**iStorage Server** 

# Working with iSCSI HBA Performing a Network Diskless Boot

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# **Table of Contents**

Overview	3
Configuring iStorage Server	4
Creating Target	4
Installation and configuration of HBA adapter	. 12
Mounting HBA adapter	. 12
Configuring HBA adapter	. 12
Installing Operating System on the network hard drive	. 25
Contact	. 29

### **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 popular in storage industry world and make iStorage Server suitable for any size of business.

This article will demonstrate how to install iSCSI HBA Adapter and how to configurate iStorage Server to perform a network diskless boot. Network diskless boot is a process that runs the operating system on the remote server which is running iStorage Server instead of executing it locally. You can also use a local hard drive for SWAP files or crash dumps. That can provide enormous benefit for virtualization computing servers environments in relation to RAID arrays. To boot a machine without any hard drive you will need to have a HBA adapter installed. HBA (Host Bus Adapter) connects a host system (the computer) to other network and storage devices.

In this case we will need at least two computers – machine with installed iStorage Server and sufficient hard drive capacity for installing Operating System and a client machine equipped with a HBA Adapter.

## **Configuring iStorage Server**

### Preparing server for network diskless boot

We will create iSCSI Target image file using iStorage Server on which we will install operating system for network diskless boot.

### **Creating Target**

Open iStorage Server Management Console.

iStorage Server Management Console				
<u>Storage</u> <u>Clients</u> <u>View</u> <u>T</u> ools <u>H</u> elp				
Create Delete Start Si	top Refresh Add Ri	move View Access S	ttings Print About	
KemSafe     Targets     Applications     OFFilters	iStorage Server: KernSa General Targets Applications IP Filt	afe ers Users Groups Logs		
	Storage General Pro	operties	Properties	
	General			
	Hostname:	KernSafe		
	Bind Address:	All Address		
	Port:	3260		E
	Management Method:	Active Directory		
	State:	ОК		
	Status			
	Status:	Started		
	License:	Free License		
	Server Portal			
4	192.168.241.1	3260		-
Done			🔇 Connected: KernSafe(Free Lic	ense)

Launch the **iStorage Server Management Consolle**, press the **Create** button on the toolbar, the **Create iSCSI Target Wizard** will appear.

Select device type.

Create iSCSI Target Wizard	×
iSCSI Device Type Select which device type of the iSCSI target you want to create.	2
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 >	Cancel

Chose Hard Disk.

Create iSCSI Target Wizard	X
<b>iSCSI Medium Type</b> Select medium of the iSCSI disk you want to create.	2
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 ISCS Larget by Using a Usik partition.	
Create 15C51 target by using physical disk.	
< <u>Back</u> Next >	Cancel

#### Choose Image File in iSCSI Medium Type page.

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

#### Chose Standard Image File in iSCSI Image Type.

Device F	arameters					
🔘 Us	e existing image file	e (	<u>Create a new</u>	image file		
E:\N	etwork_OS.img			Brows	e	
Devic	e Size in MBs:	40960				
Options						
🗸 Us	e sparse file on NT	FS file system	n			
Note:	Using sparse file c	an save your	harddisk space,	the size of disk in	mage file only	
deper file siz	d on its content us e is less than 1T by	ed. But we re vtes	ecommentd that u	using this feature	when image	

Select **Create a new image file** or **Use existing image file** if you already have one. Then specify the device size.

Checking **Use sparse file on NTFS file system** will save your hard disk space by expanding image file depending on its content used.

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.	
< <u>B</u> ack <u>N</u> ext >	Cancel

Choose the Authentication Mechanism. Decide which authentication mechanisms you would want to use: **Anonymous, CHAP, IP Filter** or **Mixed** authentication.

#### 1) Anonymous

All initiators will get full access permission without any authorization required.

#### 2) CHAP (Challenge-handshake authentication protocol)

All initiators need to specify a CHAP user and secret to connect to the target. iStorage Server has a built-in user called "Guest", which is used for initiators without CHAP secret specified.

#### 3) IP Filters

All initiators will be authorized by the incoming IP address defined by IP Filter roles.

#### 4) Mixed

Security policy is determined by both CHAP and IP Filters.

If you check **Inherit security roles from global settings**, all client security roles are form global settings, otherwise, each client will have its own permission.

You can	specify a target name	e and other options I	to complete iSCSI	arget creating.	
Basic Target I	nformation				
Enter Tar	get Name:				
iqn.2008	08.com.kemsafe:kem	nserver.iscsihba			
Report	as readonly device w	when initiator can no	t get write access		
Enable	multiple initiators with	full access conne	cted (sharing and o	clustering)	
Nata					
By default.	only one client has fu	Il access right, whe	n the second initia	or log on with full	
access, it	vill fail.		ANAC		
But this op	tion is ustuli for cluster	nng, disk snanng an	Id INAS.		

Enter the name for your target device.

If you check **Report as readonly device when initiator cannot get write access**, the system will give you a report when you load the target without write access.

Press the **Finish** button to continue.

iStorage Server Management Console						
Storage Clients View Tools He	łp					
Create Delete Start	Stop Refresh Add Remove Vi		Cess Settings Print	About		
E KernSafe 	iStorage Server: KernSafe	ups Logs				
	Target Name	Device Type	Source	Capacity	Authentication	Status
	🁒 iqn.2008-08.com.kernsafe:kernserver.iscsihba	Disk Drive	E:\Network_OS.img	40.00G	Anonymous	Enabled
Logs						
Done			S) (	onnected: Ke	rnSafe(Free License)	

After successfully creating an iSCSI Target, you should be able to see it in your **Targets** tab in **iStorage Server Management Console**.

# Installation and configuration of HBA adapter

### **Mounting HBA adapter**

**NOTE**: Before purchasing HBA adapter, please make sure that your motherboard will be able to support it.

To mount HBA adapter in your computer, please follow these steps:

- 1. Turn off and plug out the computer.
- 2. Remove the computer cover by unscrewing the screws.
- 3. Chose empty PCI bus slot to mount the adapter.
- 4. Remove the slot cover.
- 5. Carefully place the HBA adapter into place.
- 6. Reinstall computer cover and tighten the screws.
- 7. Plug in and turn on the computer.
- 8. Install appropriate drivers (if needed) and fallow the manufacturer instructions.

### **Configuring HBA adapter**

**NOTE**: In this case I'm using QLogic QLA4010C iSCSI Adapter. Depending on HBA adapter you are using, steps may vary.

After successfully mounting HBA adapter in machine you will see information screen, as well as how you can access utility for managing the adapter.

QLogic Corporation QLA4010 iSCSI ROM BIOS Version 1.11 Copyright (C) QLogic Corporation 1993-2005. All rights reserved. www.qlogic.com Press (CTRL-Q> for Fast!UTIL BIOS for Adapter 0 is disabled ROM BIOS NOT INSTALLED (CTRL-Q> Detected, Initialization in progress, Please wait...

Using QLogic card, you need to press **CTRL+Q** to access Fast!UTIL.



After loading Fast!UTIL, please choose **Configuration Settings** to set up HBA adapter.



Choose Host Adapter Settings.



Change setting of Host Adapter BIOS to Enabled.



Type Initiator IP Address.

Press ESC key to go back to Configuration Settings screen.



Chose iSCSI Boot Settings.



Select **Primary Boot Device Settings** to set up settings of your iSCSI target device.



Type **Target IP** and **iSCSI Name** for iSCSI device you wish to connect during booting process.



Press **ESC** key to go back to main menu.

A confirmation window will appear, choose **Save changes**, to save all settings.



While at main menu, chose **iSCSI Disk Utility** to check if initiator successfully found the device.

CSI Adapte r resent resent resent resent resent resent resent	2.0	iqn.2008-08.0	com.kernsi	afe:kernse
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Select device and press **Enter** if you want to perform operations on that disk.



Chose which operations you want to perform, whereupon press Esc key to exit Fast!UTIL.

**QLogic Corporation** QLA4010 iSCSI ROM BIOS Version 1.11 Copyright (C) QLogic Corporation 1993-2005. All rights reserved. www.qlogic.com Press <CTRL-Q> for Fast!UTIL ISP4010 Firmware Version 3.00.00.18 QLogic adapter using IRQ number 3 Product Product Device Device Adapter Target Lun Vendor Revision ID ID Number ID Number Type Number **iSCSI** Adapter 2.0 KernSafe 0000 0 Disk 0 ROM BIOS Installed

After successfully setting up iSCSI Target Device, you will see that HBA adapter is connected to that device.

### Installing Operating System on the network hard drive

Installing Operating System, such as Windows, on the network hard drive is as simple as it would be on normal physical hard drive. After placing the CD/DVD into the Optical Drive, just follow the instructions and choose the network drive as a disk on which you want to install OS.

**NOTE**: Older operating systems such as Windows XP or Windows Server 2003 may require additional drivers to successfully perform installation of OS.

Follow Windows 7 installation steps to install OS on iSCSI Target Device.

😽 Install Windows		<u>_   ×</u>
	Windows <sup>.</sup> 7	
Langua <u>ge</u> to install	: English	
Time and currency format	English (United States)	•
Keyboard or input method	US	-
Enter your language	and other preferences and click "Next" to continu	
Copyright © 2009 Microsoft Corporation. All I	rights reserved.	Next

Where do you want to install Wi	indows?		
Name	Total Size	Free Space Type	
Disk 0 Unallocated Space	40.0 GB	40.0 GB	
€ <u>L</u> oad Driver	2	Drive options ( <u>a</u> dvanced)	
		<u>N</u> e	xt

iSCSI Target Device looks just like a normal disk, you may format it or partition it, just like a normal physical hard drive.



After successfully installing OS, you may boot to Windows and start using it as a normal OS, every network task will be performed transparently to the user.

## Contact

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



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