully compatible with the newest Windows Server 2012. iStorage Server can deliver immediate benefits for the new server environment which is implemented with Window Server 2012 as it is allowed to centralized manage and consolidate storage. iStorage Server provides a lot of features, such as RAID, VHD, CDP, Snapshot and Failover etc. These features are very popular and important in Storage Industry and make iStorage Server suitable for any size of business.

High Availability is the implementation of technology so that if one component fails, another can take over seamlessly right now. By using highly available platform, the downtime of the business can be reduced to a seriously short time which wouldn't be noticed by the users.

In the new version of iStorage Server 3.1, we have highly improved the High Availability feature which allows to create High Availability iSCSI SAN with Multiple Channels.

This document gives you step-by-step instructions on KernSafe iStorage Server configuring for Creating High Availability iSCSI SAN for Window Server 2012. We need two servers and one client, the preparation is as follows:

1

Details	IP Address	OS
iStorage Server1	SYNC:192.168.1.103	Windows 2000 SP4 +
	DATA:192.168.0.103	
iStorage Server2	SYNC:192.168.1.104	Windows 2000 SP4 +
	DATA:192.168.0.104	
Client	192.168.0.105	Windows Server 2012

Configure iStorage Server

Create HA storage

We create HA storage on iStorage Server1

Launch the iStorage Server management console, press create on the toolbar of iStorage Server management console, the create device wizard is shown as below.

Create iSCSI Target Wizard	x
iSCSI Device Type Select which device type of the iSCSI target you want to create.	
Hard Disk Create iSCSI target by using physical disk, partition, standard image file or VHD.	
 Optical Device Create iSCSI target by using physical optical drive or CD / DVD image file. 	
 Generic SCSI Create iSCSI target by using generic SCSI device, such as disk, CD-ROM, tape, printer. 	
 Advanced Device Create advanced iSCSI target such as CDP device and snapshot linked device. 	
	_
< <u>Back</u> <u>N</u> ext > Cancel	

Select Hard Disk, press Next to continue.

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

Select Image File as the iSCSI Medium Type.

Press **Next** to continue.

Create iSCSI Target Wizard	x
iSCSI Image Type Select image type of the iSCSI disk you want to create.	<u></u>
 Standard Image File Create iSCSI disk by using a standard disk image file. Virtual Hard Disk (VHD) Create iSCSI disk by using a Virtual Hard Disk image file. 	
< <u>B</u> ack <u>N</u> ext >	Cancel

Select Standard Image File and then press Next.

Create iSCSI Target Wizard
Virtual Image Disk Configuration Specify a image file full path and parameters.
Image file parameters
C:\Users\Administrator\Documents\2limg Browse Device Size in MBs: 4096 Fill with zeros Enable windows cache
File system options Sparse file (Recommended for image files smaller then 1TB) Compressed (Enable file system compress feature) Encrypted (Enable NTFS encryption feature)
< <u>B</u> ack <u>N</u> ext > Cancel

Specify the File path and device capacity.

Press **Next** to continue.

Create iSCSI Target Wizard	x
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	
O 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.	
< <u>B</u> ack <u>N</u> ext > C	ancel

Select the **Authorization** method.

Press **Next** to continue.

Create iSCSI Target Wizard	x
Completing the Create iSCSI Wizard You can specify a target name and other options to complete iSCSI target creating.	Ð
Basic Target Information Target Name: iqn.2006-03.com.kemsafe:iStorageHA ✓ 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	

Specify the Target Name as you like.

Note: Check "Enable multiple initiators with full access connected".

Press Finish to complete the creation.

3	iStorage Serv	er Management Console		_ 🗆 🗙
<u>F</u> ile <u>S</u> erver Stora <u>g</u> e <u>C</u> lients ⊻i	ew <u>T</u> ools <u>H</u> elp			
Create Delete Start Stop	Refresh Add Remove View	Access Settings Print About		
Servers Tree ×	障 iStorage Server: LocalHost			
- 2012-02 (127.0.0.1:3261)	General Targets Applications IPFilters	Users Groups Logs		
iStorageHA	Target Name	Device Type Source	Capacity Authentication	Status
Applications	🁒 iqn.2006-03.com.kernsafe:iStorageHA	Disk Drive C:\newimage.img	4.00G Anonymous	Enabled
Groups				
	<u>u</u>		🖉 Connected: LocalHo	st (Ultimate License) 🙏

Create HAPartner Storage.

We create HAPartner Storage on iStorage Server2.

Launch the iStorage Server management console, press create on the toolbar of iStorage Server management console, the create device wizard is shown as below.

Create iSCSI Target Wizard	x
iSCSI Device Type Select which device type of the iSCSI target you want to create.	
Hard Disk Create iSCSI target by using physical disk, partition, standard image file or VHD.	
Optical Device Create iSCSI target by using physical optical drive or CD / DVD image file.	
Create iSCSI target by using generic SCSI device, such as disk, CD-ROM, tape, printer.	
 Advanced Device Create advanced iSCSI target such as CDP device and snapshot linked device. 	
< <u>B</u> ack <u>N</u> ext > Can	cel

Select Hard Disk and press Next to continue.

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

Select Image File and then press Next.



Choose Standard Image File.

Create iSCSI Target Wizard
Virtual Image Disk Configuration Specify a image file full path and parameters.
Image file parameters
<u>C</u> reate a new image file Use existing image file
Full path and name of the image file:
C:\Users\Administrator\Documents\2limg
Device Size in MBs: 4096
Fill with zeros
File system options
Sparse file (Recommended for image files smaller then 1TB)
Compressed (Enable file system compress feature)
Encrypted (Enable NTFS encryption feature)
< <u>B</u> ack <u>N</u> ext > Cancel

Specify the File path and device capacity.

Press Next to continue.

Create iSCSI Target Wizard	x
Authorization You can select an authorization mode, Anonymous, CHAP or IP filter.	4
 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. 	
< <u>B</u> ack <u>N</u> ext > C	Cancel

Select Anonymous authorization.

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 Target Name: iqn.2006-03.com.kemsafe.iStorageHAPartner ✓ 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			

Type the Target Name.

Note: Check "Enable multiple initiators with full access connected".

Press Finish to complete the creation.

3	iStorage Server Ma	nagement	Console			- 🗆 X
<u>F</u> ile <u>S</u> erver Stora <u>g</u> e <u>C</u> lients ⊻i	ew <u>T</u> ools <u>H</u> elp					
Create Delete Start Stop	Refresh Add Remove View Acces	s Setting:	s Print About			
Servers Tree ×	iStorage Server: LocalHost					
≟	General Targets Applications IPFilters Users	Groups	ogs			
iStorageHAPartner	Target Name	Device Type	Source	Capacity	Authentication	Status
🛺 Applications	iqn.2006-03.com.kernsafe:iStorageHAPartner	Disk Drive	C:\newimage.img	4.00G	Anonymous	Enabled
IPFilters Ilsers						
Groups						
Logs						
	<u>.</u>			Ø Conne	cted: LocalHost (Ulti	mate License)

Create Application

On iStorage Server1, open the iStorage Server management console,

click **Create** and then select **Application**.

The Create Application Wizard will be shown as below.

Create Application Wizard
Application Type Select which type application that you want to create.
 Synchronous Replication Create real-time remote synchronous replication to iSCSI target or image file. Asynchronous Replication Create real-time remote asynchronous replication to iSCSI target or image file. High Availability Node Create a high-availability iSCSI SAN node or synchronizing with other iSCSI targets. Automatic Snapshots Create automatical snapshots and replications to other iSCSI targets.
< <u>Back</u> <u>N</u> ext > Cancel

Select High Availability Node as the Application Type.

Press **Next** to continue.

Create Application Wizard				
Failover Configuration You can specify two servers to fail over each ot	ther.			
ase Target				
Target Name	Device Type			
✓ iqn.2006-03.com.kemsafe:iStorageHA	Disk			
artner Target				
	Setti			
	< Back Next > Car			

Check the **Base Target** then press **Settings** to configure the partner.

Select iSCSI Target
-iSCSI Source
Host Name: 192.168.1.104 Port: 3260
CHAP Use CHAP to logon
User Name:
Secret:
Target
Target: iqn.2006-03.com.kernsafe:iStorageHAPartner 💉
Discovery OK Cancel

Input the IP Address of iStorage Server2 and the press Discovery to find

the mirror target, Choose **HAPartner** in the drop-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			
Failover Configuration You can specify two servers to fail over each othe	r.		
Base Target			
Target Name	Device Type		
✓ iqn.2006-03.com.kemsafe:iStorageHA	Disk		
Partner Target			
ian 2006 02 com komosfo iStornan HAPathor			
Ign.2006-03.com.kemsare.iStorageHArather	Setting		
	Back <u>N</u> ext > Cancel		

Press **Next** to continue.

Create Application Wizard				
Synchronizatio You can specify	n Settings parameters for synchroniz	ation.		4
Sync				
Local Address:	192.168.1.103	~	Local Port:	Any 🗸
Remote Address:	192.168.1.104	~	Remote Port:	3260
Alternative Sync 1				
Local Address:	Any	~	Local Port:	Any 🗸
Remote Address:	192, 168.0, 104	~	Remote Port:	3260
Alternative Sync 2				
Specify a folder to	save temporary data dump	(folder must ex	cist):	
C:\Temp\				Browse
		< <u>B</u> ack	<u>N</u> ext >	Cancel

Configure the **Synchronization** Settings.

In iStorage Server 3.0, we have improved the HA feature which can use multiple channels for SYNC to prevent Split-brain. We choose the 192.168.1.103 as the primary.

Mirror Synchronization	x		
Synchronization Type			
O Create mirror device with full synchronization from base iSCSI target			
Create mirror device without synchronization (Manual Initialization)			
Warning: all data on the mirror device will be destroyed after synchronization. OK Cancel			

Now, the mirror target should be synchronized from the base target, if the two targets are both the new and not initialized, we can choose

Create mirror device without synchronization (Manual Initialization), otherwise, we must choose Create mirror device with full synchronization from base target.

Press **OK** to continue.

	Create Application Wizard		
3	Completing the Create Applicatio Wizard		
	Application name: SAN Cluster		
	Cluster type: iSCSI		
	Local node: iqn.2006-03.com.kemsafe:iStorageHA		
	Local portal: 192.168.1.103:Auto		
	Remote node: iqn.2006-03.com.kemsafe:iStorageHAPartner		
	Remote portal: 192.168.1.104:3260		
	Work path: C:\Temp\		
	To close this wizard, click Finish.		
	< <u>B</u> ack Finish Cancel		

Press **Finish** to complete the application.

3	iStorage Server Management Console	□ X
<u>F</u> ile <u>S</u> erver Stora <u>g</u> e <u>C</u> lients ⊻i	iew <u>T</u> ools <u>H</u> elp	
🛛 🐻 - 🐻 🛛 🚿 🎜	📿 🎩 📠 🛅 . 🔒 . 🌼 🖶 🕕	
Create Delete Start Stop	Refresh Add Remove View Access Settings Print About	
Servers Tree X	😭 iStorage Server: LocalHost	
E KernSate Servers E 2012-02 (127.0.0.1:3261)	Consol Typeste Applications Intilkers Likers Groups Long	
E-39 Targets	Target Name Application Type Partner Device S	Status
Applications	👼 iqn.2006-03.com.kernsafe:iStorageHA High Availability iSCSI: 192.168.1.104:3260:iqn.2006-03.com.kernsafe:iStorageHA F	Running
Groups		
	∬ Connected: LocalHost (Ultimate L	License) .::

When the application is successfully created, it will be shown as above.

Now we should do the same operations on iStorage Server2 to create an

application. Choose **HA** as the mirror target.

3	iStorage Server Mana	gement Console		_ 🗆 X
<u>File Server Storage Clients </u>	(iew <u>T</u> ools <u>H</u> elp			
Create Delete Start Stop	Refresh Add Remove View	Access Settings Print] ① t About	
Servers Tree ×	iStorage Server: LocalHost			
ia-line WIN-SJTUU94N3NO (127.0.0.1	General Targets Applications IPFilters	Users Groups Logs		
iStorageHAPartner	Target Name	Application Type P	Partner Device	Status
🖓 Applications	🔊 iqn.2006-03.com.kernsafe:iStorageHAPar	High Availability i	SCSI: 192.168.1.103:3260:iqn	Running
Logs				
	4			>
Second Connected: LocalHost (20-Days Trial)				

Configure Client

Install MPIO

Launch the **Server Manager** in Windows Server 2012 and then click **Manage** on the top right corner, select **Add Roles and Features**.



The Wizard will be shown as below.

Ъ	Add Roles and Features Wizard	
Select features	Select one or more features to install on the selected server.	DESTINATION SERVER WIN-SJTUU94N3NO
Installation Type	Features	Description
Server Selection Server Roles Features Confirmation Results	□ Data Center Bridging ^ □ Data Center Bridging Enhanced Storage □ Failover Clustering □ □ Group Policy Management □ □ Ink and Handwriting Services □ □ Internet Printing Client □ □ IP Address Management (IPAM) Server □ □ SNS Server service □ □ LPR Port Monitor Management OData IIS Extension □ Media Foundation ▶ ▶ Message Queuing ✓ ✓ Multipath I/O □ □ Network Load Balancing ✓	Multipath I/O, along with the Microsoft Device Specific Module (DSM) or a third-party DSM, provides support for using multiple data paths to a storage device on Windows.
	< Previous Next >	Install Cancel

Select **Multipath I/O** and then press **Next** to continue.

Connect Targets

Launch the Administrator Tools-> Microsoft iSCSI initiator.

Switch to the Discovery tab. Add each IP Address of iStorage Server by

clicking **Discover Portal...**

	iSCSI I	nitiator Properties	S	x
Targets Discovery	Favorite Targets	Volumes and Devices	RADIUS Configuration	
Target portals			Defect	1
The system will lo	ok for <u>T</u> argets on f	following portals:	Refresh	
Address	Port	Adapter	IP address	
192.168.0.103	3260	Default	Default	
192.168.0.104	3260	Default	Default	
To add a target p	ortal, click Discove	r Portal.	Discover Portal	
To remove a targ then click Remove	et portal, select th	e address above and	<u>R</u> emove	
iSNS servers The system is reg Name	istered on the folk	owing <u>i</u> SNS servers:	Refresh	
To add an iSNS se To remove an iSN then click Remove	rver, click Add Ser S server, select th	rver. Je server above and	Add Server Remove	
More about Disc	overy and iSNS			
L		OK	Cancel Apply	

Switch to the Targets tab.

iSCSI Initiator Properties	s X
Targets Discovery Favorite Targets Volumes and Devices Quick Connect	RADIUS Configuration
To discover and log on to a target using a basic connection, i DNS name of the target and then click Quick Connect.	type the IP address or
Target:	Quick Connect
Discovered targets	
	<u>R</u> efresh
Name	Status
ign.2006-03.com.kernsate:iStorageHA	Inactive
To connect using advanced options, select a target and then dick Connect.	Connect
then click Disconnect.	Disconnect
For target properties, including configuration of sessions, select the target and click Properties.	Properties
For configuration of devices associated with a target, select the target and then click Devices.	De <u>v</u> ices
More about basic iSCSI connections and targets	
ОК	Cancel Apply

Connect the target by click **Connect** button.

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

Check Add this connection to the list of Favorite Targets.

Target 1

Connect To Target	x
Target name: jqn.2006-03.com.kernsafe:iStorageHA	
Add this connection to the list of Favorite Targets. This will make the system automatically attempt to restore the connection every time this computer restarts.	
Enable multi-path	
Advanced OK	Cancel

Target 2

Connect To Target	×
Target name: iqn.2006-03.com.kernsafe:iStorageHAPartner	
Add this connection to the list of Favorite Targets. This will make the system automatically attempt to restore the connection every time this computer restarts.	
Enable multi-path	
Advanced OK	Cancel

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

iSCSI Initiator Propertie	s X
Targets Discovery Favorite Targets Volumes and Devices	RADIUS Configuration
Quick Connect To discover and log on to a target using a basic connection, DNS name of the target and then click Quick Connect.	type the IP address or
Target:	Quick Connect
Discovered targets	
	<u>R</u> efresh
Name	Status
ign.2006-03.com.kernsafe:iStorageHA	Connected
To connect using advanced options, select a target and ther click Connect.	Connect
To completely disconnect a target, select the target and then click Disconnect.	Disconnect
For target properties, including configuration of sessions, select the target and click Properties.	Properties
For configuration of devices associated with a target, select the target and then click Devices.	De <u>v</u> ices
More about basic iSCSI connections and targets	
ОК	Cancel Apply

Now, the client is connected to the two targets.

Enable Multipath Support

Launch MPIO manager by clicking **Start-> MPIO**.

Check Add support for iSCSI device.

	MPIO P	roperties		x
MPIO Devices	Discover Multi-Paths	DSM Install	Configuration S	napshot
SPC-3 comp	liant			
Device Ha	rdware Id			
I Add sup	port for iSCSI devices			
Add sup	port for SAS devices			
			<u>A</u> dd	
Others				
Device Ha	rdware Id			
			Add	
		10 11 1 1		
	tion on discovery of mu	itipathed dev	/ices	
			ОК	Cancel

Click Add button.

Windows will prompt you to reboot the server.



After the server is restarted, we should initialize the disk.

Click Administrator Tools-> Computer Manager.

Initialize Disk
You must initialize a disk before Logical Disk Manager can access it. Select disks: Disk 1
Use the following partition style for the selected disks:
OK Cancel

Select **Disk 1** and press **OK** to finish the initialization.

Right click the disk and then select New Simple Volume, format and partition as wizard.

If successful, it will be shown as below.

£	Computer Management 📃 🖬 🗙							
<u>File Action View H</u> elp								
🗢 🔿 🙍 📰 🛿 🖬 😫 🗙 I	ef 🖻 🔍 😼							
🛃 Computer Management (Local 🛛 Vo	olume	Layout	Type	File System	Status	Сара	city	Actions
⊿ 👔 System Tools 🛛 🗔	• (C:)	Simple	Basic	NTFS	Healthy (Boot, Page File, Crash Dump, Primary Pa	artition) 23.66	GB	Disk Management
Task Scheduler	New Volume (E:)	Simple	Basic	NTFS	Healthy (Primary Partition)	4.00	GB	Mars Artiger
Event Viewer	System Reserved	Simple	Basic	NTFS	Healthy (System, Active, Primary Partition)	350 N	ИВ	More Actions
Shared Folders								
Beformance								
Device Manager								
⊿ 🦉 Storage								
Windows Server Backup								
🔄 Disk Management								
Services and Applications								
<				Ш			>	
						^		
B	Disk 0	Custom D			152			
24	4.00 GB	350 MB N	reserve TFS	a	(C;) 23.66 GB NTES			
0	Inline	Healthy (System,	Active, Prima	ry Healthy (Boot, Page File, Crash Dump, Prima	ry Partition)		
							_	
B	Disk 1	N		<u>.</u>			=	
4.	.00 GB	4.00 GB N	TFS //					
0	Online	Healthy (Primary	Partition)				
	Oco pouro							
	D-ROM (D-)							
N	lo Media							
							v	
<	Unallocated 📕 🖡	rimary pa	rtition				-	
								,

Note: Though we have connected to two targets, there will be only one disk with two active connections for Failover.

Contact

Support:	support@kernsafe.com
Sales:	sales@kernsafe.com
Home Page:	http://www.kernsafe.com/
Product Page:	http://www.kernsafe.com/product/istorage-server.asp
	×
Licenses:	http://www.kernsafe.com/product/istorage-server/lic
	ense-compares.aspx
Forum:	http://www.kernsafe.com/forum/



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