

Production Installation and Configuration

Openfiler NSA

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1. INTRODUCTION

1.1. Purpose of Document

This document provides technical information about installing and configuring Openfiler Storage Management System.

1.2. Intended Audience

This manual is intended for

- IT / Support department
- Technical staffs that perform installation and configuration on Openfiler.

1.3. Scope of this guide

This document consists of 2 parts:

- The first part is to describe the steps to install Openfiler.
- The second part is to describe the steps to configure Openfiler to be used for Oracle RAC.

2. Openfiler Installation

2.1. System Requirements

Openfiler is compatible with 32-bit and 64-bit industry standard server hardware. It can also be installed in a virtual machine environment as guest OS in VMware and other virtual machine.

For production deployment in either virtualized or bare-metal configuration, it is recommend 64-bit Intel Xeon or AMD Opteron architecture processors for best performance. Future release of Openfiler may only support 64-bit processors therefore they are highly recommend for new Openfiler installations.

2.1.1. 32 bit Installation

- 32-bit 1GHz or higher performance processor.
- 512MB or higher of RAM
- 512MB disk space for memory swap area.
- 1GB disk space for Openfiler OS installation
- 100MB Ethernet network interface.
- Separate storage volumes/disks for data export.

2.1.2. 64 bit Installation

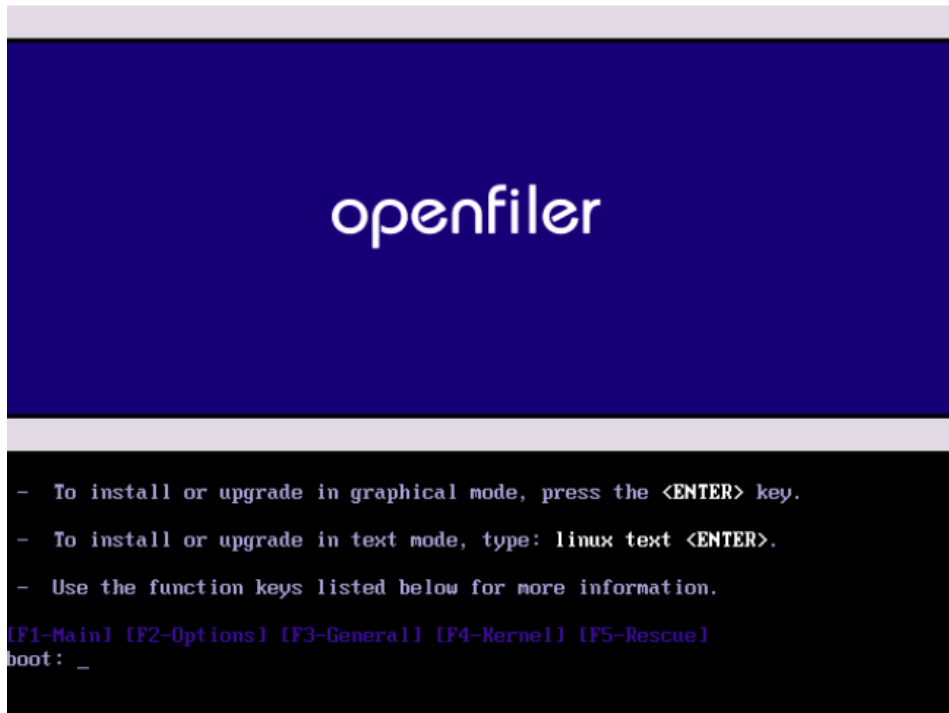
- 64-bit 1.6GHz or higher performance processor.
- 1GB or higher of RAM.
- 1GB disk space for memory swap area.
- 2GB disk space for Openfiler OS installation.
- 1GB Ethernet network interface.
- Separate storage volumes/disk for data export
- Hardware RAID controller

2.1.3. VMWare Installation

- 32-bit or 64-bit hypervisor / VMM
- VMware Player, VMware Server, VMware Workstation, VMware ESX compatible
- Symbios or Buslogic virtual SCSI disk driver.
- IDE virtual disk driver.
- 512MB minimum virtual RAM.
- Virtual network interface.

2.2. Installing Openfiler

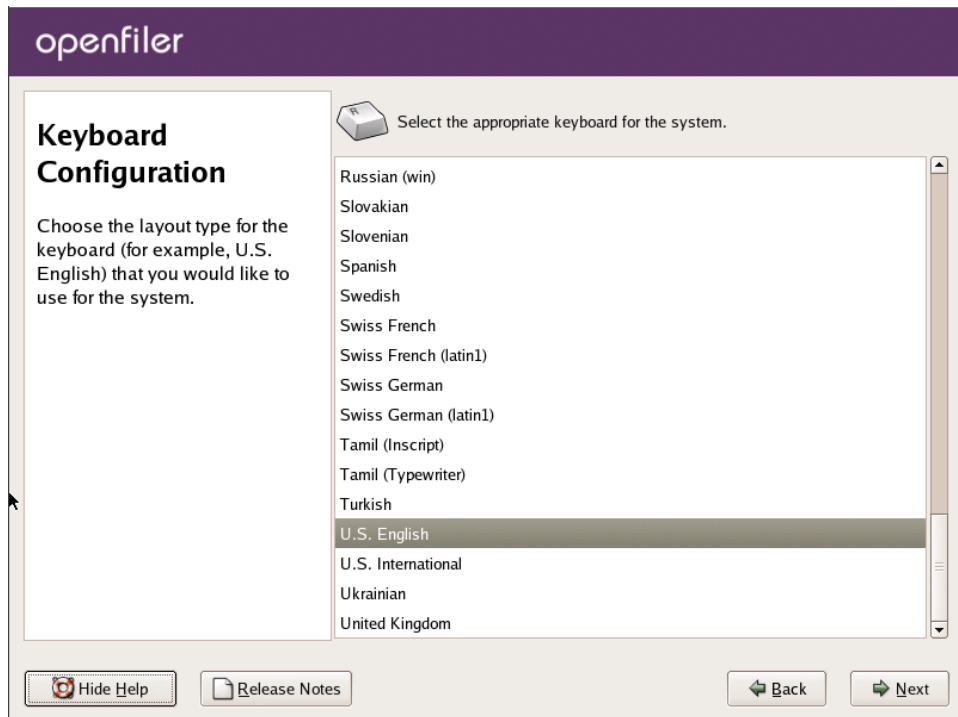
- To begin the installation, insert disk into CD/DVR-ROM drive and ensure the system is configured to boot off the CD/DVD-ROM drive. After the system POSTs, the installer boot prompt will come up. To perform a graphical installation, **just hit the “Enter” key at the prompt** to choose graphical installation.



- The next step is to click on the Next button to proceed with the installation

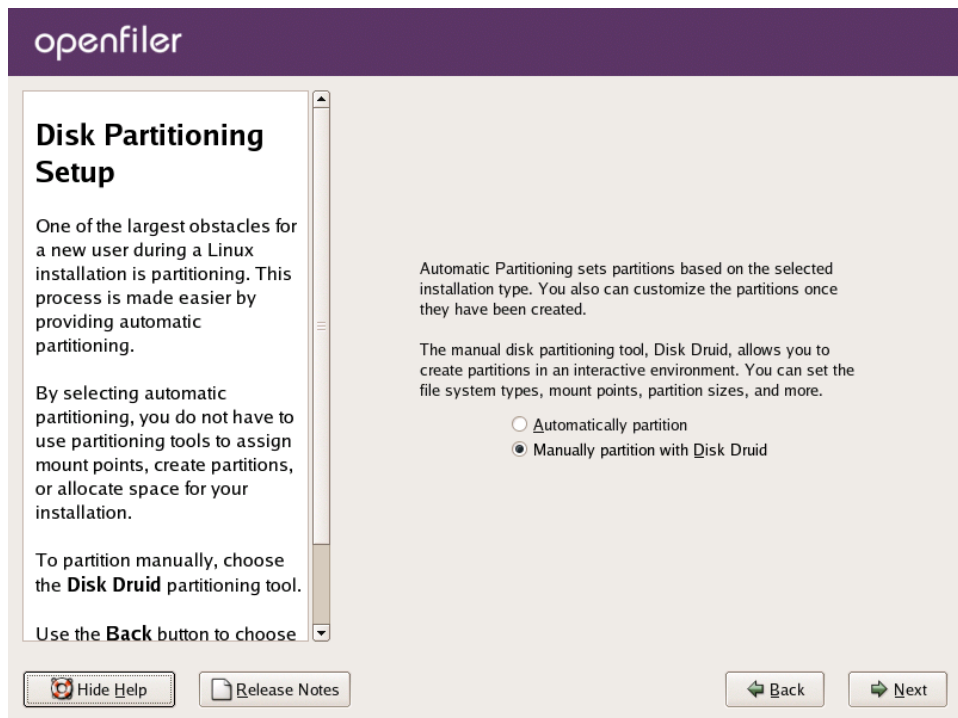


- Use the scroll bar on the right to scroll up and down and select the desired keyboard layout from the list:



- Next step is the disk partitioning. Select “Manual Disk Partitioning” because **Openfiler does not support automatic partitioning and will be unable to configure data storage disk in the Openfiler graphical user interface if automatic partitioning selected.**

Click the Next button once you have selected the correct radio button option.



- On the disk setup screen, please delete existing partitions on the system. Then create three partitions on the system in order to proceed with the installation:

“/boot” –this is where the kernel will reside and the system will boot from.

“/root” – this is the system root partition where all the system applications and libraries will be installed.

“/swap” - this is the swap partition for memory swapping to disk.

- Highlight the disk where the partition will be created and click on the “New” button. To create the “/boot” partition follow the list of all entries required in the dialog box:

Mount Point: /boot

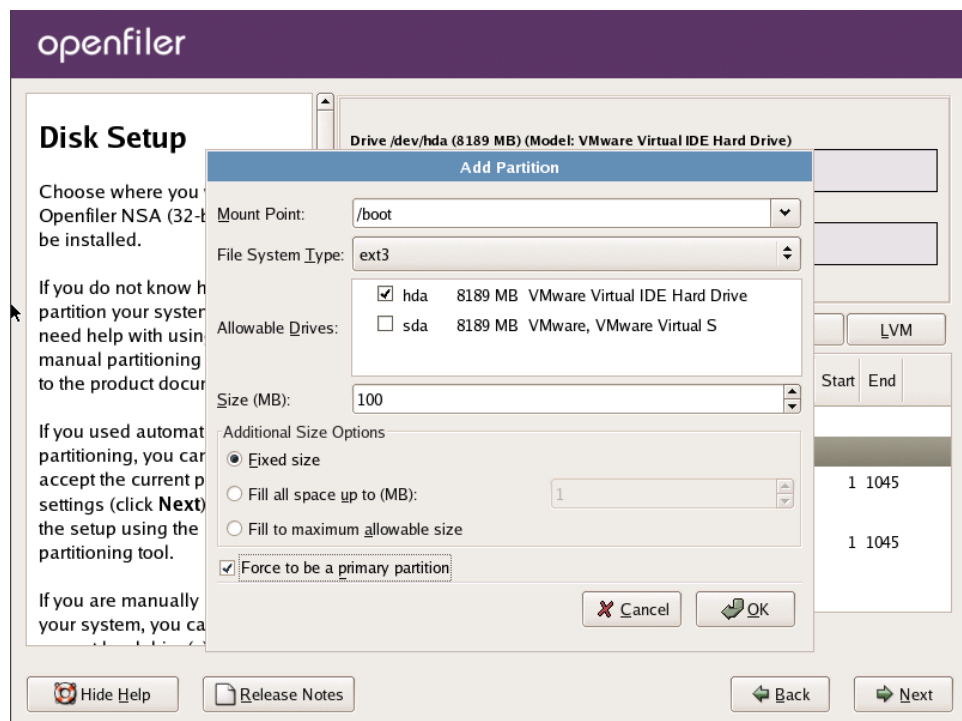
File system Type: ext3

Allowable Drives: select *one* disk only. This should be the first IDE (*hda*) or first SCSI disk (*sda*)

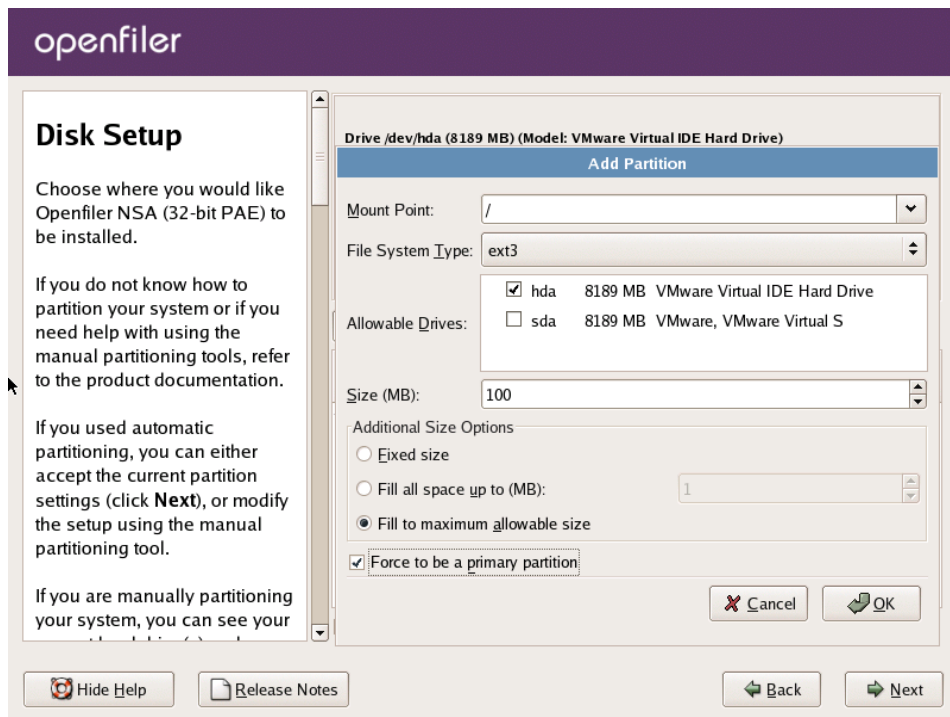
Size(MB): 100 (this is the size in Megabytes, allocate 100MB by entering "100")

Additional Size Options: select Fixed Size radio button from the options.

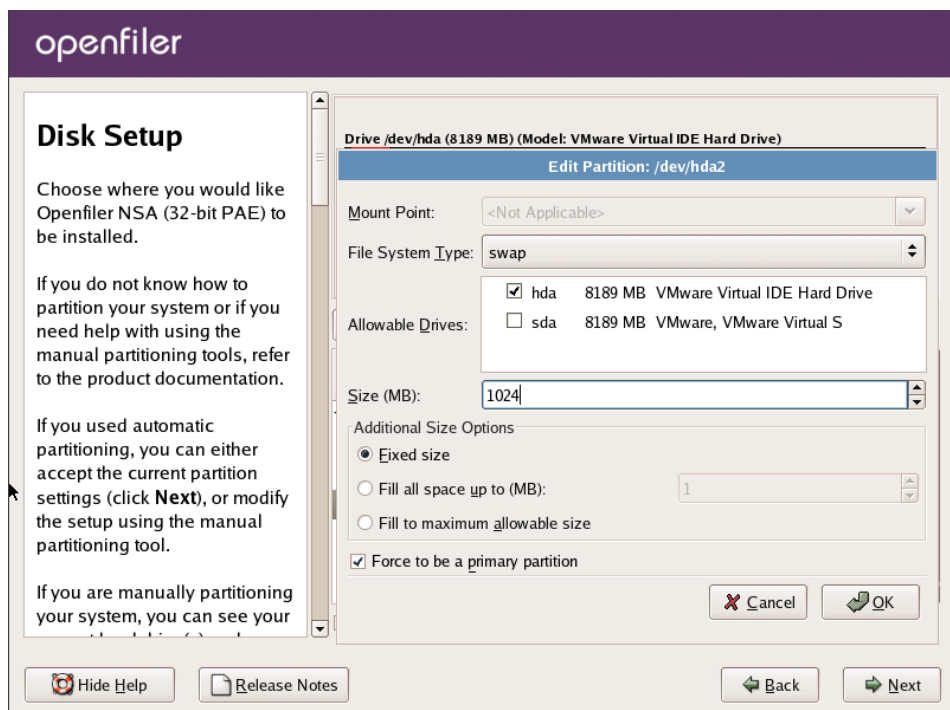
Force to be a primary partition: checked (select this checkbox to force the partition to be created as a primary partition)



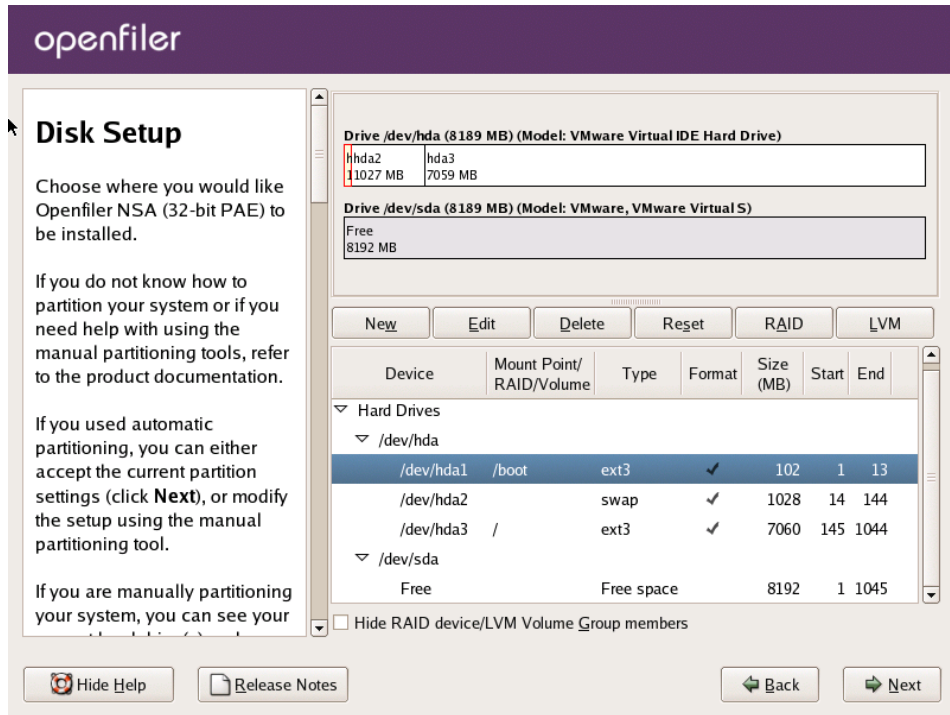
- Proceed by creating a *root* partition. Click on the “New” button. The details are identical to what was entered for the /boot partition except this time the Mount Point: should be “/” and the Size (MB): should be 2048MB or at a minimum 1024MB.



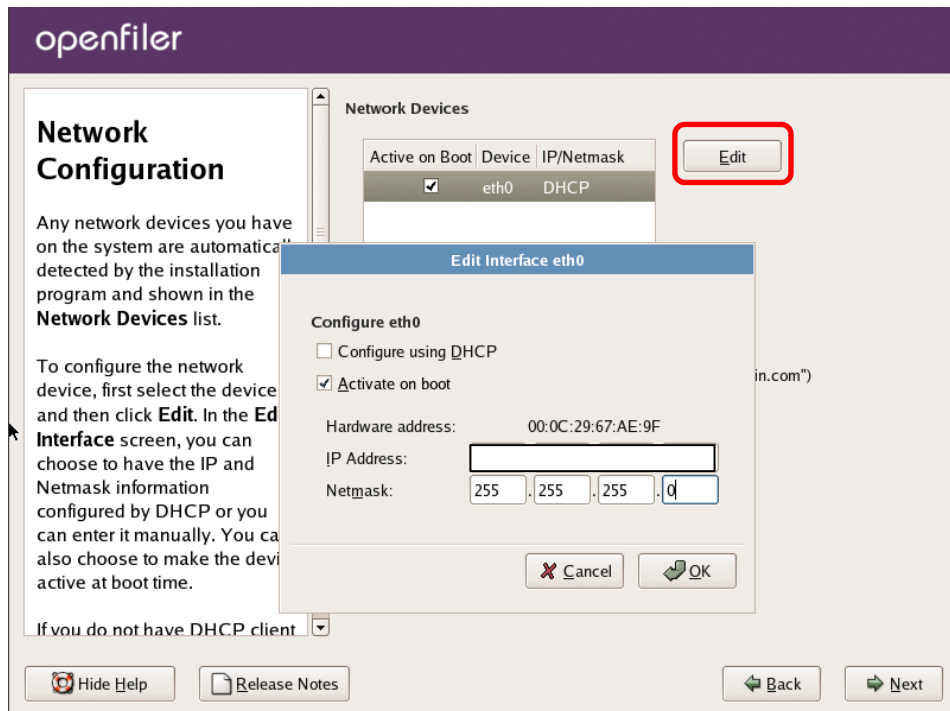
- Proceed by creating a *swap* partition. Click on the “**New**” button. Select “**/swap**” on the drop list and the Size (MB): of the partition should be at least 1024MB and need not exceed 2048MB.



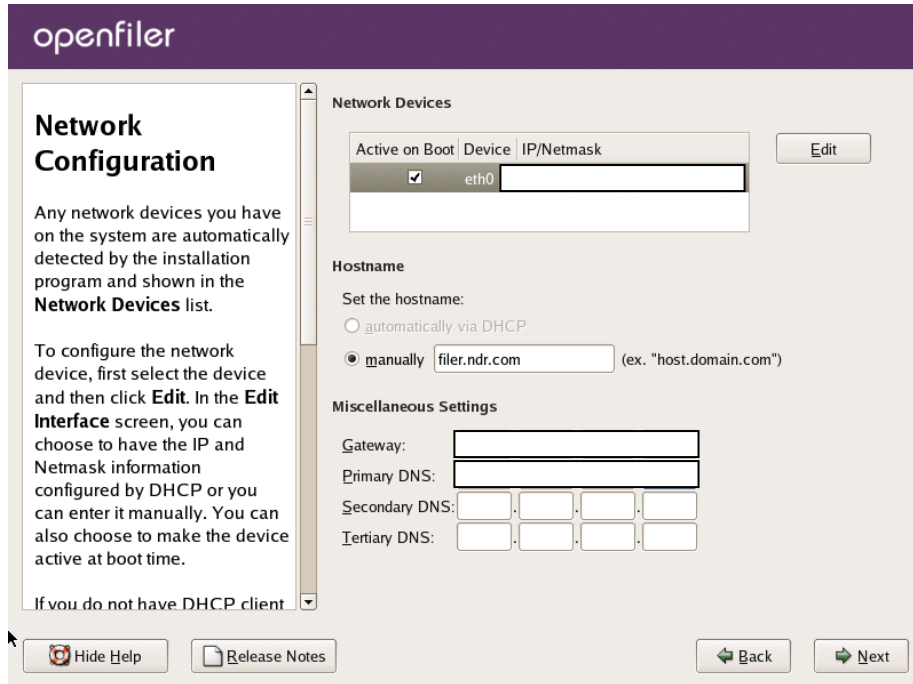
- Click the OK button to create the partition. The disk partition scheme should resemble the following:



- In this section network devices, system hostname, and DNS parameter will be configured. To define a specific IP address and hostname, click **Edit** button at the top right corner at the screen in the Network Devices section. Like image below:



- Once network IP address have been configured, enter a hostname for the system, configure gateway IP address and DNS server IP addresses. The following illustration shows an example where a hostname has been assigned, and gateway IP, primary and secondary DNS information has also been entered.



- Set the default system time zone. If the system BIOS has been configured to use UTC, check the UTC checkbox at the bottom of the screen and click **Next** to proceed.



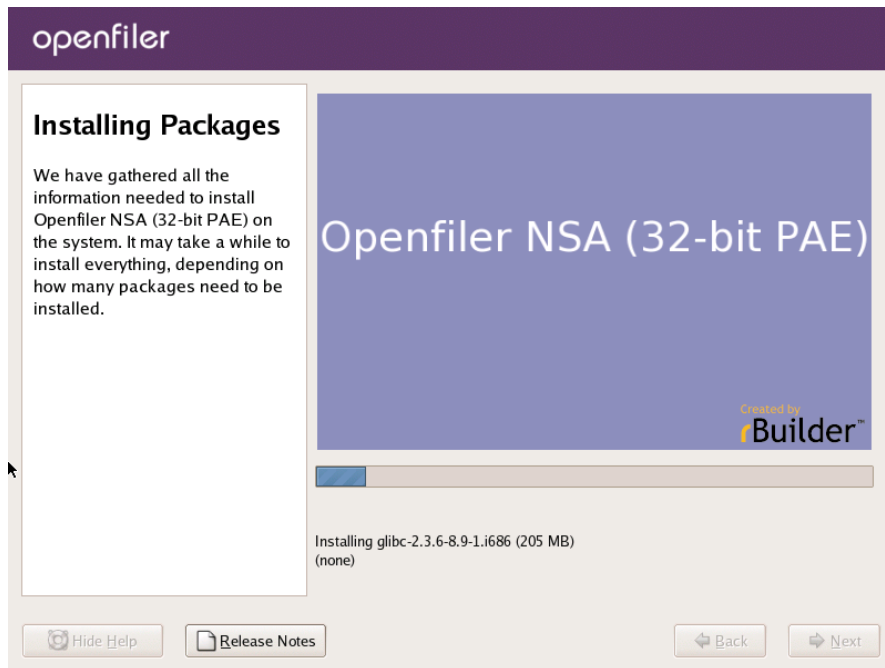
- Configure a root password for the system. Logging in with the root account, it is possible to perform any administrative tasks that are not offered via the web interface. Click **Next** to proceed with the installation process.



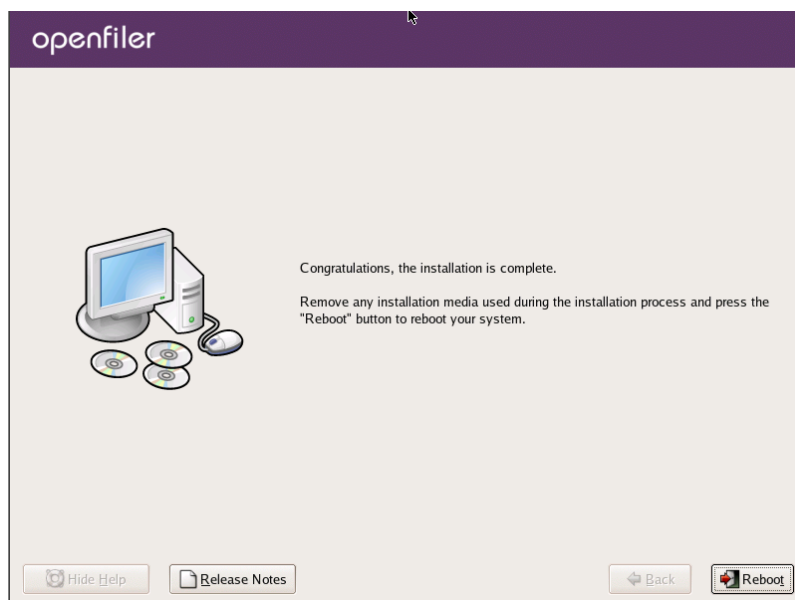
- Click Next if satisfied with the entries in the previous screens.



- Once you have clicked Next in the preceding section, the installer will begin the installation process. The following screenshots depict what happens at this point.



- At this point simply need to click the Reboot button to finish the installation and boot into the installed Openfiler system.



- Once the system boots up, Openfiler can be configured by pointing the browser at the hostname or IP address of the Openfiler.

Management Interface : <https://<ip-of-openfiler-host>:446>
Administrator Username: openfiler
Administrator Password : password

3. Openfiler Configuration

3.1. Configure Openfiler for iSCSI

- To perform system administration via web-based interface, use a web browser, and then type the URL of the web application to the address “https://ip-address (of openfiler host):446”, enter the username and password of administrator



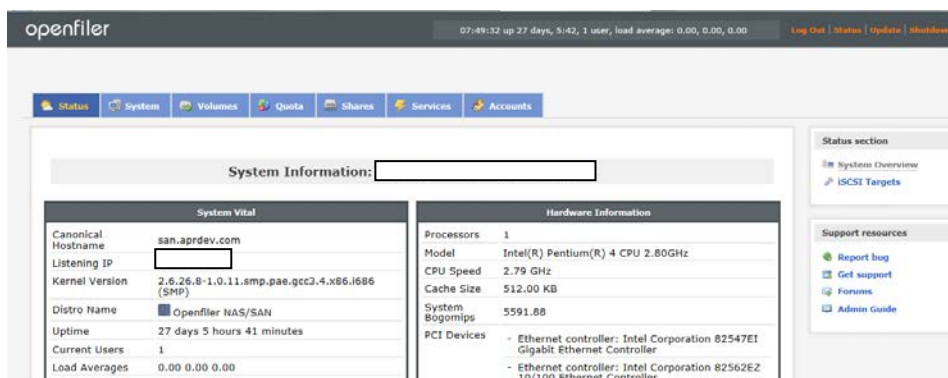
- If logging in using SSH the terminal will look like this

```
-----
Commercial Support: http://www.openfiler.com/support/
Administrator Guide: http://www.openfiler.com/buy/administrator-guide
Community Support: http://www.openfiler.com/community/forums/
Internet Relay Chat: server: irc.freenode.net channel: #openfiler
-----
(C) 2001-2008 Openfiler. All Rights Reserved.
Openfiler is licensed under the terms of the GNU GPL, version 2
http://www.gnu.org/licenses/gpl-2.0.html
-----

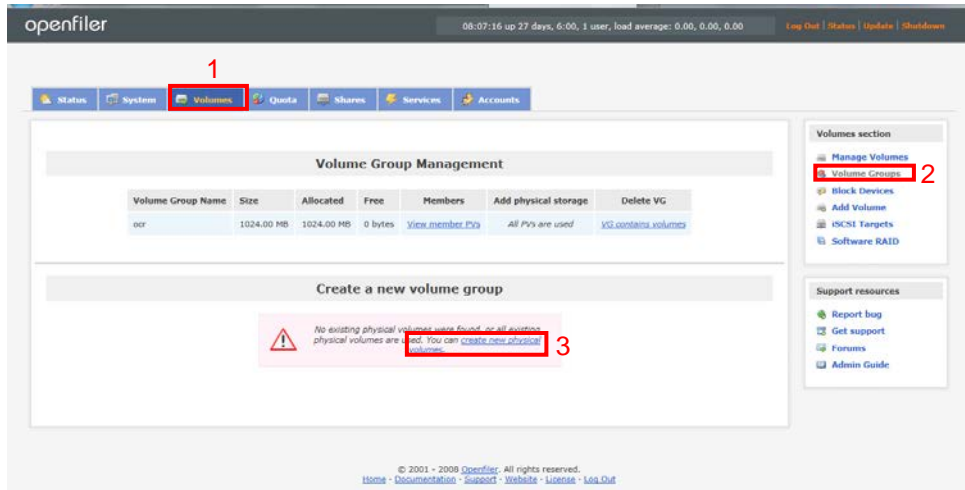
Welcome to Openfiler NSA (32-bit PAE), version 2.3
Web administration GUI: https://[redacted]:446/

filerndr login: openfiler
Password: [redacted]
```

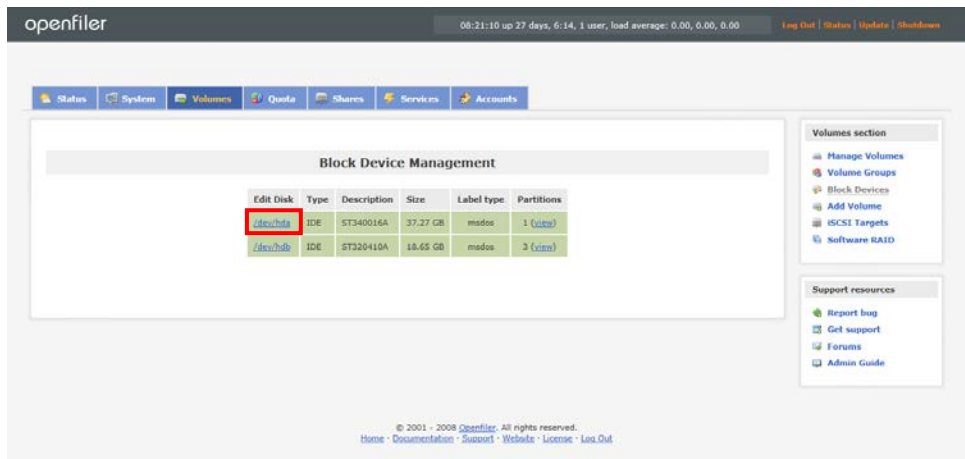
- The main menu for web GUI will look like this



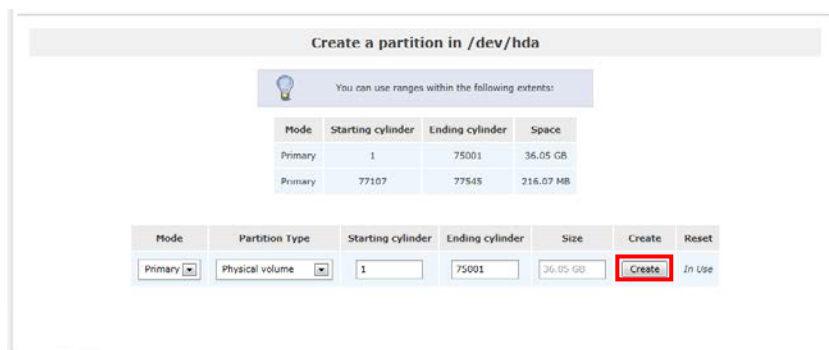
- First create physical volume. Click Volumes tab first, then Volume Groups, and click create new physical volumes.



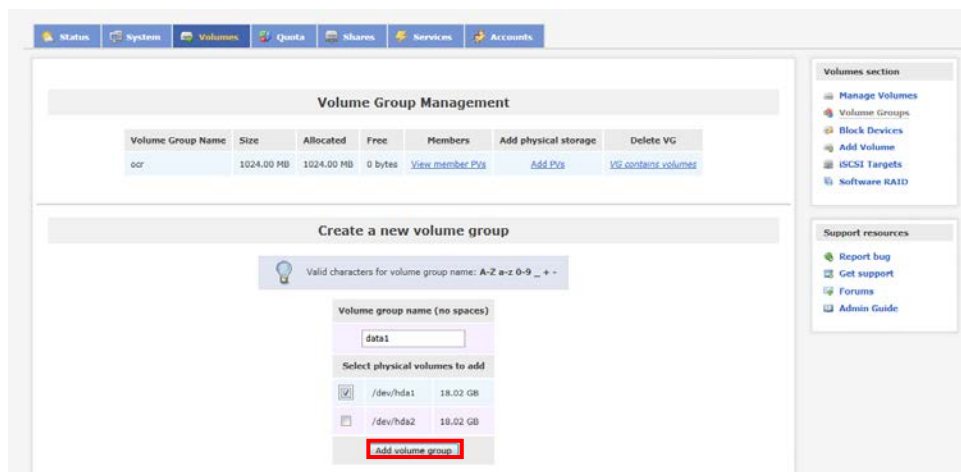
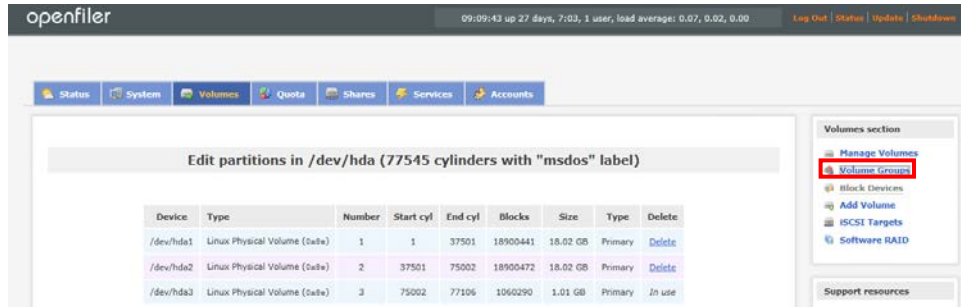
- Then click the desired hard disk in this case /dev/hda



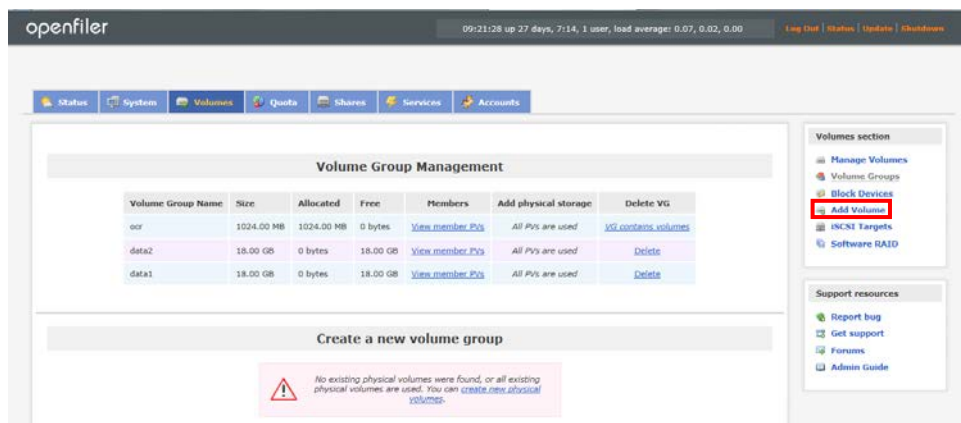
- Change partition type to physical volume and the ending cylinder, the size (according needs) will be automatically adjusted, then click create.



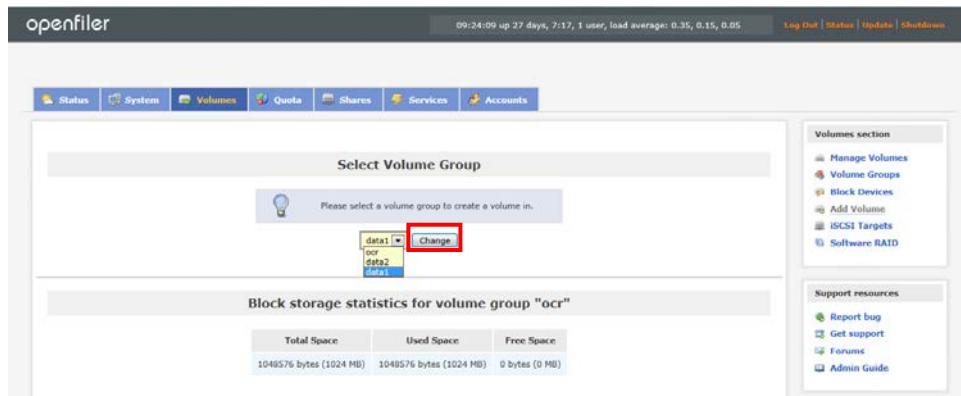
- Next step is creating a “Volume Group”. Specify the name of the volume group (for example: data1) to be created, and define the physical volume will also be included into the volume group and click the button **Add Volume Group**.



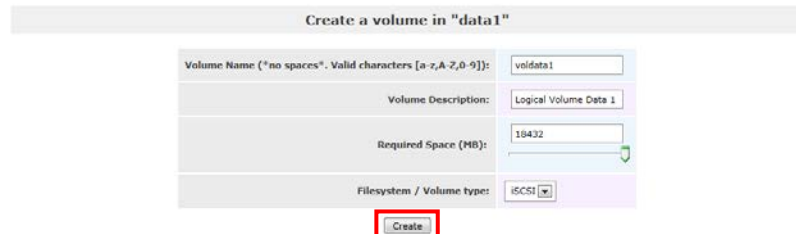
- Next step is creating a “Logical Volume”. It can be done by clicking the button **Add Volume**.



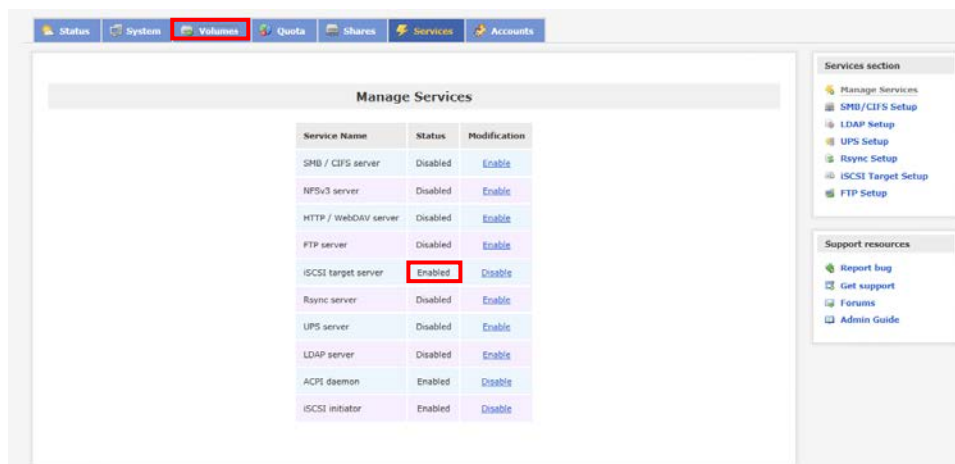
- Select the desired Volume Group where the Logical Volume will reside, then click change.



- Insert the desired Volume Name, slide the required space, and choose the Filesystem (in this case iSCSI), then click create.



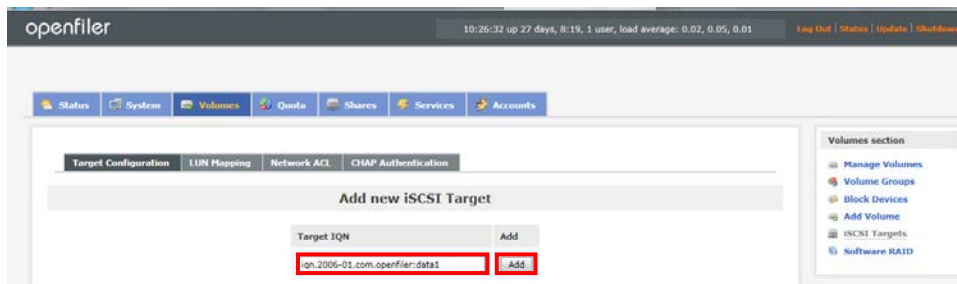
- To be able to initiate iSCSI service, then click enable, so the status is enabled. Then click Volumes to start configuring iSCSI services.



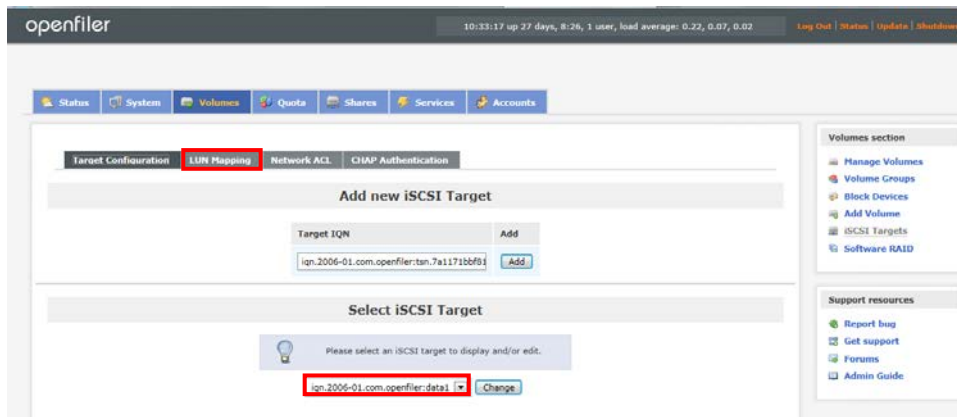
- To be able to configure iSCSI service, then click iSCSI Targets.



- Insert the name for IQN, it already provided, but it can be changed to your desire. Then click Add.



- Next is to configure LUN - iSCSI target (red box) mapping, Click LUN Mapping.

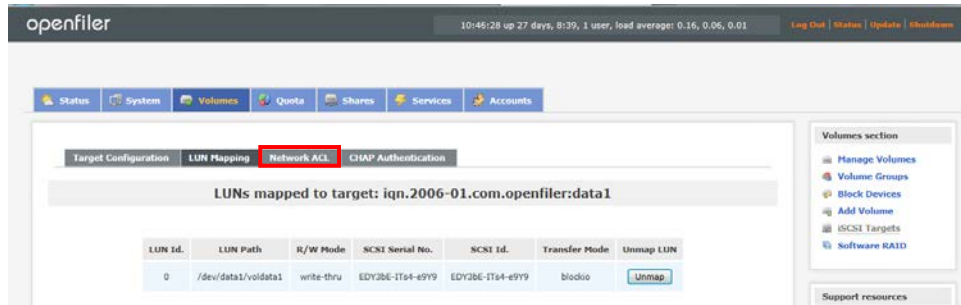


- Next is to configure LUN to iSCSI target mapping, Click LUN Mapping.

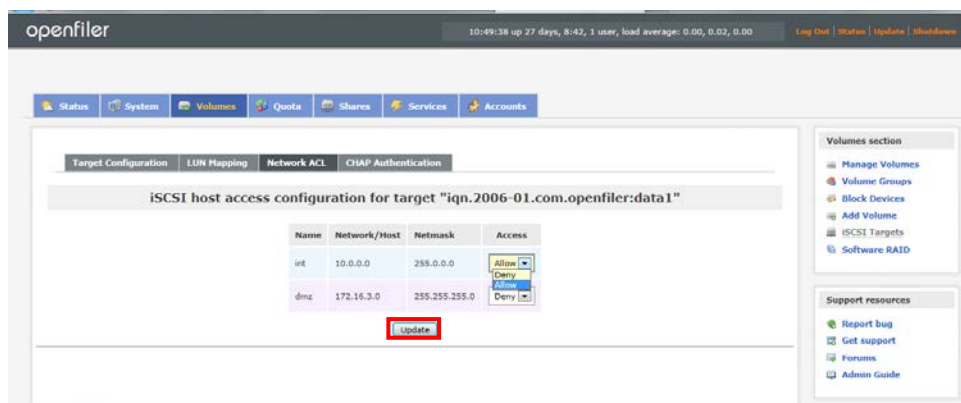
Map New LUN to Target: "iqn.2006-01.com.openfiler:data1"

Name	LUN Path	R/W Mode	SCSI Serial No.	SCSI Id.	Transfer Mode	Map LUN
disk1	/dev/disk1/disk1	write-thru			blockio	Map
disk2	/dev/disk2/disk2	write-thru			blockio	Map
oor1	/dev/oor/oor1	write-thru	Ewk7r1-qHT3-4l0	Ewk7r1-qHT3-4l0	blockio	Map
oor2	/dev/oor/oor2	write-thru	UTvDyu-a20m-Qo2u	UTvDyu-a20m-Qo2u	blockio	Map
vot1	/dev/oor/vot1	write-thru	gUjHqR-Q4FD-QY9S	gUjHqR-Q4FD-QY9S	blockio	Map
vot2	/dev/oor/vot2	write-thru	YjgU9H-mJqG-288S	YjgU9H-mJqG-288S	blockio	Map
vot3	/dev/oor/vot3	write-thru	gDu0He-pluF-E3WK	gDu0He-pluF-E3WK	blockio	Map
asm	/dev/oor/asm	write-thru	Yk2B11-M86-dafv	Yk2B11-M86-dafv	blockio	Map
Logical Volume Data 1	/dev/data1/voldata1	write-thru	EDY38E-ITs4-eYV9	EDY38E-ITs4-eYV9	blockio	Map
Logical Volume Data 2	/dev/data2/voldata2	write-thru	B1k1TD-9fi-p8uk	B1k1TD-9fi-p8uk	blockio	Map

- The result of LUN to iSCSI target mapping configuration will be like this. Then Network ACL also need to be configured, so that iSCSI service is accessible, click Network ACL.



- Change Access to Allow to the desired Network, Click Update.



- The configuration is finished, now try to access from another computer to be used as an iSCSI initiator (iSCSI target which would use).

3.2. Configure iSCSI target for Oracle RAC

To be noted that this configuration will only provide basic needs to be able to install Oracle CRS, ASM, and RAC. Perhaps there will be some adjustment that need to be done if performance and high availability are necessary; Network Bonding, RAID, etc.

So it can be started by creating 3 volume groups in Openfiler, inside each volume groups there are volumes that will be mapped to each iSCSI Target.

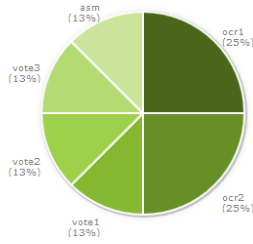
The first volume group is “ocr” volume group that have 6 volume; 2 for Oracle Cluster Registry, 3 for Voting Disk, and 1 for Oracle ASM.

Each of that volume will be mapped to their own iSCSI target.

While for the second and third volume group, each will have one volume only. This volume will be used as ASM disk.

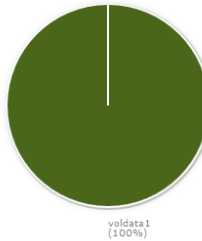
- Volume Groups with its Volumes.

Volumes in volume group "ocr" (1024 MB)



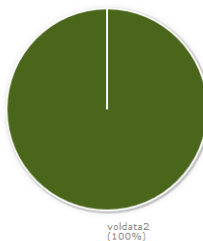
Volume name	Volume description	Volume size	File system type	File system size	FS used space	FS free space	Delete	Properties	Snapshots
ocr1	ocr1	256 MB	iSCSI	Not applicable	Not applicable	Not applicable	In use	Edit	Create
ocr2	ocr2	256 MB	iSCSI	Not applicable	Not applicable	Not applicable	In use	Edit	Create
vote1	vote1	128 MB	iSCSI	Not applicable	Not applicable	Not applicable	In use	Edit	Create
vote2	vote2	128 MB	iSCSI	Not applicable	Not applicable	Not applicable	In use	Edit	Create
vote3	vote3	128 MB	iSCSI	Not applicable	Not applicable	Not applicable	In use	Edit	Create
asm	asm	128 MB	iSCSI	Not applicable	Not applicable	Not applicable	In use	Edit	Create
0 MB allocated to snapshots									
0 MB of free space left									

Volumes in volume group "data1" (18432 MB)



Volume name	Volume description	Volume size	File system type	File system size	FS used space	FS free space	Delete	Properties	Snapshots
voldata1	Logical Volume Data 1	18432 MB	iSCSI	Not applicable	Not applicable	Not applicable	In use	Edit	Create
0 MB allocated to snapshots									
0 MB of free space left									

Volumes in volume group "data2" (18432 MB)



Volume name	Volume description	Volume size	File system type	File system size	FS used space	FS free space	Delete	Properties	Snapshots
voldata2	Logical Volume Data 2	18432 MB	iSCSI	Not applicable	Not applicable	Not applicable	Delete	Edit	Create
0 MB allocated to snapshots									
0 MB of free space left									

3.3. Configuring iSCSI initiator

3.3.1. Solaris Operating System

- By default iscsi initiator service already started. If not type this to enable

```
svcadm enable svc:/network/iscsi/initiator:default
```

- Login as root user, then type this command to use SendTargets discovery. This method allows one or more network portals to be configured on an initiator, and the initiator will query these portals during a discovery session to locate targets that have been presented to it.

```
iscsiadm modify discovery -- sendtargets enable
```

- Type this command to start discovery on Openfiler iSCSI Target.

```
iscsiadm add discovery-address openfiler-ip-address:3260
```

- Type this command to attach Openfiler iSCSI Target to OS, persistent on reboot.

```
devfsadm -i iscsi
```

- Type this command to list Openfiler iSCSI Target.

```
iscsiadm list target -vS
```

- Check the available target as disk using.

```
format
```

3.3.2. Linux Operating System (Red Hat)

- To be able to use iscsi initiator install software package iscsi-ainitiator-utils (for debian or ubuntu use open-iscsi).

```
yum install iscsi-initiator-utils
```

- After iscsi initiator installation finished start the service, and make it started when the server is rebooted .

```
service iscsi start  
chkconfig iscsi on
```

- Then start the discovery process using SendTargets Method, using this command.

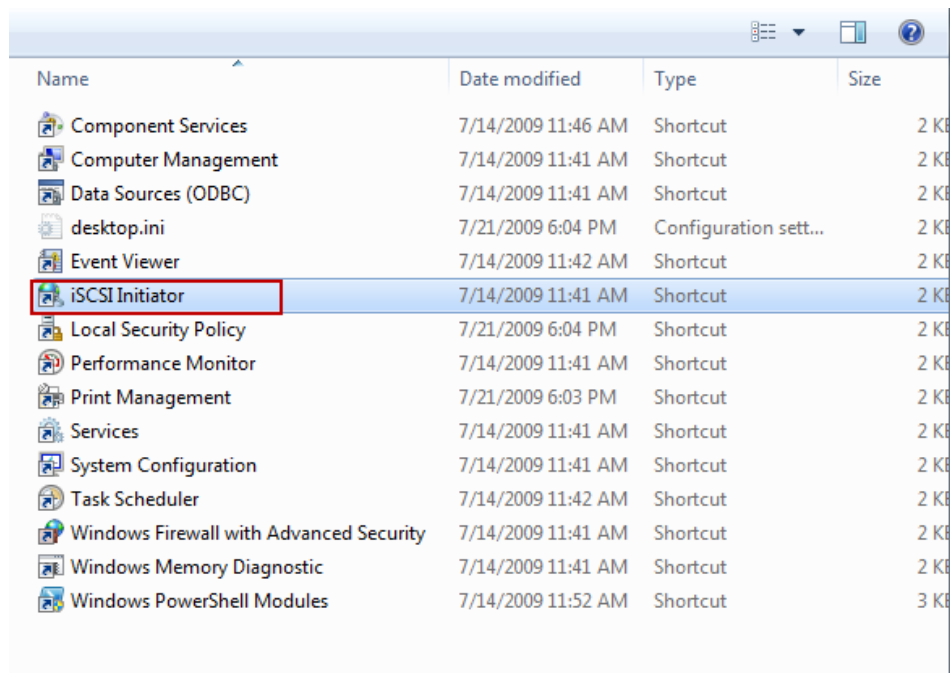
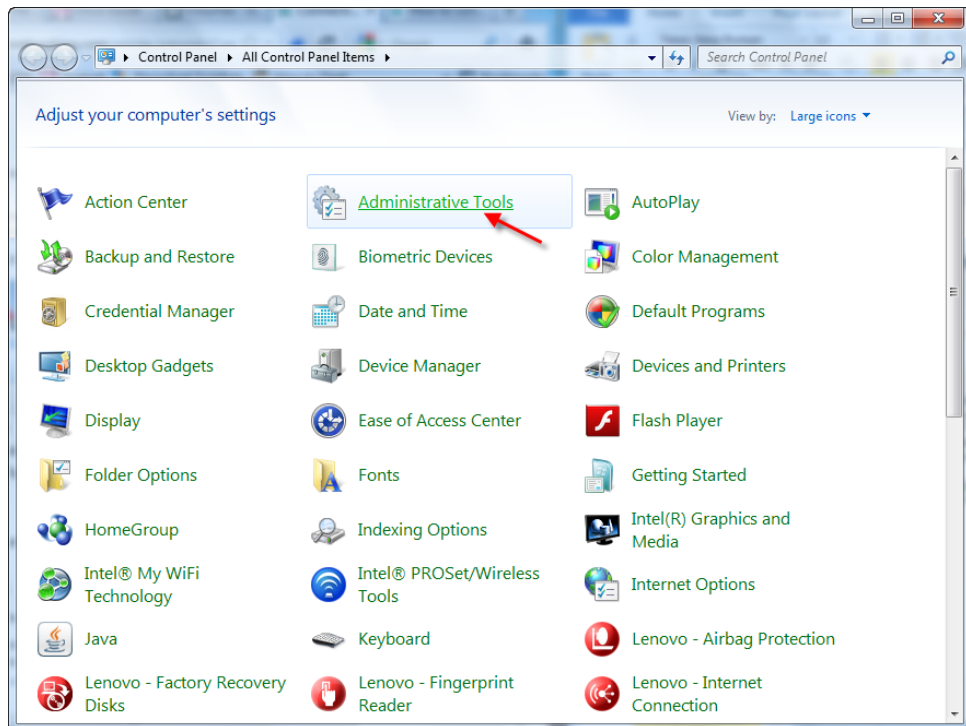
```
iscsiadm -m discovery -t sendtargets -p openfiler-ip-address:3260
```

- Restart the service, and check the disk.

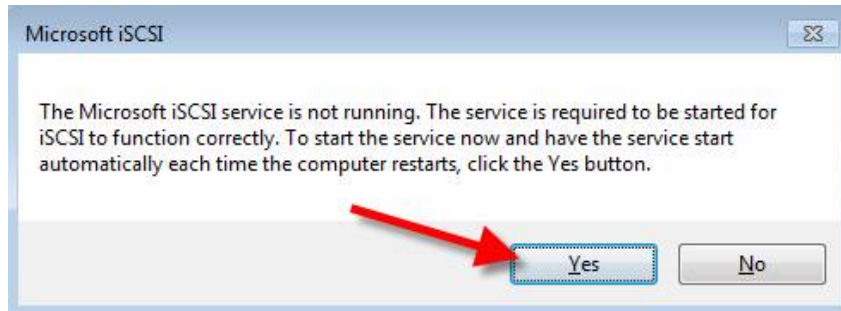
```
service iscsi restart  
fdisk -l
```

3.3.3. Windows Operating System (Windows 7)

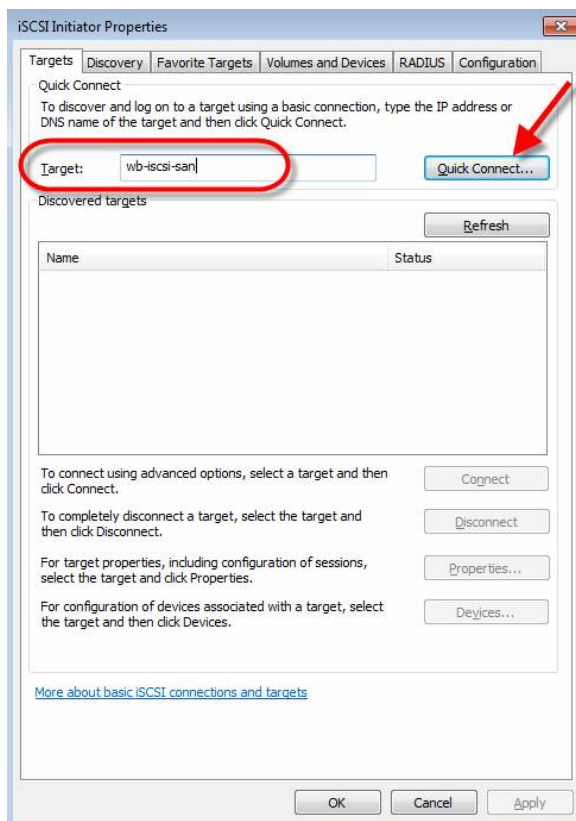
- By default in Windows Vista, Windows Server 2008, and Windows 7, the iscsi initiator already installed. The configuration can be started, by going to “Control Panel” and then click “Administrative Tools” then click “iSCSI initiator”.



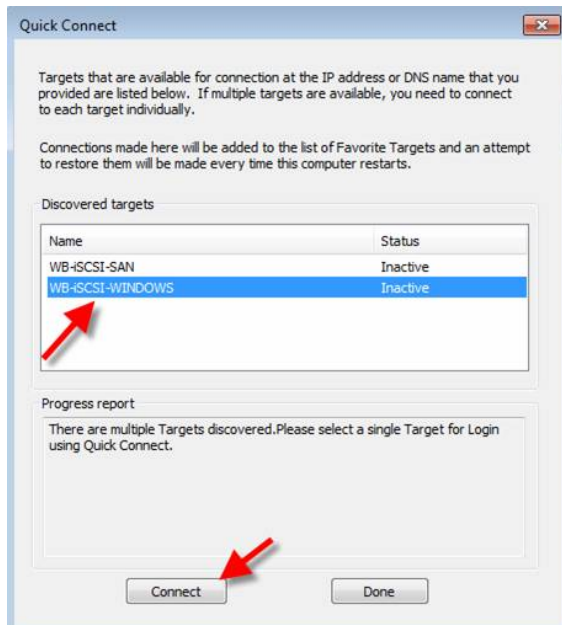
- When “iSCSI initiator” executed for the first time, there will be a prompt saying that iSCSI initiator service need to be run first, click yes to start it.



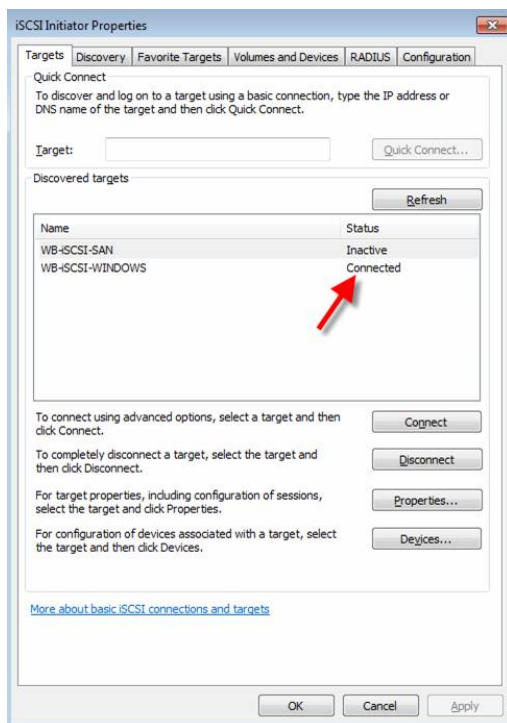
- After that, wait for several time, there will iSCSI properties box. Insert the IP address for Openfiler in the Target box, then press quick connect.



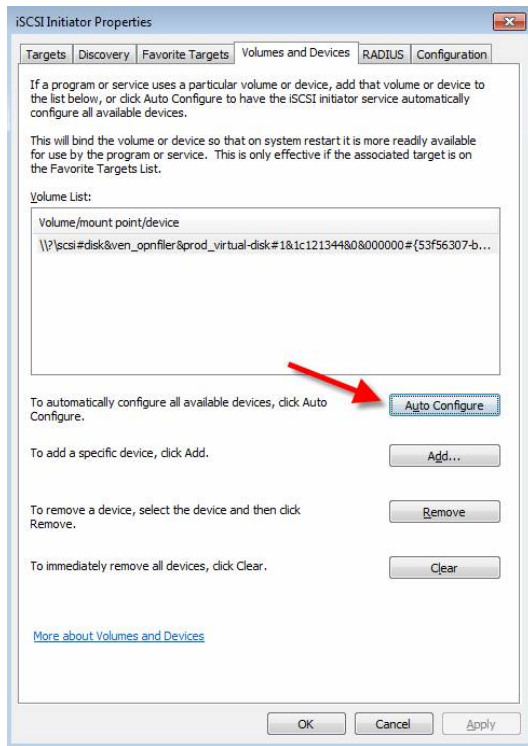
- Choose one of the iSCSI Target to connect



- In the iSCSI initiator properties box, the status of the selected iSCSI Target will change to connected



- Go to Volume and Devices in iSCSI Initiator Properties box, then select Auto Configure to make the connected iSCSI Target more resilient. After that click OK to finish the configuration.



- Go to Computer Management to see whether there are new disk available. If there is, then the disk need to be initialized before it can be used.

