# Creating a 2 node virtual SQL Server 2008 Cluster Configuration Using Windows 2008 MSCS

 Reference No:
 16/02/2010

 Date:
 16/02/2010

 File Name:
 Creating a 2 node SQL Server 2008 Cluster Configuration using Windows 2008 MSCS.doc

 Version:
 1.0

Author: Perry Whittle

# **Modification Log**

Work Order	Date	Author	Comments

## Contents

1	PUR	POSE OF THE DOCUMENT	4
	1.1	AUDIENCE	4
2	CLU	STERING BRIEF OVERVIEW	4
3	CRE	ATING THE WINDOWS CLUSTER	5
	3.1	INSTALL & CONFIGURE VMWARE SERVER	5
	3.2	CREATE & CONFIGURE THE NAS VM1	0
	3.3	CREATE THE CLUSTER VM'S (DC AND CLUSTER NODES)2	7
	3.4	ATTACHING THE ISCSI LUNS	5
	3.5	INSTALLING THE WINDOWS 2008 CLUSTER4	0
	3.6	CREATE THE MICROSOFT DISTRIBUTED TRANSACTION COORDINATOR RESOURCE5	4
4	INS	ALLING THE SQL SERVER INSTANCE5	8
	4.1	INSTALLING THE FIRST NODE	8
	4.2	ADD A CLUSTER NODE	8
	4.3	SO HOW WOULD I HAVE AN ACTIVE \ACTIVE CONFIGURATION?7	1
5	<mark>APP</mark>	ENDIX A NAMED INSTANCES & NETWORK NAMES7	2
	5.1	NON CLUSTERED	2
	5.2	CLUSTERED	2

## 1 PURPOSE OF THE DOCUMENT

This document explains how to create a virtual 2 node SQL Server cluster using VMWare Server 2.0.1, Windows 2008 Enterprise 64bit and SQL Server 2005 Enterprise 64 bit. For the purposes of this document the following apply;

Fail-Over	A Microsoft Cluster implementation method			
SSMS	SQL Server Management Studio			
T-SQL	Transact_SQL (the native SQL Server command language)			
MSCS	Microsoft Cluster Services. The underlying technology for SQL			
	Server Fail-Over clustering			
NIC	Network interface card			
Virtual Server	A unique computer name in the domain. During fail-over this			
Name	computername is passed from one node to another			
Virtual IP Address	A unique IP Address in the network. During fail-over this IP			
	Address is passed from one node to another			
NOS	Operating System			
Node	A host which participates in a cluster			
Quorum	The centralised repository used by MSCS			
Heartbeat	A segregated private network for communication detection between			
	nodes			
Active\Passive	A cluster configuration which involves an active node and a passive			
	node. The passive node becomes active on Fail-Over.			

#### 1.1 AUDIENCE

The document is intended to be accessible by Support representatives expressing a wish to learn more about Windows\SQL Server clustering with a view to supporting the SQL Server application under this platform. It is not expected that the reader is familiar with the Windows operating system and MSCS.

## 2 CLUSTERING BRIEF OVERVIEW

MSCS involves 2 or more computers (they don't have to be physical you can use virtual machines too) configured into a cluster relationship, however they do all have to use the same NOS (i.e. Enterprise or Datacentre). This technology requires a central, shared storage (it cannot exist on the machine itself). Clusters use Virtual Server Names and Virtual IP Addresses to create a reference for the network connection to the clustered application. For example SQL Node 1 has a computername of S-DBA-SQL-P01 and IP Address of 10.20.0.120. SQL Server instance, INST1 has a computername of S-DBA-SQL-C03 and IP Address of 10.20.0.126. All network calls to the SQL Server instance 1 are made through the virtual server name and IP address, not the Nodes actual name or IP Address. During fail-over this virtual name is de registered and re registered and along with the IP address passed to the partner Node like a ticket, re directing network calls to the new Node.

## **3 CREATING THE WINDOWS CLUSTER**

MSCS for Windows 2008 has changed and is now more stringent upon the supported resources for clustering, especially storage. To emulate storage that supports SCSI-3 persistent reservations, we are using FreeNAS as a virtual SAN device. The first steps in this article, install and configure the VMWare Server hypervisor and then the FreeNAS virtual machine.

## 3.1 INSTALL & CONFIGURE VMWARE SERVER

Note: For this to be workable you must have sensible hardware available. You will need a multi socket, multi core machine and plenty of RAM and disk space.

Install VMware Server 2.0.1 and then ensure you add your domain account to the following local group on your pc

\_\_vmware\_\_

Login to the Vmware Server console supplying your domain account and password, you see the following;

🕒 🗸 🖉 https:// -95918:8333/ui/#{e:"H	ostSystem ha-host",w:{t:true,i	:0}}		✓ Ø c	ertificate	Error 🍫 🗙	Google UK	• 9
Elle Edit View Favorites Tools Help								
🚖 🕸 🎉 Wilware Infrastructure Web Access						6	• 🖻 • 🖶 • 🔂	Page • 🎯 T <u>o</u> ols • '
🖗 VMware Infrastructure Web Access		*						
Application Virtual Machine Administr	ration 🔲 🔢 🕨 🧐	a –				Help	Virtual Appliance Mar	ketplace   Log Out
Inventory	95918							
-95918		ines Tasks Events Permissions						
	General					Commands		
	Hostname	. 95918.				🗗 Create Virtu	al Machine	
	Manufacturer	Dell Inc.					Machine to Inventory	
	Model	OptiPlex 745				• Add Datasto	ore	
						Configure Opt		
	Processors	Intel(R) Pentium(R) D CPU 3.40GH	Iz			• Edit Host Se		
		1 CPU				<ul> <li>Edit Virtual I</li> <li>Refresh Net</li> </ul>	Machine Startup/Shuti	own Settings
	Usage	1525.00 MHz					MOLE LIST	
						VMware Tips		=
	Memory	1.98 GB					(Concess)	
	Usage	798 MB					Whwate Infhattracture 3	
	Datastores							
	Name 🔺	Capacity Free Sp	ace Location				6664 · · · ·	
	standard	137.3 GB 118.12	GB C:\Virtual I	Machines\			Contract of Contra	
	<				>	Upgrade to VMv afford!	vare Infrastructure at	a price you can
	Networks						r utilization and get hi	ther performance
	Name 🔺		VMnet	Туре		Improve server	danzadon and gec m	gner performance.
	Bridged		vmnet0	bridged				
	HostOnly		vmnet1	hostonly				
	NAT <		vmnet8	nat	>			
	<u>×</u>				/			
<>								
Task	Target	Status	Triggered A	t v	Trioge	ered by	Completed At	
	Tongus		mggu cu /	N 1				

Open the VMWare "Manage Virtual Networks" option from the Start menu and go straight to the "Host virtual adapters" tab as shown below.

Add a new virtual adapter for VMnet2 and VMnet3 then click "Apply"

a <sup>9</sup> Virtual Network Editor		
Summary       Automatic Bridging       Host Virtual Network Mapping       Host         Image: State of the list below shows which virtual networks have host virtual adapters that allow the host computer to connect to the network       Host virtual networks have host virtual netw	st Virtual Adapters   [ ual adapters - virtual E atwork.	
Network Adapter	Virtual Network	Status
WMware Network Adapter VMnet1	VMnet1	Enabled
WWware Network Adapter VMnet8	VMnet8	Enabled
Add	Digable	Remove
OK Cance	el <u>A</u> pply	Help

Now go to the DHCP tab and remove any DHCP assignments (click each item and remove) the click "Apply".

Use this page to configure the Dynamic Host Configuration Protocol settings for individual vinetworks as well as control the DHCP service. Urtual Network Subnet Netmask Description VMnet1 192.168. 1. 0 255.255.255. 0 vmnet1 VMnet2 10. 10. 10. 0 255.255.255. 0 vmnet2 VMnet8 192.168.140. 0 255.255.255. 0 vmnet8	rtual Network	Editor			
Add       Remove       Properties         ICP       Add       Remove       Properties         Minet1       192.168.1.0       255.255.255.0       vmnet1         Minet2       10.10.10.0       255.255.255.0       vmnet2         Minet8       192.168.140.0       255.255.255.0       vmnet2         Minet8       192.168.140.0       255.255.255.0       vmnet8         Add       Remove       Properties         ICP service       Started       Start         ervice request:       Started       Start	nary Automatic I	Bridging   Host Virtual	Network Mapping	lost Virtual Adapters	DHCP NAT
Mnet1       192.168.1.0       255.255.255.0       vmnet1         Mnet2       10.10.10.0       255.255.255.0       vmnet2         Mnet8       192.168.140.0       255.255.255.0       vmnet8         Add       Remove       Properties         CP service         ervice status:       Started       Start         Start         Stagp	🕽 networks as v			on Protocol settings fo	or individual vi
Amet2         10. 10. 10. 0         255.255.255. 0         vmnet2           /Mnet8         192.168.140. 0         255.255.255. 0         vmnet8           Add         Remove         Properties           ICP service	virtual Network	Subnet	Netmask	Description	
Mnet8     192.168.140.     255.255.255.     vmnet8       Add     Remove     Properties       CP service	Mnet1	192.168. 1. 0	255.255.255, 0	vmnet1	
Add Remove Properties HCP service ervice status: Started ervice request: Started Stgp					
rvice status: Started Start rvice request: Stop			A <u>d</u> d	Remove	Properties
ervice request:	ICP service				
	ervice status:	Started			<u>S</u> tart
Restart	ervice request:				Stop
					R <u>e</u> start

Go to the "Host virtual network mapping" option and change the subnets to be used for VMnet 1, 2 & 3. Do this by clicking the arrows (indicated) and selecting "Subnet" from the pop-up menu

Virtual Netw	ork Editor 🔀
Summary Autom	atic Bridging Host Virtual Network Mapping Host Virtual Adapters DHCP NAT
Use this adapters	page to associate individual virtual networks to specific physical and virtual network as well as change their settings.
VMnet <u>0</u> :	Bridged to an automatically chosen adapter
VMnet <u>1</u> :	🕎 VM to host
VMnet <u>2</u> :	🕎 VM Heartbeat
VMnet <u>3</u> :	VMware Network Adapter VMnet3
VMnet <u>4</u> :	Not bridged
VMnet <u>5</u> :	Not bridged
VMnet <u>6</u> :	Not bridged
VMnet <u>7</u> :	Not bridged
VMnet <u>8</u> :	VMware Network Adapter VMnet8
VMnet <u>9</u> :	Not bridged
	OK Cancel Apply Help

For VMnet1 set the IP address to 192.168.1.0

Subnet	
IP <u>A</u> ddress:	192 . 168 . 1 . 0
<u>S</u> ubnet Mask:	255 . 255 . 255 . 0
	OK Cancel

For VMnet2 set the IP address to 10.10.10.0

Subnet	X
IP <u>A</u> ddress:	10 . 10 . 10 . 0
<u>S</u> ubnet Mask:	255 . 255 . 255 . 0
	OK Cancel

For VMnet3 set the IP address range to 192.168.93.0

Subnet	×
IP <u>A</u> ddress:	192 . 168 . 93 . 0
<u>S</u> ubnet Mask:	255 . 255 . 255 . 0
	OK Cancel

Click "OK" to exit the virtual network editor

It's a good idea to open your host machine network connections and rename the virtual LAN adapters to something a little more meaningful, as shown below;

Setwork Connections				
File Edit View Tools Advance	d Help			
🕞 Back 👻 🕥 👻 🥬	Search 😥 Folders	B 🕑 🗙 🍤	····	
Address 🔕 Network Connections				💌 🄁 Go
Name	Туре	Status	Device Name	Phone # or Hc
LAN or High-Speed Internet VMware Network Adapter VMnet8 VM to host VM to SCSI Network VM Heartbeat Local Area Connection Wizard	LAN or High-Speed Inte LAN or High-Speed Inte LAN or High-Speed Inte LAN or High-Speed Inte LAN or High-Speed Inte	rnet Connected, rnet Connected, rnet Connected,	VMware Virtual Ethernet Adapter for VMnet8 VMware Virtual Ethernet Adapter for VMnet1 VMware Virtual Ethernet Adapter for VMnet3 VMware Virtual Ethernet Adapter for VMnet2 Broadcom NetXtreme 57xx Gigabit Controller	
🛐 New Connection Wizard	Wizard			•
<				

Click the "refresh networks list option" within the VMWare Server console to refresh the virtual networks.

With the VMware Server console installed and configured and the virtual networks created, it's now time to create a datastore to hold all the ISO images we wish to install from.

Select the host node in the server console as shown below and under "Commands" click "Add datastore";

🔮 VMware Infrastructure Web Access 🕻						
Application Virtual Machine Administr	ration 🔲 🔢 🕨 🧐	à				Help   Virtual Appliance Marketplace   Log Out
Inventory		ines Tasks Events Permissions				
-	· · ·	ines Tasks Events Permissions				Commands
▲	General	05040				
T I	Hostname	-95918				Create Virtual Machine
	Manufacturer					Add Virtual Machine to Inventory     Add Datastore
	Model					Configure Options
	0.0					Edit Host Settings
	Processors	Intel(R) Pentium(R) D CPU 3.40GHz				Edit Virtual Machine Startup/Shutdown Settings
		1 CPU				Refresh Network List
	Usage	678.00 MHz				VMware Tips
						VMware Tips
	Memory	1.98 GB				(Common
	Usage	717 MB				Weater influenzation 3
	Datastores				-	
	Name 🔺	Capacity Free Space	e Location			Silita a second
	standard	137.3 GB 105.12 G	B C:\Virtual Mad	chines\		2014/2.2. <sup>20</sup>
	<				>	Upgrade to VMware Infrastructure at a price you can
	Networks				-	afford! Improve server utilization and get higher performance.
	Name 🔺		VMnet	Туре		Improve server utilization and get higher performance.
	Bridged		vmnet0	bridged		
	HostOnly		vmnet1	hostonly		
	NAT		vmnet8	nat		
	<				>	
1) III III III						
Task	Target	Status	Triggered At 🛪		Trigg	ered by Completed At
Task	Target	Status	Triggered At v	7	Trigg	ered by Completed At

At the dialog supply a datastore name (ISOs) and a local path (C:\ISOs) then click "OK";

🖶 Add Datas	tore	×
Name:		
1		
O Local D	atastore	
Map a directo datastore.	ory on the host system as a	
Directory P	ath:	
0		
○ CIFS		
	l folder over a network s a VMware datastore.	
Properties:		
Server:		
	Examples: SERVER, nas.example.com, 192.168.0.1	
Folder:		
	Examples: \common\ISO- images, d\$	·
Authorizati	on:	
Username:		
	Examples: MYDOMAIN\user, SERVER\user	
Password:		]
Help	ОК	Cancel

## 3.2 CREATE & CONFIGURE THE NAS VM

The first VM we need to create is the NAS server. Create a new VM with the following properties;

🖶 Create Virtual Machine			×
Pages		Guest Operating System	٦
Name and Location	^		
Guest Operating System Memory and Processors		Select the operating system you plan to install in your virtual machine. Your selection will be used to recommend settings and optimize performance.	
Hard Disk Properties		Once the virtual machine has been created, you will need to install this operating system from your own installation disc.	
Network Adapter Properties		Operating System: Vindows operating system Novell Netware Solaris operating system	
CD/DVD Drive Properties		Linux operating system     Other operating systems  Version: FreeBSD (64-bit)	
Floppy Drive Properties		▶ Product Compatibility	
USB Controller	~		
Help		Back Next Cancel	Í

Add a 2GB virtual hard disk and a network adapter. Bind the virtual NIC to whichever virtual switch you want to use for the iSCSI network (VMNET2 in my case).

Boot the ISO image accepting all defaults. Once the NOS has booted (shown below), select option 9 from the menu.

NASTest VMware Remote Console 👻 Devices 👻	- 🗆 ×
*** This is FreeNAS, version 0.7.1 (revision 5024) built on Tue Jan 26 00:11:57 UTC 2010 for i386-livecd Copyright (C) 2005-2010 by Olivier Cochard-Labbe. All rights reserved. Visit http://www.freenas.org for updates.	
LAN IPv4 address: 192.168.1.250	
Port configuration:	
LAN -> em0	
Console setup 	
Enter a number:	
To direct input to this virtual machine, press Ctrl+G.	vare <sup>.</sup>

You want to install the Full OS using the 3rd option.

1	NASTest VMware Remote Console - Devices -	- 🗆 ×
	Install & Upgrade	1
	<ol> <li>Install 'embedded' OS on HDD/Flash/USB</li> <li>Install 'embedded' OS on HDD/Flash/USB + DATA + SWAP partition</li> <li>Install 'full' OS on HDD + DATA + SWAP partition</li> <li>Upgrade 'embedded' OS from CDROM</li> <li>Upgrade 'full' OS from CDROM</li> <li>Upgrade and convert 'full' OS to 'embedded'</li> </ol>	
	COK < Exit >	-
To	direct input to this virtual machine, press Ctrl+G. 🛛 🚗 🗞 🦕 📳 👜 🖛	ware <sup>.</sup>

## Answer "OK" to continue

	NASTest VMware Remote Console - Devices -	- 🗆 ×
	FreeNAS installation-	
	FreeNAS 'full' installer for HDD.	
	- Create MBR partition 1, using UFS, customizable size for OS - Create MBR partition 2, using UFS, for DATA - Create MBR partition 3, as SWAP - Easy to customize (e.g. install additional FreeBSD packages)	
	WARNING: There will be some limitations: 1. This will erase ALL partitions and data on the destination disk	
	<mark>&lt;_OK→</mark> ⟨Cancel>	
To	direct input to this vitual machine, press Ctrl+G. 📃 🕞 🦕 🖛	vare <sup>.</sup>

Select "OK" for the CD drive,

🛃 NASTest	VMware Remote Console 👻 Devices 👻	_ 🗆 ×
	Choose installation media	
	acd0 VMware Virtual IDE CDROM Drive/00000001	
	Cancel>	
To direct input to	this virtual machine, press Ctrl+G. 📃 🔒 🗐 🗤	ware'

Select "OK" for the virtual disk,

🛃 NASTest	VMware Remote Console 👻 Devices 👻	- 🗆 ×
	Choose destination media Select media where FreeNAS OS should be installed. 180 2048MB <umware, 1.0="" s="" umware="" virtual=""></umware,>	
	Cancel>	
To direct input to	this virtual machine, press Ctrl+G. 🚑 😪 🗐 🗐 🕶	ware'

Supply the OS partition size of 512MB,

🛃 NASTest	VMware Remote Console 👻 Devices 👻	- 🗆 ×
	Enter the size for OS partition in MB (Min 128MB):	
	512	
	<pre>Cancel&gt;</pre>	
To direct input to	this virtual machine, press Ctrl+G. 📃 😭 🗐 🖛	nware <sup>.</sup>

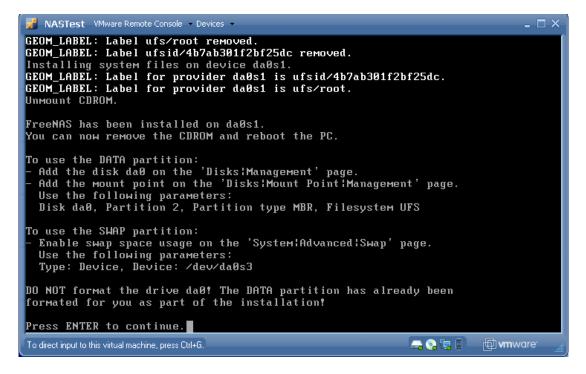
Select "yes" to add a swap partition,

🛃 NASTest 🛛 VMware Remote	Console - Devices -	- 🗆 ×
	Do you want to add a swap partition?	
To direct input to this virtual machin	e, press Ctrl+G. 🚍 🚱 🗐 🗐 🗤	ware _

Supply the swap partition size of 1024MB,

🛃 NASTest VMware	Remote Console 👻 Devices 👻	_ 🗆 ×
	Enter the size of the swap partition in MB. 1024 CON Cancel>	
To direct input to this virtual	machine, press Ctrl+G.	<b>vm</b> ware

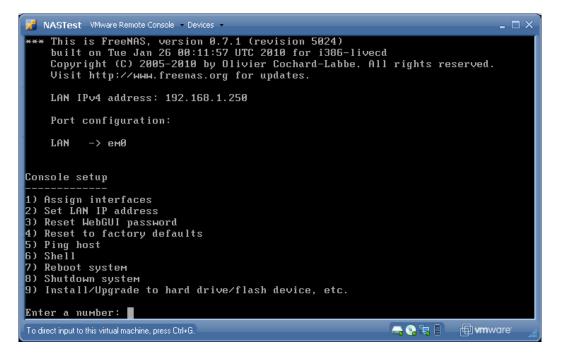
Installation completed, press "Enter" to continue.



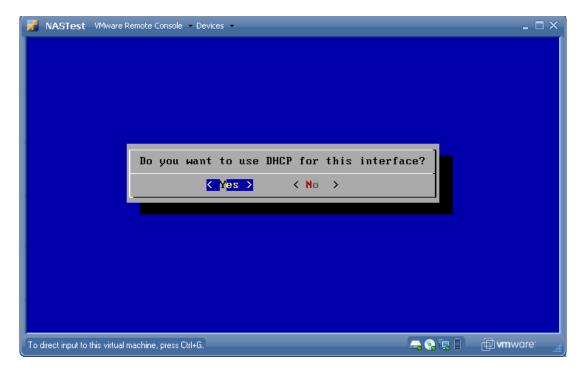
Now select "Exit" to finish.

NASTest VMware Remote Console - Devices -	- 🗆 ×
Install & Upgrade I Install 'embedded' OS on HDD/Flash/USB Install 'embedded' OS on HDD/Flash/USB + DATA + SWAP partitio Install 'full' OS on HDD + DATA + SWAP partition Upgrade 'embedded' OS from CDROM Upgrade 'full' OS from CDROM Upgrade and convert 'full' OS to 'embedded'	n
< OR > <∎xit >	
To direct input to this virtual machine, press Ctrl+G.	) <b>vm</b> ware

Now we need to set the LAN IP address. Select option 2 from the menu



The LAN configuration starts as follows. Select whether to use DHCP (no for our scenario)



#### Enter the new LAN IP address

📝 NASTest VMware Remote Cor	nsole - Devices -		- 🗆 ×
	Enter new LAN IPv4 address. 10.10.10.2 CR > <cancel></cancel>		
To direct input to this virtual machine, p	ess Ctrl+G.	🚐 🚷 🗔 🛢	🗇 <b>vm</b> ware <sup>.</sup>

Supply the Network mask (using CIDR notation),

NASTest VMware Remote Console - Devices -	- 🗆 ×
	1
Enter new LAN subnet mask. Subnet masks are entered as bit counts (as in CIDR notation).	
e.g. 255.255.255.0 = 24 255.255.0.0 = 16 255.0.0.0 = 8	
24	
Cancel>	
To direct input to this vitual machine, press Ctrl+G.	<b>m</b> ware:

Select "no" for the IPv6 configuration,

🛃 NAST	est	VMware Remote Console Devices	- 🗆 ×
		Do you want to configuration IP∨6 for this interface?	
		< Yes > < No >	
To direct inp	out to th	nis virtual machine, press Ctrl+G. 📃 📮 🔂 🗐	<b>vm</b> ware"

Press "Enter" to continue,

NASTest VMware Remote Console - Devices -	- 🗆 ×
Initializing interface. Please wait	
The LAN IP address has been set to: IPv4: 10.10.10.2/24	
You can access the WebGUI using the following URL: http://10.10.10.2:80	
Press ENTER to continue.	
To direct input to this virtual machine, press Ctrl+G.	vare <sup>.</sup>

Shutdown the server using option 8 from the menu as we now have to create\attach the virtual hard disk to the NAS VM that will hold our iSCSI LUNs.

Click the "Add hardware" option and add a new disk 20GB in size, pre allocating all disk space (shown below).

🖶 Add Hardware Wizard	X
Pages	Properties
Hardware Type	How much software and data should this hard disk be able to store?
Hard Disk Properties	Capacity: 20 🖨 GB 🔻
Ready to Complete	Location: [standard] NASTest/NASTest_2.vmdk Browse 31.78 GB available
	<ul> <li>File Options</li> <li>Allocate all disk space now</li> <li>Split disk into 2 GB files</li> <li>Disk Mode</li> <li>Virtual Device Node</li> <li>Policies</li> </ul>
Help	Back Next Cancel

Once the disk has been added, boot the NAS VM and login to the NAS web management page using the username admin and password "freenas" (without quotes).



Go to "Disks" > "Management". Click the + sign as indicated,

nas.local - Disks   Management - Windows Inter	rnet Explorer						
✓				✓ <sup>4</sup> 7	K Google U	ĸ	
lit ⊻jew Favorites Iools Help							
Preenas.local - Disks Management					🙆 • 🔊 ·	🖶 🔹 🔂 Bage	
International Action	ccess Status Diagnosti	cs Advance	ed Help				eenas.local
Disks   Management Management S.M.A.R.T. iSCSI Initiator							
Disk Size Description		Serial number	Standby time	File system	Status		
Rescan disks						+ 🔨	
	FreeNAS © 2005-2010 by Olivier 0	Cochard-Labbe. All	rights reserved.				
					Internel		😤 100% 👻 🚲

Select the disk and use ZFS pre formatted file system, then click "add". After adding the disk you must click the "Apply changes" button.

ystem Network	Disks	Services	Access	Status	Diagnostics	Advanced	Help
Disks   Manag	emen	t   Disk   A	dd				
Management 5.	M.A.R.T.	iSCST Initiat	OF				
Hanagement 3.	- 1.A. N. I .	ISCSI Initiat	.01				
Disk		da 1: 3	20480MB (VMv	are, VMware \	/irtual S 1.0)	~	
Description		da1: 2	0480MB (VMw	re, VMware Vir are, VMware V irtual IDE CDR		1)	
Transfer mode		Auto This all	vows you to se	t the transfer r	mode for ATA/IDE h	ard drives.	
Hard disk standby t	ime		rs on 💉 ie hard disk int	o standby mod	le when the selecte	d amount of time	after the last hard disk access has been elapsed.
Advanced Power Ma	anagement	Disabl This all		ver the power	consumption of the	drive, at the expe	ense of performance.
Acoustic level		Disabl This all		t how loud the	drive is while it's op	erating.	
S.M.A.R.T.			tivate S.M.A.	R.T. monitoring	g for this device.		
S.M.A.R.T. extra o	ptions	Extra c	options (usually	/ empty). Plea:	se check the docum	entation.	
Preformatted file sy	vstem	This all	torage pool de ows you to se ormat menu.		m for preformatted	hard disks contain	ing data. Leave 'Unformated' for unformated disks and format them
Add Cancel							

After adding the disk click "Disks" > "ZFS". Select "Pools" > "Virtual device". Click the + sign

Syst	em Netwo	rk Disks	Services	Access	Status	Diagnostics	Advanced	Help	
D	isks   ZFS	Pools   Vi	rtual de	vice					
	Pools Datas	ets Configu	ration						
	/irtual device	Managemen	t Tools	Information	I/O stat	tistics			
	Name		Туре		Descriptio	on			1
									+

Supply a device name and select the disk then click "Add", you must click the "Apply changes" button afterwards.

Disks   ZFS   Pools   Virtu	al device   Add
Pools Datasets Configuration	
Virtual device Management	Tools Information I/O statistics
Name	Data_Vol
Туре	Stripe
Devices	da1 (20480MB, VMware, VMware Virtual S 1.0)
Description	You may enter a description here for your reference.
Add Cancel	

Now click "Management" as shown below and then click the + sign

Disks   ZFS   Pools   Ma Pools Datasets Configura	_	t					
Virtual device Management		ormation I/O	statistics				
Name	Size	Used	Free	Capacity	Health	AltRoot	]
							+
		FreeNAS © 200	5-2010 by Olivier C	Cochard-Labbe. All	rights reserved.		

Supply a name and select the virtual device then click "Add", you must click the "Apply changes" button afterwards.

nagement   Add
tion
Tools Information I/O statistics
Data_Vol
Data Vol (stripe)
Creates the pool with an alternate root.
Sets an alternate mount point for the root dataset. Default is /mnt.
You may enter a description here for your reference.

Once this is done you may then go to "Services" > "iSCSI target". The first task is to enable the iSCSI Target by checking the box indicated and then clicking "Save and restart".

5CSI Target		📃 Enabl
Base Name	ign.2007-09.jp.ne.peach.istgt The base name (e.g. ign.2007-09.jp.ne.peach.istgt) will append the target name that is not starting with 'ign.'.	
Discovery Auth Method	Auto	
Discovery Auth Group	None  The initiator can discover the targets with correct user and secret in specific Auth Group.	
Advanced settings		
I/O Timeout	30 I/O timeout in seconds (30 by default).	
NOPIN Interval	20 NOPIN sending interval in seconds (20 by default).	
Max. sessions	32 Maximum number of sessions holding at same time (32 by default).	
Max. connections	8 Maximum number of connections in each session (8 by default).	
FirstBurstLength	65536 ISCSI initial parameter (65536 by default).	
MaxBurstLength	262144 ISCSI initial parameter (262144 by default).	
MaxRecvDataSegmentLength	262144 BGSI initial parameter (262144 by default).	

Go to the "Initiators" section and click the + sign.

ttings Targets Porta	ls Initiators Auths Media		
nitiator Groups			
Initiator Group	Tag Initiators	Networks	
	A Initiator Group contains authorised initiator nan	nes and networks to access the target.	+

If you want all initiators to connect click "Add" (you could lock down which machines connect by specifying their IDs here), you must click the "Apply changes" button afterwards.

ettings Targets Porta	Is Initiators Auths Media
Tag number	1 Numeric identifier of the group.
Initiators	ALL
Authorised network	10.10.10.0/24
Comment	You may enter a description here for your reference.

#### Click "Portal group" and then click the + sign

ervices   iSC	6I Targe	t   Portal	Group	)		
Settings Target	Portals	Initiators	Auths	Media		
Portal Groups						
Portal Group		Tag	Portal	s		
A Portal Group contains IP addresses and listening TCP ports to connect the target from the initiator.		+				

Specify the portal (accept the default in our case) then click "Add". You must click the "Apply changes" button afterwards.

Services   iSCSI Tar	get   Portal Group   Add
Settings Targets Port	als Initiators Auths Media
Tag number	1 Numeric identifier of the group.
Portals	10.10.10.2:3260
Comment	The portal takes the form of 'address:port'. for example '192.168.1.1:3260' for IPv4, '[2001:db8:1:1::1]:3260' for IPv6. the port 3260 is standard iSCSI port number. For any IPs (wildcard address), use '0.0.0.0:3260' and/or '[::]:3260'. Do not mix wildcard and other IPs at same address family.
	You may enter a description here for your reference.
Add Cancel	

Now click "Targets". You may now set up the LUNs you wish to present to the cluster nodes. Click the + sign to add an extent.

ixtent	Name	Path			Si	ize			1
	Extents must be de	fined before they can be us	ed, and ex	xtents cannot be used more tha	n once.				+
arget	Name		Flags	LUNs		PG	IG	AG	
	At the highest leve	l, a target is what is present	ted to the i	nitiator, and is made up of one	or more ext	tents.			+

Supply the extent name, type, path and size. Remember to click "Apply changes" button when prompted.

ervices   iSCSI Target   Extent   Add					
Settings Targets Porta	lls Initiators Auths Media				
Extent Name	Quroum String identifier of the extent.				
Туре	File Type used as extent.				
Path	/mnt/Data_Vol/Quorum File path (e.g. /mnt/sharename/extent/extent0) used as extent.				
File size	500 MIB S Size offered to the initiator. (up to 8EIB=8388608TIB. actual size is depend on your disks.)				
Comment					
Add Cancel					

Extents added! Now click the + sign next to targets and configure those.

I the changes have	been applied successfully.								
Targets									
Extent	Name	Path				Size			
	Quroum	/mnt/Data_Vol/Qu	Jorum			500MiB			4 💢
	SQLBak	/mnt/Data_Vol/SQLBak					7000MiB		
	SQLData	/mnt/Data_Vol/SQLData					9000MiB		
	SQLLog	/mnt/Data_Vol/SQLLog					3000MiB		
	Extents must be de	fined before they can be us	sed, and e	xtents cannot be used	more than once.				+
Target	Name		Flags	LUNs		PG	IG	AG	]
	At the highest level	, a target is what is presen	ted to the i	initiator, and is made up	o of one or more	extents.			+

Configure the following options for each target (Quorum, SQLData, SQLLog, SQLBak).

ervices iSCSI Tai	rget   Target   Add
Settings Targets Port	tals Initiators Auths Media
Target Name	Quorum Base Name will be appended automatically when starting without 'iqn.'.
Target Alias	Optional user-friendly string of the target.
Туре	Disk Cogical Unit Type mapped to LUN.
Flags	Read/Write (rw)
Portal Group	Tag1  The initiator can connect to the portals in specific Portal Group.
Initiator Group	Tag1 v The initiator can access to the target via the portals by authorised initiator names and networks in specific Initiator Group.
Comment	You may enter a description here for your reference.
LUNO	
Storage	Quroum (/mnt/Data_Vol/Quorum)  The storage area mapped to LUNO.

Targets added! The target name is the label presented to the computer node over the iSCSI network.

1 The changes have	rtals Initiators Auths	5 Media						
largets								
Extent	Name	Path			Size			
	Quroum	/mnt/Data_Vol/	Quorum			500MiB		
	SQLBak	/mnt/Data_Vol/	SQLBak	7000MiB			4	
	SQLData	/mnt/Data_Vol/	/SQLData			9000MiB		
	SQLLog	/mnt/Data_Vol/S	SQLLog		3000MiB			4 💢
	Extents must be def	ined before they can be	used, and e	xtents cannot be used more than once	e.			+
Target	Name		Flags	LUNs	PG	IG	AG	
	iqn.2007-09.jp.ne.	peach.istgt:Quorum	rw	LUN0=/mnt/Data_Vol/Quorum	1	1	none	4 🗙
	iqn.2007-09.jp.ne.	peach.istgt:SQLBak	rw	LUN0=/mnt/Data_Vol/SQLBak	1	1	none	44
	iqn.2007-09.jp.ne.	peach.istgt:SQLData	rw	LUN0=/mnt/Data_Vol/SQLData	1	1	none	44
	iqn.2007-09.jp.ne.	peach.istgt:SQLLog	rw	LUN0=/mnt/Data_Vol/SQLLog	1	1	none	42
				initiator, and is made up of one or mor				+

Initiator Group which is identified by tag number defines authorised initiator names and networks. Auth Group which is identified by tag number and is optional if the target does not use CHAP authentication defines authorised users and secrets for additional security. Extent defines the storage area of the target.

## 3.3 CREATE THE CLUSTER VM'S (DC AND CLUSTER NODES)

Now we are ready to start creating the VM's. Under the "Commands" section, select "Create virtual machine". Enter a Virtual machine name and select a datastore (this datastore maps to a folder on your local drive) then click "Next";

Create Virtual Machine				×
Pages		Name and Location		
Name and Location Guest Operating System Memory and Processors	^	Enter a descriptive name for your ner datastore where its configuration files		and specify the
Hard Disk		Name: ClusterDC		
Properties		Datastore 🔺	Capacity	Available
		ISOs	137.3 GB	80.6 GB
Network Adapter		standard	137.3 GB	105.12 GB
Properties	Ξ			
CD/DVD Drive				
Properties				
Floppy Drive				
Properties				
USB Controller				
	~			
Help		В	ack Next	Cancel

Select the Operating System type (Enterprise Edition for clustering) and click "Next";

🖶 Create Virtual Machine		×
Pages	٦	Guest Operating System
Name and Location Guest Operating System Memory and Processors	^	Select the operating system you plan to instal in your virtual machine. Your selection will be used to recommend settings and optimize performance.
Hard Disk Properties		Once the virtual machine has been created, you will need to install this operating system from your own installation disc. Operating System:       Windows operating system
Network Adapter Properties	Ш	<ul> <li>Novell Netware</li> <li>Solaris operating system</li> <li>Linux operating system</li> </ul>
CD/DVD Drive Properties		<ul> <li>Other operating systems</li> <li>Version: Microsoft Windows Server 2003, Enterprise Ed ▼</li> </ul>
Floppy Drive Properties		▶ Product Compatibility
USB Controller	~	
Help		Back Next Cancel

Select the RAM (256Mb for DC and 512MB for each cluster node) and CPU (1 each) then click "Next";

Create Virtual Machine		×
Pages		Memory and Processors
Name and Location	^	
Guest Operating System		Memory
Memory and Processors		Increasing a virtual machine's memory allocation can improve its performance but may also impact other running applications.
Hard Disk		
Properties		Size: 256 MB
Network Adapter		• Recommended Size (256 MB)
Properties	=	Recommended Minimum (128 MB)
		The guest operating system may not start up below this size.
CD/DVD Drive		Recommended Maximum (8192 MB)
Properties		Memory swapping may occur above this size.
Floppy Drive		Processors
Properties		Select the number of processors carefully. We do not recommend
		reconfiguring this value after installing the guest operating system.
USB Controller		Count: 1 🗸
	~	
Help		Back Next Cancel

#### Select to create a new virtual disk;

Create Virtual Machine	×
Pages	Hard Disk
Name and Location Guest Operating System Memory and Processors	A virtual disk is a special type of file, which will start small and then grow larger as you add applications and data to your virtual machine.
Hard Disk	Create a New Virtual Disk Choose this option to add a blank disk to your virtual machine.
Properties	Use an Existing Virtual Disk
Network Adapter	Choose this option to reuse or share a hard disk from another virtual machine.
Properties 📃	• Don't Add a Hard Disk
CD/DVD Drive	
Properties	
Floppy Drive	
Properties	
USB Controller	
Help	Back Next Cancel

Supply a size for the virtual disk and select SCSI bus (SCSI ID 0 for the VM boot drives in our example), make sure to pre allocate the disk space for the virtual disks. Click "Next";

Preate Virtual Machine		>
Pages		Properties
Name and Location Guest Operating System Memory and Processors	^	How much software and data should this hard disk be able to store? Capacity: 10 😴 GB 👻
Hard Disk Properties		Location: [standard] ClusterDC/ClusterDC.vmdk Browse
Network Adapter Properties		105.12 GB available ► File Options ► Disk Mode
CD/DVD Drive Properties		Virtual Device Node       Adapter:     IDE 0       Device:     0
Floppy Drive Properties		▶ Policies
USB Controller	~	
Help		Back Next Cancel

The Windows 2008 nodes need a 20GB disk drive and 10GB for the DC.

#### Select "Add a network adapter" and the network selection browse opens

🖶 Create Virtual Machine		×
Pages	Network Adapter	٦.
Name and Location Guest Operating System Memory and Processors	Network adapters give your virtual machine access to port groups that have been configured for virtual machine use on the host. If no such port groups have been configured, you will not be able to connect to any network.	
Hard Disk Properties	→ Add a Network Adapter	
Network Adapter	Don't Add a Network Adapter	
Properties		
CD/DVD Drive Properties		
Floppy Drive Properties		
USB Controller		
Help	Back Next Cancel	
neip	Dack Next Cancel	

Select "Host only" for this vNIC and click "Next";

🖶 Create Virtual Machine		×
Create Virtual Machine  Pages Name and Location Guest Operating System Memory and Processors Hard Disk Properties Network Adapter Properties CD/DVD Drive Properties Floppy Drive Properties USB Controller	Properties         Which network will your virtual machine access?         Network Connection:       HostOnly         Bridged         Connect at Power On:         HostOnly         NAT	
Help	Back Next Cancel	

Select to use an ISO image for the vCD drive and click the browse button,

🖶 Create Virtual Machine	×
Pages	CD/DVD Drive
Name and Location Guest Operating System Memory and Processors	CD and DVD media can be accessed on the host system or on your local computer.
Hard Disk Properties	Host Media  → Use a Physical Drive Choose this option to give the guest operating system access to a physical CD or DVD drive on the host system.
Network Adapter Properties	Use an ISO Image     Choose this option to give the guest operating system access to an     ISO image residing on the host file system.
CD/DVD Drive Properties	
Floppy Drive Properties	• Don't Add a CD/DVD Drive
USB Controller	
Help	Back Next Cancel

The datastore browser opens, drill down and select the Windows 2003 R2 Enterprise ISO (or Windows 2008 for a cluster node) and click "OK". At the "create virtual machine window" click "Next";

🖶 Select File			×
Inventory	Contents	Information	n
<ul> <li>D-95918.corp.northampto</li> </ul>	📁 SQL Server x86 Ent	Name:	ISOs
🔻 🦉 ISOs	📁 Windows Server Enterprise 2003 R2 v	Type:	Datastore
SQL Server x86 E		Capacity:	137.304 G
🕨 📁 Windows Server E		Available:	80.604 GB
<ul> <li>standard</li> </ul>			
		<	>
File Type: ISO Image (*.iso)	▼		
		ОК	Cancel

At the next screen do not add a floppy drive and click "Next";

Create Virtual Machine	×
Pages	Floppy Drive
Name and Location Guest Operating System Memory and Processors	Floppy media can be accessed on the host system or on your local computer.
Hard Disk Properties	Host Media     Use a Physical Drive     Choose this option to give the guest operating system access to a
Network Adapter Properties	<ul> <li>physical floppy drive on the host system.</li> <li>Use a Floppy Image Choose this option to give the guest operating system access to a floppy image residing on the host file system.</li> </ul>
CD/DVD Drive Properties	Create a New Floppy Image     Choose this option to create a new floppy image on the host file     system.
Floppy Drive Properties	
USB Controller	<ul> <li>Don't Add a Floppy Drive</li> <li>✓</li> </ul>
Help	Back Next Cancel

Do not add a USB controller and click "Next";

🖶 Create Virtual Machine	×
Pages Name and Location Guest Operating System Memory and Processors	USB Controller A USB controller gives your virtual machine access to USB devices plugged into the host.
Hard Disk Properties	<ul> <li>→ Add a USB Controller</li> <li>Don't Add a USB Controller</li> </ul>
Network Adapter Properties	
CD/DVD Drive Properties	
Floppy Drive USB Controller	
Ready to Complete	Back Next Cancel
nop	

## At the last screen click "Finish" to complete the VM

₫	🖶 Create Virtual Machine 🛛 🗙 🗙		
Γ	Pages	Ready to Complete	
	Name and Location Guest Operating System Memory and Processors	Please verify that your new	w virtual machine is configured correctly. ClusterDC
	Hard Disk Properties	Location: Guest Operating System: Memory:	[standard] Microsoft Windows Server 2003, Enterpri 256 MB
	Network Adapter Properties	Processors: Hard Disk:	1 8 GB
	CD/DVD Drive Properties	Network Adapter: CD/DVD Drive: USB Controller:	Using "HostOnly" Using "[ISOs] Windows Server Enterpris No
	Floppy Drive	▶ More Hardware	
	Ready to Complete		
L	Help Power on	your new virtual machine no	w Back Finish Cancel

Create the remaining VMs (node 1 and node 2) using Windows 2008 Enterprise software. Use a pre allocated 20GB virtual disk for each node, also add 2 more vNICs, these will be used for the Heartbeat and iSCSI networks. This is done as follows;

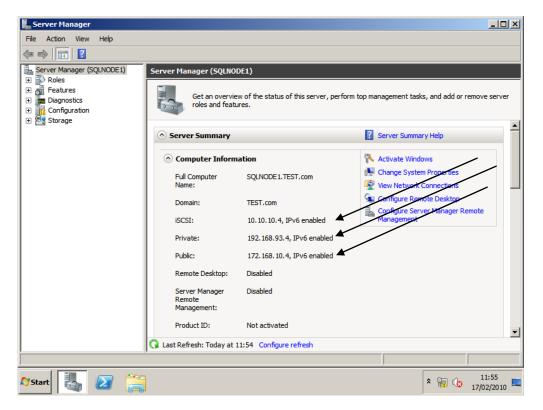
With the base VM created, select the first node and under the "Command" section click "Add hardware", the following screen appears. Click "Network adapter" and the vNIC properties appear;

🖶 Add Hardware Wizard		×
Pages         Hardware Type         Hard Disk         Properties         Ready to Complete	Hardware Type         Select a device from the following list:         Hard Disk         Network Adapter         CD/DVD Drive         Floppy Drive         Serial Port         Parallel Port         Passthrough SCSI Device         Sound Adapter         USB Controller	
Help	Back Next Cancel	

Select the "VMnet2" option from the drop down list and click "Next". Add in a 3<sup>rd</sup> vNIC for VMnet3, then click "Finish" to complete. Do this for the second cluster node too.

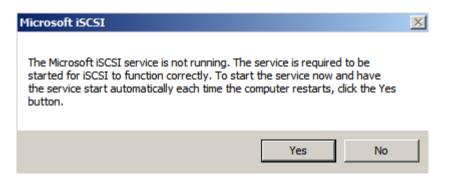
🖶 Add Hardware Wizard	
Pages	Properties
Hardware Type	Which network will your virtual machine access?
Network Adapter Properties	Network Connection: Bridged  Bridged
Ready to Complete	Connect at Power On: HostOnly VMnet2 NAT
Help	Back Next Cancel

Install the windows operating systems on each VM and create a domain controller with a test domain on ClusterDC. Configure Public networking between the 3 VM's and join the 2 nodes to the domain. Configure the iSCSI network between the VM's and the NAS VM. Configure the heartbeat network between the cluster node VMs. Once this is done you may proceed with the rest of the instructions in this document. If you are unsure with any aspect of the NOS build or configuration consult your Windows administrator for help with this. The screenshot below shows the deployed Windows 2008 server with network adapters.



#### 3.4 ATTACHING THE ISCSI LUNS

Once the cluster nodes have been created and networking configured we need to start the Windows iSCSI initiator and discover the iSCSI LUNs. Open administrative tools and double click the iSCSI Initiator. You may receive a message indicating the service is not running and needs to be started, this is shown below. Accept this message to continue.



With the service now started the following dialog should appear. Enter the NAS VM IP address and click "Quick connect".

You may even use IPsec for secure communications. Most importantly your iSCSI traffic should pass over a private, segregated network (much like the VMWare Vmotion network).

	Properties		
argets Disco	overy Favorite Targets Volumes and Device		JS Configuration
Quick Connec	t		
	and log on to a target using a basic connection,	type the	IP address or
DNS name of	f the target and then click Quick Connect.		
Target:	10.10.10.2		Quick Connect
Discovered ta	argets		
Discovered a	. <u>4</u> . 0		Refresh
Name		Status	
To connect u	ising advanced ontions, select a target and the	n	General
	using advanced options, select a target and the	n	Connect
To connect u click Connect		n	Cognect
click Connect		n _	Co <u>n</u> nect
click Connect To completel	t. y disconnect a target, select the target and	n	
click Connect To completel	t. y disconnect a target, select the target and	n	Co <u>n</u> nect Disconnect
click Connect To completel	t. y disconnect a target, select the target and	n	
dick Connect To completel then click Dis	t. y disconnect a target, select the target and connect.	n	
dick Connect To completel then dick Dis For target pr	t. y disconnect a target, select the target and connect. operties, including configuration of sessions,	n _	Disconnect
dick Connect To completel then dick Dis For target pr	t. y disconnect a target, select the target and connect. operties, including configuration of sessions,	n _	
click Connect To completel then click Dis For target pr	t. y disconnect a target, select the target and connect.	n	Disconnect
click Connect To completel then click Dis For target pr select the tar	t. y disconnect a target, select the target and connect. operties, including configuration of sessions, rget and click Properties.		Disconnect
dick Connect To completel then dick Dis For target pr select the tar For configura	t. y disconnect a target, select the target and connect. operties, including configuration of sessions, rget and click Properties. ation of devices associated with a target, select		Disconnect Properties
dick Connect To completel then dick Dis For target pr select the tar For configura	t. y disconnect a target, select the target and connect. operties, including configuration of sessions, rget and click Properties.		Disconnect
dick Connect To completel then dick Dis For target pr select the tar For configura	t. y disconnect a target, select the target and connect. operties, including configuration of sessions, rget and click Properties. ation of devices associated with a target, select		Disconnect Properties
click Connect To completel then click Dis For target pr select the tar For configura	t. y disconnect a target, select the target and connect. operties, including configuration of sessions, rget and click Properties. ation of devices associated with a target, select		Disconnect Properties
dick Connect To completel then dick Dis For target pr select the tar For configura	t. y disconnect a target, select the target and connect. operties, including configuration of sessions, rget and click Properties. ation of devices associated with a target, select		Disconnect Properties
dick Connect To completel then dick Dis For target pr select the tar For configura	t. y disconnect a target, select the target and connect. operties, including configuration of sessions, rget and click Properties. ation of devices associated with a target, select		Disconnect Properties
dick Connect To completel then dick Dis For target pr select the tai For configura the target ar	t. y disconnect a target, select the target and connect. roperties, including configuration of sessions, rget and click Properties. ation of devices associated with a target, select nd then click Devices.		Disconnect Properties
click Connect To completel then click Dis For target pr select the tai For configura the target ar	t. y disconnect a target, select the target and connect. roperties, including configuration of sessions, rget and click Properties. ation of devices associated with a target, select nd then click Devices.		Disconnect Properties
click Connect To completel then click Dis For target pr select the tai For configura the target ar	t. y disconnect a target, select the target and connect. operties, including configuration of sessions, rget and click Properties. ation of devices associated with a target, select		Disconnect Properties
click Connect To completel then click Dis For target pr select the tai For configura the target ar	t. y disconnect a target, select the target and connect. roperties, including configuration of sessions, rget and click Properties. ation of devices associated with a target, select nd then click Devices.		Disconnect Properties
dick Connect To completel then dick Dis For target pr select the tar For configura the target ar	t. y disconnect a target, select the target and connect. roperties, including configuration of sessions, rget and click Properties. ation of devices associated with a target, select nd then click Devices.		Disconnect Properties
dick Connect To completel then dick Dis For target pr select the tar For configura the target ar	t. y disconnect a target, select the target and connect. roperties, including configuration of sessions, rget and click Properties. ation of devices associated with a target, select nd then click Devices.		Disconnect Properties
dick Connect To completel then dick Dis For target pr select the tar For configura the target ar	t. y disconnect a target, select the target and connect. roperties, including configuration of sessions, rget and click Properties. ation of devices associated with a target, select nd then click Devices.		Disconnect Properties
dick Connect To completel then dick Dis For target pr select the tar For configura the target ar	t. y disconnect a target, select the target and connect. roperties, including configuration of sessions, rget and click Properties. ation of devices associated with a target, select nd then click Devices.		Disconnect Properties
dick Connect To completel then dick Dis For target pr select the tar For configura the target ar	t. y disconnect a target, select the target and connect. roperties, including configuration of sessions, rget and click Properties. ation of devices associated with a target, select nd then click Devices.		Disconnect Properties
dick Connect To completel then click Dis For target pr select the tar For configura the target ar	t. y disconnect a target, select the target and connect. roperties, including configuration of sessions, rget and click Properties. ation of devices associated with a target, select nd then click Devices.		Disconnect Properties

The quick connect dialog opens as shown below. Click each target and then click connect. When all targets are connected, click "Done".

Quick Connect	2
Targets that are available for connection at the IF provided are listed below. If multiple targets are to each target individually. Connections made here will be added to the list of to restore them will be made every time this comp	available, you need to connect
Discovered targets	
Name	Status
iqn.2007-09.jp.ne.peach.istgt:Quorum	Inactive
iqn. 2007-09. jp.ne.peach.istgt: SQLBak	Inactive
iqn.2007-09.jp.ne.peach.istgt:SQLData	Inactive
iqn.2007-09.jp.ne.peach.istgt:SQLLog	Inactive
Progress report There are multiple Targets discovered.Please se using Quick Connect.	lect a single Target for Login
Connect	Done

## All targets connected!

gets Discovery Favorite Targets Volumes and Devic	es   RADIUS   Configuration
uick Connect o discover and log on to a target using a basic connectior	type the IP address or
NS name of the target and then click Quick Connect.	ry type the in dual cas of
arget:	Quick Connect,
scovered targets	-
	<u>R</u> efresh
Name	Status
qn.2007-09.jp.ne.peach.istgt:Quorum	Connected
qn.2007-09.jp.ne.peach.istgt:SQLBak	Connected
	Connected Connected
ign. 2007-09. jp. ne. peach. istgt: SQLLog o connect using advanced options, select a target and th	Connected
ign. 2007-09.jp.ne.peach.istgt:SQLData ign. 2007-09.jp.ne.peach.istgt:SQLLog io connect using advanced options, select a target and th lick Connect. io completely disconnect a target, select the target and hen dick Disconnect.	Connected
gn.2007-09.jp.ne.peach.istgt:SQLLog o connect using advanced options, select a target and th ick Connect. o completely disconnect a target, select the target and	Connected

Go to the "Volumes and devices" tab and click "Auto configure" then click "OK"

iSCSI Initiator Properties	2
Targets Discovery Favorite Targets Volumes and Devices RAD	IUS Configuration
If a program or service uses a particular volume or device, add that the list below, or click Auto Configure to have the iSCSI initiator servi configure all available devices.	
This will bind the volume or device so that on system restart it is more for use by the program or service. This is only effective if the associ- the Favorite Targets List.	
Volume List:	
Volume/mount point/device	
\\?\scsi#disk&ven_freebsd∏_iscsi_disk#1&1c121344&0&0000	00#{53f56307-b6b
\\?\scsi#disk&ven_freebsd∏_iscsi_disk#1&1c121344&0&00010	00#{53f56307-b6b
\\?\scsi#disk&ven_freebsd∏_iscsi_disk#1&1c121344&0&00020	00#{53f56307-b6b
\\?\scsi#disk&ven_freebsd∏_iscsi_disk#1&1c121344&0&00030	00#{53f56307-b6b
To automatically configure all available devices, click Auto Configure.	Auto Configure
To add a specific device, click Add.	Add
To remove a device, select the device and then dick Remove.	Remove
To immediately remove all devices, dick Clear.	Clear
More about Volumes and Devices	
ОК С	ancel <u>Apply</u>

If you now open disk management you will see the following, notice the disks are offline and unknown!

🖺 Server Manager						<u>- 🗆 ×</u>
File Action View Help						
🗢 🔿 🖄 🖬 😰 🖬 😣						
Server Manager (SQLNODE1)	Disk Managemer	1t Volume List +	- Graphical View		Actions	
	Volume	Layout	Type File System	n Status	Disk Management	-
Diagnostics	(C:)	Simple	Basic NTFS	Healthy (Boot, Page File,	More Actions	•
🕀 🎆 Configuration	GRMSXVOL_EN_		Basic UDF	Healthy (Primary Partition		
🖃 📇 Storage	System Reserve	d Simple	Basic NTFS	Healthy (System, Active,		
Windows Server Backup						
	1			•		
	_		_			
	Disk 0 Basic	System Rese				
	15.00 GB	100 MB NTFS	14.90 GB NTFS			
	Online	Healthy (Syster	n, Healthy (Boot, I	Page File, Crash Dump,		
	Unknown					
	500 MB	500 MB				
	Offline 🕕 Help	Unallocated				
	Disk 2					
	6.84 GB	6.84 GB				
	Offline (	Unallocated				
	Help	1				
	Unknown					
	8.79 GB	8.79 GB				
	Offline 🕕	Unallocated				
	Help	<u> </u>				
	GDisk 4					
	Unknown 2.93 GB	2.93 GB				
	Offline 🕕	Unallocated				
	Help					
	Unallocated	Primary parti	tion		]	

Right click each disk and select "Online". Once all disks are online, right click any disk again and select "Initialise". The wizard will initialise all drives found online.

Disk 0	
Basic 15.00 GB Online	System Reser         (C:)           100 MB NTFS         14.90 GB NTFS           Healthy (System,         Healthy (Boot, Page File, Crash Dump, I
Golisk 1 Unknown 500 MB Not Initialized	500 MB Unallocated
GDisk 2	
Unknown 6.84 GB Not Initialized	6.84 GB Unallocated
Disk 3	
Unknown 8.79 GB Not Initialized	8.79 GB Unallocated
GDisk 4	
Unknowr 2,93 GB Online	
Offline Offline	rties ated
Unall Help	ry partition

## And Initialise

You must initialize a disk before Logical Disk Manager can access it. Select disks: ♥ Disk 1 ♥ Disk 2 ♥ Disk 3 ♥ Disk 4 Use the following partition style for the selected disks: ● MBR (Master Boot Record) ● GPT (GUID Partition Table) Note: The GPT partition style is not recognized by all previous versions of Windows. It is recommended for disks larger than 2TB, or disks used on Itanium-based computers. OK Cancel
<ul> <li>✓ Disk 1</li> <li>✓ Disk 2</li> <li>✓ Disk 3</li> <li>✓ Disk 4</li> <li>Use the following partition style for the selected disks:</li> <li>( MBR (Master Boot Record)</li> <li>( GPT (GUID Partition Table)</li> <li>Note: The GPT partition style is not recognized by all previous versions of Windows. It is recommended for disks larger than 2TB, or disks used on Itanium-based computers.</li> </ul>
<ul> <li>✓ Disk 2</li> <li>✓ Disk 3</li> <li>✓ Disk 4</li> <li>Use the following partition style for the selected disks:</li> <li>(© MBR (Master Boot Record)     </li> <li>(GUID Partition Table)     </li> <li>Note: The GPT partition style is not recognized by all previous versions of Windows. It is recommended for disks larger than 2TB, or disks used on Itanium-based computers.     </li> </ul>
<ul> <li>Disk 3</li> <li>Disk 4</li> <li>Use the following partition style for the selected disks:</li> <li>MBR (Master Boot Record)</li> <li>GPT (GUID Partition Table)</li> <li>Note: The GPT partition style is not recognized by all previous versions of Windows. It is recommended for disks larger than 2TB, or disks used on Itanium-based computers.</li> </ul>
<ul> <li>Disk 4</li> <li>Use the following partition style for the selected disks:</li> <li>MBR (Master Boot Record)</li> <li>GPT (GUID Partition Table)</li> <li>Note: The GPT partition style is not recognized by all previous versions of Windows. It is recommended for disks larger than 2TB, or disks used on Itanium-based computers.</li> </ul>
Use the following partition style for the selected disks: MBR (Master Boot Record) GPT (GUID Partition Table) Note: The GPT partition style is not recognized by all previous versions of Windows. It is recommended for disks larger than 2TB, or disks used on Itanium-based computers.
<ul> <li>MBR (Master Boot Record)</li> <li>GPT (GUID Partition Table)</li> <li>Note: The GPT partition style is not recognized by all previous versions of Windows. It is recommended for disks larger than 2TB, or disks used on Itanium-based computers.</li> </ul>
<ul> <li>GPT (GUID Partition Table)</li> <li>Note: The GPT partition style is not recognized by all previous versions of Windows. It is recommended for disks larger than 2TB, or disks used on Itanium-based computers.</li> </ul>
Note: The GPT partition style is not recognized by all previous versions of Windows. It is recommended for disks larger than 2TB, or disks used on Itanium-based computers.
Windows. It is recommended for disks larger than 2TB, or disks used on Itanium-based computers.
Windows. It is recommended for disks larger than 2TB, or disks used on Itanium-based computers.
Itanium-based computers.
OK Creat
OK Cancel
©Disk 3
Unknown 8.79 GB 8.79 GB
8.79 GB 8.79 GB Not Initialized Unallocated
Unknown
2.93 GB 2.93 GB Unallocated

<b>Disk 0</b> Basic 15.00 GB Online	System Reser 100 MB NTFS Healthy (System, Healthy (Boot, Page File, Crash Dump, I
Disk 1 Basic 499 MB Online	Quorum (Q:) 497 MB NTFS Healthy (Primary Partition)
Disk 2 Basic 6.83 GB Online	SQLBak (V:) 6.83 GB NTFS Healthy (Primary Partition)
Disk 3 Basic 8.79 GB Online	SQLData (R:) 8.79 GB NTFS Healthy (Primary Partition)
Disk 4 Basic 2.93 GB Online	SQL Logs (T:) 2.93 GB NTFS Healthy (Primary Partition)
Unallocated	Primary partition

1.4

Create your disk partitions in the usual manner. All disks online and formatted!

## 3.5 INSTALLING THE WINDOWS 2008 CLUSTER

The Windows 2008 cluster may now be verified\created, but first we need to enable this feature in Windows 2008 feature manager. Click "Add features" to continue,

E Server Manager		
File Action View Help		
🗢 🔿 🖄 🔝		
Server Manager (SQLNODE 1)  Roles  Diagnostics  Configuration  Storage	View the status of features installed on this server	er and add or remove features.
Windows Server Backup	<ul> <li>Features Summary</li> </ul>	Peatures Summary Help
	• Features: 0 of 42 installed	Add Features
	Last Refresh: Today at 12:16 Configure refresh	
🎝 Start 🛃 🗾	)	I2:16 17/02/2010

Select the Failover Clustering checkbox and click "Next".

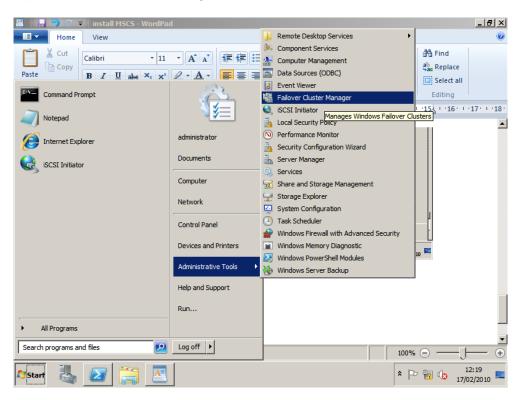
Add Features Wizard		×
Select Features		
Features Confirmation Progress Results	Select one or more features to install on this server.  Peatures  Peatures Peat	
灯 🔣 🛃	< Previous Next > Install Cancel           A         P         Image: Second	

Click "Install" to proceed.

Add Features Wizard	ion Selections	×
Features Confirmation Progress Results	To install the following roles, role services, or features, click Install.  (1) 1 informational message below  (2) This server might need to be restarted after the installation completes.  Failover Clustering	
ſ	Print, e-mail, or save this information	
	Image: Second	

Review any errors or warnings and click "Close" once the installation finishes.

Add Features Wizard		× i
Installation Resu	lts	
Features Confirmation Progress Results	The following roles, role services, or features were installed successfully: <ul> <li>                 1 varning message below         </li> </ul> Mindows automatic updating is not enabled. To ensure that your newly-installed role or feature is automatically updated, turn on Windows Update in Control Panel.                      Failover Clustering	-
Ē	Print, e-mail, or save the installation report           < Previous         Next >         Close         Cancel	
🄊 Start 퉳 🕢 🧊	<ul> <li>P 12:19</li> <li>17/02/20</li> </ul>	



Open Failover Cluster manager from the Administrative Tools menu.

Select the option to create a cluster.

闂 Failover Cluster Manager				<u>_0×</u>
File Action View Help				
📲 Failover Cluster Manager	Failover Cluster Manager			Actions
	Create failover clusters, validate hardware fo	r notential failover clusters, and ner	f,	Failover Cluster M 🔺
	configuration changes to your failover cluster			👹 Validate a Confi
				📲 Create a Cluster
	* Overview			Manage a Cluste
	A failover cluster is a set of independent compute			View 🕨
	availability of services and applications. The clus physical cables and by software. If one of the nor			Properties
	services (a process known as failover).			Help
	Clusters			
	A Management		1	
	<ul> <li>Management</li> </ul>		1	
	To begin to use failover clustering, first validate y cluster. After these steps are complete, you can include migrating services and applications to it fr Windows Server 2008, or Windows Server 2008	manage the cluster. Managing a c om a cluster running Windows Serv	lu	
	Sector State A Configuration	Understanding cluster val	ic	
	Create a Cluster	Creating a failover cluster	2	
	Manage a Cluster	Managing a failover cluster	B	
		Migrating services and ap	£	
		-	-	
	•	<b>_</b> _		<u> </u>
		)	_	
🖉 Start 🛃 🗾 🦉			* [	12:21 17/02/2010

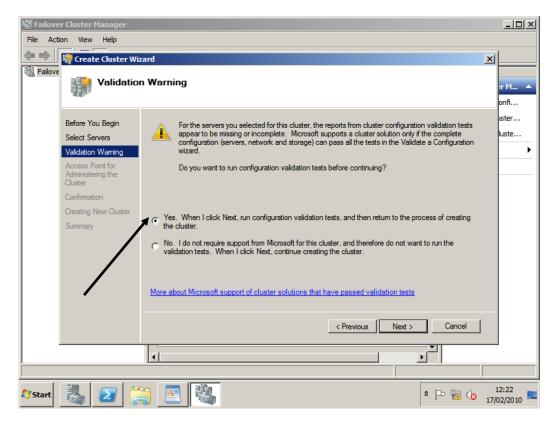
Review the beginning notes and click "Next".

臂 Create Cluster Wiz	zard	X
Before Yo	ou Begin	
Before You Begin Select Servers Validation Warning Access Point for Administering the Cluster Confirmation Creating New Cluster Summary	This wizard creates a cluster, which is a set of servers that work together to increase the availability of clustered services and applications. If one of the servers fails, another server begins hosting the clustered services and applications (a process known as failover). Before you run this wizard, we strongly recommend that you run the Validate a Configuration wizard to ensure that your hardware and hardware settings are compatible with failover clustering. Microsoft supports a cluster solution only if the complete configuration (servers, network, and storage) can pass all tests in the Validate a Configuration wizard. In addition, all hardware components in the cluster solution must be "Certified for Windows Server 2008 R2". You must be a local administrator on each of the servers you want to include in the cluster. To continue, click Next. More about Microsoft support of cluster solutions that have passed validation tests More about the name and IP address information needed for a new cluster Do not show this page again	
	Next > Cancel	

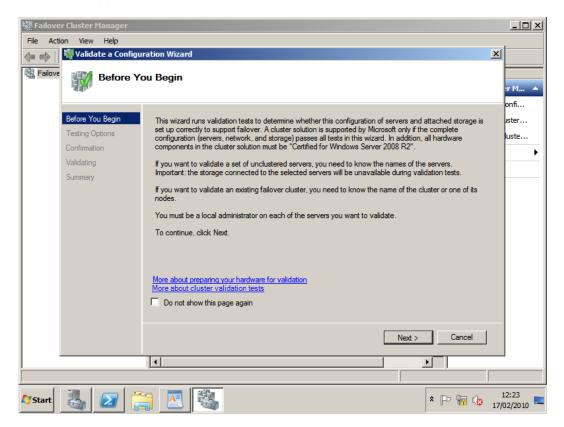
# Select the server(s) to include in the cluster

×
e

Review the validation warning. Select the radio button shown below and click "Next".



Click "Next" to start the cluster validation wizard. This is required to be eligible for Microsoft support if it is ever needed.



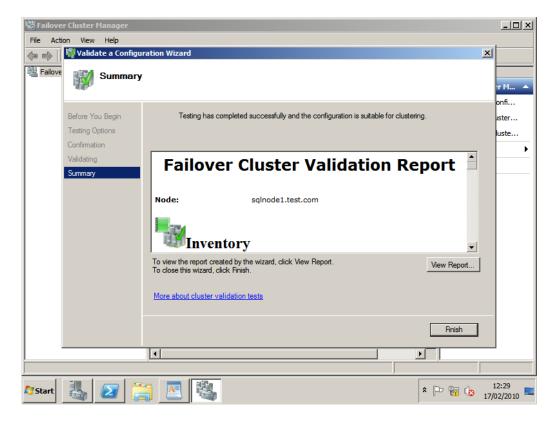
Select the option to "Run all tests". This will thoroughly test all storage, networks, operating system, etc.

Failove	er Cluster Manager		<u>- 🗆 ×</u>
File Act	tion View Help		
	👹 Validate a Configu	ration Wizard	
Failove	Testing (	Options	er M 🔺
	Before You Begin	Choose between running all tests or running selected tests.	ister
	Testing Options Confirmation	The tests include Inventory tasks, Network tests, Storage tests, and System Configuration tests.	luste
	Validating	Microsoft supports a cluster solution only if the complete configuration (servers, network, and storage) can pass all tests in this wizard. In addition, all hardware components in the cluster solution must be "Certified for Windows Server 2008 R2"	<b>⊢</b>
	Summary	tor windows Server 2008 K2".	
		<ul> <li>Run all tests (recommended)</li> </ul>	
		C Run only tests I select	
		More about cluster validation tests	
		< Previous Next > Cancel	
			_
<b>&amp;</b> Start	🍇 🗾 🕻	🗧 🔼 🚳	12:23 7/02/2010 💻

Click "Next" to start validation

🕎 Failove	er Cluster Manager				
File Act	ion View Help				
<₽ 🔿	👹 Validate a Configu	ration Wizard		×	
Railove	Confirma	tion			er M 🔺
	Before You Begin Testing Options	You are ready to start validation. Please confirm that the following settings are correct	:		onfi ıster luste
	Confirmation Validating	Servers to Test			<b>•</b>
	Summary	sqlnode1.test.com			
	Gammary				
		Tests Selected by the User	Category		
		List BIOS Information	Inventory		
		List Environment Variables	Inventory		
		List Fibre Channel Host Bus Adapters	Inventory		
		List iSCSI Host Bus Adapters	Inventory	<b>•</b>	
		To continue, click Next. More about cluster validation tests			
			< Previous Next > Canc	el	
L					
<u> </u>					
<b>Start</b>	3		* 🕞 👘		12:25 02/2010 💻

Once validation has completed you may review the report. When you have finished click "Finish".



If you have any failures you must remediate these before you may continue. The cluster installation will now continue if the tests were successful. Supply a <u>unique</u> cluster name and IP address and then click "Next".

🐯 Failover Cluster Manager		
File Action View Help		
🗢 🔿 🛛 📴 Create Cluster	Wizard X	
Failove		r M 🔺
Before You Begin	Type the name you want to use when administering the cluster.	ster
Select Servers Access Point for	Cluster Name: S-DBA-C01	uste
Access Point for Administering the Cluster	One or more IPv4 addresses could not be configured automatically. For each network to be used, make sure the network is selected, and then type an address.	
Confirmation		
Creating New Cluste Summary	Networks Address	
	I 172.168.10.0/24	
	More about the administrative Access Point for a cluster	
	< Previous Next > Cancel	
🔊 Start 🛃 🗾		2:31 2/2010 💻

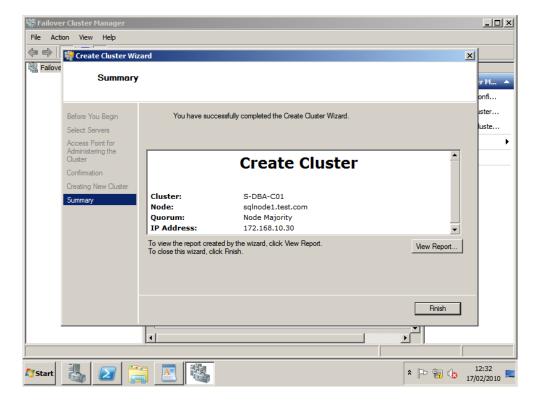
Click "Next" to confirm the details.

	er Cluster Manager					
	tion View Help					
	🚏 Create Cluster Wiz	zard			<u>×</u>	
闆 Failov	Confirma	tion				er Maa 🔺
						onfi
						ister
	Before You Begin	You are ready to create a clu The wizard will create your c	uster. Juster with the following setting	nde.		uste
	Select Servers Access Point for	ine wizara will create your e	dater wat the following setting	igo.		
	Administering the Cluster	Cluster:	S-DBA-C01		<b></b>	<u> </u>
	Confirmation	Node: IP Address:	sqlnode1.test.com 172.168.10.30			
	Creating New Cluster		1,21100110100			
	Summary					
		1			<b>Y</b>	
		To continue, click Next.				
				< Previous Next >	Cancel	
		•				
<b>A</b> Start	🛃 🗾 🕻	3 🖪			* 🕩 🖬 ゆ 👔	12:31 7/02/2010 💻

The cluster configuration starts.

蠷 Failov	ver Cluster Manager		
	tion View Help		
	📲 Create Cluster Wi	zard	×
📲 Failov		New Churter	
	Creating	New Cluster	er M 🔺
			onfi
	Before You Begin	Please wait while the cluster is configured.	uster
	Select Servers		luste
	Access Point for Administering the Cluster		
	Confirmation		
	Creating New Cluster		
	Summary		
		Bringing resource group 'Cluster Group' online.	
		Cancel	
1			
<b>Start</b>	3	🗿 🔼 🚳 🔹 P 🖬 🕼	12:32 17/02/2010

Once the wizard completes you may review the report and finally click "Finish". Note the Quorum type used by Windows 2008 MSCS. We will change this later for our 2 node cluster.



Change the networks names to match their intended use. Check the properties of each and set the network usage. The Public should allow cluster and public communications. The Private should allow cluster communication only and the iSCSI should allow no cluster or public communications.

闂 Failover Cluster Manager				
File Action View Help				
	(			
Hailover Cluster Manager ⊡ IIII S-DBA-C01.TEST.com	Cluster Network 1			Actions
Services and applications     Services and applications     Support     Support     Support     Support     Support     Cluster Network 2     Cluster Network 3	Summary of Cl Cluster Network 1 has Status: Up Cluster Use: Enabled	Subnets	: 0.0/24 ((Pv4)	Cluster Network 1 Show the critical View Rename Rename Refresh Properties
Cluster Events				? Help
	Name	Status	Current Owner	SQLNODE1 - Public
	Network Connections			Show the critical
	SQLNODE1 - Public	€ Up	SQLNODE1	2 Help
	•			1
🖉 Start 🔣 🔽 🚞				12:38

關 Failover Cluster Manager					
File Action View Help					
🗢 🔿 🖄 🖬 🛛 🖬					
Hailover Cluster Manager	Storage			Actions	
B S-DBA-C01.TEST.com     Services and applications				Storage	<b>A</b>
Services and applications	Summary of	Storage		dd a disk	k
SQLNODE1	<i>~</i>			View	<b></b>
📇 Storage	Storage:	Total Capacity:	Available Capacity		
Networks     Public	No disks	Total: 0 Bytes	Total: 0 Bytes	Q Refresh	
iscsi	No disks available No disks in use	Free Space: 0 Bytes Percent Free: 0%	Free Space: 0 Bytes Percent Free: 0%	? Help	
Private		Forecar free, bis	T CICCILL TICC, Die		
B Cluster Events					
			1		
	Disk	Status	Current Owner		
		No storage exists in this clust	er.		
	•		<u> </u>		
This action enables you to add a disk to	the cluster.				
🈂 Start 🕹 🗾 🧱			*	D 🖬 🕼 👔	12:41 7/02/2010 💻

We have no Storage so add the disks now by clicking "Add a disk".

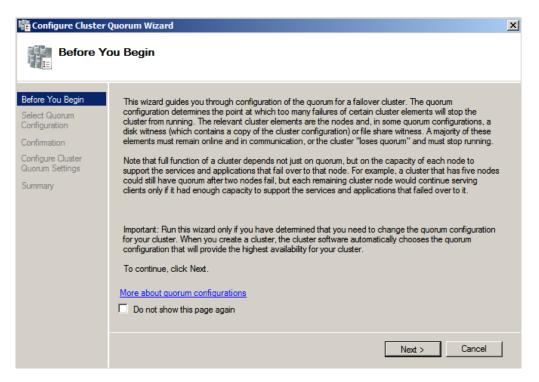
Our disks appear in the selection screen, ensure they are all checked and click "OK".

驟 Failover Cluster Manager					
File Action View Help	dd Disks to a Cluster		×		
	Select the disk or disks that you want to add.				
Failover Cluster Manager			- 1	Actions	
S-DBA-C01.TEST.com     Services and applica	Available disks:		- E	Storage	<b>^</b>
<ul> <li>Services and applica</li> <li>Nodes</li> </ul>	Resource Name Disk Info	Capacity Signature/G		📑 Add a dis	k
SQLNODE1	Cluster Disk 1 Disk 1 on node SQLNODE	1 500 MB 904724616			
Storage	🗹 📼 Cluster Disk 2 Disk 2 on node SQLNODE			View	• •
Networks	🗹 📼 Cluster Disk 3 Disk 3 on node SQLNODE		y y	Q Refresh	
Public	Cluster Disk 4 Disk 4 on node SQLNODE	1 2.93 GB 904724621			
iSCSI				? Help	
Private					
Cluster Events					
	<u> </u>		_		
		OK Cancel			
			┙╞		
			//		
This action enables you to add a disl	to the cluster.				
				ļ	
🍂 🛃 🦓			* [	D 🐘 🅼 👔	12:42 .7/02/2010 💻

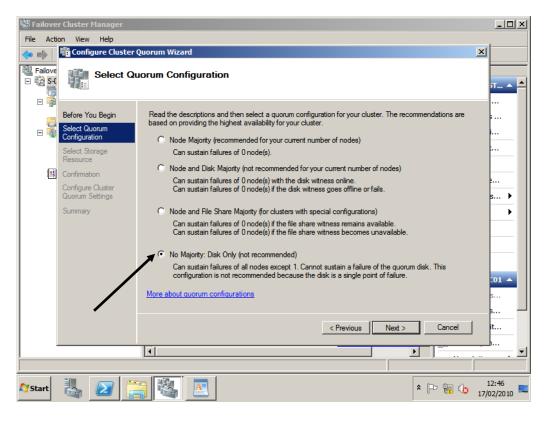
Now that the disks are added to the cluster storage we can start to re configure the Quorum settings to use a disk instead of a majority node set share. Select\highlight the cluster in Failover Cluster Manager then select "Action" > "More Actions" > "Configure Cluster Quorum Settings".

闂 Failover Cluster Manager				
File Action View Help				
🗢 🔿 🖄 🖬 🚺 🖬				
Failover Cluster Manager	Storage		Recent Cluster Events:	Actions
S-DBA-C01.TEST.com Services and applications				Storage 🔺
🗆 🍯 Nodes	Summary of St	orage		💣 Add a disk
SQLNODE1		T.1.0 "		View 🕨
🖃 🏢 Networks	Storage: 4 Total Disks - 4 online	Total Capacity: Total: 19.03 GB	Available Capacity Total: 19.03 GB	Q Refresh
Public ISCSI	4 Available Disks - 4 online No disks in use	Free Space: 18.83 GB Percent Free: 98.9%	Free Space: 18.83 GE Percent Free: 98.9%	🛛 Help
B Cluster Events				Cluster Disk 1 🔺
				Bring this resour
	Disk	Status	Current Owner	🚱 Take this resour
	Available Storage			Change drive let
	🗉 🧰 Cluster Disk 1	📀 Online	SQLNODE1	Show the critical
		Online     Online	SQLNODE1 SQLNODE1	Show Dependen
	E Cluster Disk 4	Online	SQLNODE1	More Actions
				🗙 Delete
				Properties
				🛛 Help
	•			<u> </u>
🍂 Start 🕹 🗾 🚞			* [	D 抗 🕼 12:44 17/02/2010 💻

The wizard starts as shown below, review the screen and click "Next" to continue.



Select the option below for our virtual 2 node cluster and click "Next". For clusters of 3 nodes or more you should use the majority node set. For more information on majority node sets check the online Technet documentation.



Select the storage resource to use for the Quorum drive and click "Next".

盟 Faik	over Cluster Manager					
File	Action View Help					
(=	Configure Cluster	Quorum Wizard				X
Fail	Select S	torage Resource				ı ▲ ▲
	Potoro Vou Pogio	Select the storage volume the	nat you want to assign a	as the quorum resource.		ş
	Select Quorum Configuration					. I
	Select Storage	Name	Status	Node	Location	<b>.</b>
	Resource	🔽 🖃 🧰 Cluster Disk 1	1 Online	SQLNODE1	Available Storage	
	Confirmation	Volume: (Q) ⊡ ⊡ Cluster Disk 2	File System: NTFS	497 MB (93.9% free ) SQLNODE1	Available Storage	e
	Configure Cluster	□	Online	SQLNODE1	Available Storage	
	Quorum Settings	□ ±	Online	SQLNODE1	Available Storage	s 🕨
	Summary					
						<b>:01 ▲</b> s
						s
				< Previous	Next > Cancel	] it
						h
🍂 Star	t 👪 🗾 🚺				* P 🗓 🕼	12:47 17/02/2010

Review the confirmation screen and click "Next".

键 Failove	er Cluster Manager		
File Act	tion View Help		,
(=	體 Configure Cluster	Quorum Wizard	×
Failove	Confirma	tion	jT ▲ ▲
	Refore You Regin	You are ready to configure the quorum settings of the cluster.	i
	Select Storage Resource	Quorum Configuration: No Majority           Storage:         Cluster Disk 1	<b></b>
	Confirmation Configure Cluster Quorum Settings Summary	Your cluster quorum configuration will be changed to the configuration shown above.	5 ►
		To continue, click Next.	<b>201</b>
		< Previous Next > Cancel	it
<u> </u>			
<b>A</b> Start	🥾 🗵 🕻	🗧 🖏 🔼 🔹 🔹 🕹	12:47 17/02/2010

# Cluster reconfiguration progress!

Failove	er Cluster Manager		
File Act	tion View Help		,
<= ⇒	體 Configure Cluster	Quorum Wizard	×
Failove	Configure	e Cluster Quorum Settings	эт 🔺 📥
	Defere Veu Deeie	Please wait while the quorum settings are configured.	s
	Configuration		<u></u>
	Select Storage Resource		
	Confirmation Configure Cluster		
	Quorum Settings Summary		s ▶
	Gunnary	Attempting No Majority quorum configuration with 'Cluster Disk 1'.	
			<b>101</b>
			s
		Cancel	] it
			· ··· · · ·
///Start	la 🛛 🕻		12:47 17/02/2010

🐯 Failover Cluster Manager - 🗆 🗵 File Action View Help 存 🔿 📔 🏪 Configure Cluster Quorum Wizard × Bailove ⊡ 🖏 S-C Summary л... 🔺 📥 o Before You Begin You have successfully configured the quorum settings for the cluster. ... Select Quorum Select Storage Resource Configure Cluster Quorum Settings Confirmation Configure Cluster Quorum Settings .... **)** Quorum Configuration: No Majority Cluster Disk 1 Summary Storage: ۲ -To view the report created by the wizard, click View Report. To close this wizard, click Finish. View Report... .01 🔺 Finish • ▶ • 12:47 12:47
17/02/2010 A  $\mathbf{\Sigma}$ **Start** 

Finally click "Finish" to complete the re configuration.

Disk 1 (Q drive) now set as the Quorum witness resource.

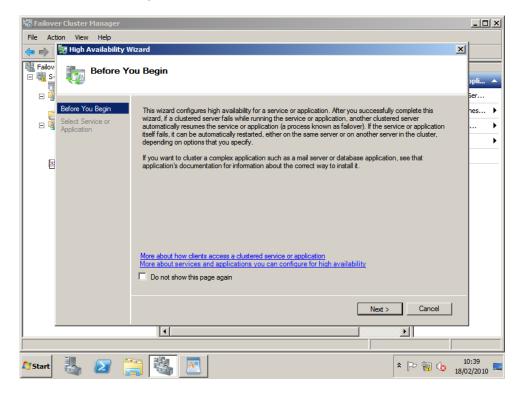
闂 Failover Cluster Manager							
File Action View Help							
🗢 🔿 🖄 🖬 🔢 🗊							
Failover Cluster Manager	Storage		Recent Cluster Events: 🔺	Actions			
S-DBA-C01.TEST.com	Summary of St	01900		Storage 🔺			
🖂 🍯 Nodes		orage		i Add a disk			
SQLNODE1		T. 10		View 🕨			
🖃 🏢 Networks	Storage: 4 Total Disks - 4 online	Total Capacity: Total: 19.03 GB	Available Capacity: Total: 18.55 GB	Q Refresh			
Public iSCSI Private	3 Available Disks - 3 online 1 In Use Disks - 1 online	Free Space: 18.82 GB Percent Free: 98.9%	Free Space: 18.37 GB Percent Free: 99.1%	🛛 Help			
Cluster Events				Cluster Disk 1 🔺			
				Bring this resour			
	Disk	Status	Current Owner	🙀 Take this resour			
	Disk Witness in Quorum			Change drive let			
	⊕ 🗔 Cluster Disk 1	Online	SQLNODE1	B Show the critical			
	Available Storage			Show Dependen			
	🗉 🧰 Cluster Disk 2	(1) Online	SQLNODE1	More Actions			
		Online     Online	SQLNODE1 SQLNODE1	Properties			
	1 Cluster Disk 4	(T) Unline	SQLNODET	👔 Help			
	•						
🎝 Start 🛃 🗾 🤶			* []	D 📊 🕼 12:48 17/02/2010 💻			

# 3.6 CREATE THE MICROSOFT DISTRIBUTED TRANSACTION COORDINATOR RESOURCE

Next we need to create a cluster resource and group for the Distributed Transaction Coordinator service. This action is now wizard driven in Windows 2008 MSCS. In Failover Cluster Manager right click 'Services and applications'

👹 Failover Cluster Manage	er							
File Action View Help								
🗢 🔿 🖄 🗊 🛛 🗊								
Hailover Cluster Manager		Services and ap	plications	Recent (	Cluster Events:		Actions	
E S-DBA-C01.TEST.com							Services and	appli 🔺
Services and app	Configure a S	Service or Application	s Type		Current Owner	Auto s	🧑 Configure	a Ser
SQLNODE1	Virtual Machin	nes •					Virtual Mad	
Storage	More Actions	>	nere are no services a	and application	ons in the cluster.		More Actio	ons 🕨
iSCSI Private	View	•	-				View	<b></b>
Private	Refresh		-				Q Refresh	
Cluster Events	Help		-				? Help	
-			-					
		Status:	Auto Start		Preferred	1 Owr		
		oraido.						
		Alerts:	Storage:		Current (	Dwne		
		Client Access Nam	e: Capacity:		Other Re	SOUR		
			or copromy.					
		IP Addresses:						
		•						
This action enables you to select	t a service or a	oplication that you can con	figure for high availabil	ity.				
🖉 Start 🕌 🛃						<b>*</b> P	18	10:39 /02/2010 💻

Review the following screen and click "Next".



Select the "Distributed Transaction Coordinator" and click "Next".

📲 Fail	lover Clu	ster M	lanager			
File	Action	View	Help			
(=	🔊 🦣 Н	igh Av	vailability V	Vizard	×	
Fai B		<b>1</b>	Select Se	ervice or Application		opli 🔺
	Befo Sele Appl Clien Sele Conf Conf	re You ct Servication tt Acce ct Storr irmation igure H lability mary	<b>ice or</b> ss Point age	Select the service or application that you want to configure for high availability: DFS Namespace Server DFS Namespace Server DFS Namespace Server Distributed Transaction Coordinator (DTC) File Server Generic Application Generic Script Generic Service The Service (SNS) Server Charse Server Charse Service		hes ) )
				More about services and applications you can configure for high availability       < Previous     Next >     Cancel		
灯 Stai	rt 튆	5		🐃 🔼 🔹 🛌		0:39 2/2010 💻

Supply a unique network name and IP address and click "Next".

Failove	er Cluster Manager		
File Act	tion View Help		
<= ⇒	🧑 High Availability V	Vizard	×
Railov		<b>D</b> : .	
□ 職 S-	Client Ac	cess Point	opli 🔺
			Ser
	Before You Begin	Type the name that clients will use when accessing this service or application:	
	Select Service or	Type the name that clients will use when accessing this service of application.	nes 🕨
E 📲	Application	Name: S-DBA-C01Dtc	· >
	Client Access Point	One or more IPv4 addresses could not be configured automatically. For each network to be used, make sure the network is selected, and then type an address.	•
	Select Storage	the network is selected, and then type an address.	
. 8	Confirmation		
	Configure High	Networks Address	
	Availability	IT2.168.10.0/24	
	Summary		
		More about how clients access a clustered service or application	
		< Previous Next > Cancel	
			-
<b>A</b> Start	3 🛛 🕻	🐃 🔼 🔹 🗈	10:40 18/02/2010

Select the storage drive to use!

	er Cluster Manager				_D×
	tion View Help				
🗢 🔿	🤯 High Availability V	lizard			×
Failov	Select St	orage			ppli 🔺
	Before You Begin Select Service or Application	Select the storage volume that You can assign additional stora		ervice or application. tion after you complete this wizard.	nes ▶
	Client Access Point	Name	Status		► ►
8	Confirmation	Cluster Disk 2 Volume: (V)	<ul> <li>Online</li> <li>File System: NTFS</li> <li>Online</li> </ul>	6.83 GB (99.1% free )	
	Configure High Availability	Volume: (R)	File System: NTFS	8.79 GB (99.2% free )	
	Summary	Volume: (T)	File System: NTFS	2.93 GB (98.6% free )	
	Summary	✓ □	✤ Online File System: NTFS	397 MB (92.5% free)	
				< Previous Next > Cancel	L L
<u> </u>		•			
灯 Start	4 🛛	<b>1</b>		* 🖻 🛱 🕼	10:40 18/02/2010

Click "Next" to create the clustered service.

腿 Failov	er Cluster Manager					
File Act	tion View Help					
🗢 🔿	🧑 High Availability V	Vizard			>	
Failov		tion				opli 🔺
	Before You Begin	You are ready to configure hi	igh availability for a Distribute	ed Transaction Coordinator (DTC).		hes ►
	Client Access Point Select Storage	Storage: Network Name: IP Address:	Cluster Disk 5 S-DBA-C01Dtc 172.168.10.38			• •
		To continue, click Next.				
				< Previous Next >	Cancel	
					<u> </u>	
<b>a</b> Start	🛃 ⊿ [			*		10:40 /02/2010 ⋿

Click "Finish" to complete the wizard

驅 Failov	er Cluster Manager		
File Ac	tion View Help		
😓 🔿	🦣 High Availability V	/izard	×
Failov	Summary		ppli▲
	Before You Begin	High availability was successfully configured for the service or application.	nes ►
	Select Service or Application		►
	Client Access Point		□▶
	Select Storage	Distributed Transaction Coordinator	
		(DTC)	
	Configure High Availability		
	Summary	Storage: Cluster Disk 5	
		Network Name: S-DBA-C01Dtc IP Address: 172.168.10.38	
		T Address. 172.100.10.30	
		To view the report created by the wizard, click View Report. To close this wizard, click Finish.	
		Finish	]
<b>A</b> Start	4 🛛 🚦	3 🚳 N	10:41 18/02/2010

The DTC clustered service is now configured and online.

👹 Failover Cluster Manager				
File Action View Help				
🗢 🔿 🖄 🖬 🚺 🗊				
Failover Cluster Manager	MSDTC Server S-DB	A-C01Dtc Recent Clus	ter Events: 🛕 Error: 14	Actions S-DBA-C01Dtc
Services and applications S-DBA-C01Dtc	Summary of S-	-DBA-C01Dtc		S-DBA-COIDtc
Nodes     SQLNODE1	Status: Online		Auto Start: Yes	Take this ser
Storage	Alerts: <none> Preferred Owners: <none< td=""><td>&lt;</td><td></td><td>Move this ser</td></none<></none>	<		Move this ser
iscSI Private	Current Owner: SQLNODE			Manage shar
Public Cluster Events				Add a shared
	Name Server Name	Status		Show the crit
				i Add storage
	🖃 🖳 Name: S-DBA-C01Dto			Add a resource 🕨
	IP Address: 172	-		🔞 Disable auto
	Microsoft Distributed Tr	ansaction Coordinator		Show Depen
		. 🞓 Online		View 🕨
	Disk Drives			🗙 Delete
	🖃 🧰 Cluster Disk 5	Online		🛋 Rename
	Volume: (Z)	File System: NTFS	397 MB (92.5% free )	Q Refresh
				Properties
				Heln 🔳
]				
🎝 Start 🐰 🗾 🧮			*	D 📊 🕼 10:41 🗮 18/02/2010

# 4 INSTALLING THE SQL SERVER INSTANCE.

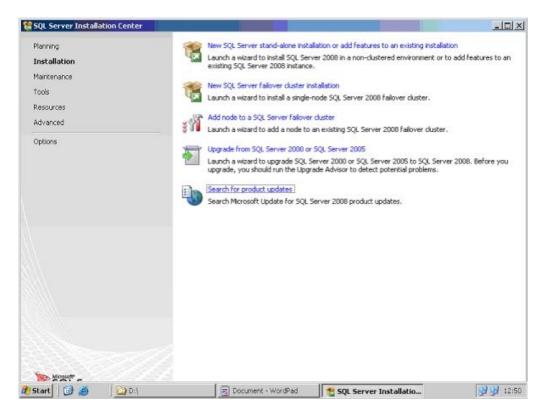
For clarification the following terms are used;

VM is a virtual machine. NIC is a network Interface Card. vNIC is a virtual Network Interface Card. DC is a Windows Domain Controller. NOS refers to the Windows operating system. HA is the VMWare high availability technology used by VMWare Virtual Infrastructure. ESX is the server operating system used by host machines in the VMWare Virtual Infrastructure.

You should have already created the user account(s) for the SQL Server services and also the cluster Windows groups for the services. With that done it's now time to start the installation. Launching the Setup on Node 1, Installation proceeds as shown below.

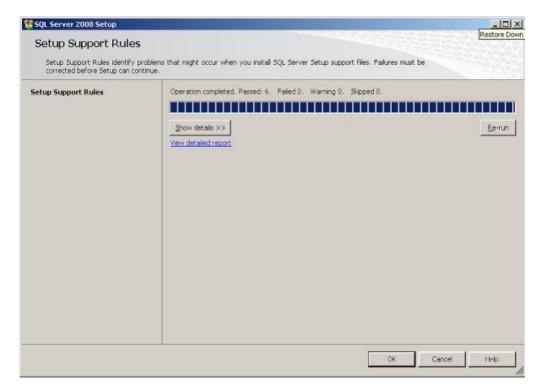
Note: The installation process between SQL Server 2005 and SQL Server 2008 has changed extensively.

## 4.1 INSTALLING THE FIRST NODE



Click Installation and then select 'New SQL Server Failover Cluster'.

You will eventually see the following. Click 'OK' if the checks have been successful.



The 'Product Key' screen will appear. Either select an edition or enter your valid licence key to continue and click "Next".

😫 SQL Server 2008 Setup		
Product Key Specify the edition of SQL Serve	r 2008 to install.	
Product Key Ucense Terms Setup Support Files	Server 2008. Enter the 25-character key from th	-
		< Back Mext > Cancel

Click 'Next' through the Licence Terms (assuming you wish to accept them). You will be presented with the 'setup support files' install dialog as shown below.

🚼 SQL Server 2008 Setup			
Setup Support Files Click Install to Install Setup Su	apport files. To install or update SQL Serv		Maximiz
Product Key	The following components are	required for 5QL Server Setup:	
License Terms	Feature Name	Status	
Setup Support Files	Setup Support Files		
		< <u>Back</u> Install Cance	

Click 'Install' through this and ensure the 'Setup Support Rules' checks complete as below.

Install a SQL Server Failover C	luster	
Setup Support Rules Setup Support Rules identify pr corrected before Setup can con	oblems that might occur when you install SQL Server Setup support files. tinue,	Failures must be
ietup Support Rules Feature Selection Disk Space Requirements Irror and Usage Reporting Duster Installation Rules	Operation completed, Passed: 20. Pailed 0. Warning 2. Skipp Hide details_<< <u>View detailed report</u>	ed 1. <u>Re</u> -run
leady to Instal nstallation Progress	Rule	Status
nstallation Progress Complete	Domain controller	Passed
	Microsoft .NET Application Security	Not applicable
	Network binding order	Passed
	Windows Firewall	Passed
	DN5 settings (NODE1)	Passed
	Windows Management Instrumentation (WMI) service (NODE	E2) Passed
	Q Cluster Remote Access (NODE2)	Passed
	Distributed Transaction Coordinator (MSDTC) installed (NODE)	E2) Passed
	Remote registry service (NODE2)	Passed
	ONS settings (NODE2)	Passed
		2
	< <u>B</u> ack	Next > Cancel Help

🎲 Install a SQL Server Failover Cluster - 0 × Feature Selection Select the Standard features to install. For dustered installations, only Database Engine Services and Analysis Services can be dustered. Setup Support Rules Features: Description: Instance Features Database Engine Services SQL Server Replication Full-Text Search Feature Selection Server features are instance-aware and have their own registry filves. They support multiple instances on a computer. Instance Configuration Disk Space Requirements Cluster Resource Group Analysis Services Cluster Disk Selection Reporting Services Cluster Network Configuration Shared Features Business Intelligence Development Studio Cluster Security Policy Client Tools Connectivity Server Configuration Integration Services Database Engine Configuration Client Tools Backwards Compatibility Error and Usage Reporting Client Tools SDK SQL Server Books Online Cluster Installation Rules Management Tools - Basic Ready to Install Management Tools - Complete Installation Progress Microsoft Sync Framework Complete Redistributable Features Select All Unselect All C:\Program Files\Microsoft SQL Server\ Shared feature directory: < <u>B</u>ack Next > Cancel Help

If they all display the green check, click 'Next' and select the features to install.

After making your selection, click 'Next' and the 'Instance Configuration' dialog appears as shown below.

Install a SQL Server Failover Clu	ster					_02
Instance Configuration Specify the name and instance ID		stance.				Minimize
Setup Support Rules Feature Selection Instance Configuration	Specify a netw failover cluster SQL Server Net	on the netwo	ork.	allover cluster. Th	is will be the name	e used to identify your
Disk Space Requirements Cluster Resource Group Cluster Disk Selection Cluster Network Configuration Cluster Security Policy Server Configuration Database Engine Configuration Error and Usage Reporting Cluster Installation Rules Ready to Install Installation Progress	C Default instance C Named instance:		[inst1			
	Instance [D: Instance goot directory:		Inst1 C:\Program Files\Mic	rosoft SQL Server	1	
	SQL Server dire		C:\Program Files\Mic		(MSSQL10.Inst1	
Complete	Instance	Cluster Network Name	Features	Edition	Version	Instance ID
				< <u>B</u> ack	Next> C	ancel Help

Supply the Instance configuration and click 'Next' to proceed to the Disk Space Requirements.

Review the disk space summary f	for the SQL Server features you selected.	
Setup Support Rules Feature Selection Instance Configuration <b>Disk Space Requirements</b> Cluster Resource Group Cluster Disk Selection Cluster Network Configuration Cluster Network Configuration Cluster Security Policy Server Configuration Database Engine Configuration Error and Usage Reporting Cluster Installation Rules Ready to Install Installation Progress Complete	Disk Usage Summary:	
	< Back Vext > Cancel He	Hp

Click 'Next' and you will be prompted for the Cluster Resource Group to use for your SQL Server 2008 Cluster.

Install a SQL Server Failover Cluste	r.			Restore D
Cluster Resource Group Create a new duster resource group	for your SQL S	erver fallover clus	ter.	
Setup Support Rules Feature Selection Instance Configuration Disk Space Requirements <b>Cluster Resource Group</b>	failover clu enter a nei	ster resources wi	Server cluster resource group. The cluster res I be placed. You can choose to use an existin group name to be created. ce group name: SQLInst1	source group is where SQL Server ig cluster resource group name or
Buster Disk Selection	Qualified	Name	Message	
Iluster Network Configuration	۲	Cluster Group	The cluster group 'Cluster Group' contains re	esource 'Cluster Name' of type 'Ne
Juster Security Policy	9	SQLInst1		
erver Configuration latabase Engine Configuration			0.e	
rror and Usage Reporting				
Juster Installation Rules				
eady to Instal				
nstallation Progress				
Complete				
	1			Refresh
			< <u>B</u> ack <u>N</u> ext	> Cancel Help

Click 'Next' again and you will be prompted for the Cluster Disk Resource to use.

your SQL Se	rver fallover clu		-
		uster.	
	sult drive for all	to be included in the SQL Server resource cluster group. The first drive will I databases, but this can be changed on the Database Engine or Analysis S	
Disk S:			
Available st	hared disks:		
Qualified	Disk	Message	
۲	Disk Q:	The disk resource 'Disk Q:' cannot be used because it is a cluster quo	rum dri
0	Disk S:		
-	_		
			Refresh
		< Back Next > Cancel	Help
	Available st		Available shared disks:          Qualified       Disk       Message         O       Disk Q:       The disk resource 'Disk Q:' cannot be used because it is a cluster quot         Image: Solution of the disk sector of the disk resource 'Disk Q:' cannot be used because it is a cluster quot       Image: Solution of the disk sector of

Click 'Next' and supply the network configuration.

Cluster Network Config Select network resources for your		r duster.					
Setup Support Rules Feature Selection	Specify the	network gettings fi	2011.003225003	duster:	Network		
Instance Configuration Disk Space Requirements	IPv4		0.10.30	255.0.0.0	public		
Cluster Resource Group Cluster Disk Selection Cluster Network Configuration Cluster Security Policy Server Configuration Database Engine Configuration Error and Usage Reporting Cluster Installation Rules Ready to Install Installation Progress Complete							
	1						Debrech
	1					_	<u>R</u> efresh

Click 'Next' and provide the details of the previously created domain security groups. The service account the SQL Server Services run under, must be a member of these domain groups.

🚼 Install a SQL Server Failover Cluste			_ D ×
Cluster Security Policy Configure the security policy for your	SQL Server failover cluster.		
Setup Support Rules Feature Selection Instance Configuration Disk Space Requirements	SQL Server failover cluster. All reso Server service accounts as members Detabase Engine domain group:	TEST/SQLOustInst	
Cluster Resource Group Cluster Disk Selection Cluster Network Configuration <b>Eluster Security Policy</b> Server Configuration Database Engine Configuration Error and Usage Reporting Cluster Installation Rules Ready to Install Installation Progress Complete	<u>ξ</u> Οί. Server Agent domain group:	TEST/SQLClustInst	
		< Back Next > Cancel	Help

Click 'Next' through the wizard and you will see the Server Configuration dialog. Here you provide details of the SQL Server services security context. Also set the collation type on the 'Collation' tab.

Server Configuration Specify the configuration.					
Setup Support Rules Feature Selection Astance Configuration	Service Accounts Collation	separate account for each	n SQL Server serv	ice.	
Disk Space Requirements	Service	Account Name	Password	Startup Type	
Iluster Resource Group	SQL Server Agent	TEST\sqlserv	••••	Manual	-
Iluster Disk Selection	SQL Server Database Engine	TEST\sqlserv		Manual	*
Cluster Network Configuration	SQL Server Integration Services 1	TEST\sqlsery		Automatic	-
Trior and Usage Reporting			o use a low privil		
Cluster Installation Rules Ready to Install	These services will be configured aut some older Windows versions the use information, dick Help.			c. Por more	
Eluster Installation Rules Ready to Install Installation Progress	some older Windows versions the use information, click Help.	er will need to specify a lov	v privilege accour		-
Cluster Installation Rules Ready to Install Installation Progress	some older Windows versions the use			<ul> <li>For more</li> <li>Startup Type</li> <li>Manual</li> </ul>	-
Error and Usage Reporting Cluster Installation Rules Ready to Install Installation Progress Complete	some older Windows versions the use information, click Help. Service	er will need to specify a lov Account Name	Password	Startup Type	

Click 'Next' and supply the Database Engine Configuration, Account Provisioning...

Install a SQL Server Failover Clusto Database Engine Config	uration	
Specify Database Engine authentica Setup Support Rules Feature Selection Instance Configuration Disk Space Requirements Cluster Resource Group Cluster Disk Selection Cluster Disk Selection Cluster Network Configuration Cluster Network Configuration Cluster Configuration Database Engine Configuration Error and Usage Reporting Cluster Installation Rules Ready to Install Installation Progress Complete	ion security mode, administrators and data directories.         Account Provisioning       Data Directories         Specify the authentication mode and administrators for the Authentication Mode         C       Windows authentication mode         @ Direct Mode (SQL Server authentication and Windows a         Bult-in SQL Server system administrator account         Enter password:         @ Confirm password:         Specify SQL Server administrators         TEST/Administrator (Administrators)         Add Quirrent User       Add	

#### And Data Directory configurations. Enable 'Filestream' if required

Database Engine Config	uration		
Specify Database Engine authentica		nd data directories.	
Setup Support Rules Feature Selection Instance Configuration Disk Space Requirements Cluster Resource Group Cluster Disk Selection Cluster Network Configuration Cluster Security Policy Server: Configuration Database Engine Configuration Error and Usage Reporting Cluster Installation Rules Ready to Install Installation Progress Complete	Account Provisioning Data Dir Data root directory: System database directory: User database log directory: User database log directory: Tgmp DB log directory: Baclup directory:	ectories FILESTREAM	

Click 'Next' and proceed to the 'Error and Usage Reporting' dialog.

🚼 Install a SQL Server Failover Clu	ister	
Error and Usage Repo	-	
Setup Support Rules Feature Selection Instance Configuration Disk Space Requirements Cluster Resource Group Cluster Disk Selection Cluster Network Configuration Cluster Network Configuration Cluster Security Policy Server Configuration Database Engine Configuration Error and Usage Reporting Cluster Installation Rules Ready to Instal Installation Progress Complete	Specify the information that you would like to automat SQL Server. These settings are optional. Microsoft tree provide updates though Microsoft Update to modify fe downloaded and installed on your machine automatica <u>Wew the Microsoft policy for SQL Server privacy and do</u> <u>Read more about Microsoft Update and Automatic Update</u> <u>Send Windows and SQL Server Error Reports to Mic- only applies to services that run without user interain configuration and how you use Microsoft software a</u>	ats this information as confidential. Microsoft may ature usage data. These updates might be ily, depending on your Automatic Update settings. at <u>a collection.</u> at <u>a collection.</u> at <u>a</u> at <u>a</u> cosoft or your corporate report server. This setting ction.
	×	Back Lext > Cancel Help

#### Click 'Next' and proceed to the Cluster Installation Rules dialog.

Setup Support Rules	Operation completed, Passed: 8. Failed 0. Warning 0. Skip	ped 0.
Feature Selection		
Instance Configuration	Hide details <<	Reirun
Disk Space Requirements Cluster Resource Group		Devan
Juster Resource Group Sluster Disk Selection	Yew detailed report	
Cluster Network Configuration	Rule	Status
Cluster Security Policy	Q Cluster supported for edition	Passed
Server Configuration	Operating system supported for edition	Passed
Database Engine Configuration	Windows Server 2003 FILESTREAM Hotfix Check	Passed
Error and Usage Reporting	Cluster Resource DLL Update Restart Check	Passed
Cluster Installation Rules		
Ready to Instal	FAT32 File System	Passed
installation Progress	SQL Server 2000 Analysis Services (64-bit) install action	Passed
Complete	Instance name	Passed
	Previous releases of Microsoft Visual Studio 2008	Passed

Ensure all checks complete and click 'Next' to review your summary.

Ready to Install Verify the SQL Server 2008 feat	ares to be installed.	
Setup Support Rules Feature Selection Instance Configuration Disk Space Requirements Duster Resource Group Cluster Network Configuration Cluster Network Configuration Cluster Network Configuration Server Configuration Database Engine Configuration Error and Usage Reporting Cluster Installation Rules <b>Ready to Install</b> Installation Progress Complete	Ready to install the SQL Server 2008 fallover cluster:         Summary         Edition: Standard         Action: InstallFalloverCluster         General Configuration         Peatures         Other Tools Connectivity         Integration Services         Management Tools - Complete         Instance Configuration         Instance Configuration         Instance IDS         Solution Services         Management Tools - Complete         Instance IDS         Instance IDS         SQL Database Engine: MSSQL10.INST1         Instance Directory: Ci(Program Files/Microsoft SQL Server)         Shared Component root directory	
	Configuration file path: C:\Program Files\Microsoft SQL Server\100\Setup Bootstrap\Log\20090429_125027\Configuration	File.ini

Click 'Next' and follow the installation progress. Once the installation has completed you should see the following...

🚼 Install a SQL Server Failover Clu	ister and a state of the state	
Complete Your SQL Server 2008 failover d	uster installation is complete.	
Setup Support Rules Feature Selection Instance Configuration Disk Space Requirements Cluster Resource Group Cluster Disk Selection Cluster Network Configuration Cluster Security Policy Server Configuration Database Engine Configuration Error and Usage Reporting	Summary log file has been saved to the following location: <u>CIUProgram Files/Microsoft SOL Server/100/Setup Bootstrap/Log(20090429_125027_ ISummary_node1_20090429_125027.btt</u> Information about the Setup operation or possible next steps: Your SQL Server 2008 failover cluster installation is complete.	
Cluster Installation Rules Ready to Install	gupplemental Information:	
Ready to Install Installation Progress <b>Complete</b>	The following notes apply to this release of SQL Server only. Microsoft Lipdate For information about how to use Microsoft Update to identify updates for SQL Server 2008, see the Microsoft Lipdate Web site <a href="http://go.microsoft.com/fwlink/?LinkId=108409">http://go.microsoft.com/fwlink/?LinkId=108409</a> > Microsoft Lipdate Web site <a href="http://go.microsoft.com/fwlink/?LinkId=108409">http://go.microsoft.com/fwlink/?LinkId=108409</a> > Microsoft Lipdate Web site <a href="http://go.microsoft.com/fwlink/?LinkId=108409">http://go.microsoft.com/fwlink/?LinkId=108409</a> Microsoft Lipdate Section (Additional Section (Additional Section (Additional Section Section (Additional Section Se	*
	Close He	lp /

This installs SQL Server to the first\active node, you now have to launch setup on each cluster node you wish to participate in the SQL Server cluster.

Previously SQL Server 2005 would deploy to all nodes in the configured cluster group and the installation progress for all nodes was viewable on the progress dialog via a drop down list.

## 4.2 ADD A CLUSTER NODE

To add a node, launch setup on the node to be installed and from the <u>Installation</u> menu select 'Add Node to a SQL Server Failover Cluster'. Installation proceeds in a similar way to the new node installation. You will see the dialogs for 'Setup Support Rules', 'Setup Support Files'. At some point after this you are required to provide the product key, unfortunately there is a bug around this portion of the installer and the following error may be encountered...

'The current SKU is invalid'

Although a hotfix is available, to work around this remove the default licence key and click 'Next'. Now click 'Back' and manually type the key then click 'Next' again. Installation should proceed without error. The node configuration should show as follows

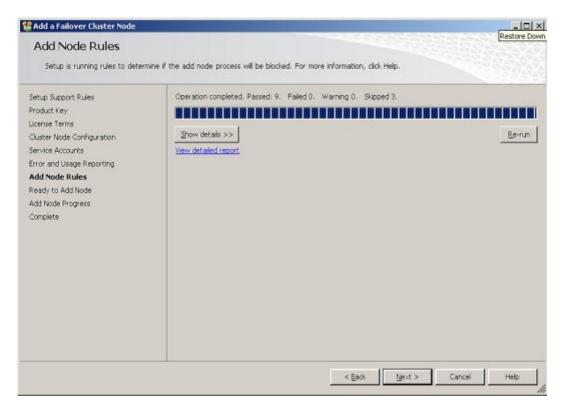
etup Support Rules roduct Key						
icense Terms	SQL Server instance name: Ngme of this node:		INST2	2		
luster Node Configuration			NODEL			
Service Accounts Error and Usage Reporting Add Node Rules	Instance Name	Cluster Network Name	Features	Nodes		
eady to Add Node	INST1	SQLCLUST	1 SQLEngine, SQL.	NODE1, NODE2		
dd Node Progress	INST2	SQLCLUST	2 SQLEngine, SQL.	NODE2		

Note the extra SQL Instance that is previously configured.

Select the InstanceName for which you are adding the node to and click 'Next' to proceed to the Service Accounts dialog.

Service Accounts Specify the configuration.				M	
ietup Support Rules	Microsoft recommends that you use a separate account for each SQL Server service.				
Product Key License Terms	Service	Account Name	Password	Startup Type	
	SQL Server Database Engine	TEST\sqlserv		Manual	
Suster Node Configuration	SQL Server Agent	TEST\sqlserv		Manual	
irror and Usage Reporting Add Node Rules Ready to Add Node Add Node Progress Complete	These services will be configured autor older Windows versions the user will n Help.	natically where possible to use	a low privilege a		
Add Node Rules Ready to Add Node Add Node Progress	older Windows versions the user will ny Help, Service	atically where possible to use ed to specify a low privilege a Account Name	a low privilage a ccount: For mor Password	ccount. On some e information, dick Startup Type	
Add Node Rules Ready to Add Node Add Node Progress	older Windows versions the user will ny Help.	adically where possible to use ed to specify a low privilege a	a low privilege a ccount. For mor	ccount. On some e information, dick	

Configure the service account details and click 'Next' through the wizard past the error and usage reporting dialog. You should see the Add Node Rules dialog as shown below.



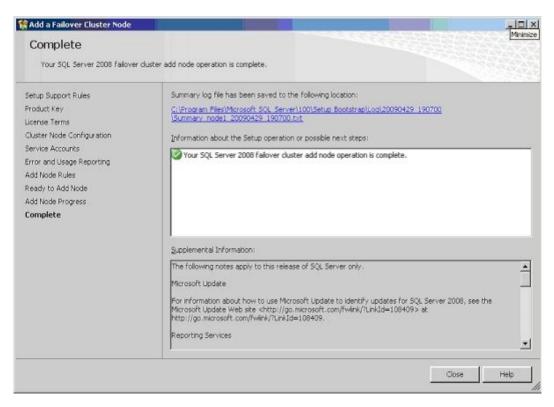
Click 'Next' and view the Add Node Rules. Click 'Install' to continue.

Add a Failover Cluster Node Ready to Add Node Verfy the SQL Server 2008 fea	tures to be installed as part of the add node operation.
Setup Support Rules Product Key Ucense Terms Cluster Node Configuration Service Accounts Error and Usage Reporting Add Node Rules <b>Ready to Add Node</b> Add Node Progress Complete	Ready to add this node to the SQL Server 2008 failover cluster:         Summary         Edition: Standard         Action: AddNode         General Configuration         Peatures         Obtabase Engine Services         SQL Server Replication         Full-Text Search         Instance configuration         Instance Name: INST2         Instance IDs         SQL Database Engine: MSSQL10.INST2
	Configuration file path: C:\Program Files\Microsoft SQL Server\100\Setup Bootstrap\Log\20090429_190700\ConfigurationFile.ini
	<back cancel="" help<="" instal="" td=""></back>

You will see the progress dialog below.

🚼 Add a Failover Cluster Node		
Add Node Progress		
Setup Support Rules Product Key License Terms Cluster Node Configuration Service Accounts Error and Usage Reporting Add Node Rules Ready to Add Node Add Node Progress Complete	Performing Windows Installer actions.         Install_sql_engine_core_inst_Cpu32_Action	
	Next > Cancel Hel	

Once installation has completed you should see the following screenshot.



Should you receive any errors, address these issues and if necessary re launch Setup.

## 4.3 SO HOW WOULD I HAVE AN ACTIVE \ACTIVE CONFIGURATION?

The more astute among you would have noticed the already installed SQL instance in the Cluster Node Configuration screenshot above. To create an active\active cluster simply create the extra resources required on the FreeNAS VM and present them over the iSCSI transport to the cluster nodes and add them as disk resources to Failover Cluster Manager. Once created, launch the installation on a passive node. Install the SQL Instance as shown above and then add nodes to the new instance. Keep the quorum drive in the cluster group (move the group to the required node before installing your secondary SQL instance).

# 5 **APPENDIX** A NAMED INSTANCES & NETWORK NAMES

During SQL Server installation setup requires you to supply an instance name for the SQL Server instance you are installing. On a non clustered system, the machine name is the instance name prefix. A virtual network name is essentially the same as a machine name in that it must be unique on the network.

Installations of SQL Server allow only one default instance, after that the rest must be named.

Take the following scenarios

## 5.1 NON CLUSTERED

A non clustered server named <u>\\MYSERVER</u> has 2 SQL Server instances installed to it. When the administrator installed SQL server they created a named instance using the name "Instance1" and a default instance.

To log on to each instance you would use,

Default

**MYSERVER** 

Named

MYSERVER\Instance1

## 5.2 CLUSTERED

A 2 node clustered system exists using the following details,

Node1

Node 2

Name = CL-01-001 IP = 10.200.1.17	Name = CL-01-002 IP = 10.200.1.18
Windows Cluster	
Name = CLU-01-001 IP = 10.200.1.12	
Default SQL Instance	Named SQL Instance
Network Name = DB-01-011 Instance Name =	Network Name = DB-01-013 Instance Name = MSUAT

You can see the complexity added to the system as there are now more names and IP addresses used for the same computers. In the clustered environment it is important to remember to disregard the node names and IP addresses when connecting to SQL Server. Everything is referenced by the Network name. In the clustered environment the Network Name and note the machine name forms the instance prefix.

To logon to the default instance you use

DB-01-011

To logon to the named instance you use

DB-01-013\MSUAT

Practice these by using names of your own to substitute the items above and ensure you understand default and named instances in both clustered and non clustered environments.