2012 R2 Clustering

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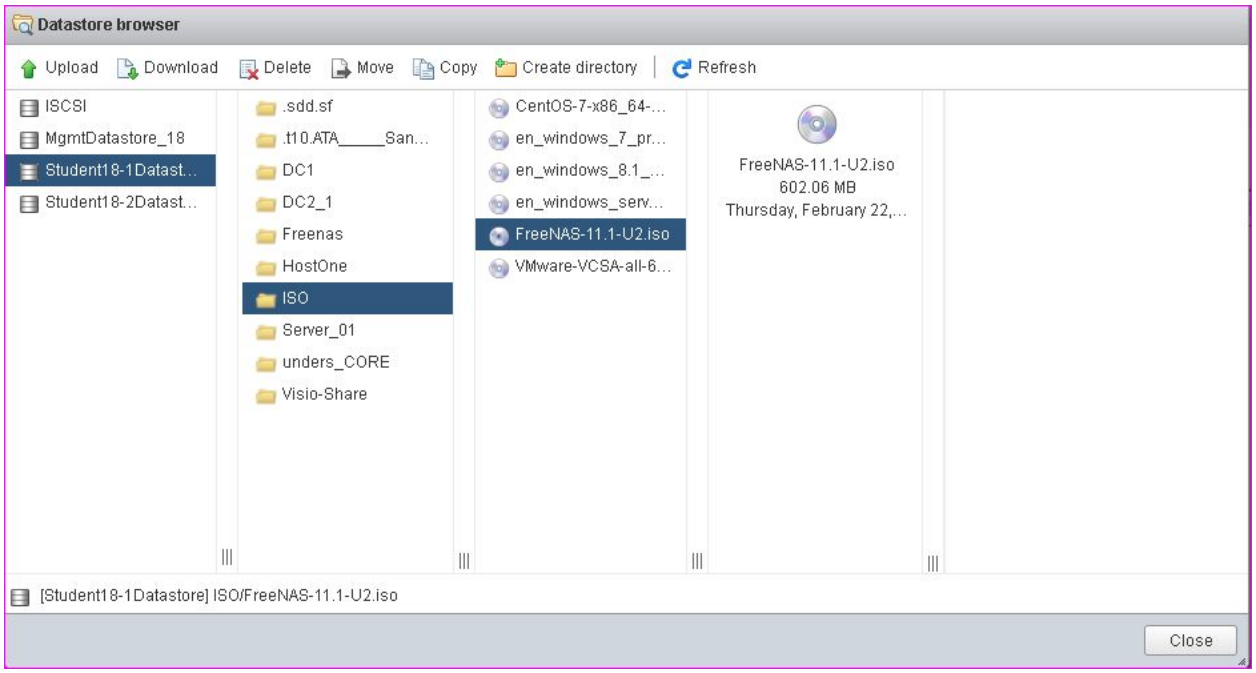
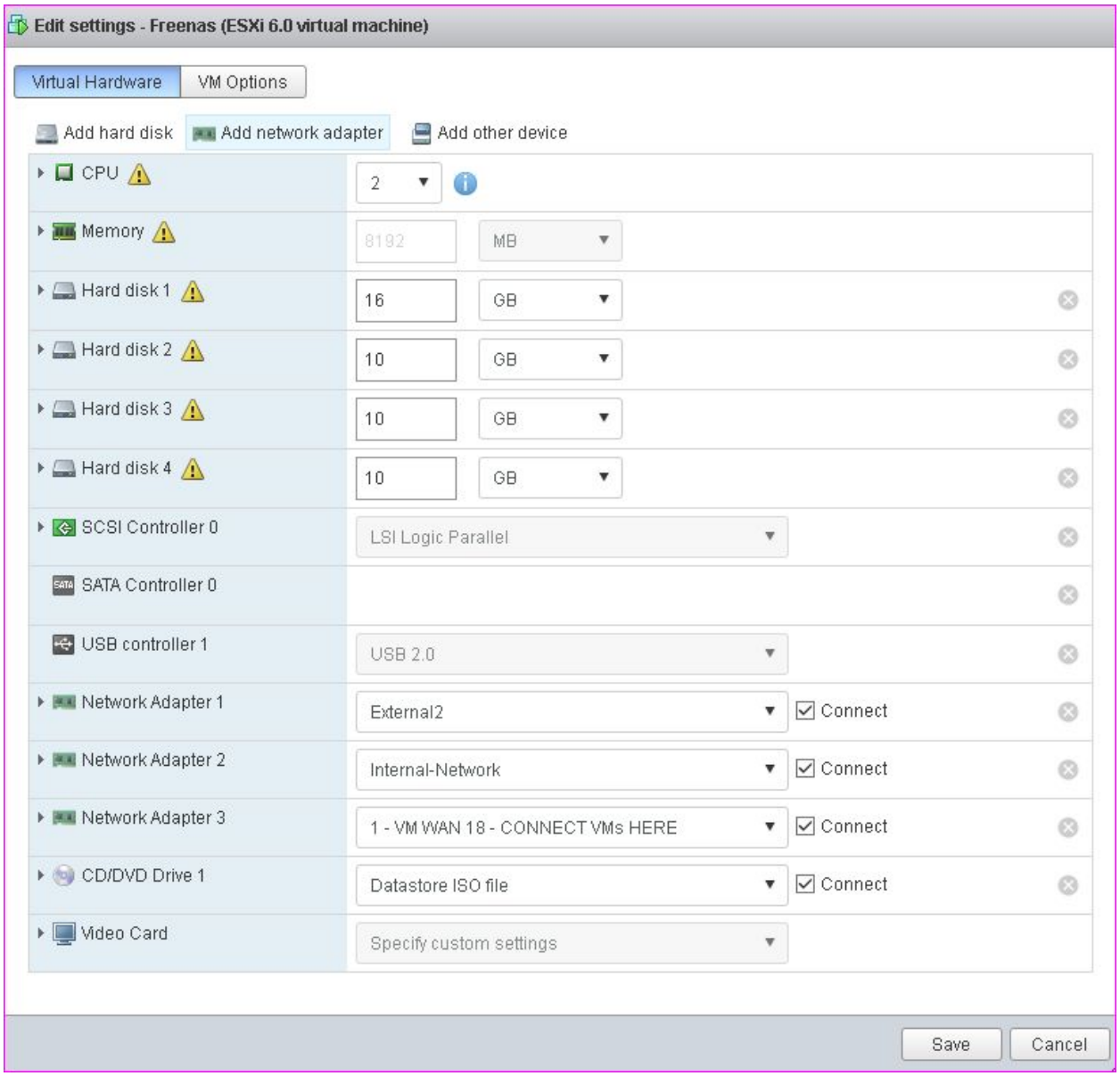
Overview

Setting up FreeNas

To set up FreeNas first you need to download the latest iso from FreeNas's official site (http://www.freenas.org/download/), in our case it was version 11.1. Next you need to upload it to a datastore with in your ESXI.



Now create a VM and use the FreeNas ISO you just uploaded to the datastore. Make sure you have at least 8GB's for the actual Freenas ISO to go on, and 3 other 10GB Hard disks to make a RaidZ. Add at least 2 network adapters as well.

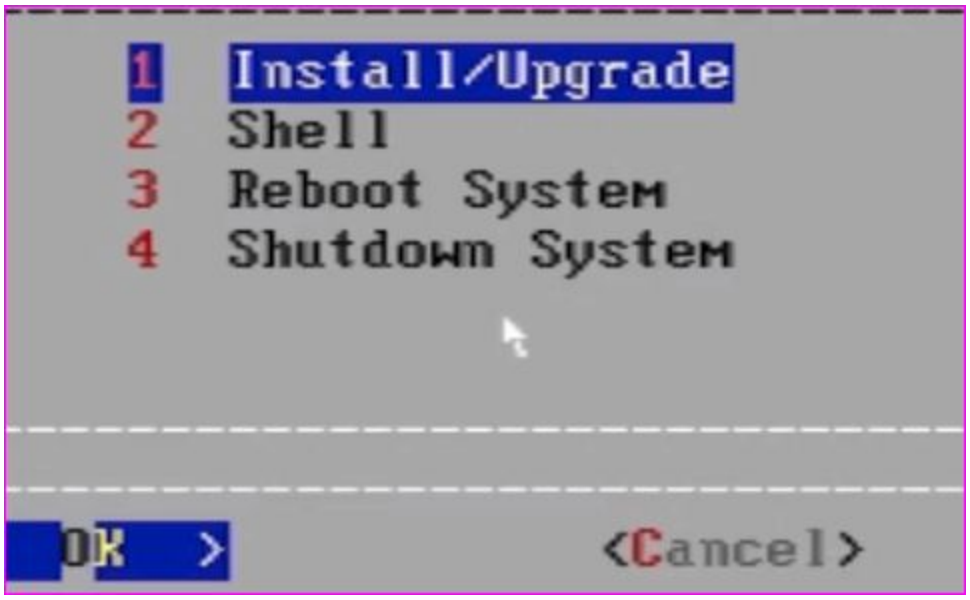


Configuring FreeNas

Now once we have booted up the FreeNas VM it's time to configure FreeNas.

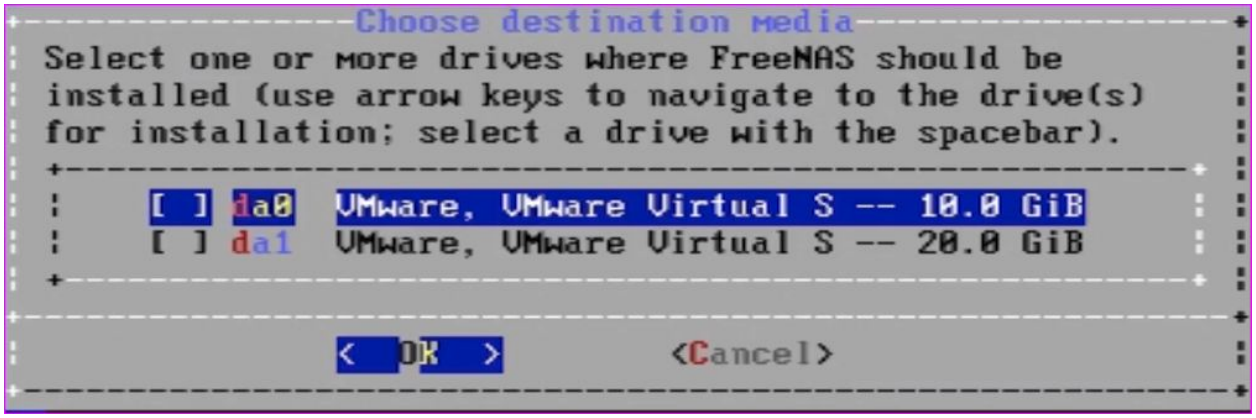
Once you get to the installer click enter on “FreeNas” to get the options menu

Now you are in the console setup hover over **Install/Upgrade** and click **Ok**.



If FreeNas prompts you saying you have less than recommended amount of RAM, either click **yes** to continue at your own risk, or **no** then start over and add at least 4GB of RAM.

Now you can choose which drive you wish to install just FreeNas on by hitting **space** on the drive and then **ok**.

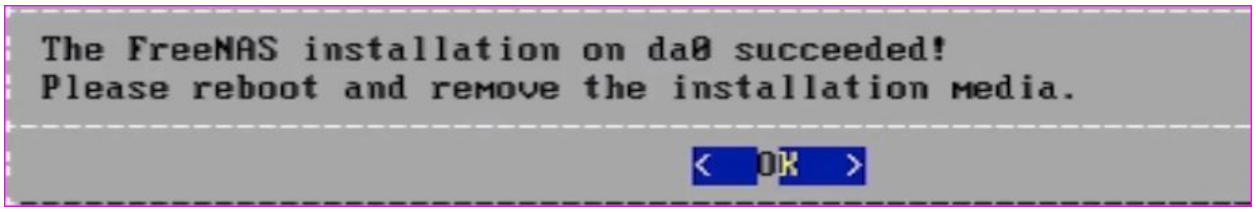


The next prompt will ask for a root password type it in twice to confirm, and make sure you remember it!

The next prompt will ask if you want to use UEFI or BIOS we chose BIOS and clicked **enter**.

Now it's installing FreeNas on your specified drive, this will take a few moments.

At the end of the installation you will need to reboot, click **Ok** to reboot.



Once it has rebooted it will give you a link to the website using a DHCP address from one your NIC's. Enter the URL into a browser to be connected to the FreeNas interface.

```
You may try the following URLs to access the web user interface:

http://192.168.2.73
```

Login using username **root** and the root password you made earlier.

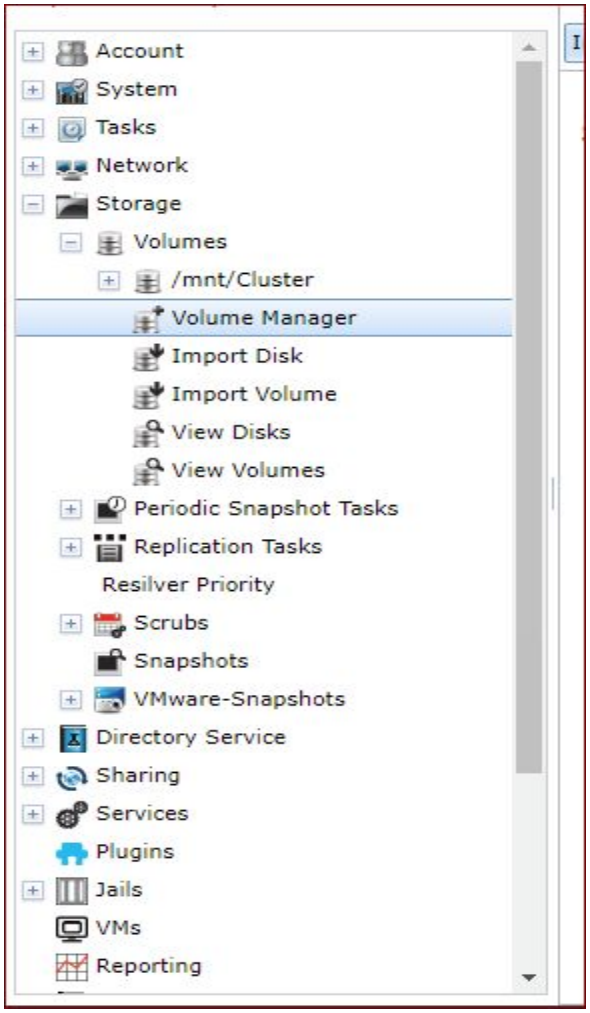
Set up the initial the first page of the initial wizard to the right timezone and language then exit out.

Now it’s time to set up storage and ISCSI.

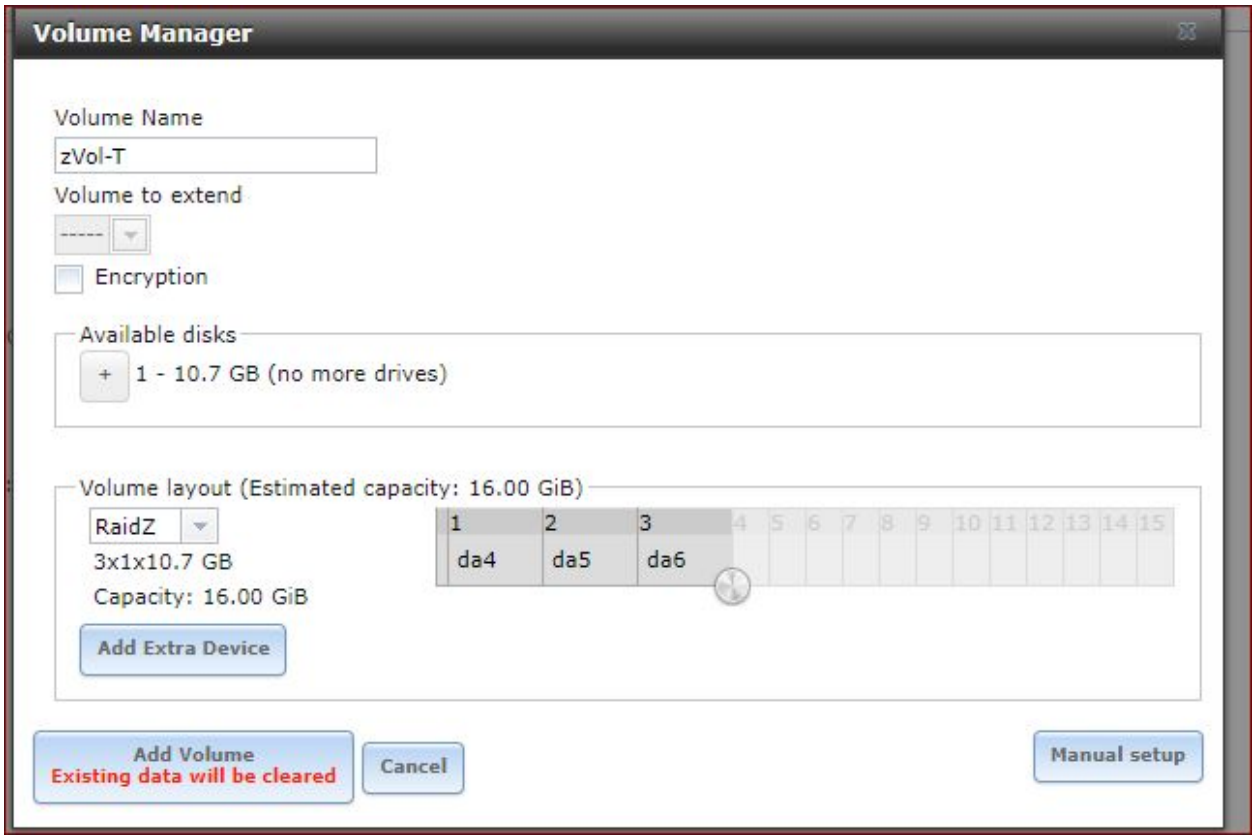
FreeNas Storage

Making a Raidz:

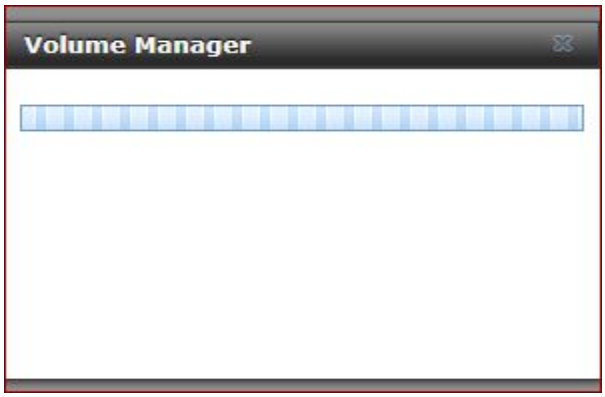
Make sure you have 3 hard drives, of the same size, for a parity drive.
For this example, we made 3 drives of 10 gigabytes each, resulting in a 16GB parity drive.
Browse to the FreeNas site, login, and browse to the Volume manager option. Double click on that, and follow the screenshots.



Give the volume a name, drag the scroll ball at the bottom to 3 to specify you are using 3 disks, which is a ZFS RAIDz volume. Make sure the drop down box is set to RaidZ then Hit “**Add Volume**”.

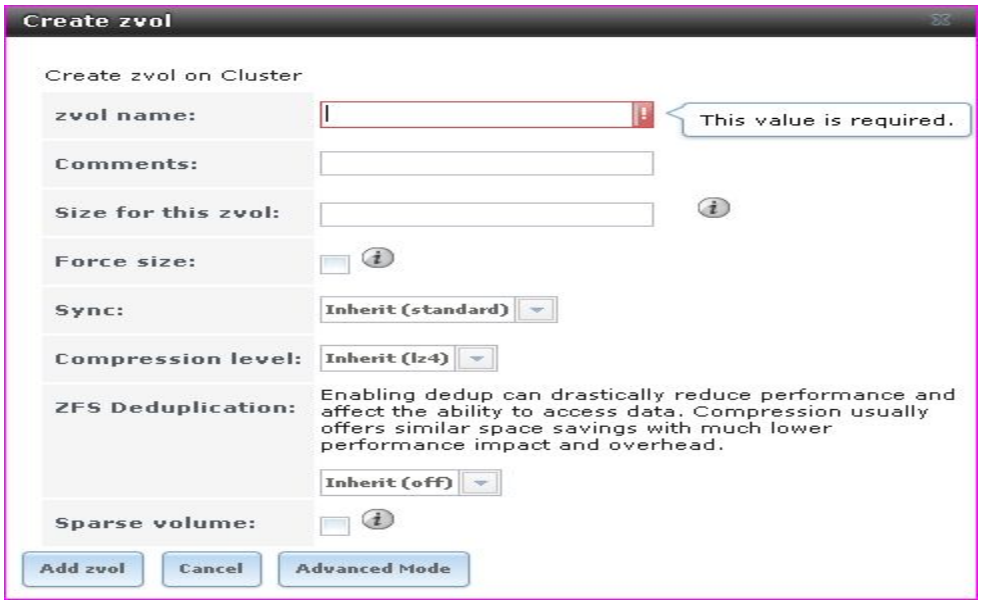


The volume will then be created.



Now that the main volume manager is set up go to the volume you just created and click it then at the bottom click add zVol.

Give the new zvol a name, a comment relative to its job, and a size. Leave the rest default and click “**Add zvol**”.



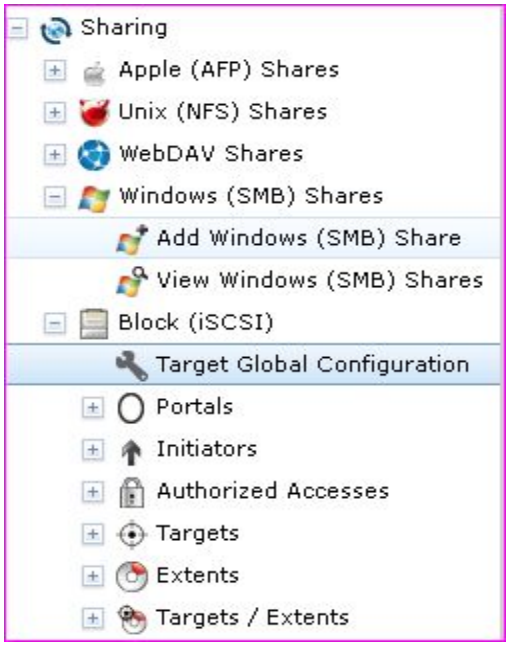
Now you’re ready to start building your iSCSI infrastructure.

ISCSI

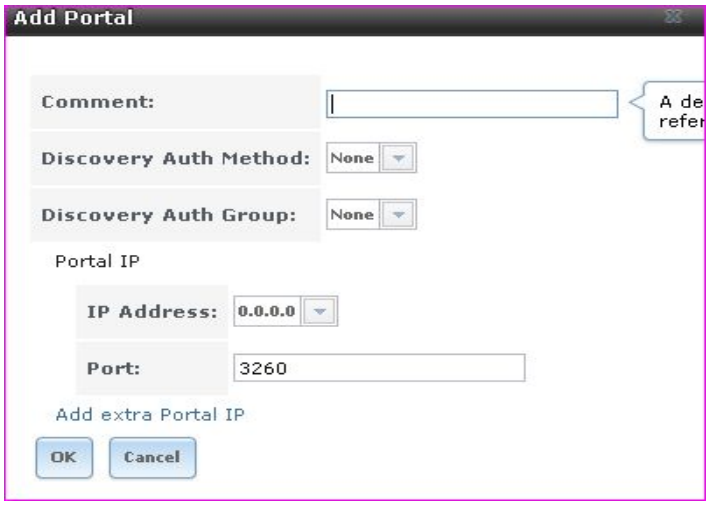
Setting up ISCSI:

First go to services and make sure iSCSI is on, by default it is off, if so turn it on by clicking “**Start Now**”.

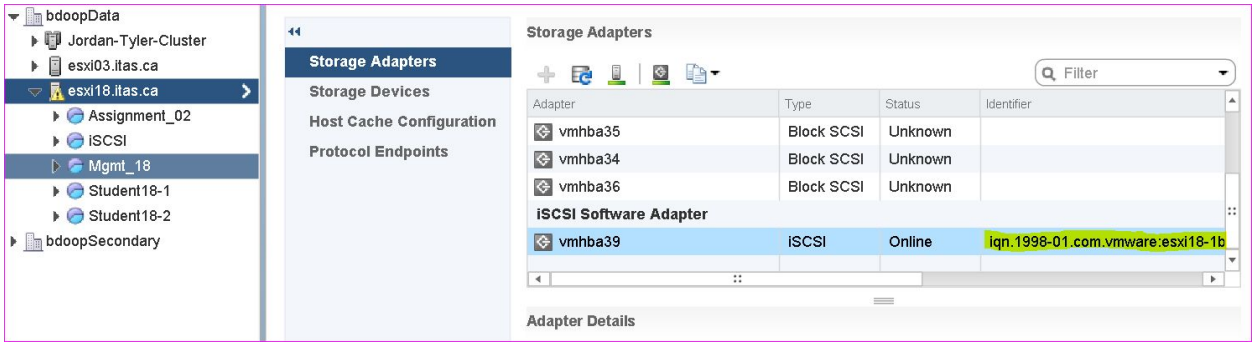
Then to get to iSCSI go to **Sharing** > **Block (iScsi)** > **Target Global Configuration.**



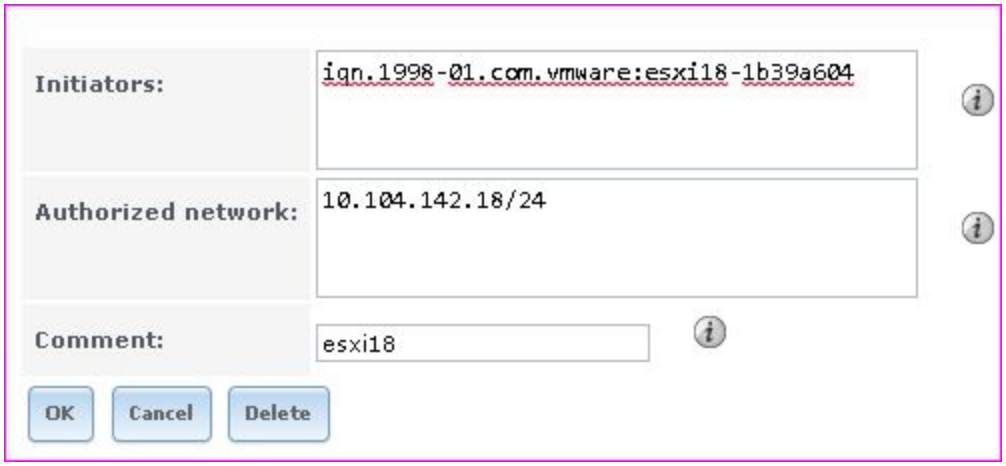
Leave it as is and go to the tab beside it "**Portals**" to configure your main listener.
At the top left of the page click "**Add Portal**". In the Add portal wizard give it a comment relative to what it's doing (ie. "main listener") select the IP you want the main listener to use from the drop down box of IP's, leave everything else to their defaults. Then click **Ok** to confirm.



Next go to the “**Initiators**” tab**.**
At the top left of the page click “**Add Initiator**”.
To find the Identifier we must first log into our vCenter and go to **Hosts & Clusters** > **ESXI18** > **Manage** > **Storage Adapters** click on the iSCSI one and copy its identifier (the iqn.12345).

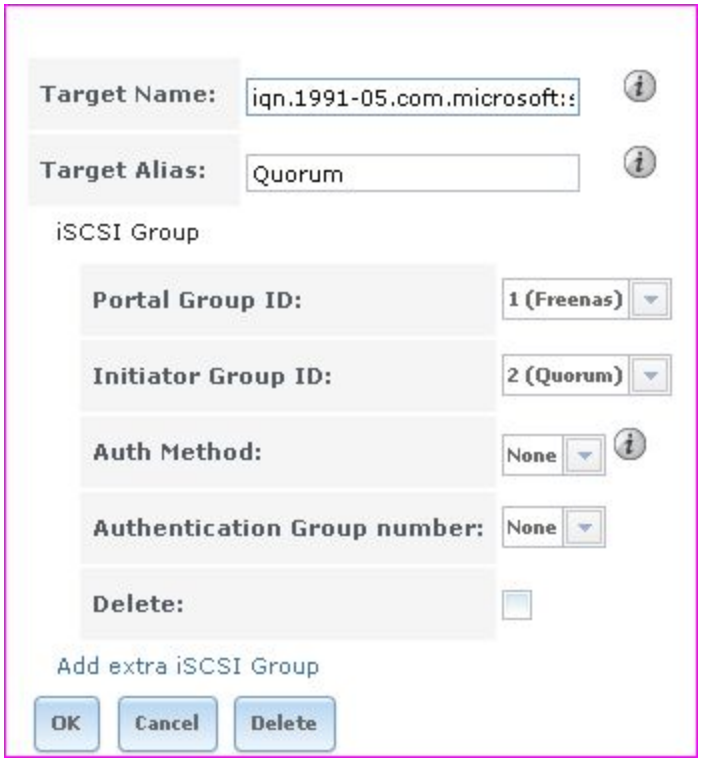


Now back in FreeNas inside the **Add Initiator** wizard paste in the iqn identifier for the **Initiator** and for the **Authorized network** make it the ESXI towers IP or leave it as All and give it a comment. Then click **Ok** to confirm.



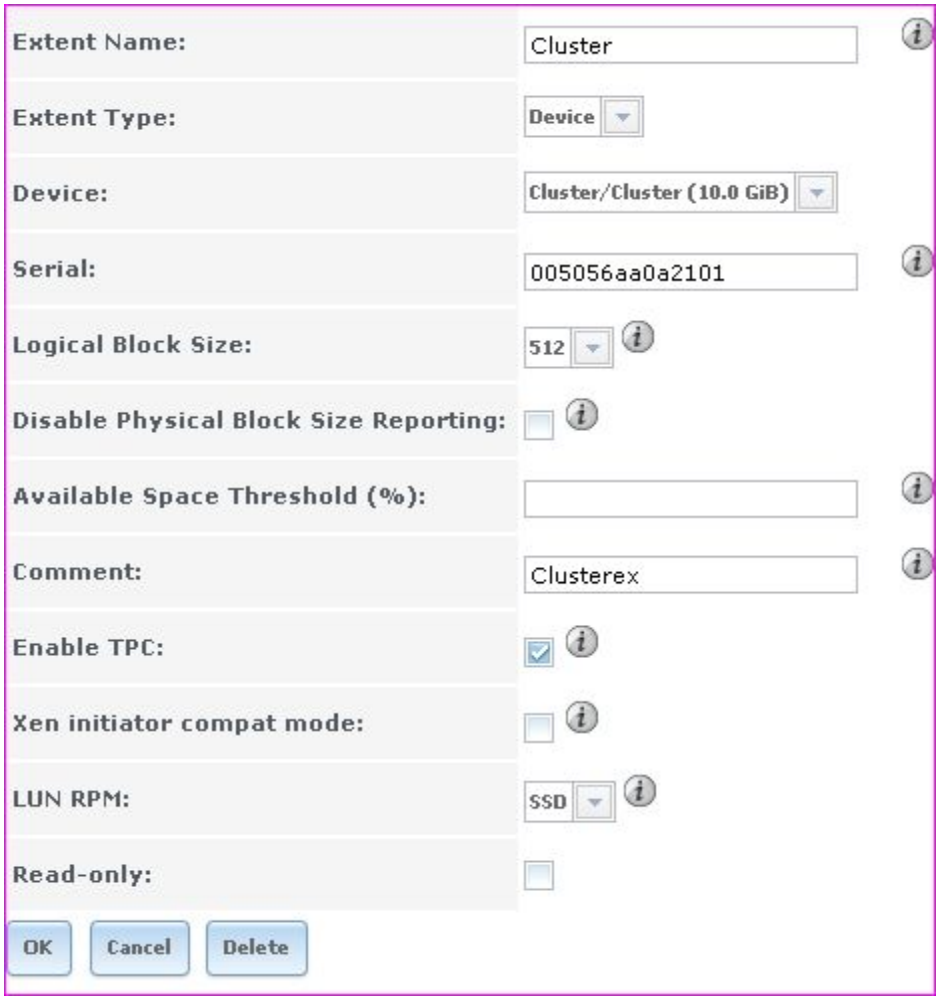
Skip over the **Authorized Access** tab and go to the **Targets** tab.
At the top left of the page click “**Add Target**”.

Give use the iqn target from earlier as the name, give it an alias under **portal group ID** chose the main listener we created earlier in the drop down box. For the **Initiator Group ID** use the initiator created earlier and click **Ok**.



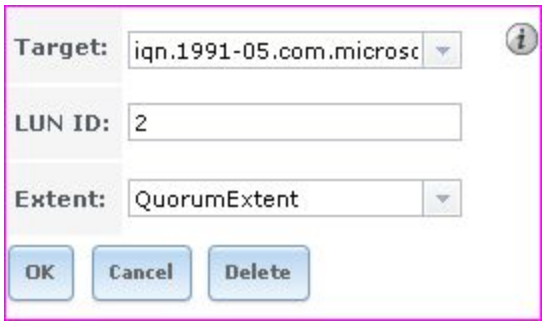
Next go to the **Extents** tab.
At the top left of the page click “**Add Extent**”

Give the Extent a name, Under the **Device** drop down box choose which device you want to store this Extent in. Give it a comment and leave the rest default. Then click **Ok** to confirm.



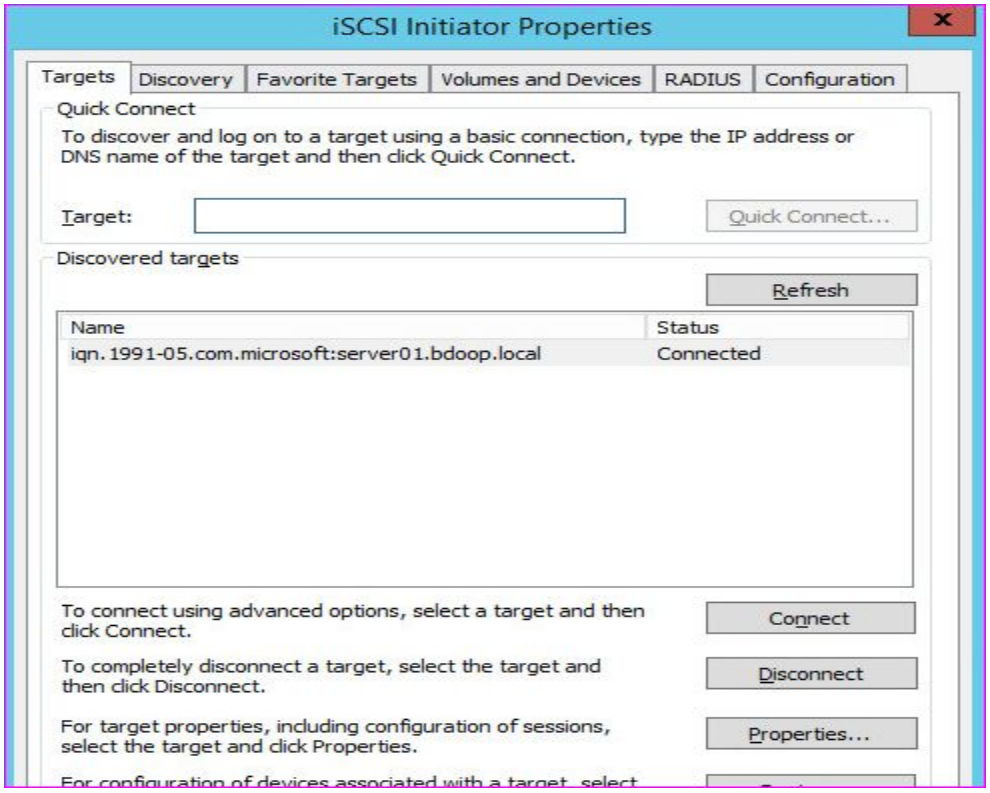
Next go to the **Associated Targets** tab.
At the top left of the page click “**Add Target/Extent**”

Choose from the **Target** drop down box which target you want to use, give it an ID, and choose which Extent you want to link it with. Then click **Ok**.



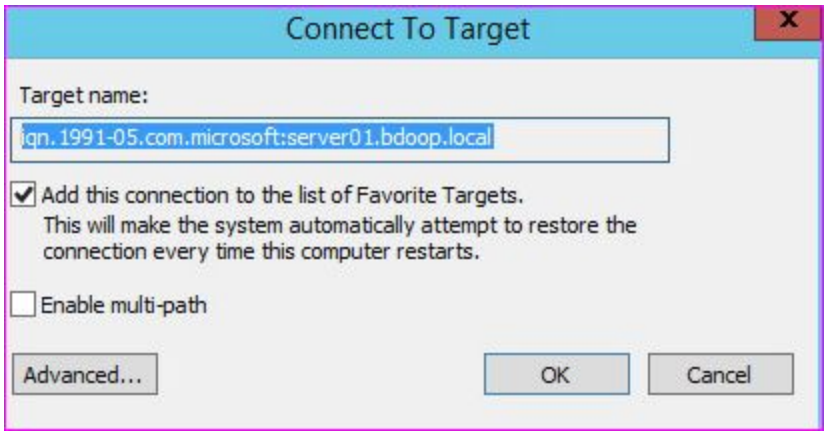
Setting up iSCSI Initiator within a server:

Now we can get out of FreeNas and go to a created server within your ESXI.
Login to a windows 2012 r2 server and go to iSCSI Initiator (windows + s “iSCSI Initiator”).



Under “**Target:**” type in the main listeners ip “10.104.142.124” and click **Quick Connect** you should then see the iqn Initiator name, click **Connect**.

Inside the **Connect to Target** pop up window click **Ok**.

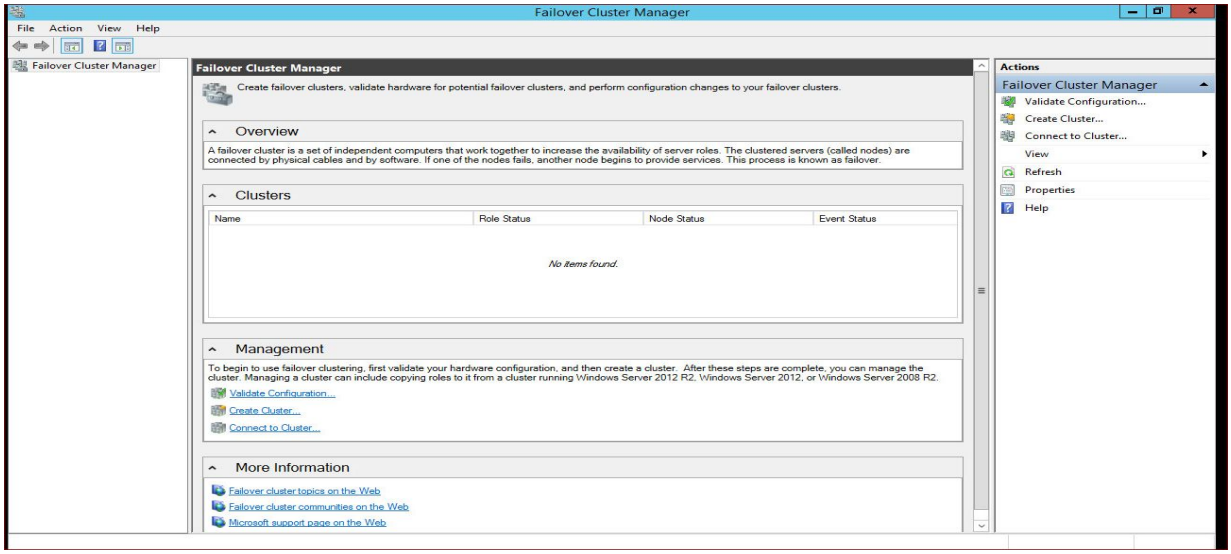


Repeat these Steps for the Second server as well!

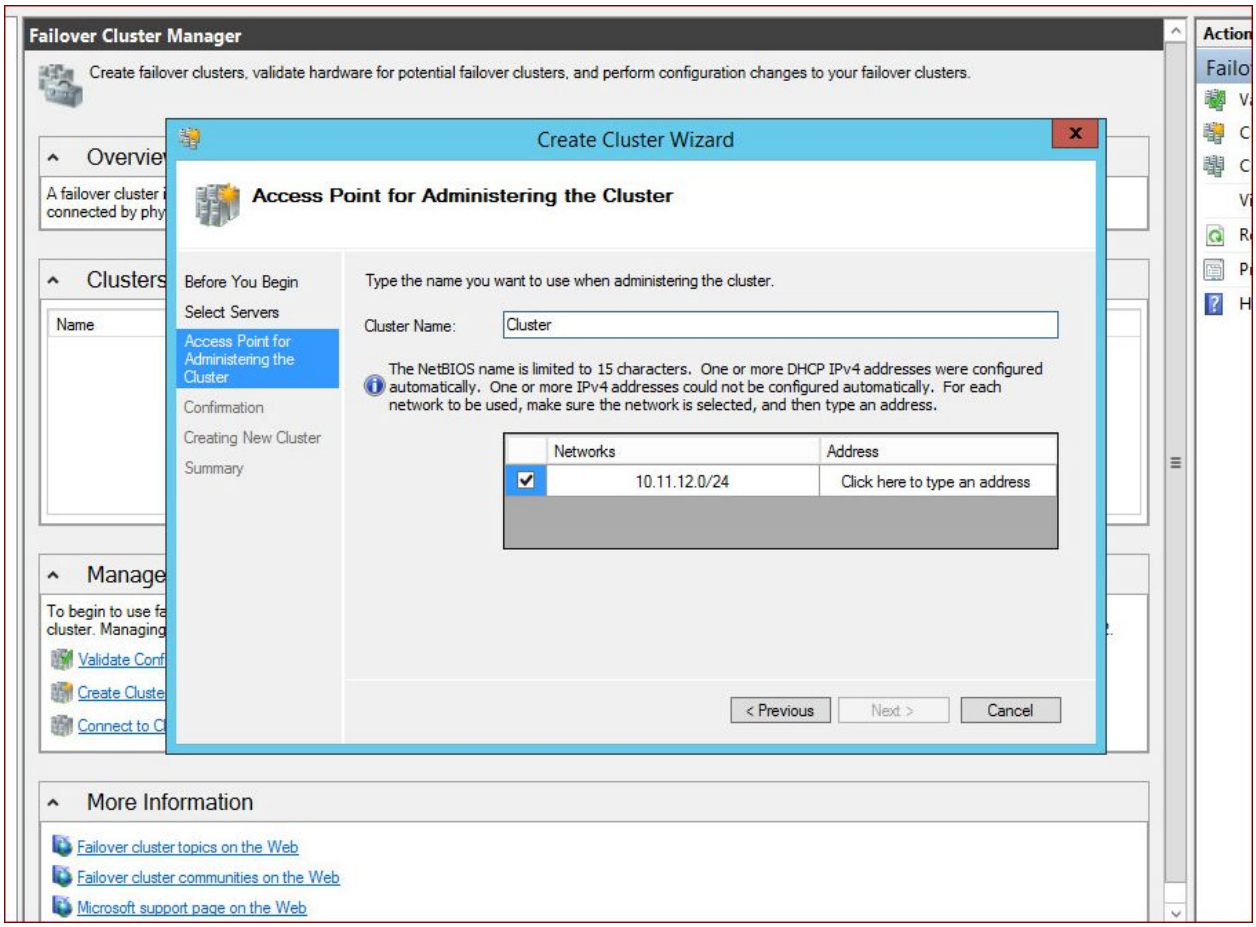
Clustering

Start by installing **Failover clustering** in server managers roles & features.

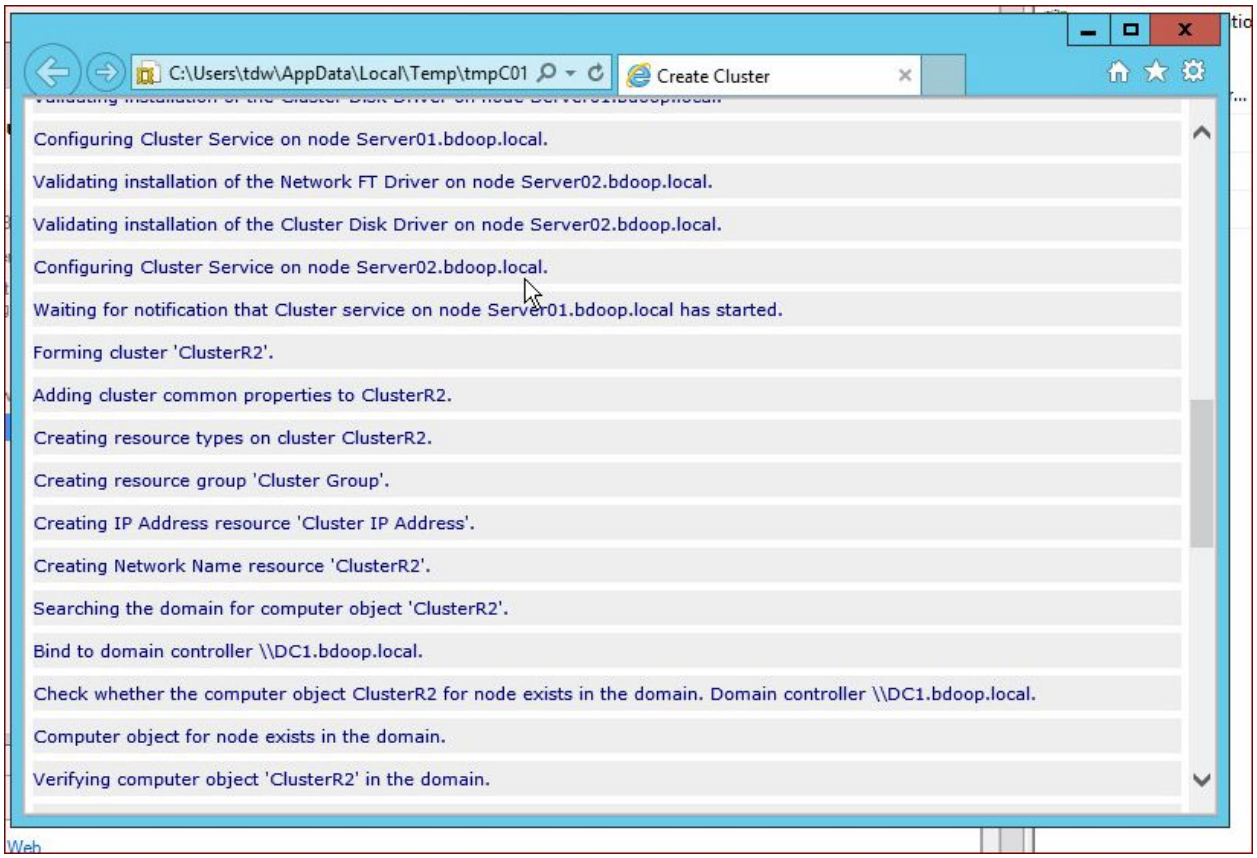
Go to failover cluster manager. As we need to create one, click the Create Cluster option...



Name your cluster, and connect it to the domain network. Hit next, confirm, and wait it out.



Here’s a Summary of what you configured in the form of report



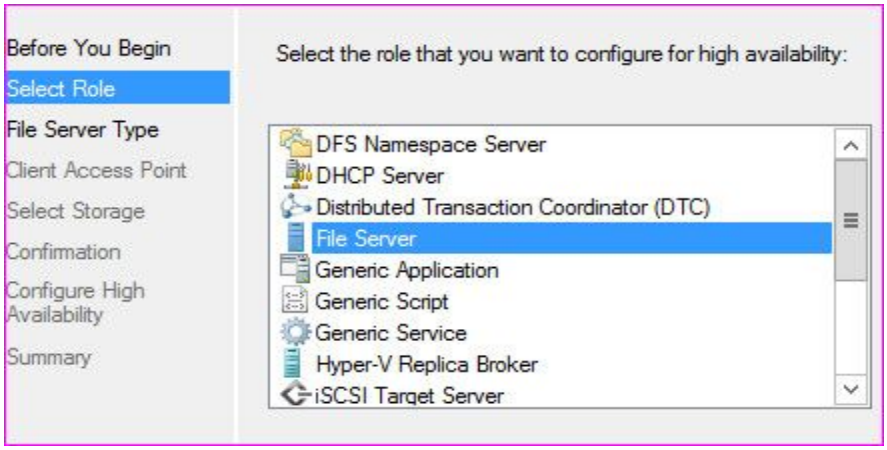
Once you have made the cluster check to see if the disks are online.

Name	Status	Assigned To	Owner Node	Disk Number
Cluster Disk 1	Online	Available Storage	Node4	
Cluster Disk 2	Online	Disk Witness in Quorum	Node4	

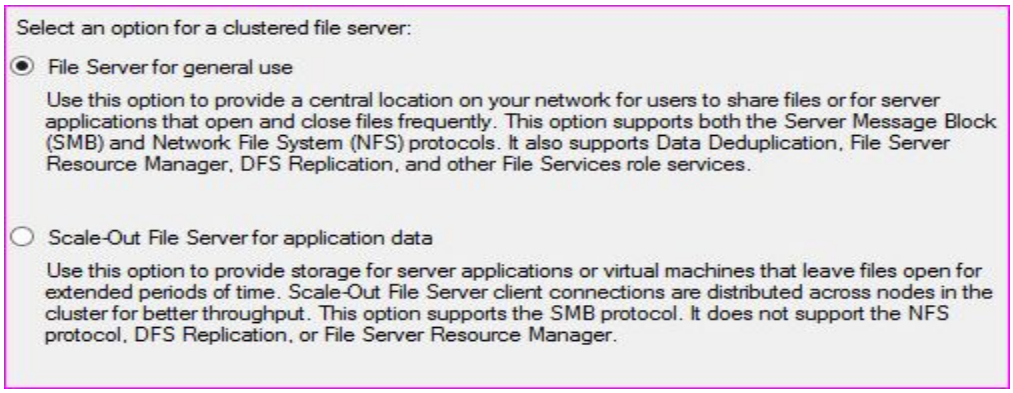
Now we can set up shared storage for our clients.

Shared Storage

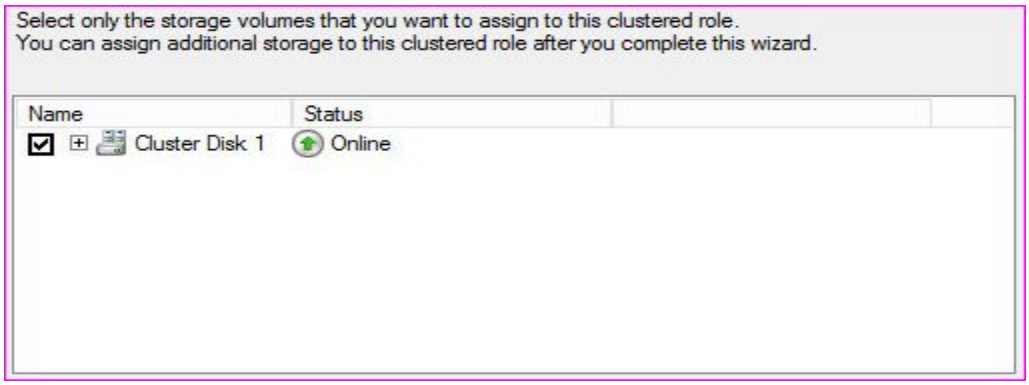
Now right click on Roles, and click **add role**, then choose **File Server.**



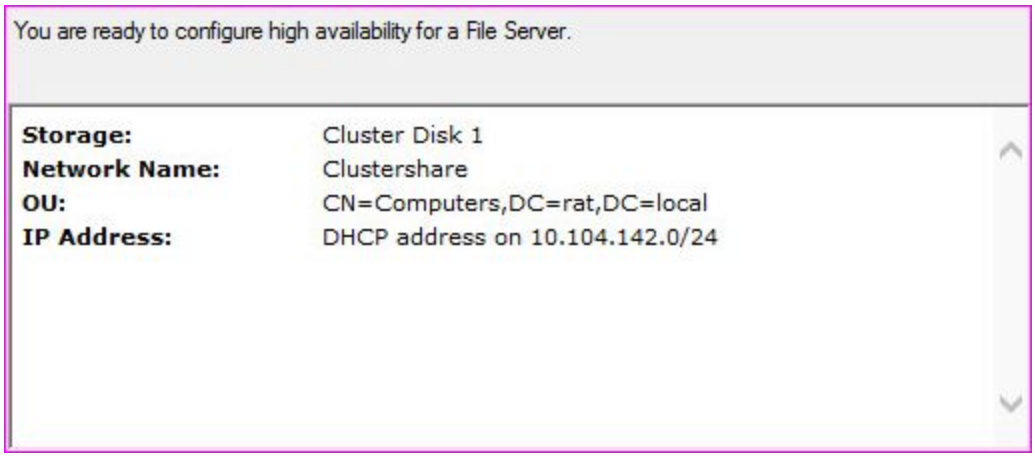
For the **File Server Type** keep as default “SMB” and click **Next** to continue.



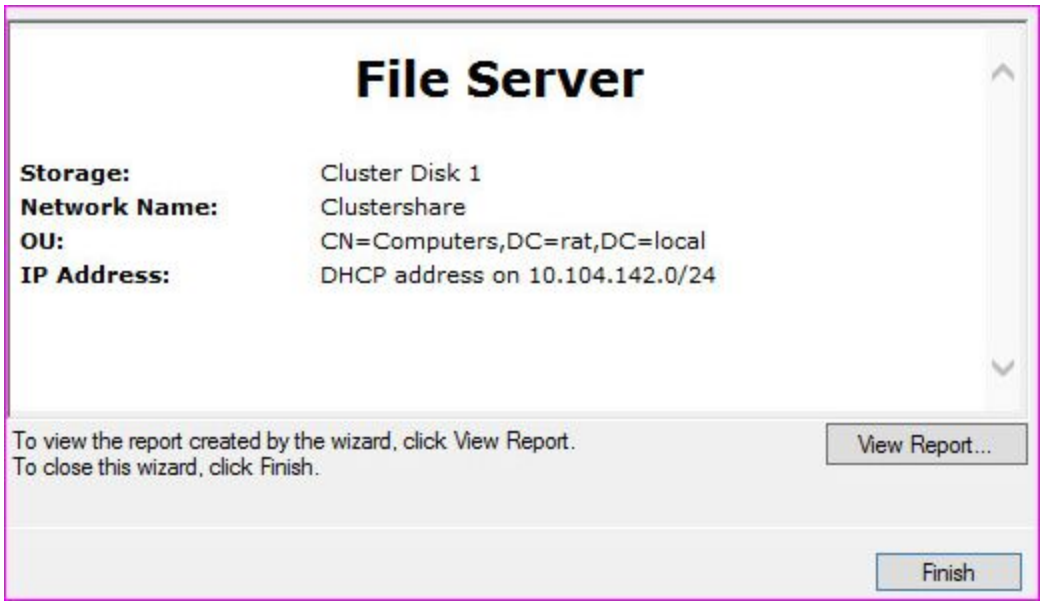
In the “**Client access Point**” tab give this shared storage a name and click **Next** to continue.



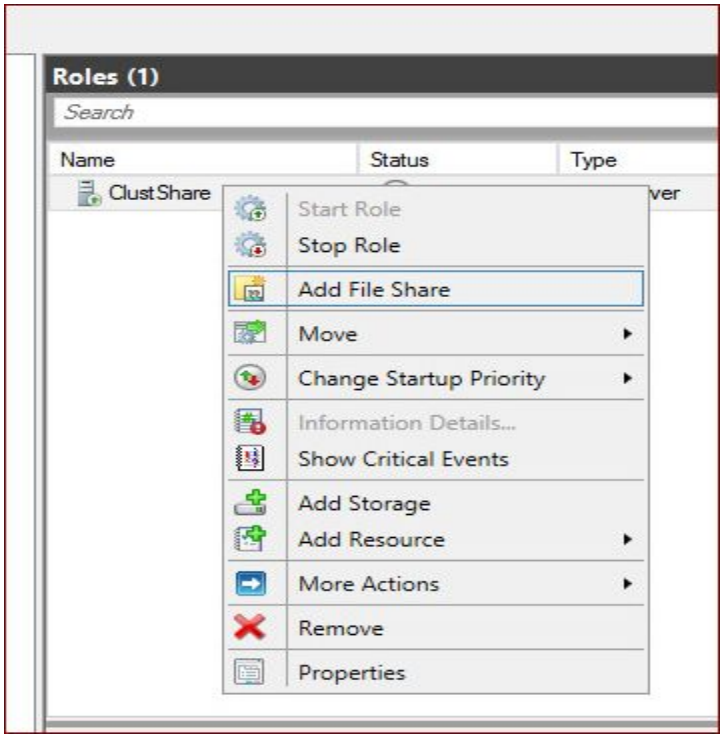
Make sure it's using your internal IP address when receiving a DHCP; otherwise there may be trouble later on (we had this as external at first and it took us a while to realize and fix it). Click **Next**.



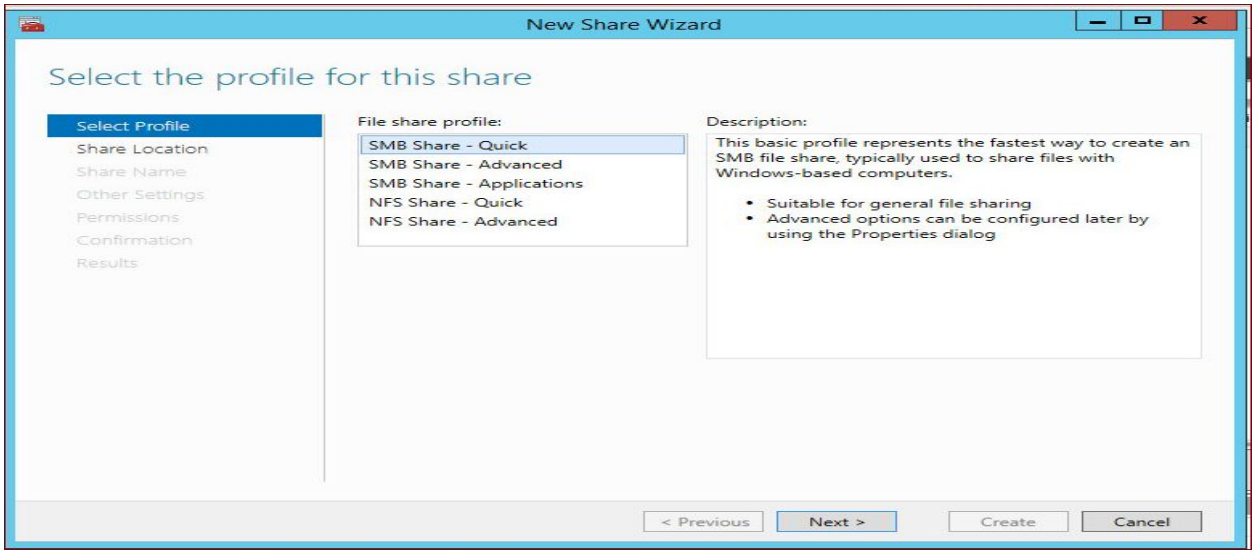
Check the summary and click **Finish**.



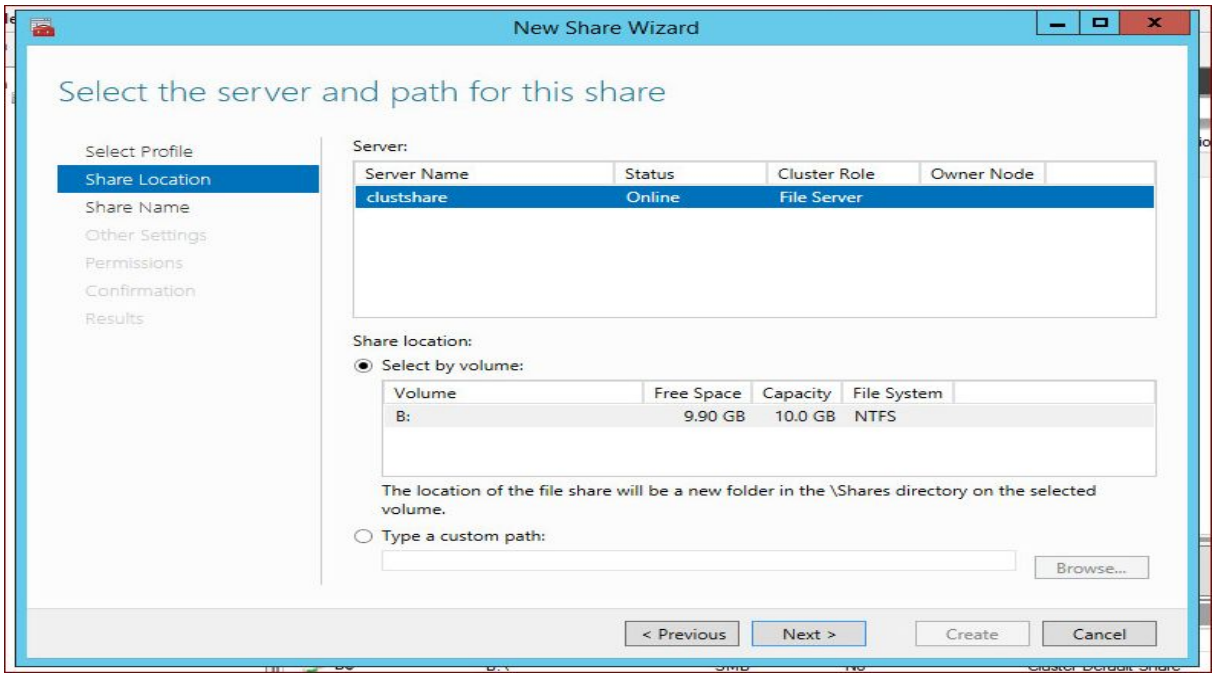
Now under **Roles** right click your share and **Click** Add File Share.



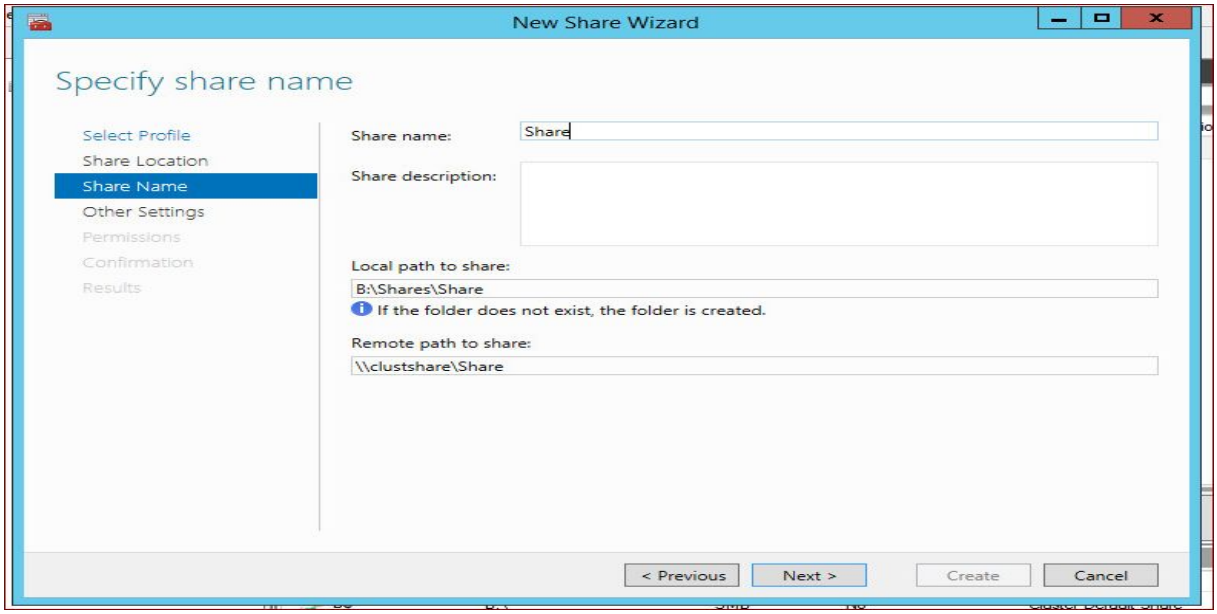
Under shares right click **properties** It should initialize the file server if you have everything configured correctly. After this is finished a **SMB** file share wizard should pop up. Select the option **SMB Share - Quick** and hit **Next.**



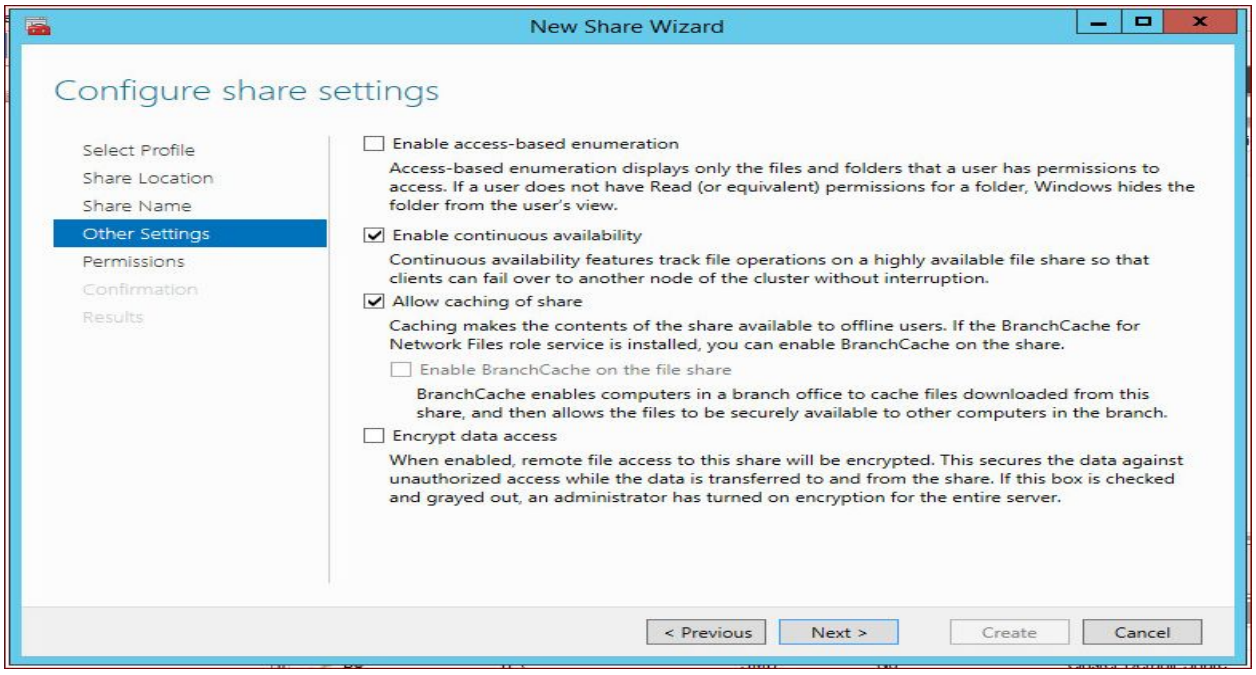
Select the location of the share by clicking on it and hit **Next**.



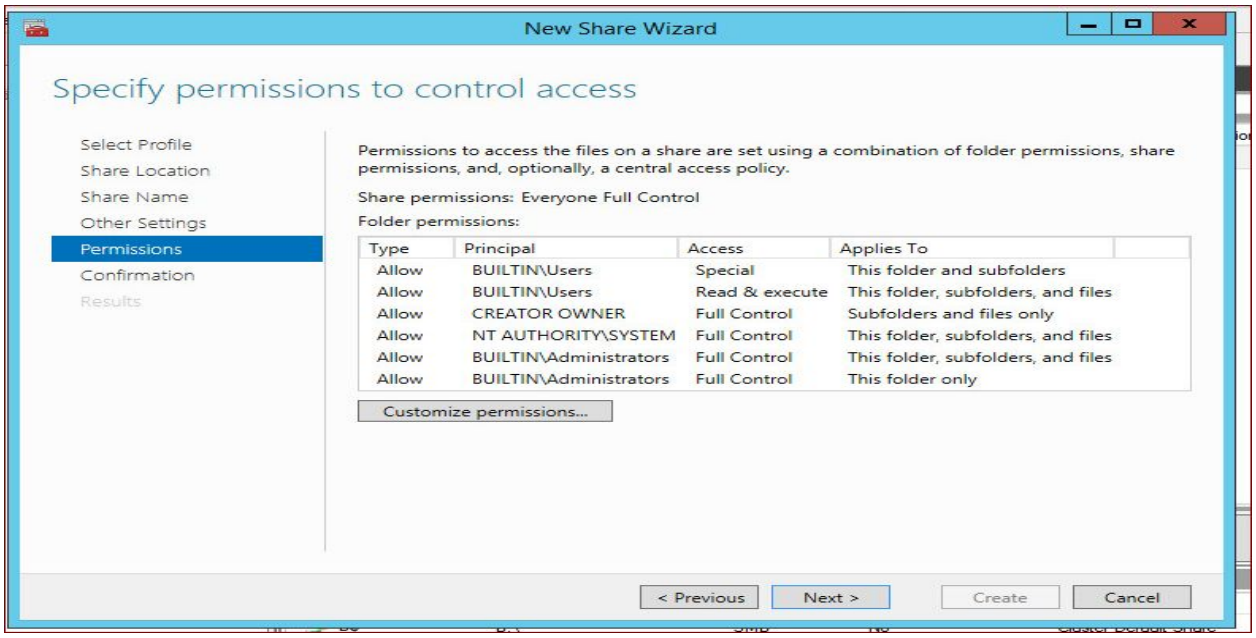
Give the new share a name and it will automatically create the path, then hit **Next**.



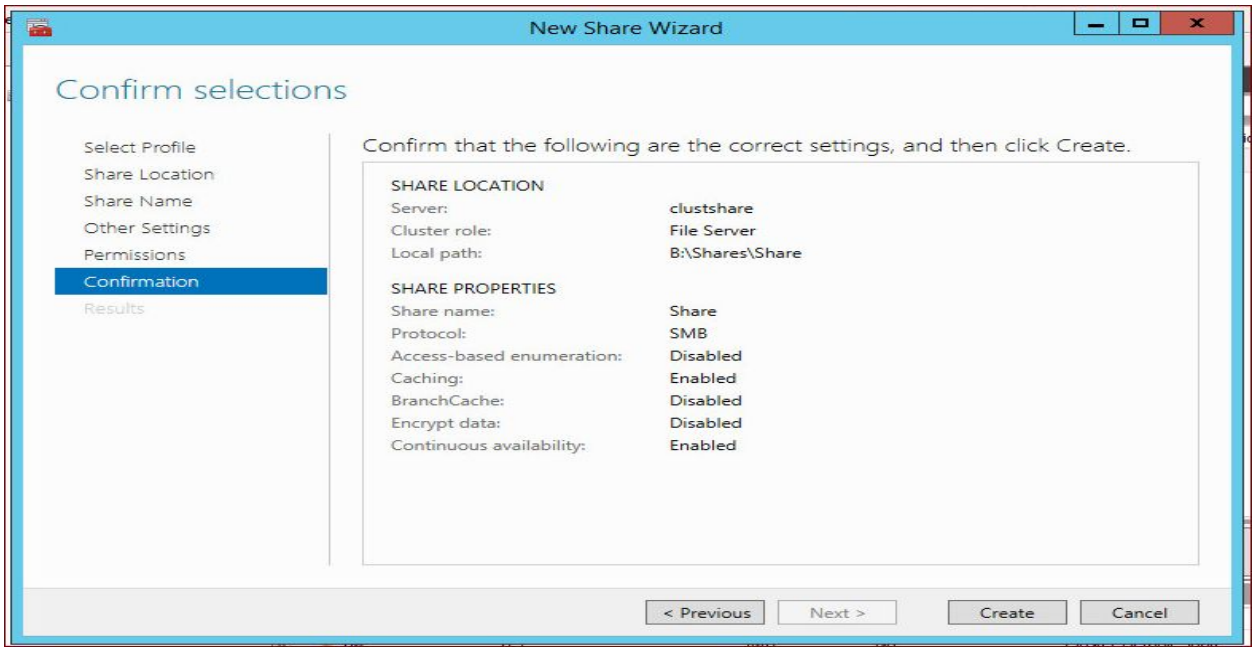
Defaults here are fine. Hit next.



Add any users you might want to allow for **special** permissions… Otherwise just move on. Hit **Next**.

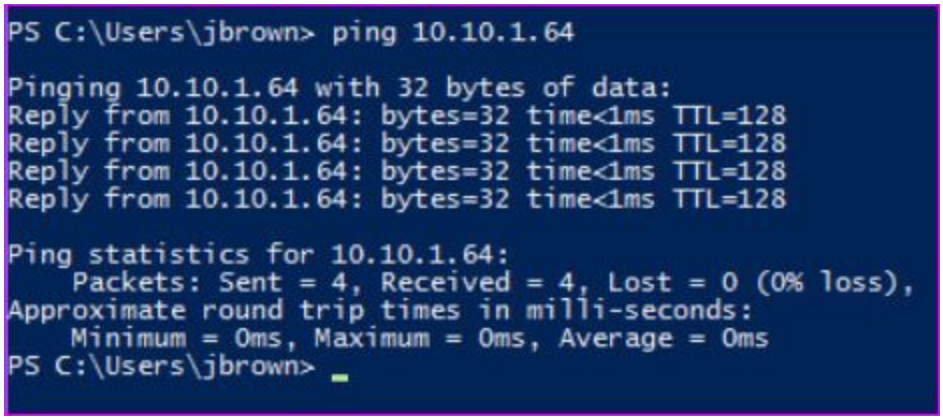


Check over the settings you configured and make sure they look reasonable, then hit **Next**.



Setting up heartbeat network

To start, we created a new switch, with a port group called “heartbeat”, and added a NIC to both servers that we wanted to connect to it. Just make sure each server is using this NIC and they can ping each other.



GPO Drive Map

For this part we will be configuring a GPO to set up a drive map of the shared file server we just created for a client computer, this way end users can connect to our cluster file share much easier.

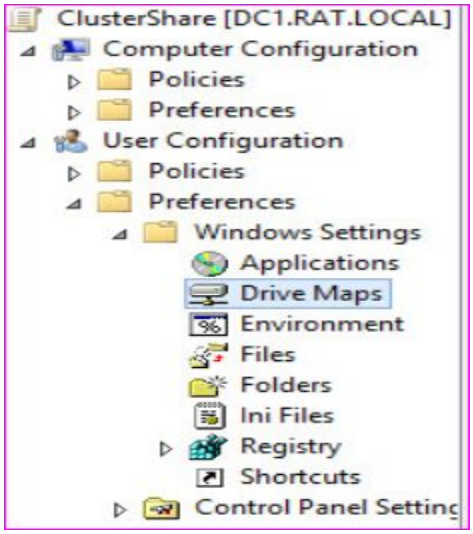
Configuration of GPO

In server manager click on **Tools** at the top right choose and open **Group Policy Management**.

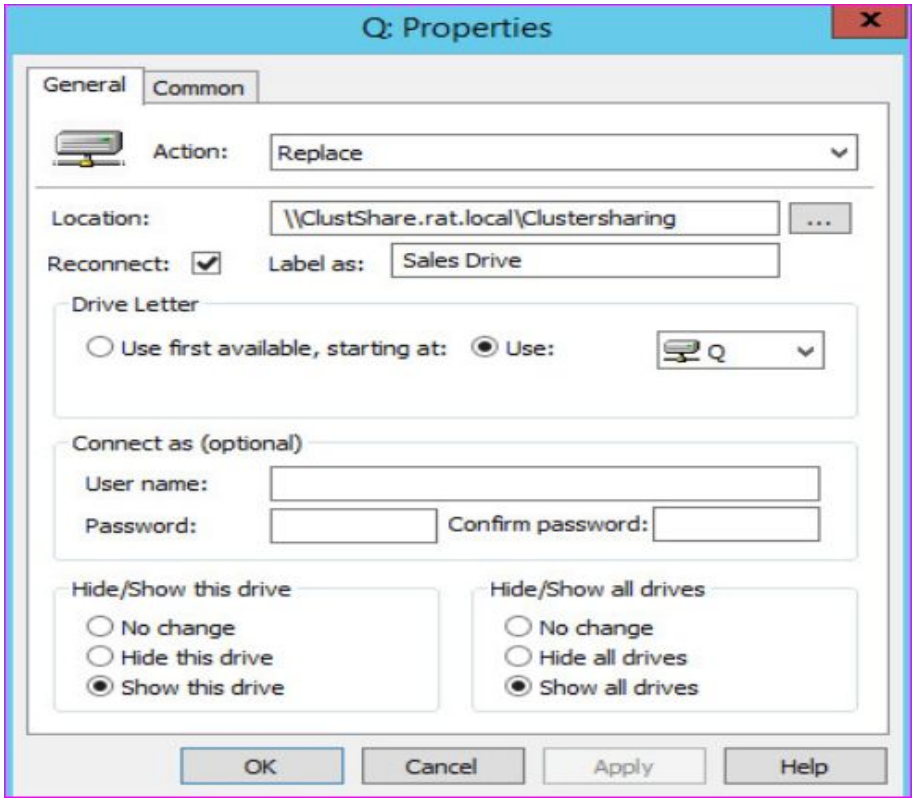
Once open right click an OU click **Create a GPO in this domain, and Link it here…**

Give the GPO a Name and click **Ok**.

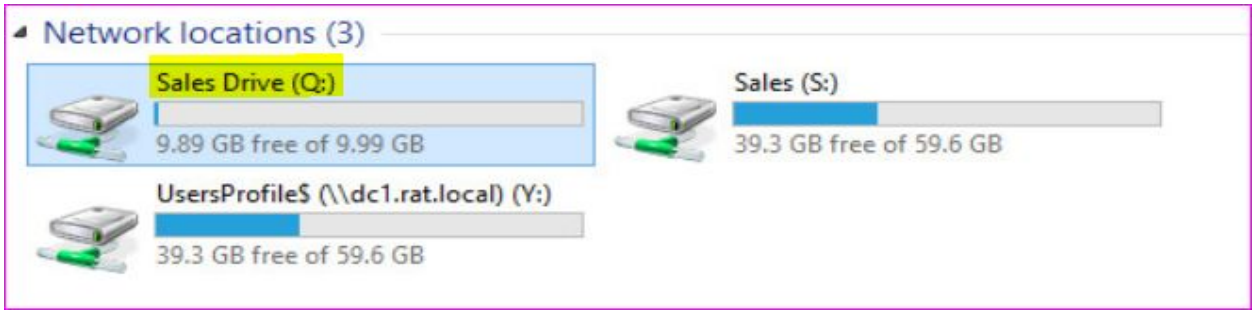
Go to **User Configuration** > **Preferences** > **Windows Settings** and right click on Drive Maps and click **New Mapped Drive**.



Our shared folder was located at \\CLUSTSHARE\B$, SO we made the share here, we called it clustersharing. So in the Drive Map properties make sure you specify the correct location of the shared folder, then hit the check box for **Recconect** give it a **Label** and a **Drive letter**, hit **Ok** to submit your configurations.



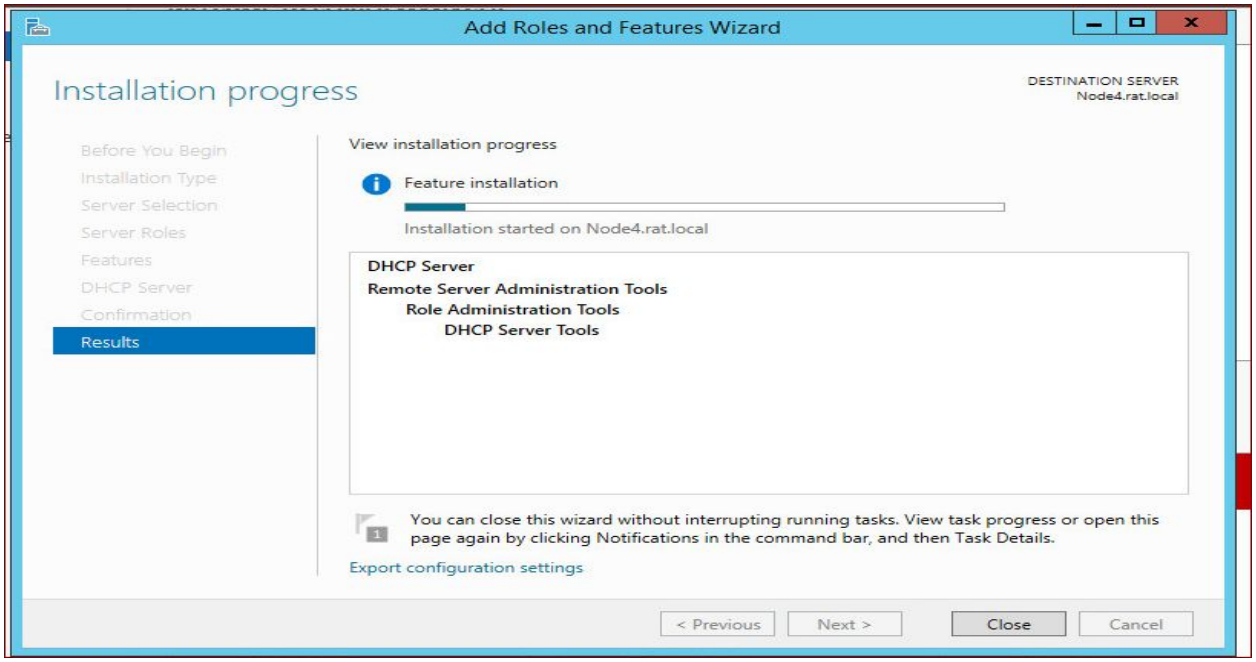
Now login to the client corresponding to the GPO OU and if you configured everything right it should be there after a quick "**gpforce /update**" in the cmd and after another login it will show up in file explorer under **This PC** > **Network Locations**.



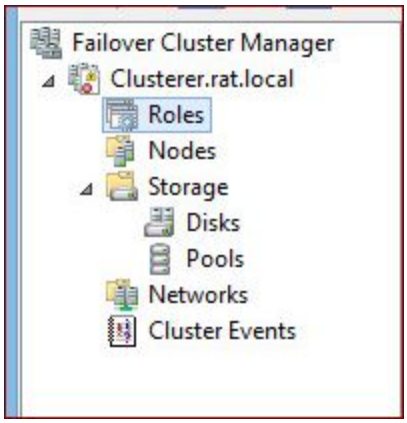
Redundant DHCP servers

Don’t forget to **un-authorize** your dhcp server!

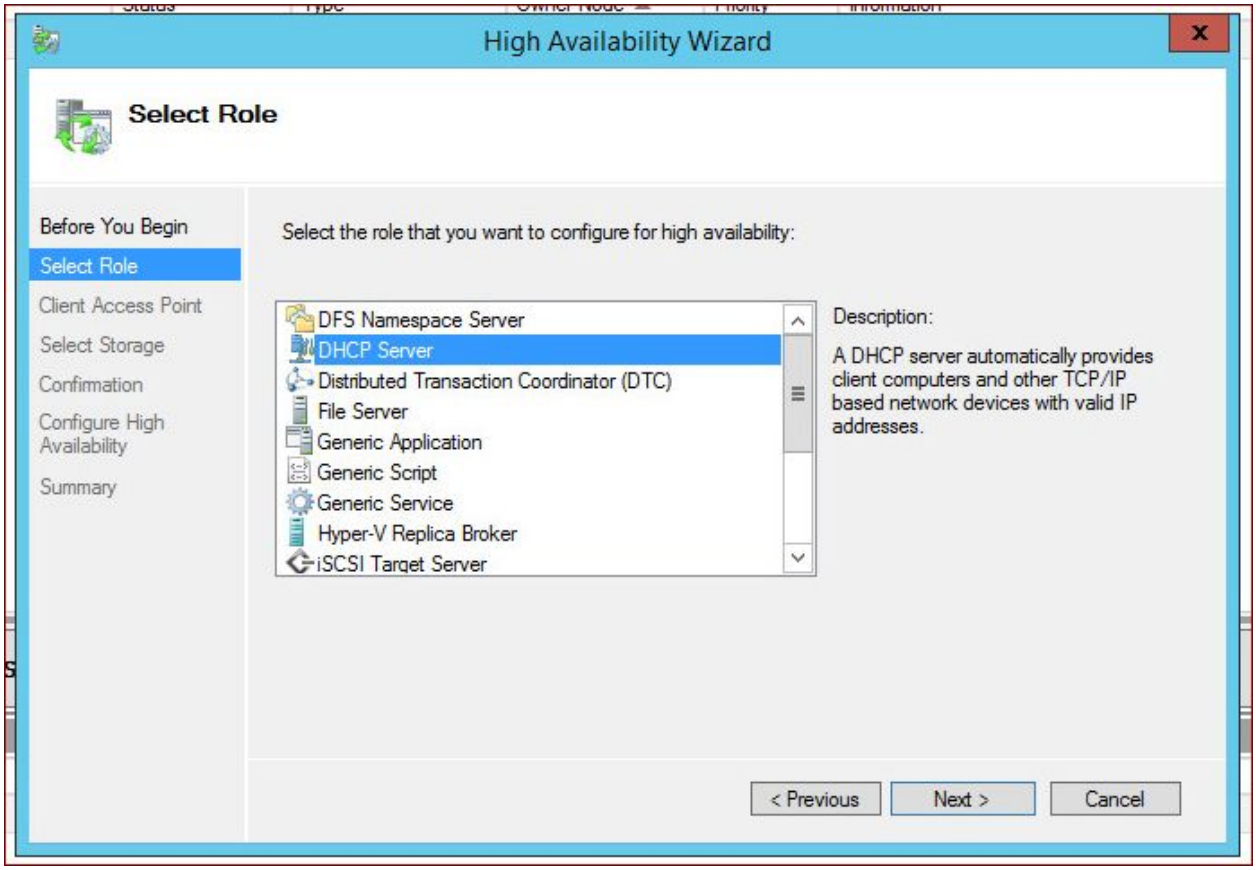
Install the DHCP role on your nodes within Server Manager (Add Roles and Features)!



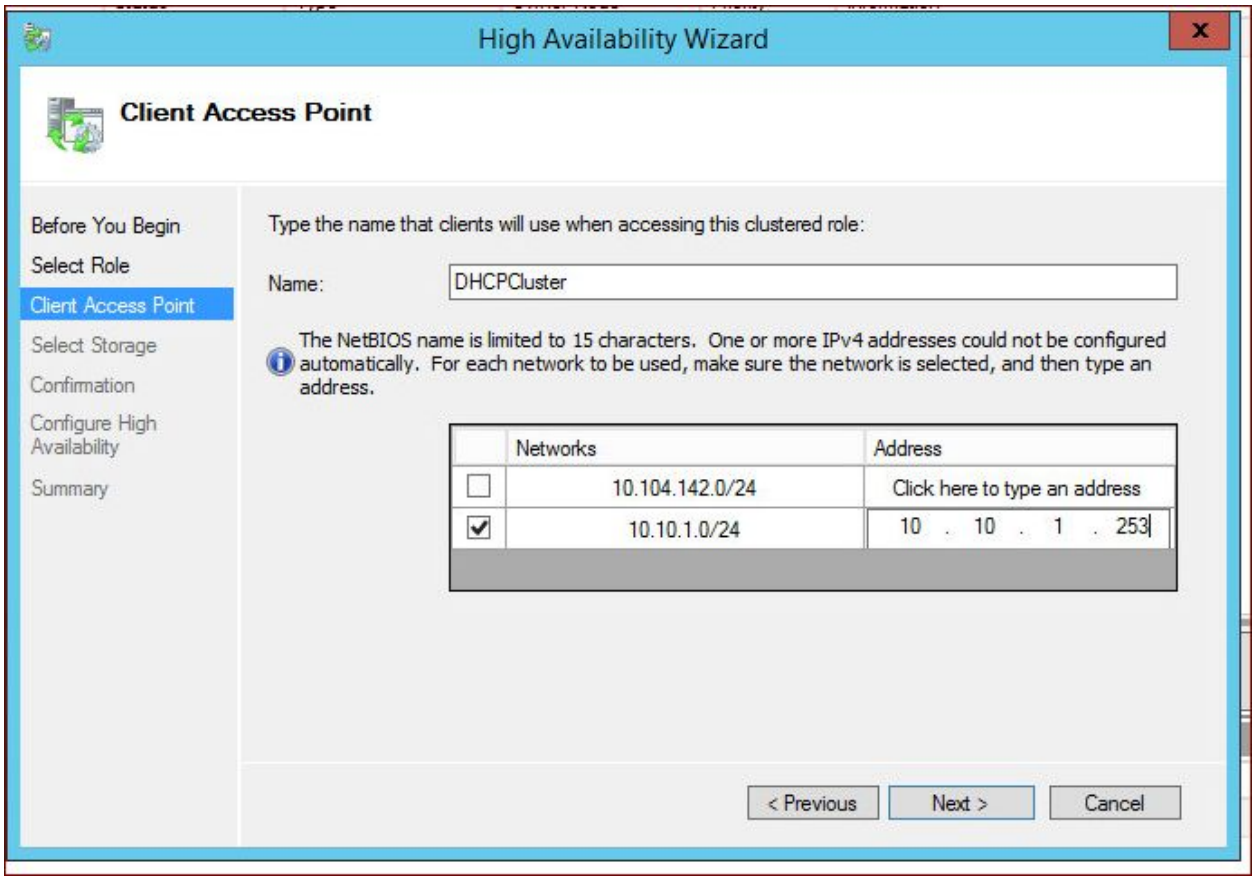
Inside Failover Cluster,
Click **Roles,** after finished installing **DHCP** on both nodes.



Click **DHCP Server,** then **next.**



Put it **ONLY** on the network you need it on, and give it an IP. Hit next.



Choose your **storage,** hit confirm, and watch your new **DHCP** server go. Also, make sure to authorize it as a **DHCP server!!!**

Now our Cluster give IP’s through DHCP on our internal network to clients.

Summary

A cluster is a redundant pool of servers that can provide roles to a domain, provided by windows. A cluster can be setup and running quite quickly, provided you do not mess up the disks like we did. Having a cluster of servers on your domain will help keep your servers up and alive.

References

- https://www.youtube.com/watch?v=oWC7rZWb0as
- https://www.youtube.com/watch?v=1HCnuzb2LSk
- https://www.youtube.com/watch?v=kMs34c_7BUs
- http://searchstorage.techtarget.com/definition/iSCSI
- http://docs.oracle.com/cd/E19082-01/817-2271/gbcik/index.html
- https://technet.microsoft.com/en-us/library/cc770620(v=ws.10).aspx
- http://doc.freenas.org/9.3/freenas_storage.html
- http://thesolving.com/server-room/how-to-configure-dhcp-failover-on-windows-server-2012-r2/
- https://enterpriseit.co/windows-server/rpc-server-unavailable-0x800706ba/
- https://serverfault.com/questions/527116/2012-cluster-service-name-failing
- https://www.youtube.com/watch?v=8m-xrOy6-2s
-