### Exchange 2003 – Implementing iSCSI for Exchange Server 2003

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### Abstract

In this article I will show you how to move your Exchange Server 2003 databases to new diskspace on a file server which storage is published over iSCSI.

### Let`s begin

### What is ISCSI?

iSCSI is short for Internet Small Computers Standard Interface and transports SCSI commands over TCP/IP. Several protocols exist today that a disk controller uses to communicate with connected disk drives such as ATA, SATA and SCSI and its derivates. All of these protocols have predefined standards that dictate how commands such as read and write requests are submitted and sent between the controller and the disk drive. iSCSI is a new protocol that extends the SCSI standards by encapsulating SCSI commands in TCP/IP packets. These commands are sent across a TCP/IP network enabling servers to access storage that is located outside of the reach of its physical hardware. iSCSI opens up a vast array of solutions such as consolidated storage, centralized backup and remote disaster recovery. With the help of iSCSI it is possible to distribute storage over long distances.

In an iSCSI network, there are three components:

- ? Target
- ? Initiator
- ? Network

The target is analogous to the disk drives in the traditional locally attached storage model; it serves up the disks to the initiator. The initiator can be compared with a traditional disk controller; it uses the disks hosted by the target. The TCP/IP network interconnects the target and the initiator. As you can see the performance of iSCSI depends on the speed of the TCP/IP network and you can determine the speed because you can choose between networks with 100 MBit/s, 1 GBit/s and more.

### Wintarget datagram



Figure 1: Wintarget datagram

There are several solutions for iSCSI from several vendors. For this article I will use the software Wintarget from String Bean Software.

WinTarget is a powerful software-based iSCSI Storage Area Networking (SAN) solution designed and optimized for the Windows platform. An intuitive and familiar interface enables WinTarget users to quickly install and configure a full-featured storage solution that delivers immediate benefits to any size organization:

- ? Reduced Total Cost of Ownership (TCO)
- ? Improved Business Productivity
- ? Rapid Deployment of New Systems and Upgrades
- ? Increase Application Availability
- ? Improved Data Protection Eliminate Data Backup Windows
- ? Rapid Data Recovery
- ? Disaster Recovery Preparedness

#### Wintarget benefits

- ? Hardware Independence
- ? IPv6 Support
- ? iSNS Integration
- ? IPSec Encryption
- ? CHAP Authentication
- ? LUN Resizing
- ? IP Take-Over Support
- ? Multi-Path I/O Support Through Multiple Sessions
- ? Active/Passive WinTarget Storage Cluster Configuration
- ? iSCSI Boot Support
- ? Windows Server 2003 x64 Support

#### System requirements

Wintarget from String Bean Software is available in two additions:

- ? Wintarget Standard Edition
- ? Wintarget Advanced Edition

You can read <u>here</u> more about the differences between these products.

<u>WinTarget Standard Edition Minimum System Requirements</u> Windows Server 2003, Windows Storage Server 2003, Windows 2000 Professional/Server with Service Pack 4 or higher, or Windows XP Professional 800 MHz or higher processor 512 MB of RAM 20 MB of disk space Gigabit NIC WinTarget Advanced Edition Minimum System Requirements Windows Server 2003 SP1 or Windows Storage Server 2003 800 MHz or higher processor 512 MB of RAM 20 MB of disk space Gigabit NIC

<u>WinTarget VSS Hardware Provider Minimum System Requirements</u> WinTarget Advanced Edition Windows Server 2003 SP1 Snapshot transport requires Windows Server 2003 SP1 Enterprise or Datacenter Edition Microsoft iSCSI Software Initiator 1.05a or higher 800 MHz or higher processor 256 MB of RAM 10 MB of disk space Gigabit NIC

Note: It is possible to implement Wintarget in 100 MBit/s networks, but If you wih to have comparable performance to traditional SANs you will need a Gigabit network ore more.

# Step by Step

To use the Wintarget software we must complete several steps:

- ? Install iSCSI Initiator
- ? Install WinTarget
- ? Add Initiator to WinTarget
- ? Create iSCSI Disk
- ? Access iSCSI Disk

For this article i have installed two virtual machines wirth Microsoft Virtual Server 2005 SP1 beta. One Windows Server 2003 Enterprise as the target which offers a 300 MB disk for Exchange storage and one Windows Server 2003 Enterprise with Exchange Server 2003 SP2 Beta (Please note: Exchange Server SP2 beta is NOT a requirement for Wintarget).

### Install iSCSI Initiator

You can get the iSCSI Initiator from the Microsoft <u>download</u> website. The iSCSI Initiator must be installed on the server which should use iSCSI storage (in this example the Exchange server). After you have downloaded the package, follow the instructions to install the iSCSI Initiator.

🙀 WinTarget - InstallShie	ld Wizard	×
	Welcome to the InstallShield Wizard for WinTarget	
	The InstallShield(R) Wizard will install WinTarget on your computer. To continue, click Next.	
A	Before continuing it is highly recommended that you review th release notes for upgrade and new features information. View Release Notes	e
	WARNING: This program is protected by copyright law and international treaties.	
	< Back Next > Cancel	

Figure 2: Installation of the iSCSI Initiator

Select all available options.

Options				
- 294				
rtual Port Driver				
itiator Service				
oftware Initiator				
icrosoft MPIO M	lultipathing Sup	port for iSCSI		
	itual Port Driver itiator Service oftware Initiator icrosoft MPIO M	irtual Port Driver itiator Service oftware Initiator icrosoft MPIO Multipathing Sup	irtual Port Driver itiator Service oftware Initiator icrosoft MPIO Multipathing Support for iSCSI	itual Port Driver itiator Service oftware Initiator icrosoft MPIO Multipathing Support for iSCSI

Figure 3: Install the Initiator service, Software Initiator and MPIO if needed

## What is MPIO

MPIO is short for Multipath Input Output. Multipathing solutions use redundant physical path components-adapters, cables, and switches-to create logical "paths" between the

server and the storage device. In the event that one or more of these components fails, causing the path to fail, multipathing logic uses an alternate path for I/O so that applications can still access their data. For more information about MPIO read the following <u>FAQ</u>.

After setup has finished you can start the iSCSI Initiator configuration. The iSCSI Initiator is installed in the control panel of your Windows Server.

iSCSI Initiator Properties	×
General Discovery Targets Persistent Targets Bound Volumes/Devi	ces
The iSCSI protocol uses the following information to uniquely identify this initiator and authenticate targets.	
Initiator Node Name: iqn. 1991-05. com. microsoft: london. nwtraders.ms	:ft
To rename the initiator node, click Change.	
specify a CHAP secret.	
To configure IPSec Tunnel Mode addresses, click	
OK Cancel Apply	

Figure 4: iSCSI Initiator properties

Please note the Initiator Node Name. The Node Name uniquely identifies an iSCSI Initiator. The Initiator name uses the FQDN of the Server and the specification *iqn.1991-05.com.microsoft*.

### Install WinTarget

Now it is time to install the Wintarget software. String Bean Software offers a time bombed version of the Wintarget software. You can download the software <u>here</u>. After downloading the package follow the installation instructions.

🚡 WinTarget			- 🗆 X
🚡 Datei Aktion A	Ansicht Fenster ?		
← →   🖬   🚰	₿		
WinTarget Hosts Devices Snapshots	WinTarget         WinTarget         New         Operating Started Guide         Online Help         Support Forums         Common Tasks         Add a New Host         Create a WinTarget Disk	<ul> <li>in WinTarget v2.0</li> <li>Improved Performance</li> <li>Windows Server 2003 x64 Support</li> <li>Host-centric Storage Management</li> <li>Virtual Disk Service (VDS) Hardware Provider Available</li> <li>get you started</li> <li>Guide to help you get started quickly.</li> <li>View WinTarget's help file for detailed instructions.</li> <li>Visit String Bean Software Storage Forums.</li> <li>Add a host to WinTarget to allow access to storage service Create a WinTarget Disk and assign it to a host.</li> </ul>	s.
 Fertig	J		<u> </u>

Figure 5: Wintarget software screen

## Create iSCSI Disk

If you are new to iSCSI or Wintarget, you should read the *Getting Started Guide*. The first step is to *Add a New Host*. Follow the instructions to install the new host. You have to specify the Initiator IQN.

ate New Host		
Identification Methods Specify identifcation methods to use	íor this host.	
A host can be identified using various specify at least ONE method of identi	methods, typically the IQN fication for this host.	of the initiator. Please
Please specify the initiator IQN for this methods click on the Advanced butto	s host (to use alternate/add on): utraders mott	litional identification
ligh. 1991-05.com.microsorcionaon.hv	vtraders.msrt	<u>B</u> rowse
Click on the Advanced button to spechost.	sify alternate/additional ider	ntification methods for this
	< Back	Next > Cancel

Now it is time to *Create a Wintarget Disk*. Click *Devices* and select the Disk which should be a new Wintarget Disk and rightclick *Create Wintarget Disk – New Volume Based Wintarget Disk*.



Figure 7: Create a new Wintarget Disk

You must assign the new Wintarget Disk to one Host.

<b>ssign To</b> Specify the h	nost(s) that will be assigne	d to this WinTarget D	)isk.	
WARNING: Y	r'ou should only assign a '	Win Target Disk to Ol	NE host unless the	e hosts are
configured in	a cluster environment or	SAN file system.		
Please specif	fy the host you wish to as	sign to this disk:		
Host Name	Description			
liondon				
Add	Delete			
Add	<u>D</u> elete			

Figure 8: Assign the new Wintarget Disk to one Host

Wintarget is now ready to offer the new disk to the Initiator.

🚡 WinTarget					
🚡 Eile Action Vie	ew <u>W</u> indo	w <u>H</u> elp			
⇐ ⇒ 🗈 🖬	🕅 😫	Və 🎽			
WinTarget Devices					
🗄 🗛 Hosts	WTD	Description	Size	Status	Assigned To
⊡ 🚽 Iondon — 💬 Devices ⊡ 📢 Snapshots	© wtD	0	298.05 MB	Idle	london

Figure 9: The new Wintarget Disk waiting for the Initiator

### Access iSCSI Disk

Navigate to the Control Panel of the Initiator (the Exchange Server) and click Discovery – Add and enter the IP-address or Hostname of the Wintarget server. Wintarget uses Pprt 3260 per default.

	Port	Adapter	IP Address
ac	3260	Default	Default
<u>A</u> dd		<u>R</u> emove	R <u>e</u> fresh
NS Servers			
Name			
		20512	<u> </u>

Figure 10: Connect to the Wintarget Server

Click on *Targets* and you will see that the Target is available but the status is Inactive. Click *Log On* to access the storage device.

CSI Initiator Prop	erties	
General Discover	, Targets Persistent	Targets   Bound Volumes/Device
Select a target an target. Click detail devices for that ta	d click Log On to acces: s to see information abou get.	s the storage devices for that at the sessions, connections and
Name		Status
iqn.2003-05.com	.stringbeansoftware:dc-l	ondon Inactive
	Details	Log On Refresh
	OK	Cancel Apply

Figure 11: Log on to the Storage device

For this article we don't need to enter more commands and options, it is enough to simply click *OK*.

Log On to Target		×
Target name:		
ign.2003-05.com.stringbeansof	ware:dc-london-target	
Automatically restore this cor	nection when the syste	em boots
🔲 Enable multi-path		
Only select this option if iSC: on your computer.	5I multi-path software i	s already installed
Advanced	ОК	Cancel

Figure 12: Log on to the Target

You have successfully logged on to the Target and now you can use the iSCSI storage. Start Compmgmt.msc, navigate to Disk Management and create a new volume based on the iSCSI storage.

CPDisk 0 Basic 8.00 GB Online	(C:) 8.00 GB NTFS Healthy (System)
CPDisk 1 Dynamic 290 MB Online	290 MB Unallocated
<b>BVD (D:)</b>	
No Media	

Figure 13: Create a new Volume based on the iSCSI disk

After creating the new storage you can change the Exchange Server database path of your information stores. Start Exchange System Manager, navigate to the Mailbox or Public Folder store, select *Database* and click *Browse* to set the new Target path for the Exchange database and the Exchange streaming database.

ibox Store (LO	NDON) Prope	rties	?
Details	1	Policies	Security
General	Database	Limits	Full-Text Indexing
Exchange datab	ase:		
F:\priv1.edb			Browse
, E <u>x</u> change strean	ning database:		
C:\Program Files	s\Exchsrvr\mdb	data\priv1.stm	Bro <u>w</u> se
<u>M</u> aintenance inte	erval:		
Use custom sch	nedule		▼ <u>C</u> ustomize
Time of last full b	ackup:		
Not available			
Time of Jast incre	emental backup:		
Not available			
ー <u>D</u> o not moun ー <u>I</u> his databas	at this store at sta e can be overw	art-up ritten by a restore	
	ок (	Cancel	Apply Help

Figure 14: Move the Exchange database to the new Storage

## Conclusion

iSCSI is a growing alternative to traditional SAN implementations with lower costs and comparable performance with easy advantages over SAN implementations. You should carefully evaluate the operational areas for iSCSI. My experience with iSCSI performance and reliability and Exchange is excellent in midsize environments. This article provides you only with basic information about iSCSI implementations. It doesn't talk about iSCSI security, performance problems, latency and more. Before you implement iSCSI solutions you should be familiar with this technology.

# **Related Links**

Wintarget iSCSI http://www.stringbeansoftware.com/products.asp Microsoft Storage Technologies - iSCSI http://www.microsoft.com/windowsserver2003/technologies/storage/iscsi/default.mspx iSCSI Performance http://www.alacritech.com/assets/applets/iSCSI\_SAN\_Performance.pdf Cluster with iSCSI http://www.microsoft.com/windowsserver2003/technologies/storage/iscsi/iscsicluster.msp <u>X</u> iSCSI definition http://www.ietf.org/rfc/rfc3720.txt iSCSI Software Initiator v2.0 http://download.microsoft.com/download/9/4/b/94ba64d1-959e-44b8-b221-206297e832bb/iSCSIinitiator.doc Microsoft Windows Storage Server Website http://www.microsoft.com/windowsserversystem/storage/default.mspx