iStorage Server: HA SAN for Windows Server 2003

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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. 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 2003. 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 | 192.168.0.191 | Windows Server 2003 |

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



Choose Hard Disk.

Press the Next button 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. | |
| < Back Next > Car | ncel |

Choose Image File in iSCSI Medium Type page.

Then press **Next** button to continue.



Choose Standard Image File.

Press the **Next** button to continue.

Specify image file path and size.

| You | an specify a image: | file as an i | SCSI device. | | | | ~ |
|-----------------------------|--|---------------------------------|---------------------------------|--------------------------------|-------------------------------|---------------------------|---|
| Device P | arameters | | | | | | |
| 🔘 Us | e existing image file | | Create a r | new image fi | ile | | |
| H:\ne | wimage.img | | | | Browse | | |
| Device | e Size in MBs: 4 | 1096 | | | | | |
| Options | e enarse file on NTF | S file evete | - | | | | |
| Note: depen file size | Using sparse file car d on its content use a is less than 1T byt | n save you d. But we i es | ir harddisk spi recommentd t | ace, the size hat using thi | e of disk ima is feature w | ge file only hen image | |
| | | | | | | | |

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, 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. | |
| | |
| Inhert securty roles from global settings. | |
| | |
| | |
| < Back Next > | Cancel |
| 1 | |

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 | X |
|--|---------|
| 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.iStorage.HA Image: Image | |
| 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 | ancel |

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 target is shown in the iStorage Server management console if successful.

| iStorage Server Management | nt Console | | |
|---|-----------------------------------|-----------------------|--|
| <u>Storage</u> <u>Clients</u> <u>V</u> iew | <u>T</u> ools <u>H</u> elp | | |
| Create Delete | Start Stop Refresh | Remove View | Access Settings Print |
| ⊡@ kernsafe-PC ⊡@ Targets iStorage.HA | iStorage Server: kernsafe | -PC | |
| Applications | Target Name | Device Source | Capac Authenticat Status |
| Users Users Logs | iqn.2006-03.com.kernsafe:iStorage | Disk Dr H:\newimage.i | 4.00G Anonymous Ena |
| Done | | Con | nected: kernsafe-PC (Ultimate License) |

Preparing HApartner Storage

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

| Create iSCSI Target Wizard | × |
|---|-------|
| 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. CD/ DVD 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. | |
| < Back Next > C | ancel |

Choose Hard Disk.

Press the **Next** button to continue.

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

Choose Image File in iSCSI Medium Type window.

Then press **Next** button to continue.



Choose Standard Image File.

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. | 4 |
| Device Parameters Use existing image file Create a new image file | |
| I:\newimage.img Browse | |
| Device Size in MBs: 4096 | |
| Options | |
| 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 a one.

Specify the device size.

Press the **Next** button to continue.

Set authorization mode.

| Create iSCSI Target Wizard | x |
|--|----------|
| 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. | |
| 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. | |
| < Back Next > | Cancel |

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. | <u></u> |
| Basic Target Information | |
| Enter Target Name: | |
| iqn.2006-03.com.kemsare.iStorage.HApartnerj | |
| 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.

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

| 3 iStorage Server Managemen | nt Console | | | | | |
|---|--|------------------------------|------------------|-------------|--------------|-----------|
| <u>Storage</u> <u>Clients</u> <u>View</u> | <u>T</u> ools <u>H</u> elp | | | | | |
| Create Delete | Start Stop Refresh Add | Remove | View A | Cess - | Settings | Print Abo |
| E- CocalHost | iStorage Server: | | | | | |
| Applications | General Targets Applications IP Filters Use Target Name | ers Groups Device T | Logs Source | Capacity | Authenticat | Status |
| | 👒 iqn.2006-03.com.kernsafe:iStorage.HAp | Disk Drive | I:\newimage.img | 4.00G | Anonymous | Enabl |
| Logs | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Ready | | | Conner | ted: (Ultim | ate License) | |

Creating Application

On Server1, right click **Applications** on the left tree of the main interface, choose **Create Application** on the pop-up menu, the **Create Application Wizard** widow is shown.

| Create Application Wizard | × |
|---|----------|
| Application Type Select which type of application you want to create. | <u> </u> |
| Mirror Application Attach to a local iSCSI target and a remote iSCSI target to create a mirror device (RAID-1). Failover iSCSI SAN Node Create an high-availability failover iSCSI SAN node by using two or more iSCSI targets | |
| < Back Next > Ca | ncel |

Choose Failover iSCSI SAN Node.

Then press the **Next** button to continue.

| Ba | ise Target | | |
|-----|--------------------------------------|-------------|------|
| [| Target Name | Device Type | |
| | viqn.2006-03.com.kemsafe:iStorage.HA | Disk | |
| | | | |
| Min | rror Target | | -dit |

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

| Select iSCSI Tar | get | | | × |
|------------------|---------------------------------------|---------|------|------|
| - iSCSI Sourc | e | | | |
| Host Name: | 192.168.0.177 | Port: | 3260 | |
| | Use CHAP to logon | | | |
| User Name: | | | | |
| Secret: | | | | |
| Target — | | | | |
| Target: | iqn.2006-03.com.kernsafe:iStorage.HAp | partner | | • |
| | DiscoveryOK | | Can | icel |

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></u> |
| Base Target | |
| Target Name | Device Type |
| Iqn.2006-03.com.kemsafe:iStorage.HA | Disk |
| Mirror Target iqn.2006-03.com.kemsafe.iStorage.HApartner | Edit |
| | < Back Next > Cancel |

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

| Mirror Synchronization |
|---|
| Synchronization Type |
| Create mirror device with full synchronization from base iSCSI target |
| Oreate mirror device without synchronization (Manual Initialization) |
| Synchronization Progress |
| Warning: all data on the mirror device will be destroyed after synchronization. |

Now, the mirror target should be synchronization 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.



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

| 🌯 iStorage Server Manag | ement Console | • X | | |
|---|---|------------|--|--|
| <u>Storage</u> <u>Clients</u> <u>V</u> ie | w <u>I</u> ools <u>H</u> elp | | | |
| Create Delete | Image: Start Image: Stop Image: Start Im | 1 About | | |
| ⊡@ kernsafe-PC ⊨@ Targets | iStorage Server: kernsafe-PC | | | |
| iStorage.HA | General Targets Applications IP Filters Users Groups Logs | | | |
| | Target Name Appli Mirror Device | Status | | |
| Users | 🔊 iqn.2006-03.com.kernsafe:iStorage.HA Cluster iSCSI: 192.168.0.177:3260:iqn.2006-03.com.kernsafe:iStorag | Running | | |
| | | | | |
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| | | | | |
| | | | | |
| | S Connected: Kernsare-PC (Ottimate L | icense) | | |

Now the application will be shown in the main interface if successful and the configuration on the iStorage Server1 is completed. We do the same operations on iStorage Server2 to create application, choose HA as the mirror target, after the creation, the main interface will be shown as follows:



Configuring on Client

Enable Multipath Support

Download Microsoft iSCSI Initiator and install it with **the Microsoft MPIO Multipathing Support for iSCSI** option enabled.

| ware Up Microso | odate Installation Wizard ft iSCSI Initiator Installatio | n | |
|--------------------|---|-------------------|-----------|
| Microso | oft iSCSI Initiator will be installed | | |
| _ Installa | ition Options | | |
| Ţ | Virtual Port Driver | | |
| R | Initiator Service | | |
| Г | Software Initiator | | |
| F | Microsoft MPIO Multipathing | Support for iSCSI | |
| | | | |
| 1 | | | |
| | | | |
| | | Z Rack New | th Cancel |
| | | | |

You will need to restart computer before continuing.

Connect to target

Lunch the MS iSCSI Initiator by selecting Start->All Programs->Microsoft iSCSI Initiator.

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

| iSCSI Initiator Prope | erties | | | × |
|---|----------------------|-------------------------------|---------------|------------------------------|
| General Discovery | Targets | Persistent Targel | s Bound Vo | umes/Devices |
| | | | | |
| Address 192.168.0.199 192.168.0.177 | Port 3260 3260 | Adapter Default Default | D D | PAddress efault efault |
| | | <u>R</u> emove | R <u>e</u> fr | esh |
| ISNS Servers - | | | | |
| Add | | Remove | Refr | esh |
| | | OK | Cancel | Apply |

Switch to the Targets tab.

| iSCSI Initiator Properties | × |
|--|---|
| General Discovery Targets Persistent Targets | Bound Volumes/Devices |
| Select a target and click Log On to access the stor target. Click details to see information about the se devices for that target. | age devices for that ssions, connections and |
| Targets: | Status |
| ign.2006-03.com.kernsafe:iStorage.HA | Inactive |
| | maarve |
| <u>D</u> etails <u>L</u> og O | n R <u>e</u> fresh |
| ОК | Cancel Apply |

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

A Log On to Target dialog is shown.

Check Automatically restore this connection when the system boots.

Target 1



Target 2

| Log On to Target | × |
|--|---|
| Target name: | |
| iqn.2006-03.com.kernsafe:iStorage.HApartner | |
| Automatically restore this connection when the system boots | |
| Enable multi-path | |
| Only select this option if iSCSI multi-path software is already installe on your computer. | d |
| Advanced OK Cancel | |

Click the **OK** button to connect the two targets.

| iSCSI Initiator Properties | x |
|---|----|
| General Discovery Targets Persistent Targets Bound Volumes/Device | es |
| Select a target and click Log On to access the storage devices for that target. Click details to see information about the sessions, connections and devices for that target. | |
| Name Status iqn.2006-03.com.kernsafe:iStorage.HA Connected iqn.2006-03.com.kernsafe:iStorage.HApartner Connected | |
| <u>D</u> etails <u>Log On</u> R <u>e</u> fresh |] |
| OK Cancel Apply | |

Now, the client is connected to the two targets, 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.



Press Next to continue.

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

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



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 | | | | | | | |
|--|---|---|---------------------------------------|---------------------------------|-----------------------------------|--|--|
| 🗐 Eile Action View Window H | elp | | | | _ 8 × | | |
| | | | | | | | |
| Computer Management (Local) System Tools System Tools System Tools Shared Folders Cocal Users and Groups Cocal Users and | Volume Layout (C:) Partition N Partition | Type File System Basic NTFS Basic NTFS | Status Healthy (System) Healthy | Capacity 39.99 GB 4.00 GB | Free Space 36.68 GB 3.98 GB | | |
| Services and Applications | Colline Colline Colline Colline Colline Colline Colline Colline Colline | (C:) 39.99 GB NTF5 Healthy (System) New Yolume (E:) 4.00 GB NTF5 Healthy | | | | | |
| | Primary partition | | | | <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

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- Sales: <u>sales@kernsafe.com</u>
- Home Page: <u>http://www.kernsafe.com/</u>
- Product Page: http://www.kernsafe.com/product.aspx?id=5
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