

# iSCSI Backups with BackupAssist



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## Introduction

With the implementation of BackupAssist v6.4, the software is now capable of providing specific destination functionality to an iSCSI destination.

This document outlines:

- Basic introduction to iSCSI.
- Speed Testing Comparison.
- Best practices for gaining the most success out of iSCSI.
- Configuring 'software' NAS using OpenFiler BSD.
- Configuring BackupAssist to write to your iSCSI destination.
- Some helpful troubleshooting tips and tricks for iSCSI.

### Need to Know Terminology

iSCSI Target – This is the term used for the storage area for the backup on your destination.

**iSCSI Initiator** – This is essentially the 'client' side of your iSCSI connection. The initiator sends the SCSI commands over the network.

**LUN** – Stands for *Logical Unit Number*. This allows you to separate the physical drive on the iSCSI host into individual targets. Each target can then be used for a specific backup job.

**iSCSI Portal** – The physical hardware of which will be your backup destination. This is usually a PC/Server or a dedicated NAS device.

## What is iSCSI - an Overview

iSCSI is a technology designed to provide access to data on a remote system over the TCP/IP protocol. It does this by sending SCSI type commands across TCP/IP which in turn allows the local machine to treat the network drive as a locally connected device. This allows for a lot of restrictions with remote storage to be lifted by the fact it's masked as a local drive.

When implemented correctly, iSCSI backups should be able to out-perform other backup destinations available (see performance testing later in this document) for commercial use.

iSCSI in BackupAssist is compatible with iSCSI targets implemented on most common distributions of Linux and Unix, as well as all versions of Windows from Server 2008 onwards. All newer style NAS devices come with iSCSI as a standard feature; however it's advised to confirm this with the hardware vendor prior to purchasing to avoid disappointment.



### Advantages of iSCSI

- Faster transfer speeds than other network based protocols.
- Allows for incremental images to be stored on a NAS device. When backing up to a network share, there isn't the presence of a snapshot manager which means that only one backup can be stored on the NAS at one time. However this limitation isn't present when using an iSCSI destination.
- Bare Metal Recovery: Windows Server Backup doesn't allow for recovery from an iSCSI target. However; using the RecoverAssist utility this is now possible with your BackupAssist solution.

### Performance/Speed Testing

The following tests were performed on a production workstation with 35GB of data.

Destination	Time Taken to complete	Throughput (GB/per hour)				
	(mins)*					
iSCSI Target #	10	210				
Network Storage #	20	105				
Locally connected	24	87.5				
USB 2.0 HDD						
QNAP 212 Turbo NAS	18	116^				
QNAP TS-459 Pro II Turbo	10	210^				
NAS						

\* Results may vary depending on the environment in use.

# iSCSI Target and Network Storage tests were run to the same physical machine with Windows installed.

\* We believe that the performance difference between the QNAP devices is that one is an 'entry' level device (Model 212) and the other an enterprise level device (Model TS-459).

## Recommended Best Practices with BackupAssist

• Use one iSCSI target for each backup job.

We have found that running multiple backups to one iSCSI target can and <u>will</u> cause data corruption.

• Use a dedicated iSCSI target for your backups.

If you want to use the iSCSI device for file storage as well; have this set up within a different iSCSI target to that of your backups.

- Allow BackupAssist to connect/disconnect your iSCSI device.
- Consider limiting access to your iSCSI target by only allowing a select group of IP addresses to connect or use CHAP or IPsec authentication.



## Supported Operating Systems

BackupAssist is able to support backups to iSCSI destinations on the following Windows operating systems:

- Windows Vista
- Server 2008
- Small Business Server 2008
- Windows 7
- Server 2008 R2
- Small Business Server 2011

## Using OpenFiler as an iSCSI target

### What is OpenFiler?

OpenFiler is an open source based networking operating system which has a configurable, front end, web based user management system – essentially turning a regular PC or server into a network attached storage (NAS) device with an underlying Linux operating system (more commonly known as a software NAS).

You can find more details on OpenFiler by visiting their website: www.openfiler.com.

#### Installing OpenFiler

#### **Pre-requisites**

To be able to install and run OpenFiler successfully; make sure you have the following available:

- Optical media (CD/DVD) created with the OpenFiler ISO. This is available for download from <a href="http://www.openfiler.com/community/download">http://www.openfiler.com/community/download</a>.
- A PC/Server that has a network card installed.
- Two physical hard drives. The drive to be used as the system drive requires a minimum of 10GB capacity.

**Note:** We found that having two physical drives (one for installing OpenFiler on and the other to use for backup data) available was easiest from a configuration standpoint. It's also the 'best practice' configuration as indicated by the developers of OpenFiler.

#### Installing OpenFiler – Graphical Installation

- 1. Place your optical media into the CD/DVD drive which you're wishing to install off. The system should then boot off the CD/DVD.
- 2. On the welcome screen press 'Enter' to install using the graphical mode.



🖳 Stuart - OpenFiler on localhost - Virtual Machine Connection	
File Action Media Clipboard View Help	
🕸   💿 💿 🕲   🔢 🕪   💑 🍮	
	openfiler
- To install or upgrade in graphical mode, press	the <enter> key.</enter>
- To install or upgrade in text mode, type: linux	text <enter>.</enter>
- Use the function keys listed below for more inf	ormation.
[F1-Main] [F2-Options] [F3-General] [F4-Kernel] [F5 boot: _	-Rescue ]
Status: Running To release your mouse press CTRL+ALT+LE	FT ARROW 🔤 🅅 🔒 🦽

- 3. Click 'Next' in the bottom right hand corner of the opening page.
- 4. Select the keyboard type that you're using for the install from the options available.

Stuart - OpenFiler on localhost - Virtual Machine Connection         File Action Media Clipboard View Help         Image:	_ <b>.</b> ×
Slovenian	^
Spanish	
Swedish	
Swiss French	
Swiss French (latin 1)	
Swiss German	
Swiss German (latin1)	
Tamil (Inscript)	
Tamil (Typewriter)	
Turkish	<b>►</b>
U.S. English	_
U.S. International	
Ukrainian	=
United Kingdom	$\sim$
Bac       A To release vour mouse press CTRL +ALT+LET ARROW	k <u>N</u> ext



5. A warning will now appear stating that the drive will be formatted and all data will be lost. Select 'Yes' to proceed with installation.



6. You'll now need to select which drive you wish to install OpenFiler on. In our example we will be installing it on /dev/sda.

🚱 Stuart - OpenFiler on localhost - Virtual Machine Connection	_ 🗆 🗡
File Action Media Clipboard View Help	
openfiler	
Installation requires partitioning of your hard drive. By default, a partitioning layout is chosen which is reasonable for r You can either choose to use this or create your own.	nost users.
Remove all partitions on selected drives and create default layout	\$
Select the drive(s) to use for this installation	
Sda 10237 MB ATA Virtual HD	
What drive would you like to boot this installation from?	
sda 10237 MB ATA Virtual HD	\$
□ Review and modify partitioning layout	
Belease Notes	⇒ <u>N</u> ext
Status: Running	□ \$ <sup>1</sup> / <sub>1</sub>

7. A warning will now appear stating that the drives you selected will be formatted and all data will be lost. Select 'Yes' to proceed with installation.





8. On the next screen, click on the 'Edit' button to bring up the network interface settings.

Edit Int	erface
Digital Equipment Corporation DECchip 2 Hardware address: 00:15:5D:01:40:27	1140 [FasterNet]
☑ Enable IPv4 support	
<ul> <li>Dynamic IP configuration (DHCP)</li> </ul>	
Manual configuration	
IP Address	Prefix (Netmask)
192.168.1.160	/ 255.255.255.0
Enable IPv6 support	
Automatic neighbor discovery	
O Dynamic IP configuration (DHCPv6)	
O Manual configuration	
IP Address	Prefix
	/
	Cancel

i. Ensure the tick box next to 'Enable IPv4 Support' is checked.

ii. Select the radio button next to 'Manual Configuration'.

iii. Enter the IP address you want to use for your OpenFiler installation and the network subnet under the 'Netmask'.

- iv. Disable the check box next to IPv6.
- v. Click 'OK' to commit these settings.
- 9. Select manually under 'Hostname' and enter the name which you want your OpenFiler machine to be known as.
- 10. Fill out the 'Miscellaneous Settings' as required and then click 'OK' once completed.

Gateway: This is the IP address to connect OpenFiler to the Internet/outside network.



**Primary DNS**: The IP address of the DNS server you wish for OpenFiler to use. **Secondary DNS**: The IP address of an alternative DNS server you wish for OpenFiler to use. This option can be left blank.

Edit Interface									
Digital Equipment Corporation DECchip 21140 [FasterNet] Hardware address: 00:15:5D:01:40:27									
🗹 En	able IPv4 support								
0	Dynamic IP configuration (DHCP)								
۲	Manual configuration								
	IP Address	Prefix (Netmask)							
	192.168.1.160	/ 255.255.255.0							
🗆 En	able IPv6 support								
۲	Automatic neighbor discovery								
0	Dynamic IP configuration (DHCPv6)								
0	Manual configuration								
	IP Address		Prefix						
			/						
		Cancel	<u>ерск</u>						

- 11. Select the relevant time zone and click 'Next'.
- 12. Enter the password for the 'Root' account within OpenFiler.

The installation wizard is now complete - click 'Next' to begin the installation.





13. Once the installation has completed, the CD will be automatically ejected and you'll need to re-boot the system.



Once the system re-boots fully, you should then have access to OpenFiler in command line format (see screen shot below). The OpenFiler installation is now complete.

*Note*: Make sure to write down the Web Administration GUI IP address. This example is https:\\192.168.1.160:446

👰 Stuart - OpenFiler on localhost - Virtual Machine Connection	_ 🗆 ×
File Action Media Clipboard View Help	
🕸 🔍 🔍 🔘 🔘 📗 🎼 🏂	
, , , , , , , , , , , , , , , , , , ,	
Commercial Support: http://www.openfiler.com/support/ Administrator Guide: http://www.openfiler.com/suy/administrator-guide Community Support: http://www.openfiler.com/community/forums/ Internet Belay Chat: server: irc.freenode.net channel: #openfiler	
(C) 2001-2011 Openfiler. All Rights Reserved. Openfiler is licensed under the terms of the GNU GPL, version 2 http://www.gnu.org/licenses/gpl-2.0.html	
Welcome to Openfiler ESA, version 2.99.1 Web administration GUI: https://192.168.1.160:446/	
Status: Running 1: To release your mouse press CTRL+ALT+LEFT ARROW	MA



#### Configuring OpenFiler as an iSCSI target via Web UI

Once you've correctly installed OpenFiler, you should now be able to access the web administration interface.

To be able to run the web administration interface, you'll need the Web Administration GUI IP address as listed when you access your OpenFiler machine locally from command line. In the example we're using https://192.168.1.160:446 is the web administration IP address



1. Open your web browser and enter the web administration IP address.

*Note:* In some browsers you may receive an 'Untrusted Connection' or security certificate warning. There isn't a security issue and you'll need to accept this to configure your iSCSI target.

2. The web administration UI login page should now appear (as shown to the right).

Enter the Username and Password. The default settings are: Username: OpenFiler Password: password



		emanagement
Username:	openfiler	
Password:	•••••	
	Log In	
Distro Release: Openfiler ESA GUI Version: r_15ec1bb936e5	2.99.1 55e65adce24a9b05 <b>95124</b>	e46b0ee-1-1
© 2001 - 2011 <u>O</u> Home · <u>Documentati</u>	<u>penfiler</u> . All rights reserve on · <u>Support</u> · <u>Website</u> · <u>L</u>	ed. .icense

3. Once you've logged in, the 'Status' screen is displayed.

penfile	er										21:58:41 up 1:	11, 0 users, load average: 0.2	3, 0.21, 0.12	Log Out St
🔦 Status	Svstem	R Volumes	🔓 Cluster	🐔 Ouota	Shares	Services	Accounts							
_		~												
														Services s
							Ма	nage Servio	es					Manage
														LDAP Se
						Service	Boot Status	Modify Boot	Current Status	Start / Stop				UPS Set
						CIFS Server	Disabled	Enable	Stopped	Start				iSCSI Ta
						NFS Server	Disabled	Enable	Stopped	Start				👼 FTP Set
						RSync Server	Disabled	Enable	Stopped	Start				
						HTTP/Dav Server	Enabled	Disable	Running	Stop				Support re
						LDAP Container	Disabled	Enable	Stopped	Start				🍓 Report I
						FTP Server	Disabled	Enable	Stopped	Start				Get sup
						iscel Target	Enabled	Disable	Rupping	Etop				📮 Poruns
						iscsr rarget	chabled	Disable	Kunning	<u>3.0p</u>				
						UPS Manager	Disabled	Enable	Stopped	Start				
						UPS Monitor	Disabled	Enable	Stopped	Start				
						iSCSI Initiator	Enabled	Disable	Running	Stop				
						ACPI Daemon	Enabled	Disable	Running	Stop				
						SCST Target	Disabled	Enable	Stopped	Start				
						FC Target	Disabled	Enable	Stopped	Start				
						Cluster Manager	Disabled	Enable	Stopped	Start				
							2.230100		11,000	2.0013				

- 4. Browse to the 'Services' screen.
- 5. Enable and start 'iSCSI target' and 'iSCSI Initiator' services.
- 6. Browse to the 'System' screen.
- 7. Scroll to the bottom to add a 'Network Access Configuration' section.



🖄 Status	🗊 System	👼 Volumes	🕞 Cluster	省 Quota	🚍 Shares	🖐 Servic	ces 🤌	Accounts							
Network Configuration															
							Hos	name: b	packupassist	t.openfiler					
							Primar	y DNS:	192.168.1.24	4					
							Seco	DNS:							
							Ga	teway: 1	192.168.1.1						
								Upo	date Car	ncel					
							Netv	vork Inte	erface C	Configu	ratior	n			
					Interface	Boot Prot	tocol IP	Address	Network	Mask S	Speed	мти	Link	Edit	
					eth0	Static	192	.168.1.160	255.255.2	255.0		1500	No	Configure	
								Create	e bonded int	terface					
	Network Access Configuration														
						Delete Na	ame	Networ	k/Host N	Netmask			Туре		
						New St	tuart PC	192.16	8.1.63	255.255.2	255.255	•	Share 💌	]	
									Update						

8. Fill in the details required to create a new network access configuration.

**Name**: This is used for your own personal identification of the machine BackupAssist is on. It doesn't require any matching or special entry.

Network/Host: Is the IP address of the system you're running BackupAssist on.

**Netmask**: The subnet mask of the machine you're using. During our testing we found if you used 255.255.255.0 that the iSCSI target wouldn't be detected. Using 255.255.255.255 allowed for the iSCSI target to be detected successfully.

Type: Leave this as the default 'Share'.

- 9. Click on 'update' to create the network access.
- Browse to the 'Volumes' screen. You should now be prompted to create a new volume group. Fill in the 'Volume Group Name' field with a value of your choice. Select the physical volume(s) which you want to be part of the volume group by checking the tick box next to the relevant drive.

In our example, the volume /dev/sdb1 is going to be a part of volume group 'iscsi\_vg'.



🖄 Status	🗊 System	📾 Volumes	🚺 Cluster	🚯 Quota	📄 Shares	梯 Services	🤌 Accounts			
							Volume G	roup Manag	ement	
					Volume	Group Name S	ize Allocated	Free Member	s Add physical storag	e Delete VG
							<b>.</b> .			
							Create a	new volume	group	
						P	Valid characters f	or volume group n + -	ame: A-Z a-z 0-9 _	
							Volume gr	oup name (no sp	paces)	
							iscsi	_vg		
							Select ph	ysical volumes t	o add	
							☑ /de	ev/sdb1 85.82	GB	
							Ac	d volume group		

- 11. Click 'Add volume group' to complete the process with the details added.
- 12. Click on the 'Add volume' option under 'Volumes section' to the right hand side.

Volumes section					
🗎 Manage Volumes					
🍓 Volume Groups					
Block Devices					
🚔 Add Volume					
💂 iSCSI Targets					
🗟 Software RAID					

13. You now need to create a volume within the volume group you've just created.

**Volume Name**: Identifier for the name of the volume you're creating. This can be set to anything.

**Volume Description**: A brief outline of the purpose of the volume (if it's not obvious from the Volume name you've entered above). This field can be left blank if you choose.

**Require Space (MB)**: Specified size of the volume you're creating in megabytes. The maximum is the amount of space available on the physical volume. However you can divide these into multiple volumes if you're backing up multiple machines to avoid conflicts.

File System/Volume Type: Change this setting to 'block (iSCSI,FC,etc)'.



🙇 Status	🗊 System	🤿 Volumes	🚯 Cluster	🐇 Quota	🚍 Shares	Services	🤌 Accounts					
												Volumes section
							Select	Volume Group				Manage Volumes     Volume Groups
						P	Please select a v	rolume group to create a vo	olume in.			Colume Groups Colume Colume Colume Column C
						Block stor	ane statistic	s for volume grou	n "iscsi va"			Support resources
						Total	Space (	Jsed Space Fre	ee Space			<ul> <li>Report bug</li> <li>Get support</li> <li>Forums</li> </ul>
						89980928 byte	es (87872 MB) 0	bytes (0 MB) 89980928 b	bytes (87872 MB)			🖾 Admin Guide
							Create com	Free (100%)	ч			
							Create a v	olume in "iscsi_vg"				
					Volum	e Name (*no sp	aces*. Valid cha	racters [a-z,A-Z,0-9]):	Stuart			
								Volume Description:	Stuart's volume iSCSI			
								Required Space (MB):	87872	D		
							Files	system / Volume type:	block (iSCSI,FC,etc)	•		
								Create				

- 14. Click on 'Create' to create the volume.
- 15. Click on the 'iSCSI Targets' option under 'Volumes section' to the right hand side.

Status 🗇 System 🖶 Volumes 🛱 Claster 🕼 Quilds 🖻 Shares 🖉 Accounts							
	Volumes section						
Select Volume Group							
	<ul> <li>Volume Groups</li> <li>Block Devices</li> </ul>						
Please select a volume group to display.	- Add Volume						
isti vo 🗐 Echange	iscSI Targets						
Volumos in volumo aroun <sup>al</sup> icosi un <sup>al</sup> (07073 MD)	Support resources						
Volumes in volume group "BCSL_Vg" (87872 MB)							
Elen a							
Volume name Volume description Volume size File system type File system size F5 used space F5 free space Delete Properties Snapshots							
stuart Stuart's volume SCS1 87872 MB ISCS1 Not applicable Not applicable Not applicable Categories International Contents International C							
0 MB allocated to unapation							
0 MB of free space left							

- 16. Click on the 'Add' button to create a new iSCSI target. Once you've created your iSCSI target click on the 'LUN Mapping' tab.
- 17. The 'LUN Mapping' tab allows for you to point the volume you created in step 13 to the iSCSI target you created in step 16.

The variable options in this screen are as follows:



**R/W Mode**: This is the permissions to the volume. The default option is full read/write permissions. This is the option that is required in this particular setup. **Transfer Mode**: The difference between 'blockio' and 'fileio' is the way caching is used on the target. We've found that transfer rates seem to be improved using blockio over fileio in our environment.

🖄 Status 🛛 🛱 System 🗖 Volumes 🚺 Clus	ster 🐇 Quota 📮 Shares 🌽 Serv	rices 🦽 Accounts		
				Volumes section
Target Configuration LUN Mapping Ne	twork ACL CHAP Authentication			🖷 Manage Volume
				Volume Groups
	LUNs mapped to target: iqn.200	06-01.com.openfiler:tsn.cd83	4e2b7b2b	Block Devices
				iscSI Targets
	A			Software RAID
	<u>No LUN</u>	Is mapped to this target		
				Current and and
	App New LUN to Target: "ign 200	06 01 com openfiloritor ed0	4-3-5-7-5-3-5-1	Support resources
h	hap new LON to Target: 1qn.200	bo-off.com.opennier:tsn.cu83	94e2D7D2D	🕷 Report bug
Name	LUN Path R/W Mode	SCSI Serial No. SCSI Id	Transfer Mode Man LUN	Get support
Hune	Low Fully			Admin Guide
Stuart's volume	e iSCSI /dev/iscsi_vg/stuart write-thru 💌	tYocC9-x7uh-IHy9 tYocC9-x7uh-IHy9	blockio 💌 Map	

- 18. Click on 'Map' to create the relationship between the volume and iSCSI target.
- 19. Browse to the 'Network ACL' tab as this will allow you to specify which machines will be able to detect the iSCSI target you've created.

Change the 'Access' option to either:

**Allow**: This will let the IP address specified under Network/Host to access the iSCSI target. **Deny**: The IP address will not be able to detect the target when searching for valid iSCSI targets.

20. Once you've made your selection, click 'Update' to commit your change.





💊 Status 🔯 System 🔿 Volumes 🚱 Cluster 😵 Quota 🖨 Shares 🌻 Services 🍰 Accounts	
Target Configuration       LUN Mapping       Network ACL       CHAP Authentication         iSCSI host access configuration for target "ign.2006-01.com.openfiler:tsn.cd834e2b7b2b"	Volumes section Manage Volumes Volume Groups Block Devices
NameNetwork/HostNetmaskAccessStuart PC192.168.1.63255.255.255Allow	<ul> <li>Add Volume</li> <li>ISCSI Targets</li> <li>Software RAID</li> </ul>
Update	Support resources & Report bug Get support Forums Admin Guide
© 2001 - 2011 <u>Openfiler</u> . All rights reserved. <u>Home</u> · <u>Documentation</u> · <u>Support</u> · <u>Website</u> · <u>License</u> · <u>Log</u> Out	

If you've made it this far, then you should now be able to configure BackupAssist to use your iSCSI target as a backup destination.



## Configuring BackupAssist to use your iSCSI target

Once you have your iSCSI target configured; BackupAssist should be able to use this as a valid backup destination; provided you use the Zip, Imaging or File Replication engines (from BackupAssist v6.4 onward).

Install BackupAssist. You will have a free 30 day trial, but beyond this trial period, you will need to purchase a base BackupAssist license to continue using this functionality.

To begin this process, create a new BackupAssist backup job. 1. Launch the BackupAssist console and choose File > New backup job from the drop-down menu.

2. Select either Imaging, File Replication or Zip from job type choices and then click 'Next' (see screenshot below).



3. Select **iSCSI** as your destination type and click 'Next'.



BackupAssist - Create Job	instant T Reported a real			-
Backup \ I i i i i Sector State Store (pr	Where do you want your bac Select your backup destination	kup? In		0
O Backup type				
O choose de stinction	External hard	RDX drive	© REV	
Choose schedule	drive USB, Firewire, eSata and other external bard dirks	Removable hard drive cartridges	Lomega REV devices	
O Setup destination	and the next starts	and as downlos of Horses		
Files and applications				
O Hutfolian	Local hard	© Metwork	12021	
O Propercientia	drive Hard drive connected locally	location A network share, including	An ISCSI target	
🔘 Name your backup		windows shares and two		
		< <u>B</u> ack	Next > Cancel	

4. Choose a Schedule and click 'Next'.

5. In the iSCSI target settings:

**i.** Enter your iSCSI target/portal IP address in the text box provided and click 'Search'. This should then produce an option under the 'Target' after a few seconds.

ii. Click on the target which you wish to run the backup to.

**iii.** Select to either have BackupAssist attempt to disconnect the target once it's finished initializing and testing the connection.

*Note:* The operating system will not always be able to disconnect a target and this is not an error in the software.

**iv.** Enter a username and secret (password) if your iSCSI target has CHAP authentication enabled. If CHAP isn't enabled then you can leave this blank.

**v.** Before using an iSCSI target for the first time it must be initialized. Click the "Test connection" button to have BackupAssist connect and initialize the target.

**Note:** If you have any issues on this section of the wizard, refer to the Troubleshooting section of this whitepaper.



BackupAssist - Create job		
BackupAssist	iSCSI target settings Set up your ISCSI target	0
Backup type	Portal: 192. 168. 1. 160	Search
• Choose destination	Target: liqn.2006-01.com.openfiler:tsn.cd834e2b7b2b	Requirements
• Choose schedule		
O Setup destination	Connection: 📝 Attempt to disconnect the target	
Files and applications	CHAP Authentication:	
Notifications	Username:	
Prepare media	Test connection	
🔘 Name your backup		
l		
	< <u>B</u> ack	Next > Cancel

Once you're happy with the configuration, click '**Next'** to move through the wizard and finish configuring your backup job.



## Recovery from an iSCSI Target

### Individual File Recovery

To recover individual applications, files and folders from a backup on your iSCSI target, you'll need to use the BackupAssist Restore Console.

If you're unfamiliar with the BackupAssist Restore Console, please review the documentation which is located <u>here</u>.

#### Disaster Recovery – Bare Metal Restore

*Note:* Bare Metal Restores are only available if you've used the Windows Imaging engine. You will need to have also created boot media using <u>RecoverAssist</u>

as well.

#### **Pre-requisites**

- 1. Boot media containing RecoverAssist.
- 2. Make sure that your system has permissions to your iSCSI target.
- 3. Your system is able to contact the iSCSI destination via a ping command.

#### Performing a Bare Metal Recovery

1. Insert the bootable media which contains RecoverAssist.

2. Boot machine, making sure the boot sequence has the bootable media in step 1 as the first option.

Windows files will now be transferred across as would usually happen when installing a fresh version of Windows. RecoverAssist will then start and perform some staging tasks that are required prior to performing a recovery:





3. Once RecoverAssist is loaded, select 'Recover from a backup located on an iSCSI target'.





4. The Specify network settings page will appear. Select either 'Obtain IP address automatically' or 'Set IP address manually'.

RecoverAssist	X
Specify network settings	
Adapter: Microsoft Virtual Machine Bus Network Adapter	
Obtain IP address automatically	
C Set IP address manually	
IP address: 192 . 168 . 1 . 96	
Mask: 255 . 255 . 0	
Gateway: 192 . 168 . 1 . 1	
DNS: 192 · 168 · 1 · 24 Dynamic	
Click Next to apply setting and proceed	
Back Next Cancel	

If you select to set the IP address manually, you'll need to fill in the following sections:

IP Address: This is the IP that you wish to issue the system you're running the recovery on.Mask: The subnet which you wish the system to be part of (usually 255.255.255.0).Gateway: This is the IP address to connect the system to the Internet/outside networks.DNS: The IP address of the DNS server you wish for the machine to use.

- 5. Select 'Next' once completed.
- 6. Type in the location of the iSCSI target into **'Portal'**. This can be either the IP address or domain name.
- 7. Then click 'Search'.



RecoverAssist				×
Specify iS	CSI target where back	ups are stored		
Choose the	location where backups are sto	red		
Portal:	192.168.1.166			Search
Target:				
Username:	[Optional]			
Secret:	••••			
Click Next to	search for backups			iscsi Help 🔞
			Back	Next Cancel

A list of available targets should then appear.

8. From the list of targets available under '**Target**', select the one which contains the backup you wish to restore.

**Optional:** Add the username and password if the destination is password protected under 'Username' and 'Secrets'.

RecoverAssist		x
Specify i	SCSI target where backups are stored	
Choose the	e location where backups are stored	
Portal:	192.168.1.166 Search	
Target:	ign.2006-01.com.openfiler:tsn.b7aace345e3a	
Username:	[Optional]	
Secret:	•••••	
Click Next f	to search for backups	
	iscsi Help 🔞	
	Back Next Cancel	

9. Click 'Next' to proceed.



 RecoverAssist will now attempt to locate valid image backups located on the target available for restoration. If successful, you'll see the following screen. Click 'Finish' to proceed.

RecoverAssist
iqn.2006-01.com.openfiler:tsn.b7aace345e3a
If you are recovering to a new hard disk, make sure the disk is at least as big as the disk that contained the volumes that were backed up, regardless of the size of those volumes. For example, if there was only one volume that was 100 GB on a 1 TB disk during backup, you should use a disk that is at least 1 TB when restoring.
and order as the machine in which they were originally backed up from.
Back Finish Cancel

11. Select a system image backup will now appear. Select either '**use the latest** available system image (recommended)' or 'Select a system image'.

Once you've selected which image you wish to restore, click 'Next'.



🙀 Re-image your computer		×	
	Select a system image backup This computer will be restored using the system image. Everything on this computer will be replaced with the information in the system image.		
	<ul> <li>Use the latest available system image(</li> <li>Location: Local Disk (C:)</li> <li>Date and time: 2/15/2012 3:00:39 A</li> <li>Computer: WS-StuartEdwards</li> <li>C Select a system image</li> </ul>	recommended) M (GMT-8:00)	
	< Back Next >	Cancel	

12. Additional Restore options will now appear. If you have to install drivers or wish to exclude disks from being restored, you can choose to on this screen. Once you've completed this select '**Next'** to proceed.

🚰 Re-image your computer	×
Choose additional restore options	à.
Format and repartition disks Select this to delete any existing partitions and reformat all disks on this computer to match the layout of the system image.	Exclude disks
If you're unable to select an option above, installing the drivers for the disks you are restoring to might solve the problem.	Install drivers Advanced
< Back Nex	Cancel

13. Confirm your settings and click on the 'Finish' button.



👰 Re-image your computer			×
Re-image your computer	Your computer will be res image: Date and time: Computer: Drives to restore:	tored from the following system (15/2012 3:00:39 AM (GMT-8:00) WS-StuartEdwards I:, C:	×
	< Bac	k Finish Cancel	

14. Windows Recovery Environment will ask you whether you want to format the disks and restore the backups you have chosen. Click on the **OK** button.

Your bare-metal restore of Windows should begin. Once done, your system should reboot and Windows will load. Congratulations - the procedure is complete!



## Troubleshooting

### Connecting to your iSCSI Target with Windows iSCSI Initiator

If you experience issues connecting to your iSCSI target using BackupAssist, try connecting to the target directly through Windows native iSCSI initiator. If you're unable to connect via this method then this indicates that there is an issue with the iSCSI targets configuration and you may need to investigate this further.

To access the iSCSI initiator within Windows (Server 2003 onward), open the Start menu and type 'iscsi' into the text box 'Search Programs and files'.

Programs (1)
Control Panel (1)
iscsi × Shut down +

Click on 'iSCSI Initiator' that appears under Programs. If this doesn't appear, you may need to download and install this from <u>Microsoft</u>.

The iSCSI Initiator Properties screen should then appear. On the 'Targets' tab, type in the Target under the Quick Connect section and click 'Quick Connect'.





iSCSI Initiat	tor Propert	ies	-	-	×
Targets	Discovery	Favorite Targets	Volumes and Devices	RADIUS	Configuration
Quick Connect To discover and log on to a target using a basic connection, type the IP address or DNS name of the target and then click Quick Connect.					
<u>T</u> arget:	192	. 168. 1. 166		Qu	ick Connect

You should then find that your iSCSI target is detected and connected if the configuration is correct.

and the second second	
Targets that are available for connection at the provided are listed below. If multiple targets are to each target individually.	IP address or DNS name that you available, you need to connect
Connections made here will be added to the list of to restore them will be made every time this com	of Favorite Targets and an attempt puter restarts.
Discovered targets	
Name	Status
ign.2006-01.com.openfiler:tsn.b7aace345e3a	Connected
Progress report	
Progress report Immediate Login Succeeded.Persistent Login fa after system reboot	ailed, target will not be available

Just to double check everything is correct; open disk management (Start > Run > and type in diskmgmt.msc) to see if the iSCSI target appears correctly. In the screen shot; our iSCSI target appears as Disk 1.



Volume	Layout	Type	File System	Status
	Simple	Basic	NTFS	Healthy (Primary Partition)
(C:)	Simple	Basic	NTFS	Healthy (Boot, Page File, Crash Dump, Primary Partition)
System Reserved (I:)	Simple	Basic	NTFS	Healthy (System, Active, Primary Partition)
		III		
Basic Su	tom Por	anuad i	(())	
232.88 GB 10	MR NTF	s s	232 79 GB	NTES
Online He	althy (Sys	s tem, Ac	Healthy (B	oot, Page File, Crash Dump, Primary Partition)
	, . ,			
Disk 1				
Basic				
465.97 GB 465	5.97 GB N	TFS		
Online He	althy (Pri	mary Pa	rtition)	
CD-ROM 0 DVD (D:)				
No Media				-
Unallocated Prin	hary partit	ion		

## Connected through Windows iSCSI Initiator however BackupAssist can't connect

If you are able to connect via the Windows iSCSI Initiator and not within BackupAssist; it's most likely due to a DNS configuration issue. Add your iSCSI target the 'Hosts' file on the machine BackupAssist is installed on. The 'Hosts' file is located at *C:\Windows\System32\drivers\etc*.

To edit the 'Hosts' file, you'll need to logged in as an administrator account. Double click on the file within Windows Explorer and open within Notepad.

On the next free line, enter the details as follows:

#### <IP Address> <UNC Name of OpenFiler Machine>

#### E.g. 192.168.1.116 openfiler.physical

Save the 'Hosts' file and then re-try connecting with BackupAssist as outlined on page 10 of this document.



## References

http://forums.openfiler.com/viewtopic.php?id=1957

http://greg.porter.name/wiki/HowTo:Openfiler

https://forums.openfiler.com/viewtopic.php?id=6472

http://wbadmin.info/articles/howto-bare-metal-restores-windows-server-2008-backup.html