

OpenFiler 2.99.1
X86_64

openfiler

Installation and Configuration Guide V 1.0

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CODE
SOCIAL

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About

Openfiler is an operating system that provides file-based network-attached storage and block-based storage area network.

- Unified Storage
- NAS Features – CIFS, NFS, HTTP
- SAN Features – iSCSI, FC
- High Availability / Failover
- Block Replication (LAN & WAN)
- Web-Based Management
- Cost-free Storage Capacity Expansion

Openfiler addresses all the key data storage concerns:

Reliability - Openfiler supports both software and hardware RAID with monitoring and alert facilities; volume snapshot and recovery

Availability - Openfiler supports active/passive high availability clustering, MPIIO, and block level replication

Performance - Linux 2.6 kernel supports the latest CPU, networking and storage hardware

Scalability - filesystem scalability to 60TB+, online filesystem and volume growth support

VM Configuration used in this guide

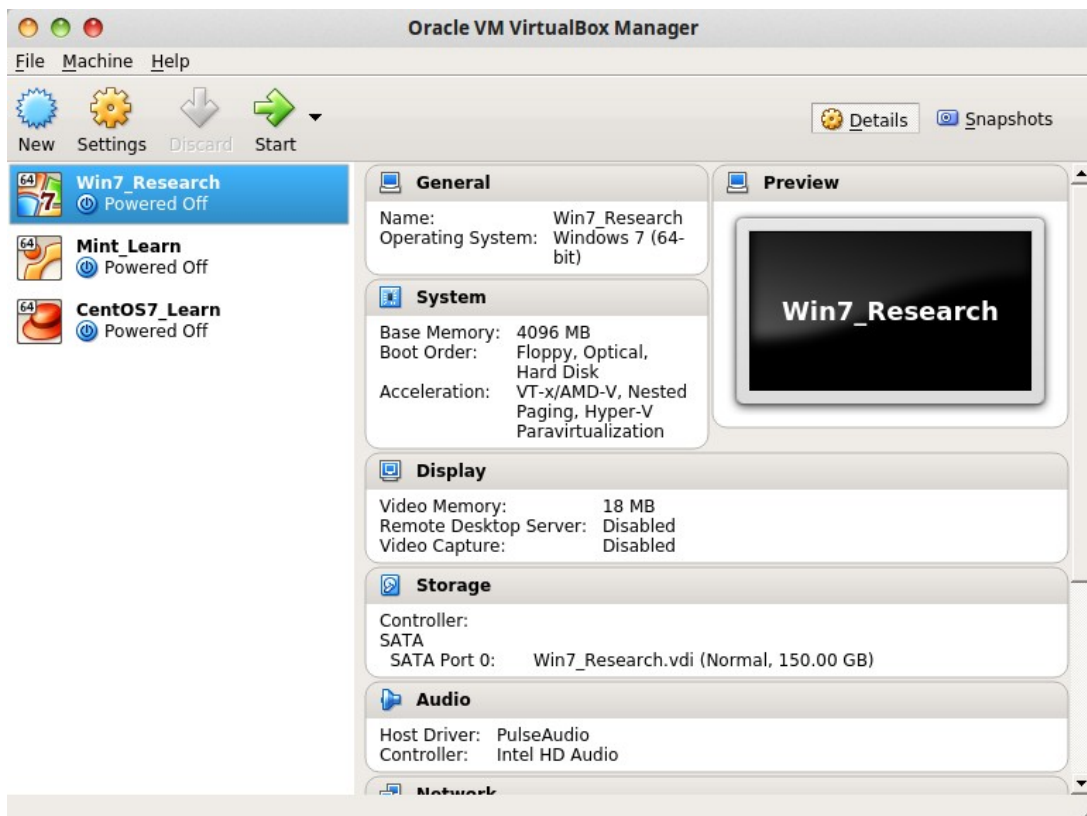
Guest OS :	Linux Mint 17.3 Cinnamon 64bit	username : enigma password : !@root123
VirtualBox :	5.1.30	
RAM :	4GB/6GB	
OpenFiler :	2.99.1	
VDI Space / Storage :	30GB	

Guest OS :	CentOS 7 64bit	hostname : centhost root passwd : !@root123 Fullname : Administrator username : enigma passwd : root123
VirtualBox :	5.1.30	
RAM :	4GB/6GB	
VDI Space / Storage :	30GB	

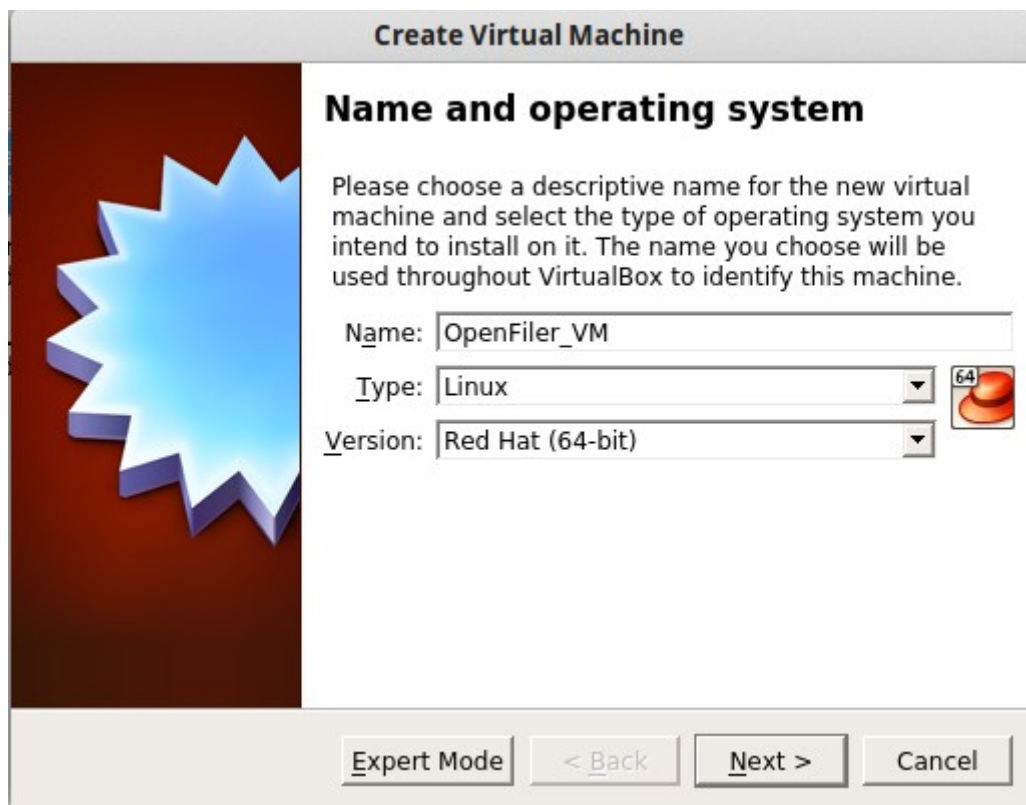
Guest OS :	OpenFiler	username : openfiler passwd : password
VirtualBox :	5.1.30	
RAM :	4GB/6GB	root username : root root password : !@Ilg007su
VDI Space / Storage :	15GB	

Installation

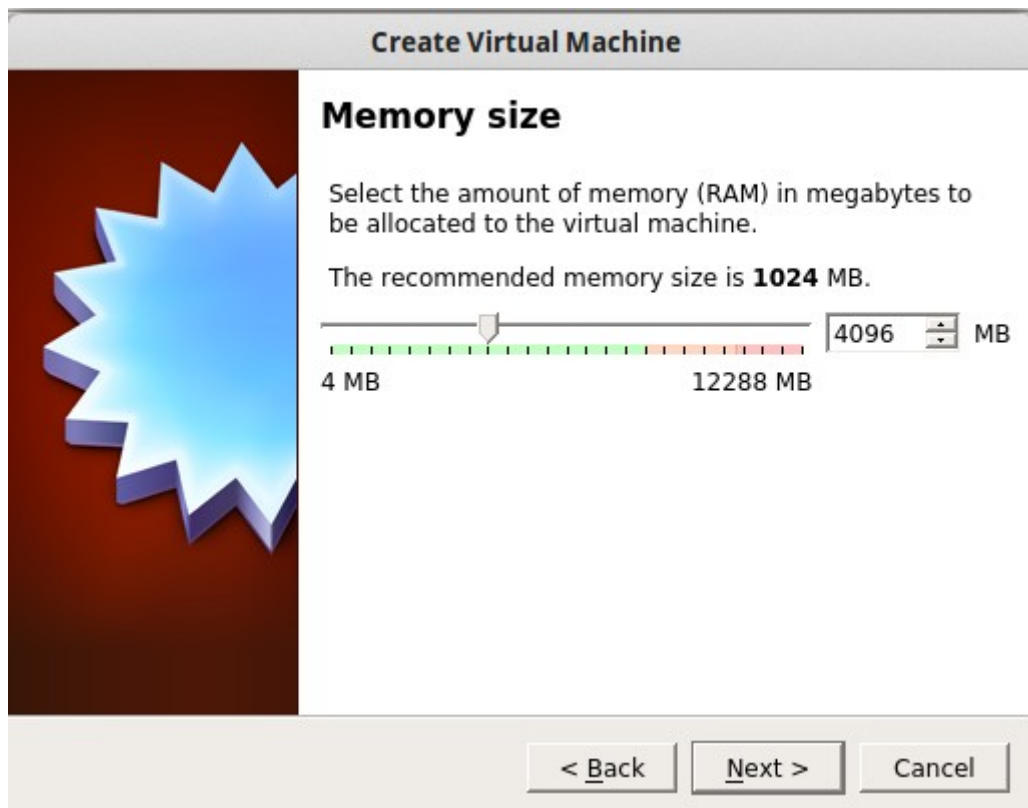
Step 1: Click on New and follow the steps ahead.



Step 2:



Step 3 :



Create Virtual Machine

Memory size

Select the amount of memory (RAM) in megabytes to be allocated to the virtual machine.

The recommended memory size is **1024 MB**.

4 MB 12288 MB

4096 MB

< Back Next > Cancel

Step 4 :



Create Virtual Machine

Hard disk

If you wish you can add a virtual hard disk to the new machine. You can either create a new hard disk file or select one from the list or from another location using the folder icon.

If you need a more complex storage set-up you can skip this step and make the changes to the machine settings once the machine is created.

The recommended size of the hard disk is **8.00 GB**.

☐ Do not add a virtual hard disk

☒ Create a virtual hard disk now

☐ Use an existing virtual hard disk file

Win7_Research.vdi (Normal, 150.00 GB)

< Back Create Cancel

Step 5 :

Create Virtual Hard Disk



Hard disk file type

Please choose the type of file that you would like to use for the new virtual hard disk. If you do not need to use it with other virtualization software you can leave this setting unchanged.

- ☒ VDI (VirtualBox Disk Image)
- ☐ VHD (Virtual Hard Disk)
- ☐ VMDK (Virtual Machine Disk)

Expert Mode < Back Next > Cancel

Step 6 :

Create Virtual Hard Disk



Storage on physical hard disk

Please choose whether the new virtual hard disk file should grow as it is used (dynamically allocated) or if it should be created at its maximum size (fixed size).

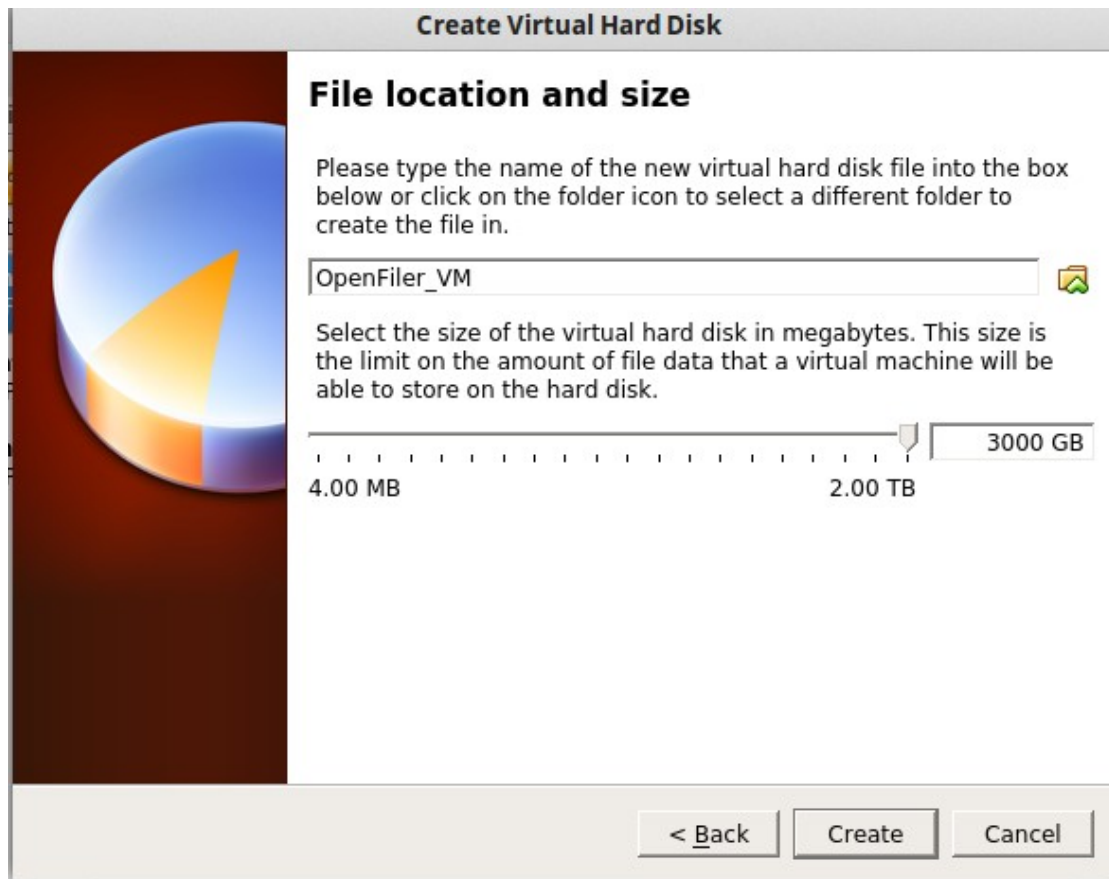
A **dynamically allocated** hard disk file will only use space on your physical hard disk as it fills up (up to a maximum **fixed size**), although it will not shrink again automatically when space on it is freed.

A **fixed size** hard disk file may take longer to create on some systems but is often faster to use.

- ☒ Dynamically allocated
- ☐ Fixed size

< Back Next > Cancel

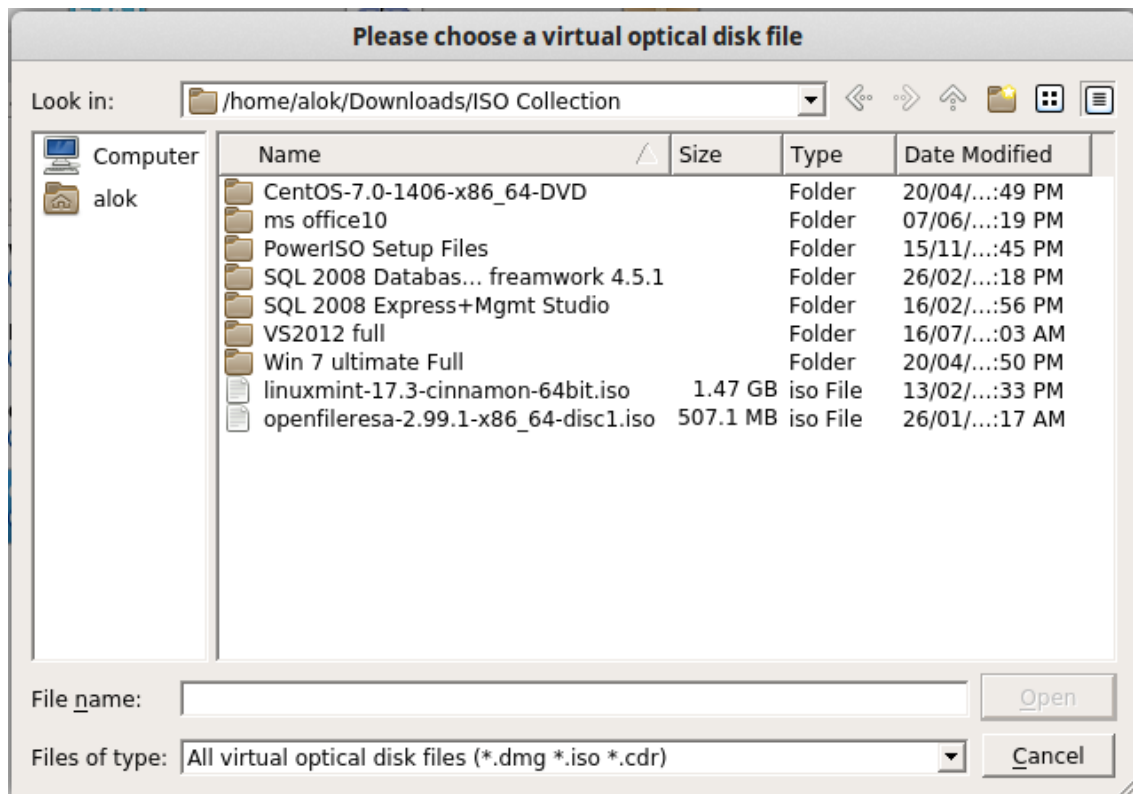
Step 7:



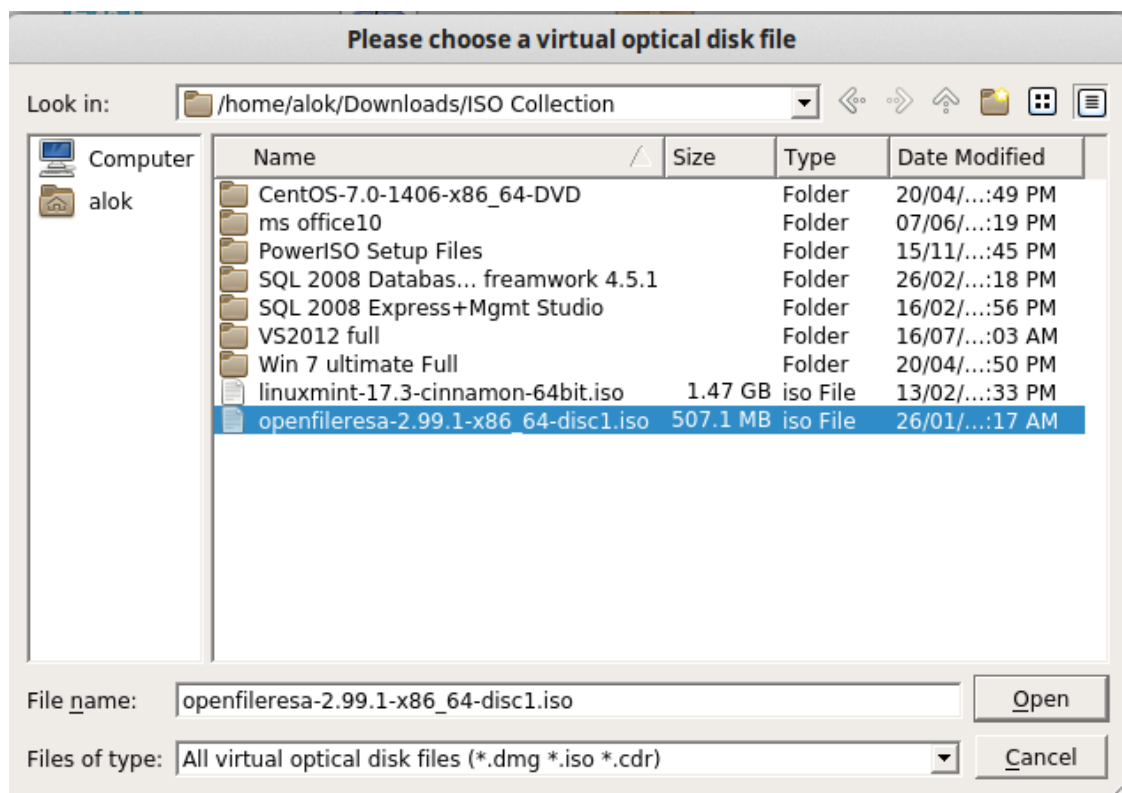
Step 8:



Step 9 :



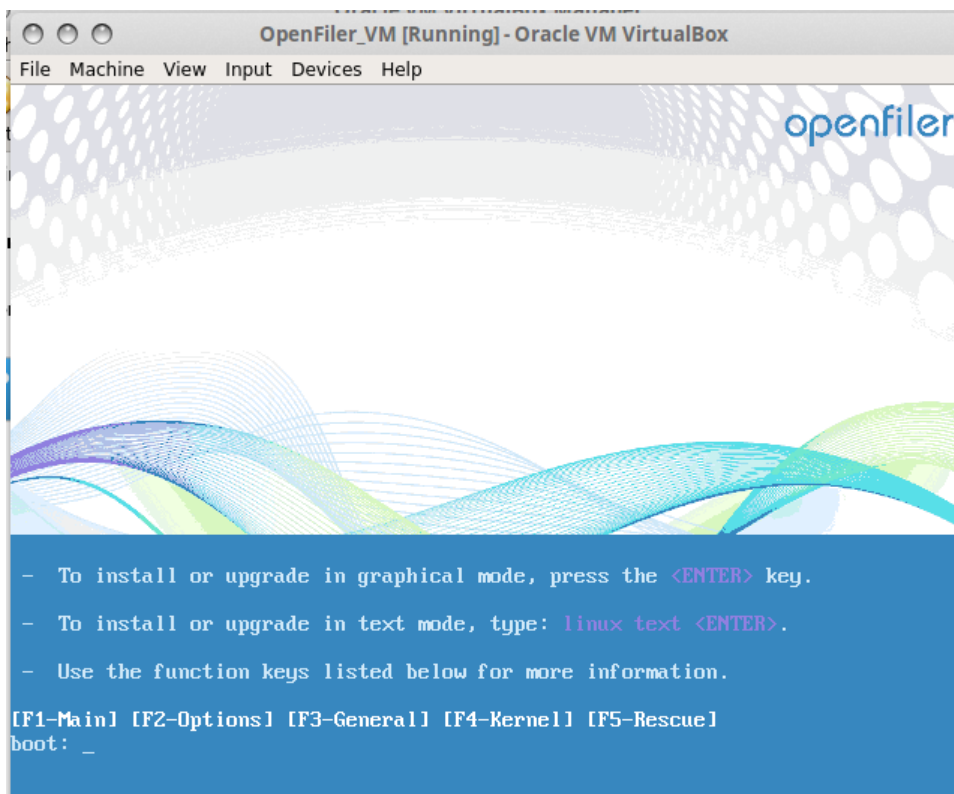
Step 10 :



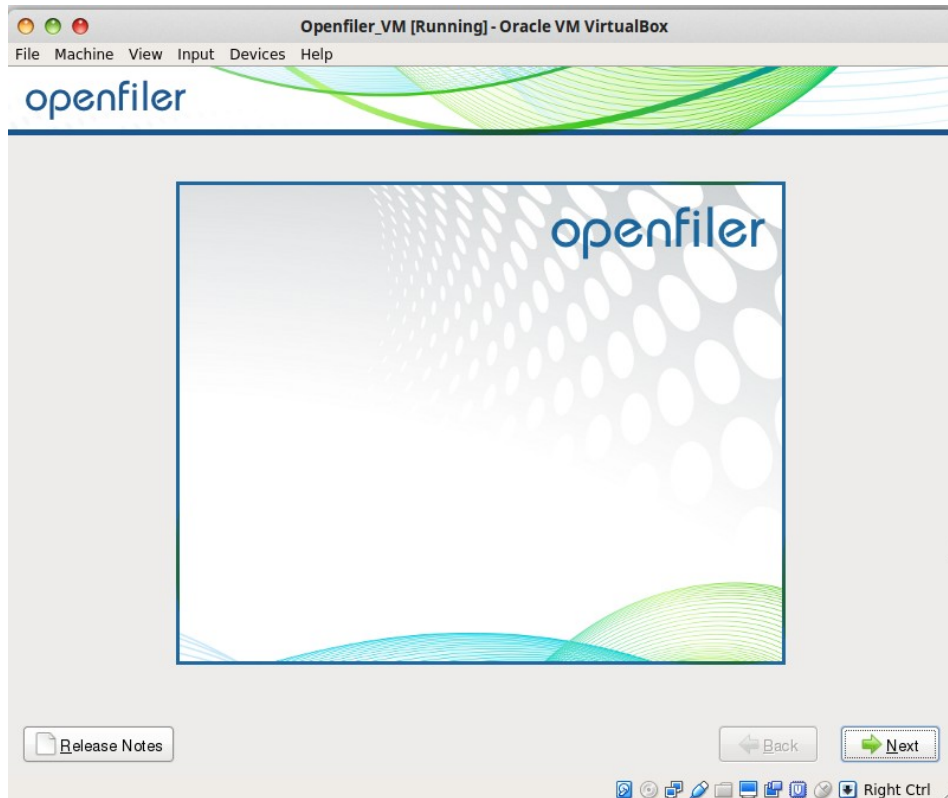
Step 11 :



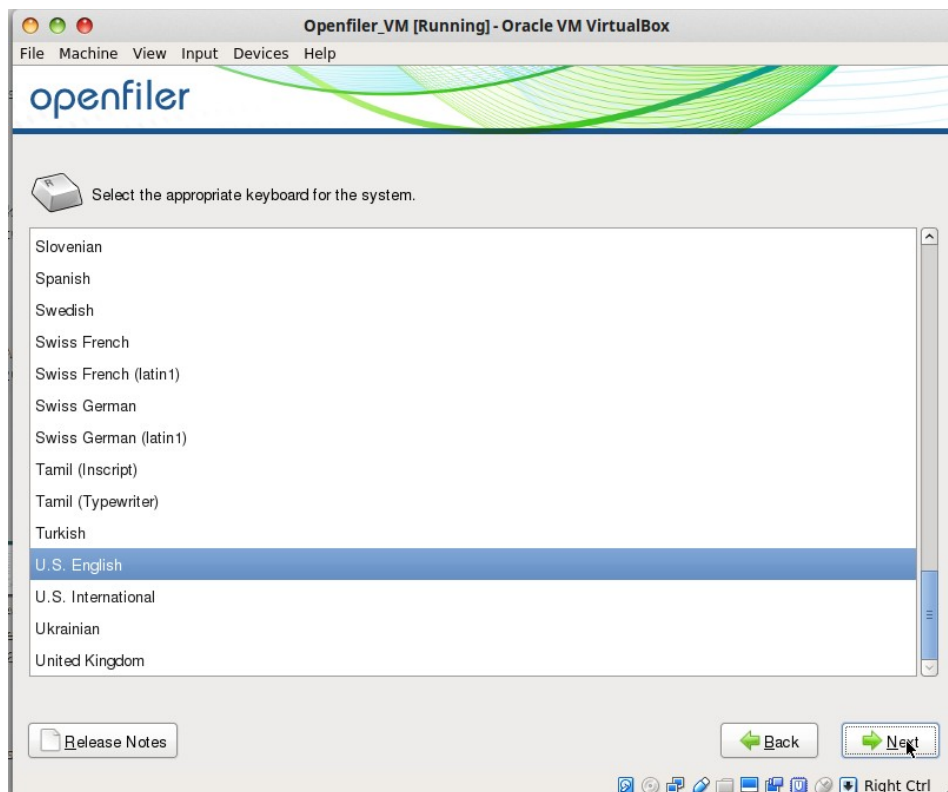
Step 12 :



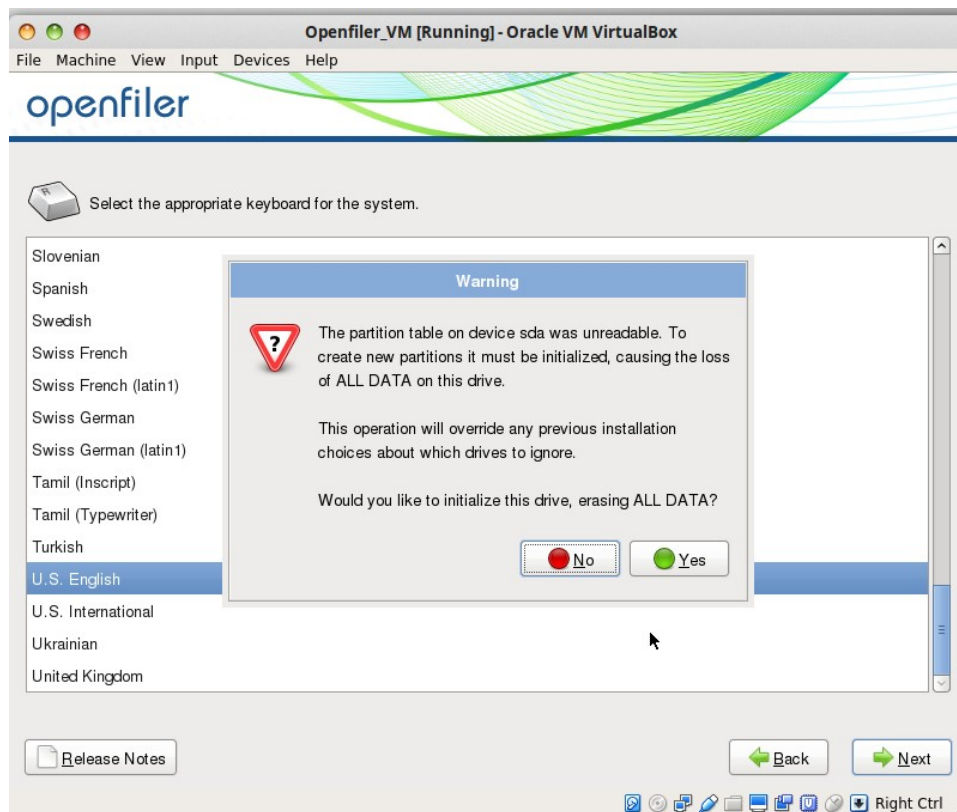
Step 13 :



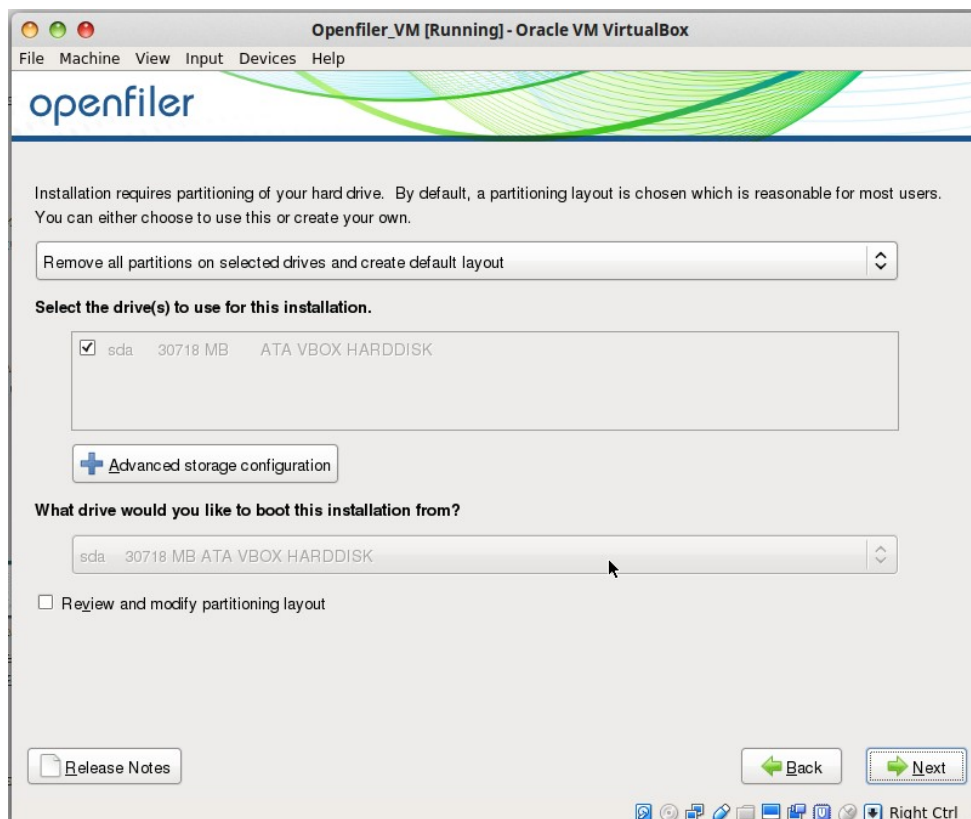
Step 14 :



Step 15 :

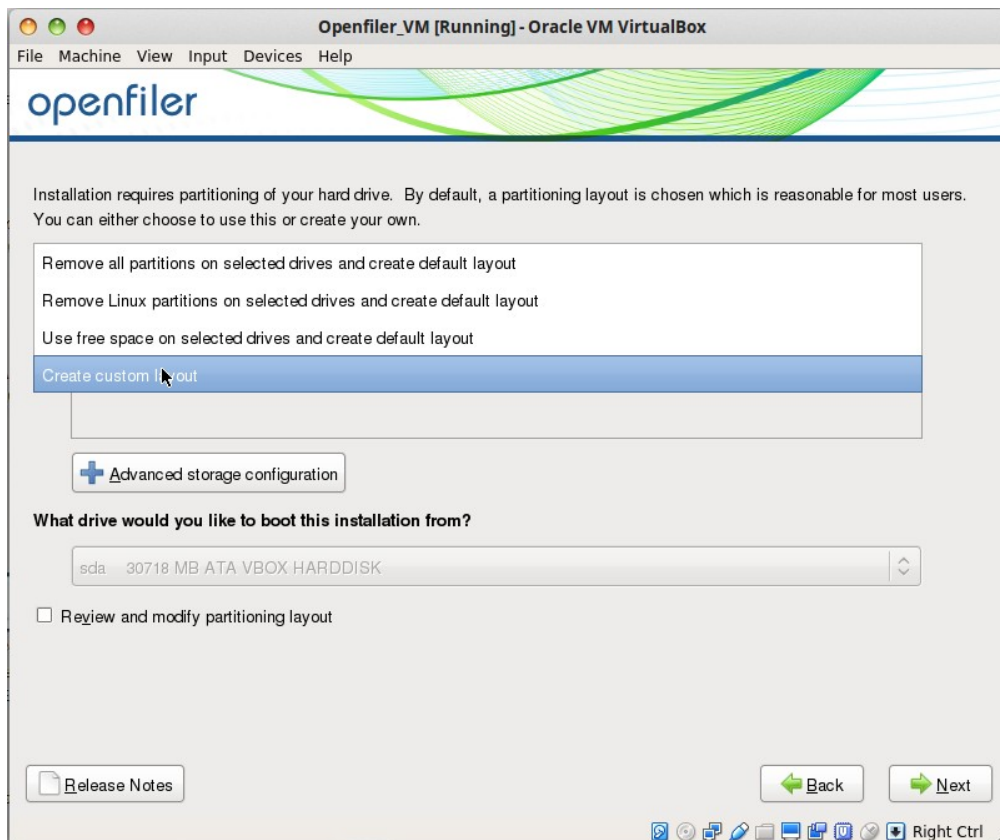


Step 16 :

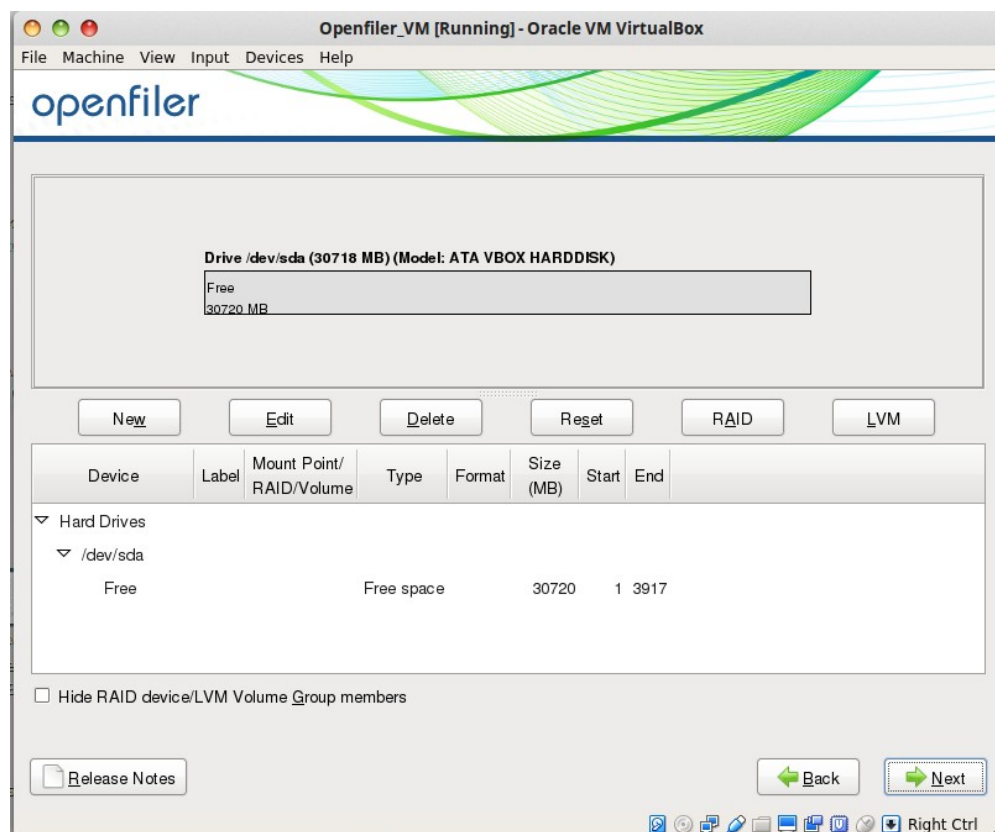


Step 17 :

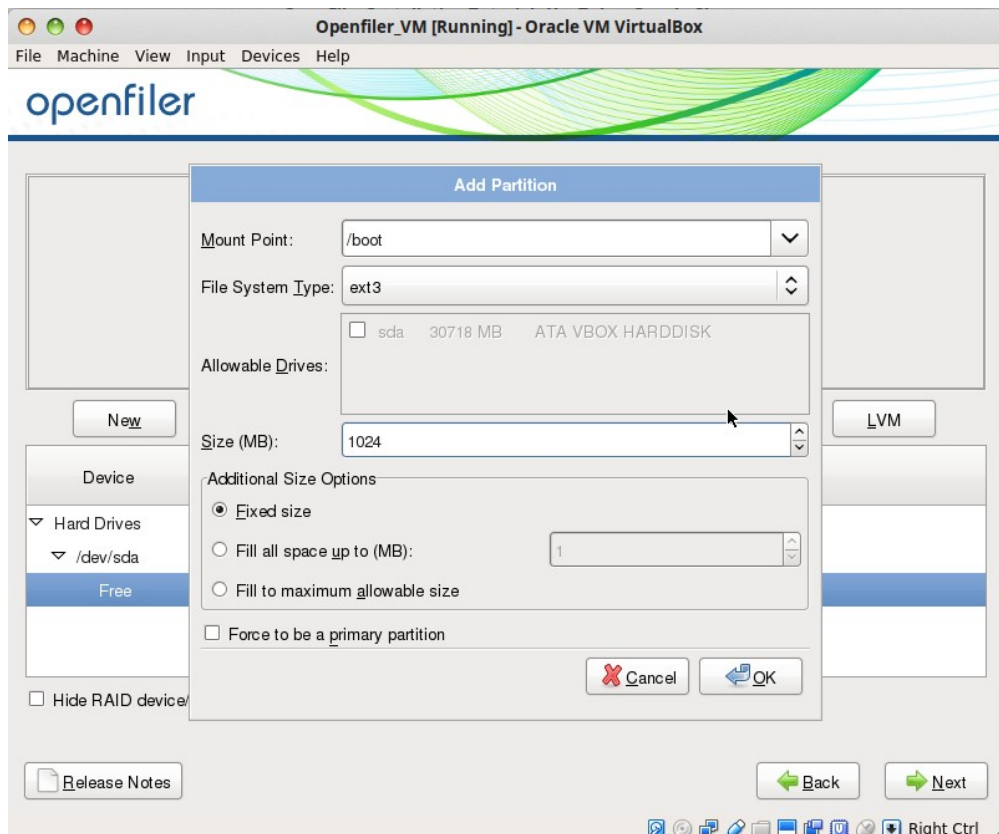
Here you need to select custom layout else you wont be able to create custom sized partitions.



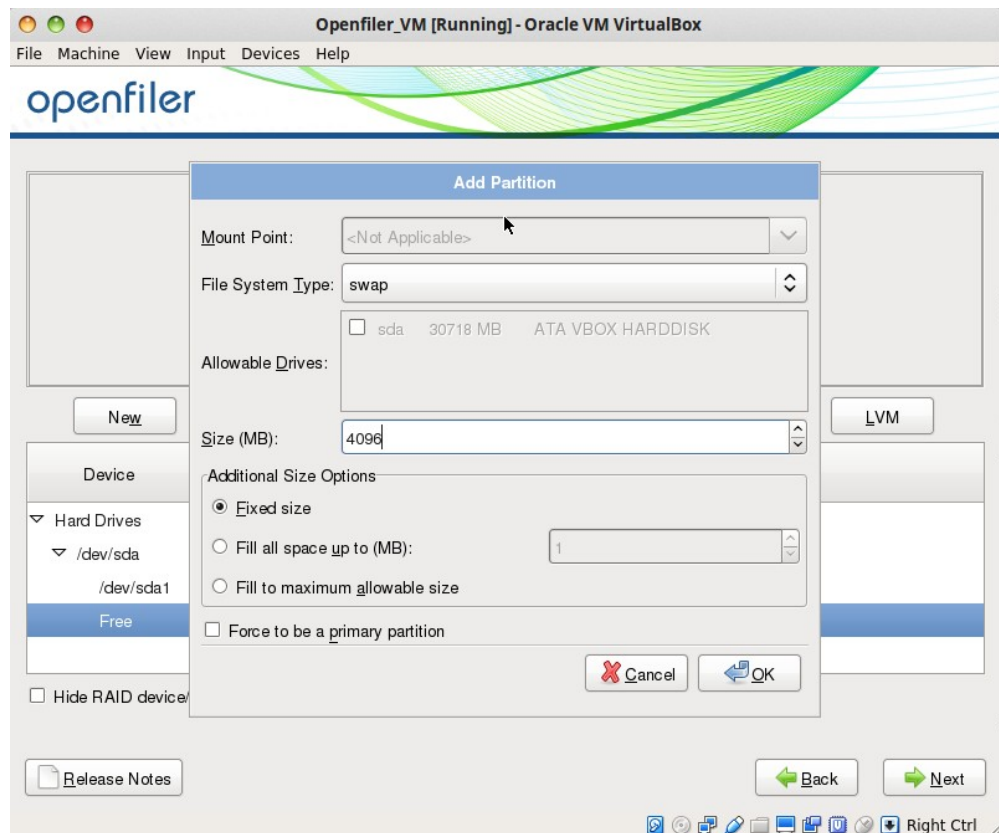
Step 18 :



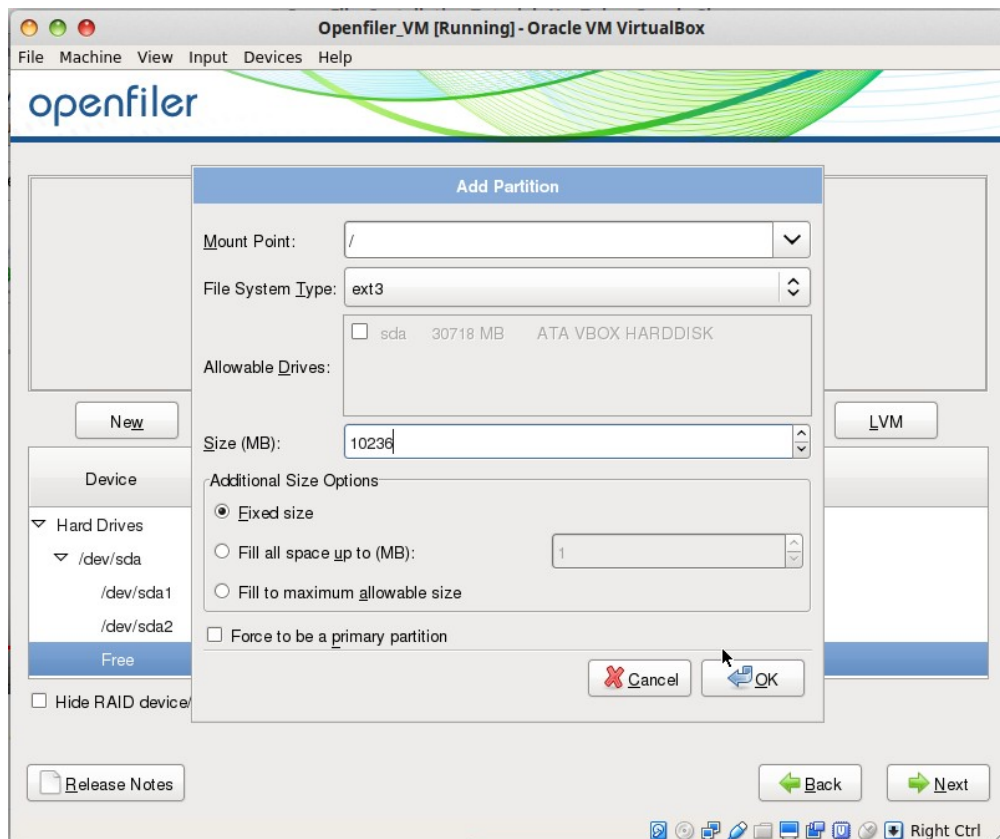
Step 19 :



Step 20 :

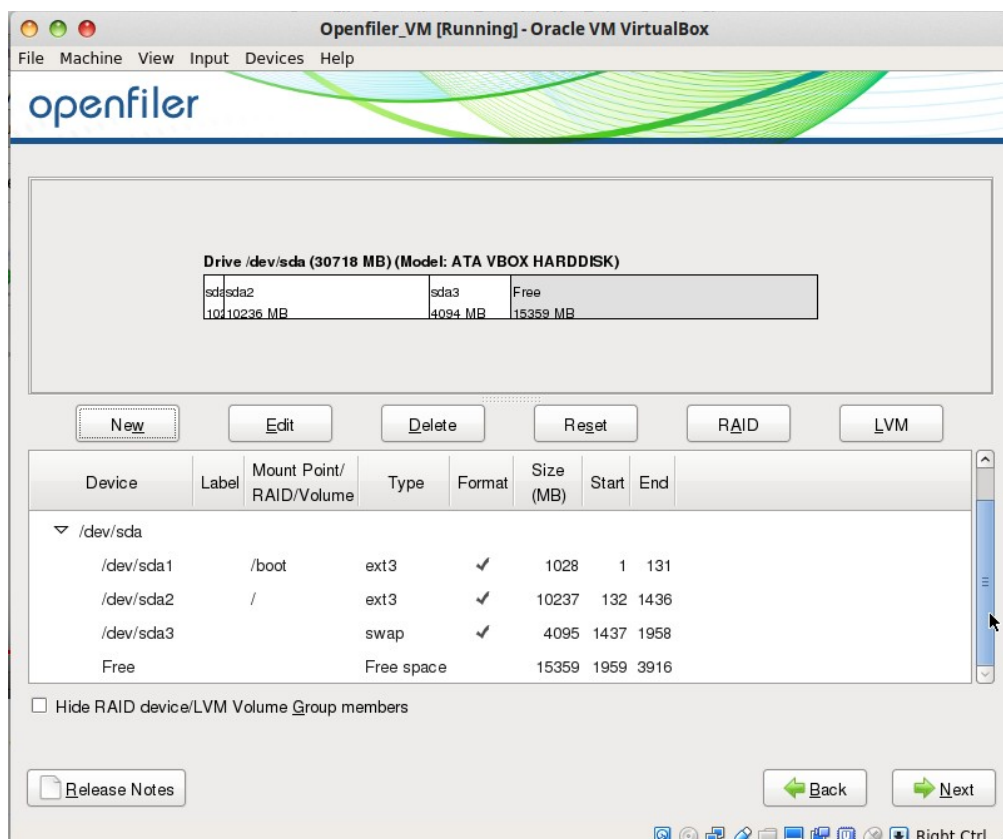


Step 21 :

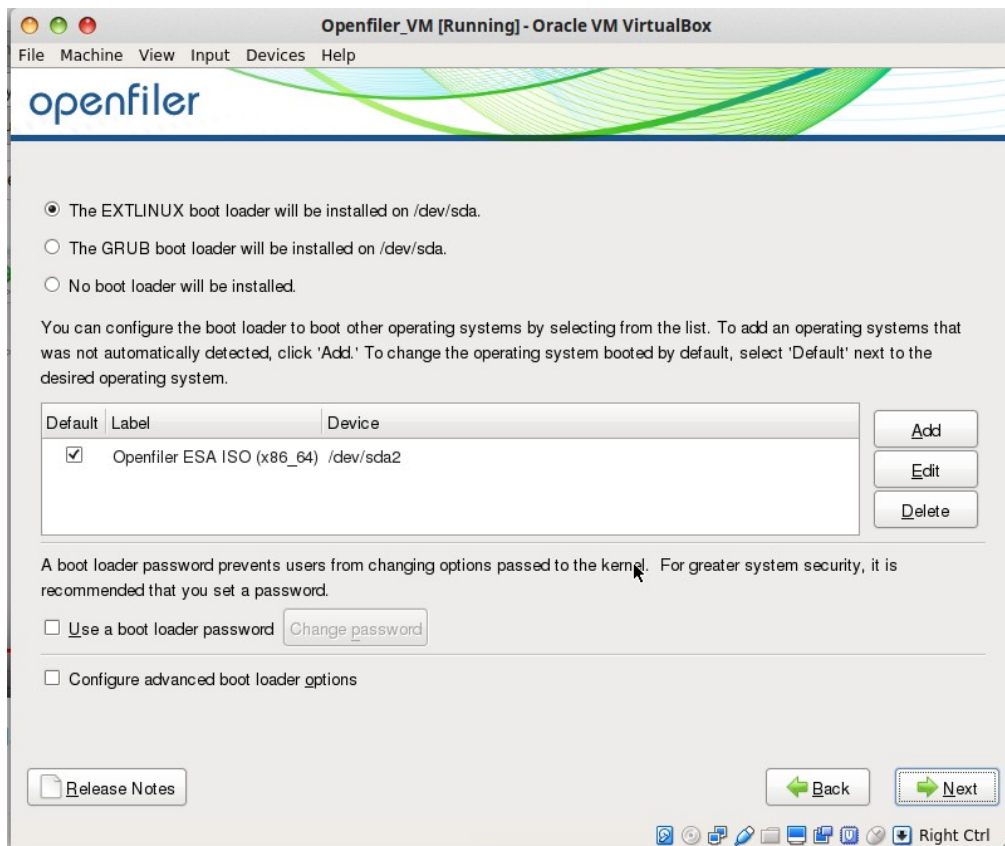


Step 22 :

Keep some space free out of total allocated to VM for later use (i.e. for creating new storage blocks / drives to share further on network)

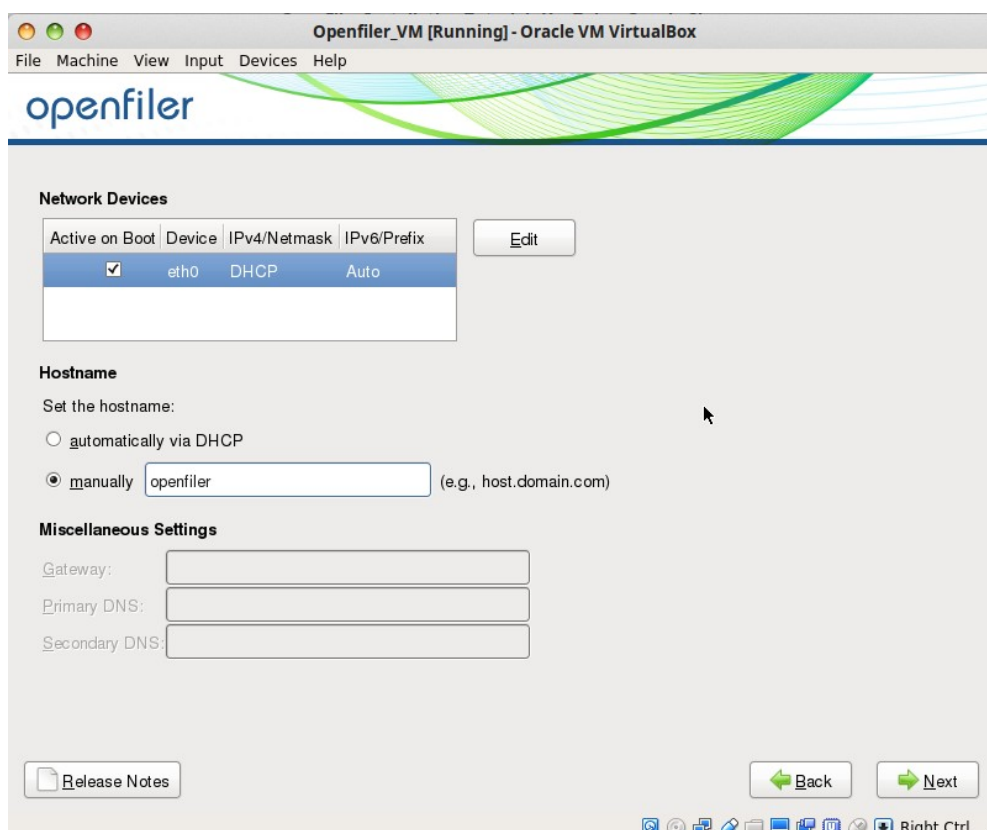


Step 23 :

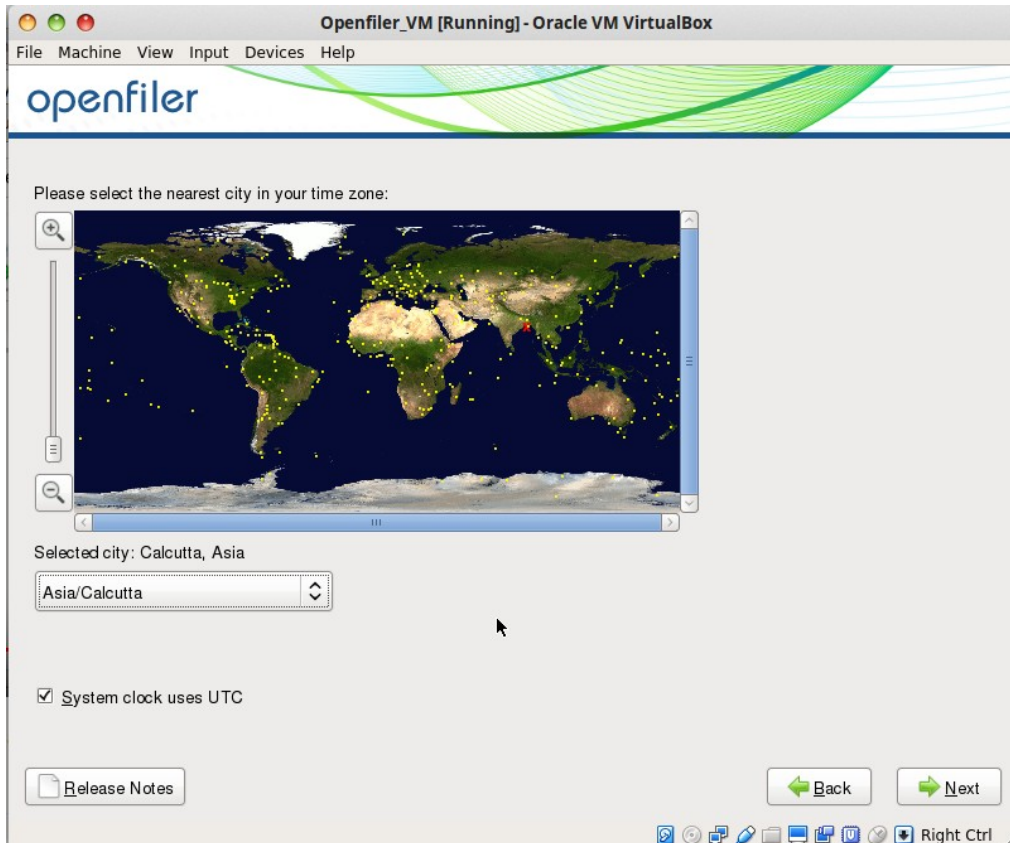


Step 24 :

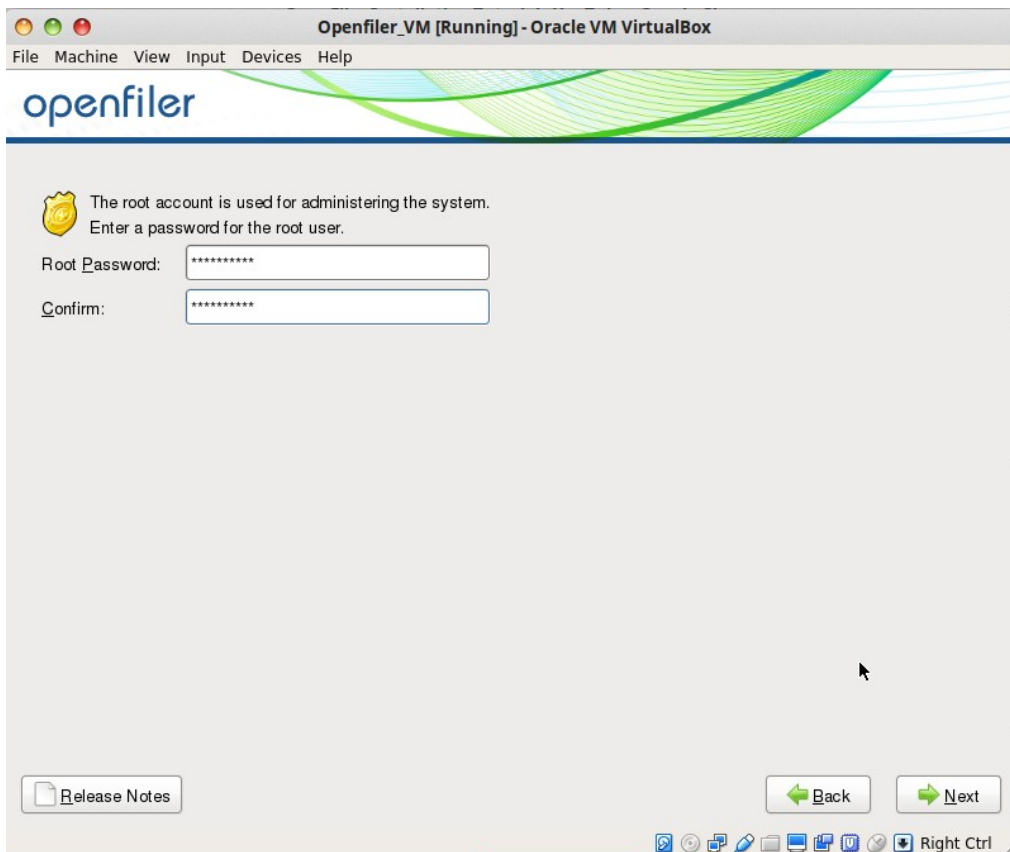
Provide a hostname to your machine and keep the DHCP settings default unless you are not sure of the settings you are planning to do for your network else it may disturb the connectivity of OS on the network.



Step 25 :



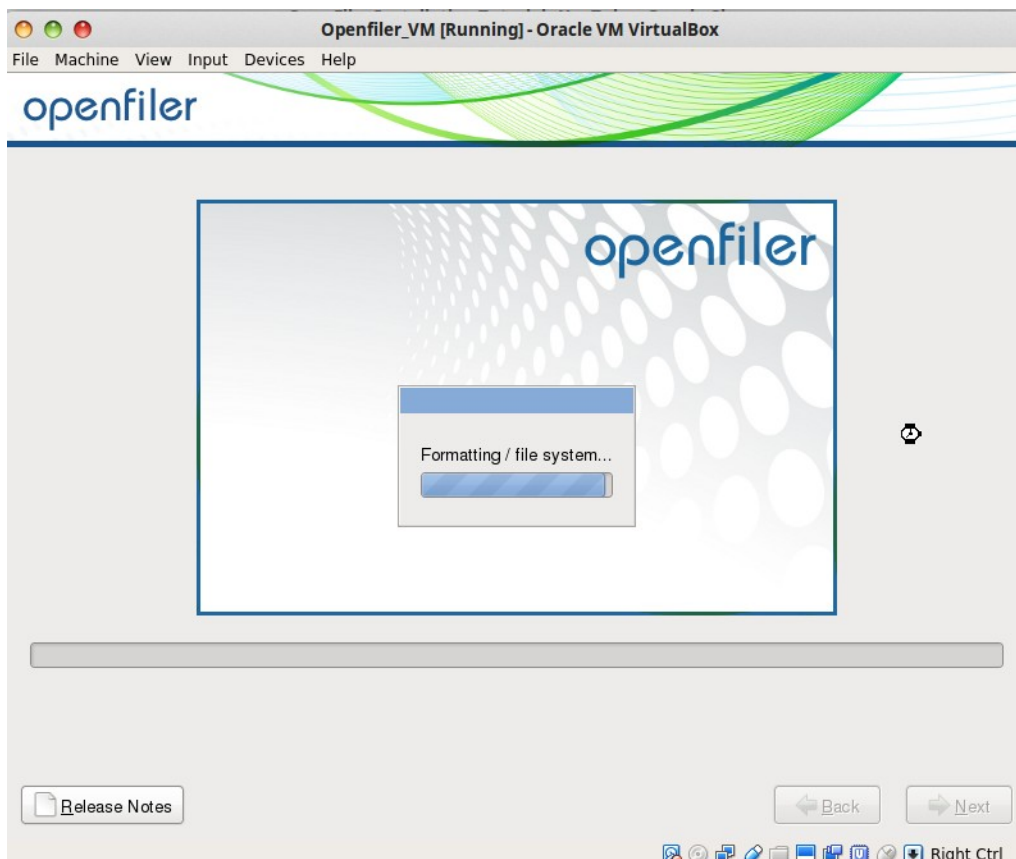
Step 26 :



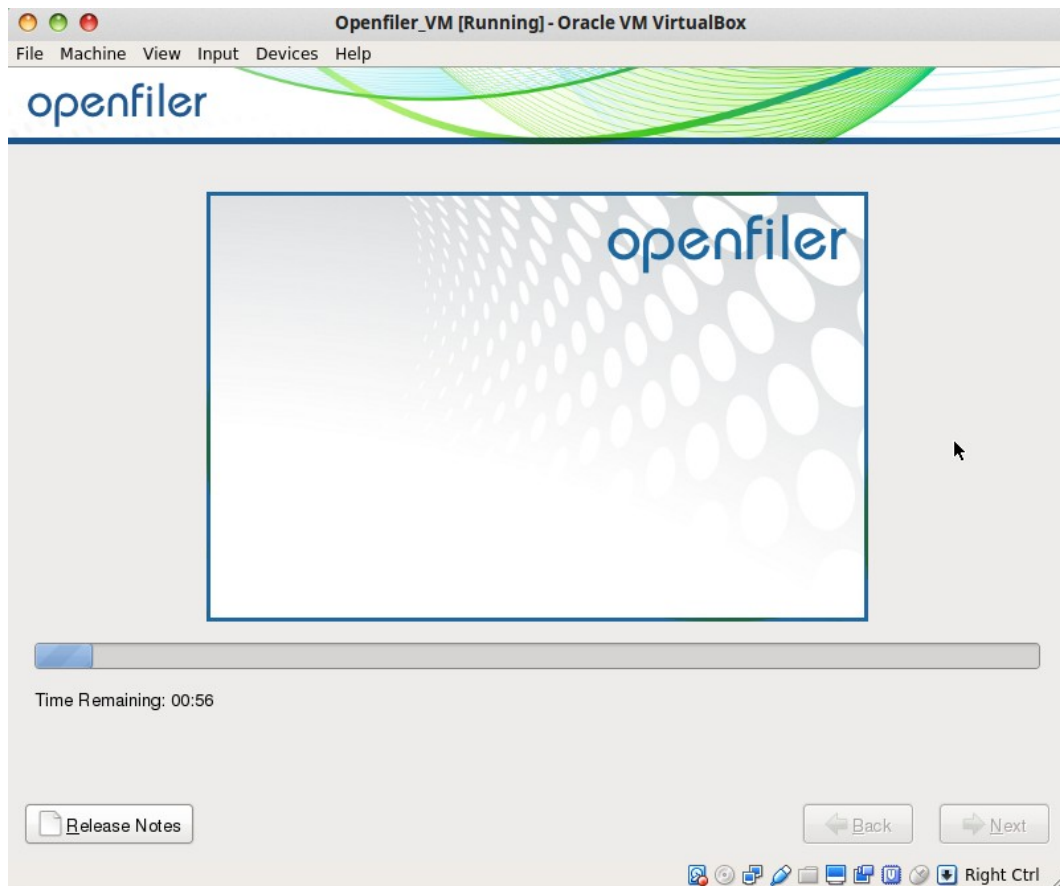
Step 27 :



Step 28 :



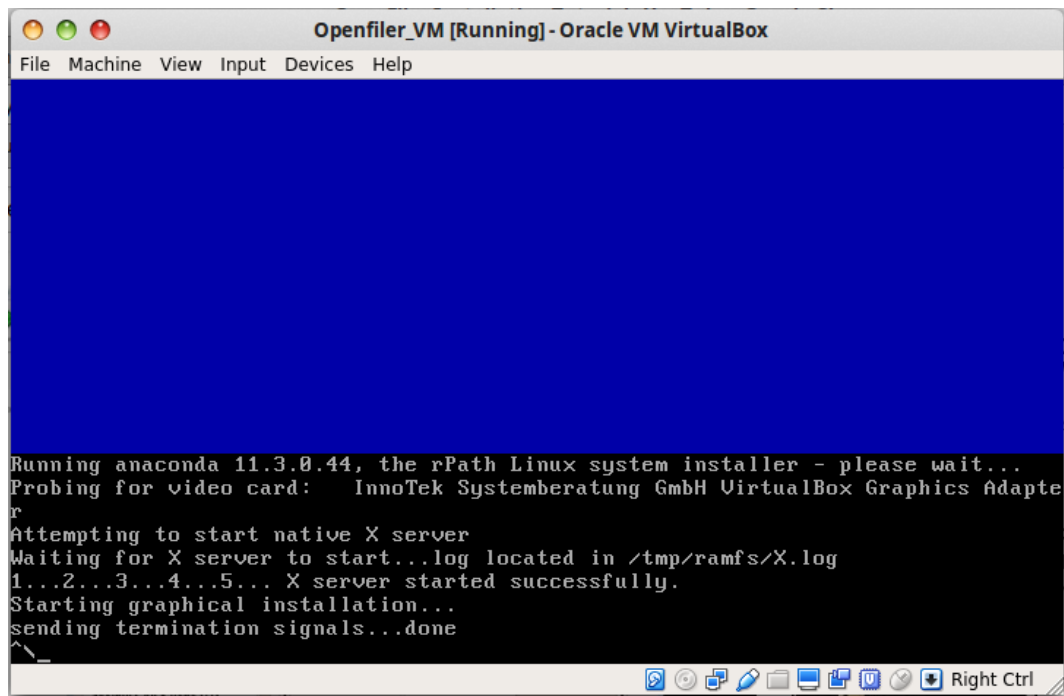
Step 29 :



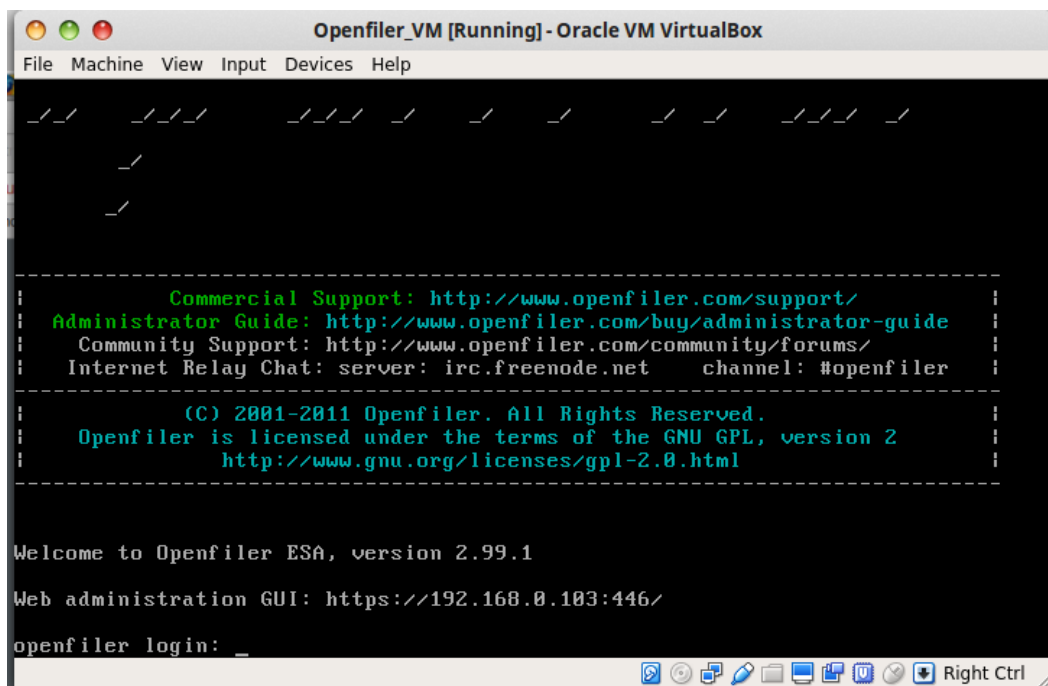
Step 30 :



Step 31 :



Step 32 :



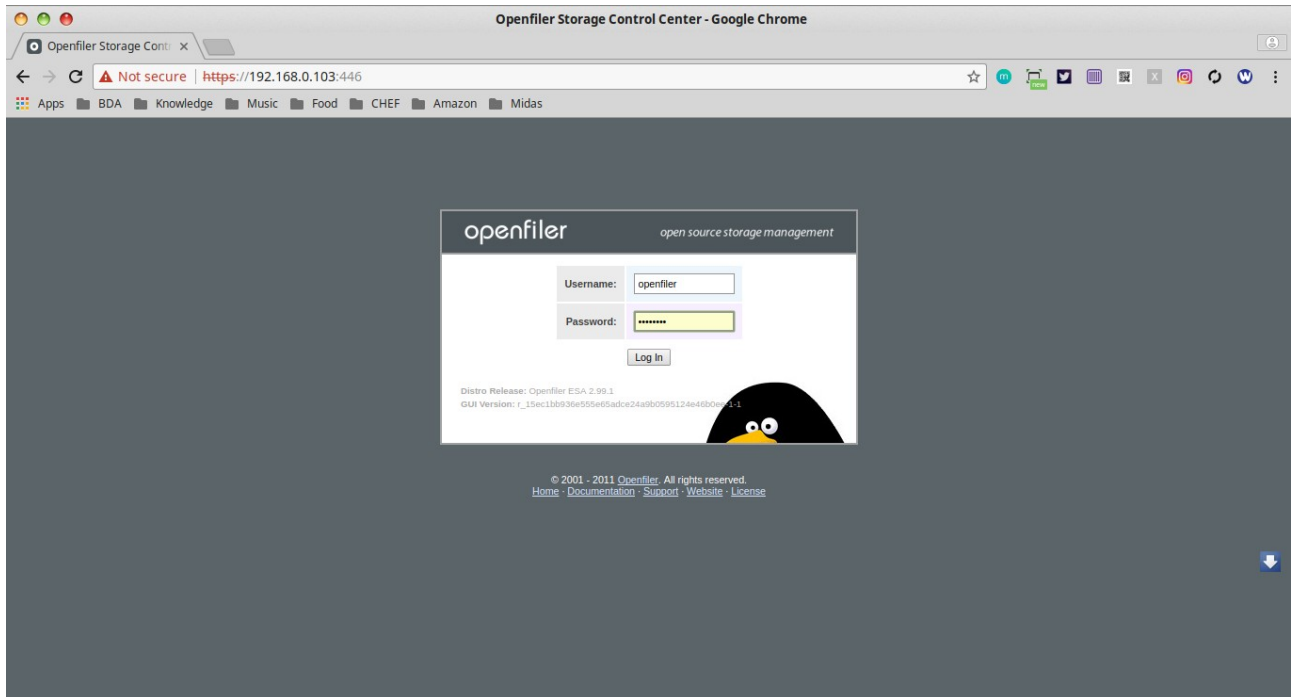
Here you can use command line option to work along with the storage provided if you know the commands well or else you have the GUI version too that makes your work lot more easier. GUI version URL is given on the terminal itself.

Remember : Openfiler runs on port 446 and HTTPS protocol.

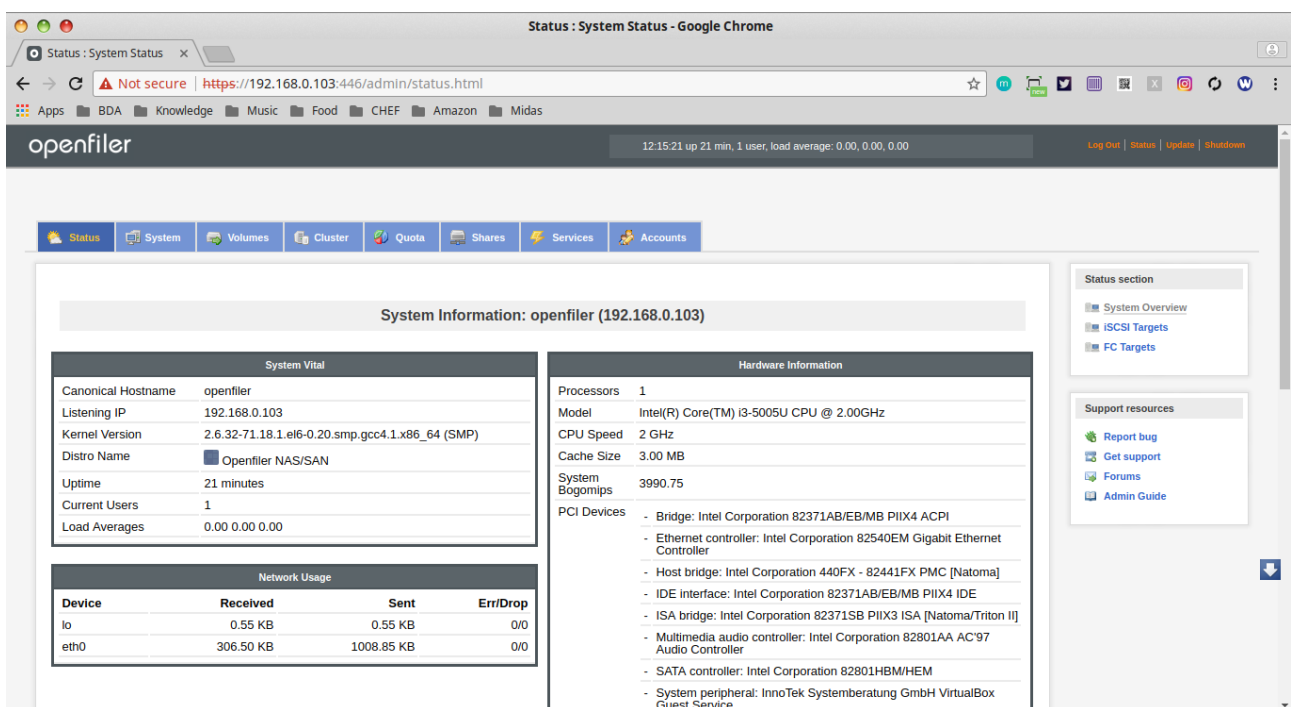
Default Login Credentials for GUI are as follows :

username : openfiler
password : password

Step 33 :



Step 34 :



Kudos!!... Now lets work on some configuration.

Configuration

Step 1 : Go to **Services Tab** and nable the necessary services and start them. (CIFS, LDAP, iSCSI Target, iSCSI initiator)

Manage Services				
Service	Boot Status	Modify Boot	Current Status	Start / Stop
CIFS Server	Disabled	Enable	Stopped	Start
NFS Server	Disabled	Enable	Stopped	Start
RSync Server	Disabled	Enable	Stopped	Start
HTTP/Dav Server	Disabled	Enable	Running	Stop
LDAP Container	Disabled	Enable	Stopped	Start
FTP Server	Disabled	Enable	Stopped	Start
iSCSI Target	Disabled	Enable	Stopped	Start
UPS Manager	Disabled	Enable	Stopped	Start
UPS Monitor	Disabled	Enable	Stopped	Start
iSCSI Initiator	Disabled	Enable	Stopped	Start
ACPI Daemon	Enabled	Disable	Running	Stop
SCST Target	Disabled	Enable	Stopped	Start
FC Target	Disabled	Enable	Stopped	Start
Cluster Manager	Disabled	Enable	Stopped	Start

Step 2 :

Go to **Accounts Tab**. Now lets configure accounts.

Select the check box : Use LDAP

Select the check box : Local LDAP server

Server : 127.0.0.1

Base DN : dc=example,dc=com

Root bind DN : dc=openfiler,dc=example,dc=com

Root bind password : <your_default_password> i.e. "password"

After making the necessary changes

What is LDAP ??? - (Lightweight Directory Access Protocol) is a software protocol for enabling anyone to locate organizations, individuals, and other resources such as files and devices in a network, whether on the public Internet or on a corporate intranet.

What is DN ??? - The **LDAP** API references an **LDAP** object by its distinguished name (**DN**). A **DN** is a sequence of relative distinguished names (**RDN**) connected by commas. An **RDN** is an attribute with an associated value in the form attribute=value; normally expressed in a UTF-8 string format.

The screenshot shows the 'Accounts section' in the Openfiler web interface. The 'User Information Configuration' tab is active. A message box states: 'Standard View is sufficient for most authentication configuration requirements. Select Expert View only if you know exactly what you are doing.' The configuration form includes the following fields:

- Use LDAP:** ☒
- Local LDAP server:** ☒ Use Local LDAP Server
- LDAP Security:** ☐ Use TLS
- Server:** 127.0.0.1
- Base DN:** dc=example,dc=com
- Root bind DN:** dc=openfiler,dc=example,d
- Root bind password:** [masked]
- SMB LDAP Configuration:** ☒ Login SMB server to root DN
- User password policy:** ☐ Allow user to change password

On the right sidebar, the 'Accounts section' menu is visible with links to Authentication, Administration, User List, Group List, and Admin Password. Below it, 'Support resources' include Report bug, Get support, Forums, and Admin Guide.

Step 3: Go to **Accounts Tab.** and Click on Administration and create a user group and atleast one user account.

Here we have created **user group - "normal users"** and **user account with username - "alok"** and **password - "pass123"**. This username and password will be used at the time of accessing the shared folder over network.

Note : Make sure that the gid (group id) is same as that of the uid (user id). For ex. If gid for group - normal user is **1236** in below image then the user id for user – alok should be **1236**. If by default it is not so then delete the user and create it again and while creating the user select the option **Override Automatic UID** and enter the id in the textbox same as that of the group you created.

The screenshot shows the 'Accounts section' in the Openfiler web interface, specifically the 'Group Administration' tab. The top status bar displays 'openfiler' and system metrics: '21:17:20 up 2:57, 0 users, load average: 0.00, 0.00, 0.03'. The 'Accounts' menu is highlighted in the top navigation bar. The 'Group Administration' section includes an 'Add new group' button and a form with the following fields:

- Group Name:** [text input]
- Override automatic GID:** ☐
- Buttons:** Add Group, Reset

Below the form, the 'Group Control' section shows a list of groups. The first entry is 'normal users (gid: 1236)'.

Step 4 : Create user account here.

The screenshot shows the 'User Administration' section of the Openfiler web interface. At the top, there are tabs for 'Group Administration' and 'User Administration'. The main heading is 'User Administration'. Below it, there is a section titled 'Add new user' which contains a form with the following fields: 'Username:', 'Password:', 'Retype password:', 'Primary Group:' (set to '1236: normal users'), and 'Override automatic UID' (unchecked). There are 'Add User' and 'Reset' buttons below the form. Below the form is a 'User Control' section showing a list of users, with one user 'alok (uid: 1236)' visible. On the right side, there is a sidebar with 'Accounts section' containing links for 'Authentication', 'Administration', 'User List', 'Group List', and 'Admin Password'. Below that is a 'Support resources' section with links for 'Report bug', 'Get support', 'Forums', and 'Admin Guide'.

Step 5 :

Here the disks attached to openfiler are listed.

The screenshot shows the 'Block Device Management' section of the Openfiler web interface. At the top, there is a header bar with the 'openfiler' logo and system status information: '22:14:28 up 17 min, 0 users, load average: 0.00, 0.00, 0.00'. There are links for 'Log Out', 'Status', 'Update', and 'Shutdown'. Below the header is a navigation bar with tabs for 'Status', 'System', 'Volumes', 'Cluster', 'Quota', 'Shares', 'Services', and 'Accounts'. The main heading is 'Block Device Management'. Below it is a table listing the attached disks:

Edit Disk	Type	Description	Size	Label type	Partitions
/dev/sda	SCSI	ATA VBOX HARDDISK	30.00 GB	mdadm	3 (view)
/dev/sdb	SCSI	ATA VBOX HARDDISK	10.00 GB	gpt	0 (view)

At the bottom of the page, there is a footer with copyright information: '© 2001 - 2011 Openfiler. All rights reserved.' and links for 'Home', 'Documentation', 'Support', 'Website', 'License', and 'Log Out'. On the right side, there is a sidebar with 'Volumes section' containing links for 'Manage Volumes', 'Volume Groups', 'Block Devices', 'Add Volume', 'iSCSI Targets', and 'Software RAID'. Below that is a 'Support resources' section with links for 'Report bug', 'Get support', 'Forums', and 'Admin Guide'.

Step 6 : Select /dev/sdb and click and you can see the disk space capacity details. Here you can create partitions according to your needs.

Free (50%)

sdb1 (40%)

[Back to the list of physical storage devices](#)

Create a partition in /dev/sdb

You can use ranges within the following extents:

Mode	Starting cylinder	Ending cylinder	Space
Primary	526	1305	5.98 GB

Mode	Partition Type	Starting cylinder	Ending cylinder	Size	Create	Reset
Primary	Physical volume	526	1305	5.98 GB	Create	In Use

Support resources

[Report bug](#)
[Get support](#)
[Forums](#)
[Admin Guide](#)

Step 7 :

openfiler22:16:00 up 19 min, 0 users, load average: 0.91, 0.23, 0.07Log Out | Status | Update | Shutdown

StatusSystemVolumesClusterQuotaSharesServicesAccounts

Edit partitions in /dev/sdb (1305 cylinders with "gpt" label)

Device	Type	Number	Start cyl	End cyl	Blocks	Size	Type	Delete
/dev/sdb1	Linux Physical Volume (8x8e)	1	1	525	4212220	4.02 GB	Primary	Delete

Free (50%)

sdb1 (40%)

[Back to the list of physical storage devices](#)

Volumes section

[Manage Volumes](#)
[Volume Groups](#)
[Block Devices](#)
[Add Volume](#)
[iSCSI Targets](#)
[Software RAID](#)

Support resources

[Report bug](#)
[Get support](#)
[Forums](#)
[Admin Guide](#)

Step 8 : Go to **Volumes Tab** and click on Volume Groups and create a volume group and select the disk you want to add to the group. Here we have created **"volgroup1"**.

openfiler 22:18:50 up 21 min, 0 users, load average: 0.17, 0.17, 0.08 Log Out | Status | Update | Shutdown

Status System **Volumes** Cluster Quota Shares Services Accounts

Volume Group Management

Volume Group Name	Size	Allocated	Free	Members	Add physical storage	Delete VG
volgroup1	4.00 GB	0 bytes	4.00 GB	View member PVs	All PVs are used	Delete

Create a new volume group

No existing physical volumes were found, or all existing physical volumes are used. You can [create new physical volumes](#).

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Volumes section

- Manage Volumes
- Volume Groups
- Block Devices
- Add Volume
- iSCSI Targets
- Software RAID

Support resources

- Report bug
- Get support
- Forums
- Admin Guide

Step 9 : Now create volumes from Add Volume option on right side of the page.

We have created one share volume (partition type : ext3 / ext4).

Free (100%)

Create a volume in "volgroup1"

Volume Name ("no spaces". Valid characters [a-z,A-Z,0-9]):	<input type="text" value="iSCSI"/>
Volume Description:	<input type="text" value="iSCSI Target"/>
Required Space (MB):	<input type="text" value="2000"/>
Filesystem / Volume type:	<input type="text" value="block (iSCSI,FC,etc)"/>

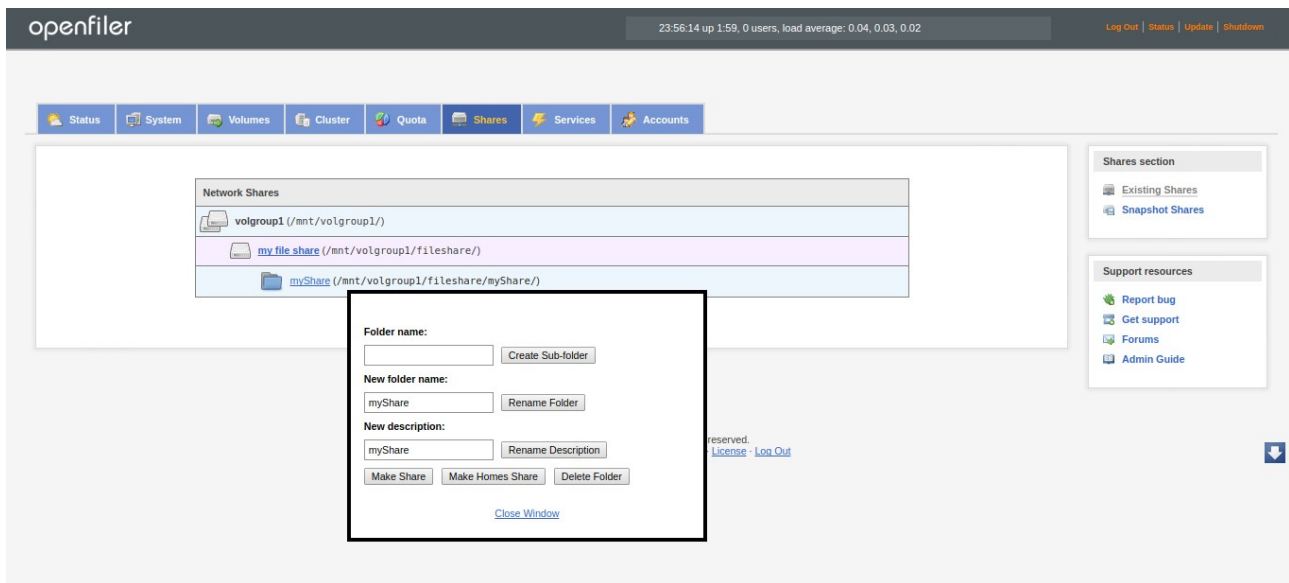
Step 10 : Go to **System Tab** and you will see the hostname and interface configuration details. Here you have to add entry for incoming connections under **Network Access Configuration** area. i.e when we will access the volume from outside network we need to add the host and netmask entry in openfiler. For ex. If our ip address range is **192.168.x.x** and netmask range is **255.255.255.x** then we will add the entry as **192.168.0.0** and **255.0.0.0** so it will accept all ip address within that range.

The screenshot shows the Openfiler System Tab configuration page. At the top, there are fields for Hostname (openfiler), Primary DNS (192.168.0.1), Secondary DNS, and Gateway (DHCP Controlled). Below these are 'Update' and 'Cancel' buttons. The 'Network Interface Configuration' section contains a table with columns: Interface, Boot Protocol, IP Address, Network Mask, Speed, MTU, Link, and Edit. The table has one entry for 'eth0' with DHCP boot protocol, IP 192.168.0.103, and mask 255.255.255.0. Below the table is a 'Create bonded interface' link. The 'Network Access Configuration' section contains a table with columns: Delete, Name, Network/Host, Netmask, and Type. It has one entry named 'server' with Network/Host 192.168.0.0 and Netmask 255.0.0.0, with a 'Share' type. Below this table are input fields for 'New' entries and an 'Update' button.

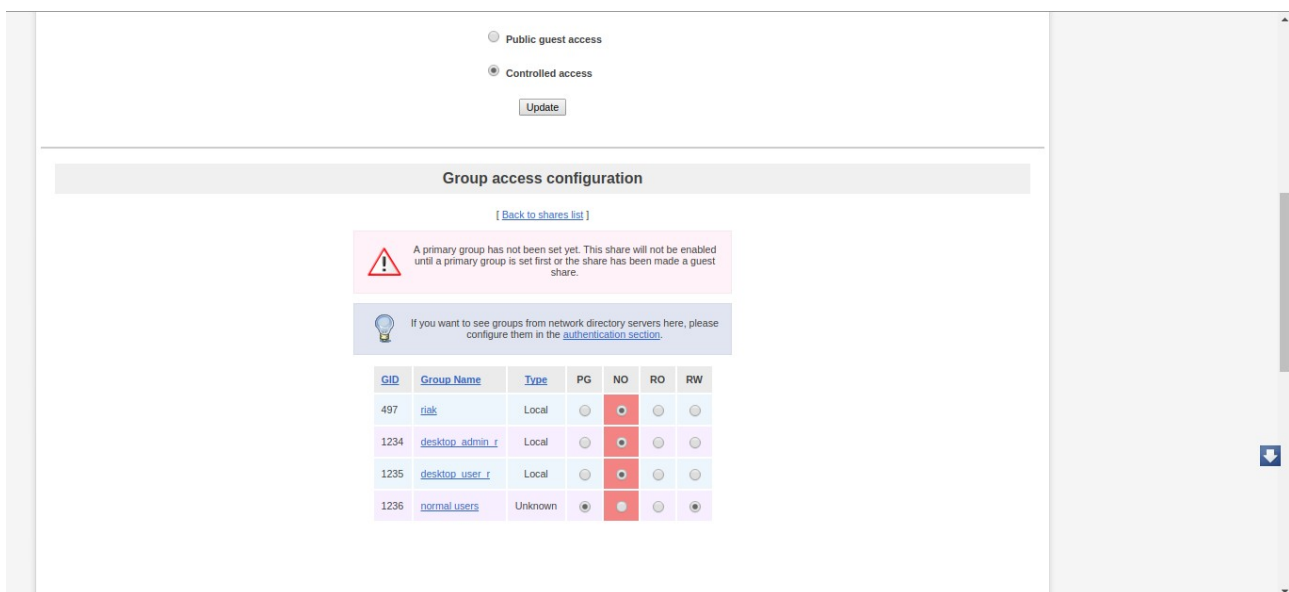
Step 11 : Go to **Shares Tab** and you will see the share volume you created listed under the volume group. Right click on the shared volume and create a folder to share.

The screenshot shows the Openfiler Shares Tab. The top navigation bar includes Status, System, Volumes, Cluster, Quota, Shares, Services, and Accounts. The main content area shows a list of 'Network Shares' with entries like 'volgroup1 (/mnt/volgroup1/)' and 'my file share (/mnt/volgroup1/fileshare/)'. A modal window is open over the 'my file share' entry, titled 'Folder name:', with a text input field containing 'myShare' and a 'Create Sub-folder' button. A 'Close Window' link is at the bottom of the modal. The right sidebar contains 'Shares section' with links to 'Existing Shares' and 'Snapshot Shares', and 'Support resources' with links to 'Report bug', 'Get support', 'Forums', and 'Admin Guide'.

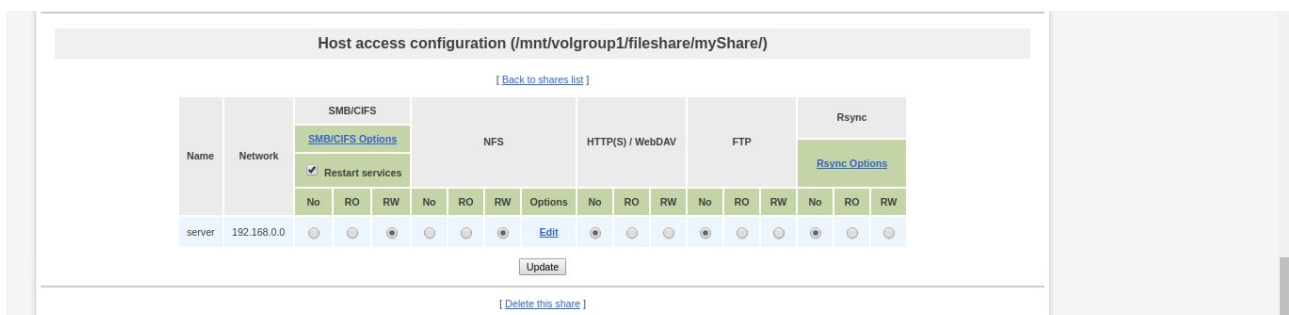
Step 12 : Right click on the folder you created and click on **Make Share** button. It will redirect you to access controls page where you will set the read / write permissions as shown in the image below.



Step 13 :



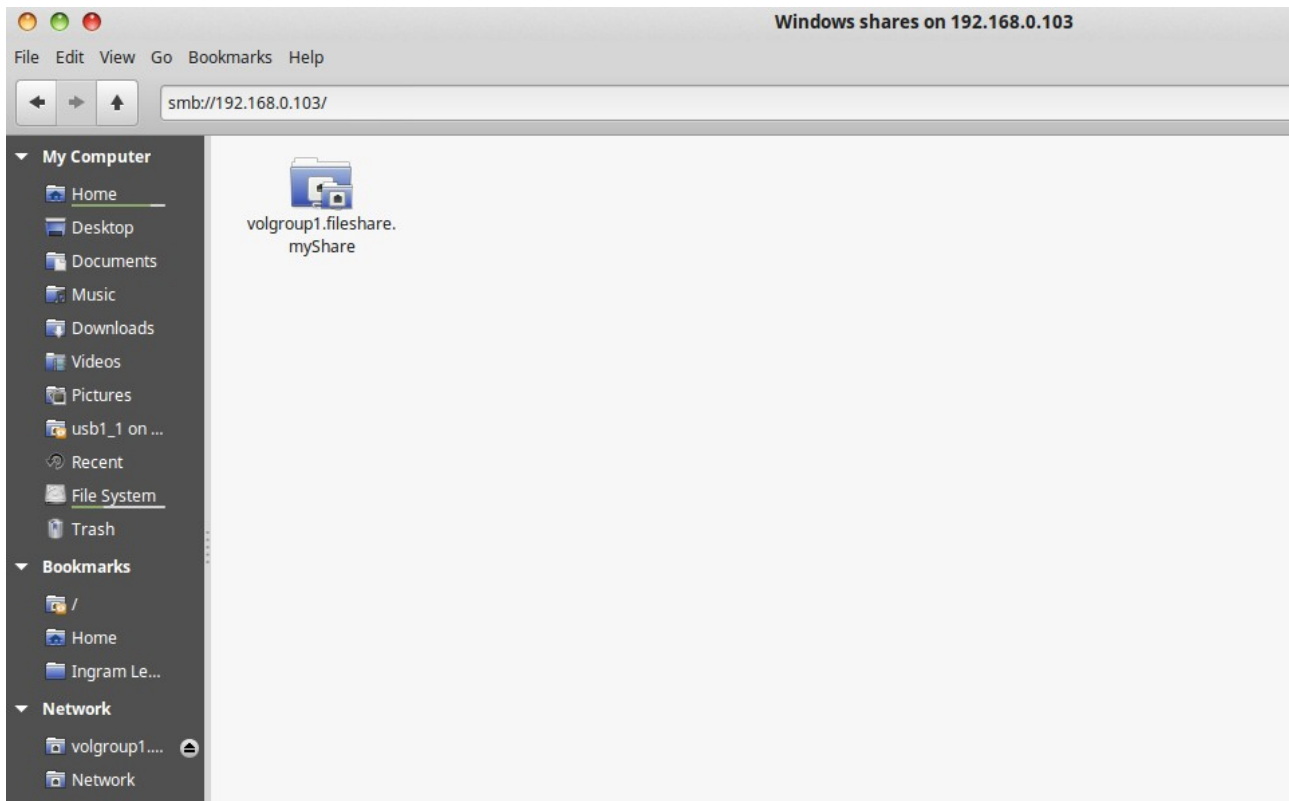
Step 14 :



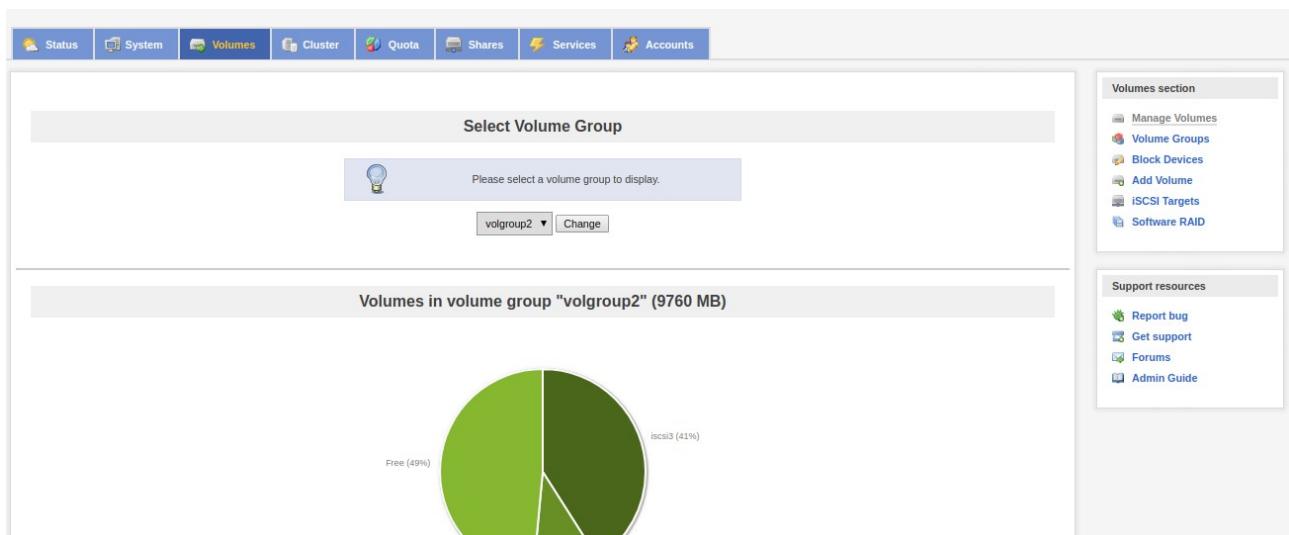
Step 15 : To access your volume type in the URL bar of the explorer

smb://<ip_address>/

here the ip address is of your openfiler OS



Step 16 : Go to **Volumes Tab** and click on iSCSI Targets on right side of the page.



Step 17 :

It will by default create a target name which we have to add by clicking on Add Button.

The screenshot shows the 'Add new iSCSI Target' section of the web interface. The 'Target Configuration' tab is selected. Below the title, there is a 'Target IQN' field with the value 'iqn.2006-01.com.openfiler:tsn.4b7d6e389316' and an 'Add' button. Below this, there is a 'Select iSCSI Target' section with a message 'Please select an iSCSI target to display and/or edit.' and a dropdown menu showing 'iqn.2006-01.com.openfiler:tsn.763ad3974bce' with a 'Change' button. At the bottom, there is a section for 'Settings for target: iqn.2006-01.com.openfiler:tsn.763ad3974bce'. On the right side, there is a 'Volumes section' with links for 'Manage Volumes', 'Volume Groups', 'Block Devices', 'Add Volume', 'iSCSI Targets', and 'Software RAID'. Below that, there is a 'Support resources' section with links for 'Report bug', 'Get support', 'Forums', and 'Admin Guide'.

Step 18 :

The added target name will appear under LUN mapping tab where we have to actually map the iSCSI volume we created earlier to the target name. Select the appropriate volume name and map it to target name.

The screenshot shows the 'LUN Mapping' tab of the web interface. The title is 'LUNs mapped to target: iqn.2006-01.com.openfiler:tsn.763ad3974bce'. Below this, there is a table with columns: LUN Id, LUN Path, R/W Mode, SCSI Serial No., SCSI Id., Transfer Mode, and Unmap LUN. The table contains one row with LUN Id '0', LUN Path '/dev/volgroup1/lscsi', R/W Mode 'write-thru', SCSI Serial No. 'PfSpGe-QcL4-ZiKd', SCSI Id. 'PfSpGe-QcL4-ZiKd', Transfer Mode 'blockio', and an 'Unmap' button. Below the table, there is a section for 'Map New LUN to Target: "iqn.2006-01.com.openfiler:tsn.763ad3974bce"'. This section contains a table with columns: Name, LUN Path, R/W Mode, SCSI Serial No., SCSI Id., Transfer Mode, and Map LUN. The table contains two rows: 'iSCSI Target 3' with LUN Path '/dev/volgroup2/lscsi3', R/W Mode 'write-thru', SCSI Serial No. '9s8Znr-8eL2-UjHp', SCSI Id. '9s8Znr-8eL2-UjHp', Transfer Mode 'blockio', and a 'Map' button; and 'iSCSI Target 4' with LUN Path '/dev/volgroup2/lscsi4', R/W Mode 'write-thru', SCSI Serial No. 't95sst-etl8-d0M2', SCSI Id. 't95sst-etl8-d0M2', Transfer Mode 'blockio', and a 'Map' button. On the right side, there is a 'Volumes section' with links for 'Manage Volumes', 'Volume Groups', 'Block Devices', 'Add Volume', 'iSCSI Targets', and 'Software RAID'. Below that, there is a 'Support resources' section with links for 'Report bug', 'Get support', 'Forums', and 'Admin Guide'.

Step 19 :

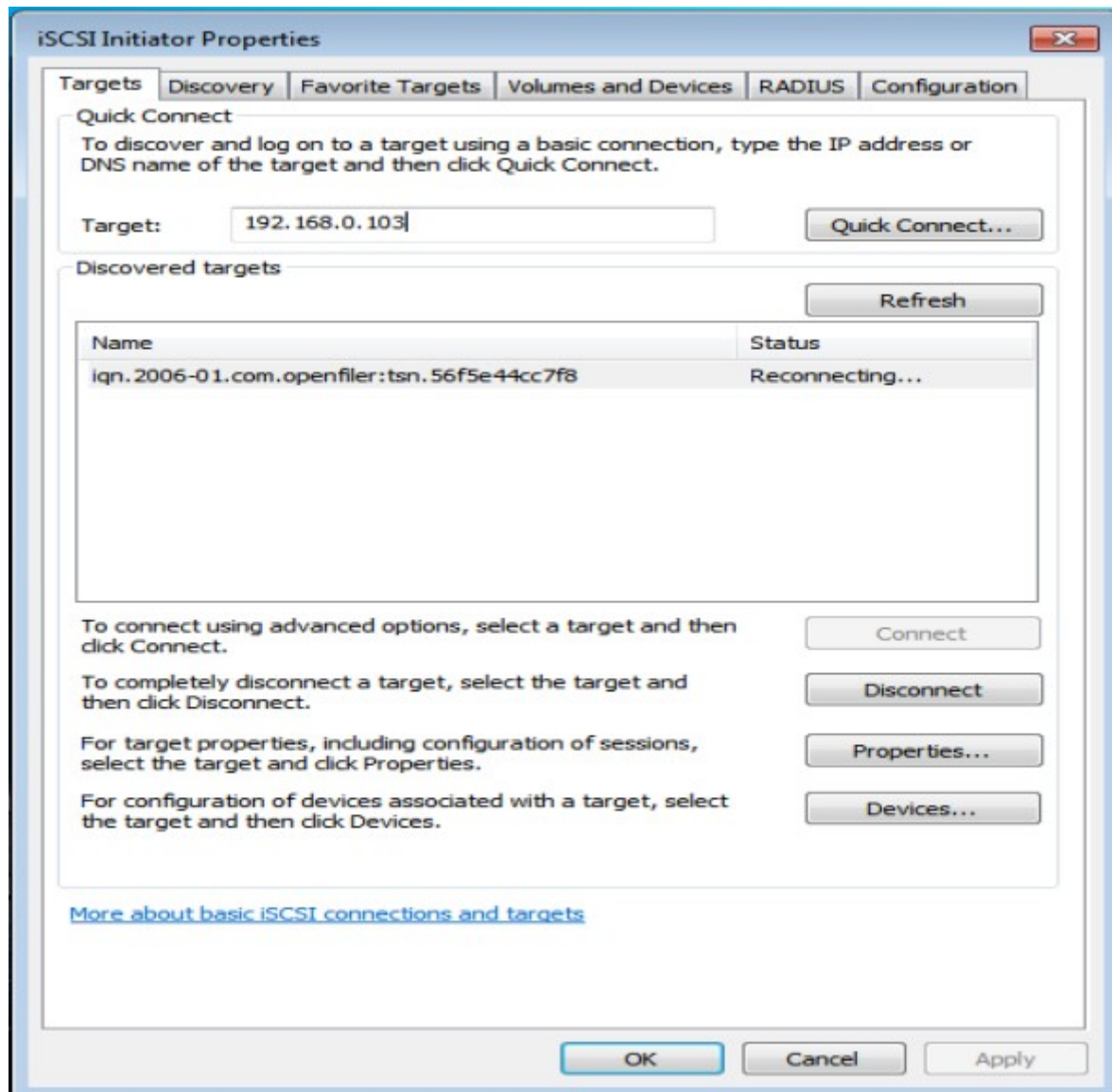
After mapping the volume then enable the access for the requests coming via incoming connections. Select **Allow** from the dropdown under **Access** column show below and click on **Update** button. That's it your iSCSI volume is ready to export now and accessed from another location.

The screenshot shows the 'iSCSI host access configuration for target "iqn.2006-01.com.openfiler:tsn.763ad3974bce"' page. The 'Network ACL' tab is selected. Below the title, there is a table with columns: Name, Network/Host, Netmask, and Access. The table contains one row with Name 'server', Network/Host '192.168.0.0', Netmask '255.0.0.0', and Access 'Allow'. Below the table, there is an 'Update' button. On the right side, there is a 'Volumes section' with links for 'Manage Volumes', 'Volume Groups', 'Block Devices', 'Add Volume', 'iSCSI Targets', and 'Software RAID'. Below that, there is a 'Support resources' section with links for 'Report bug', 'Get support', 'Forums', and 'Admin Guide'.

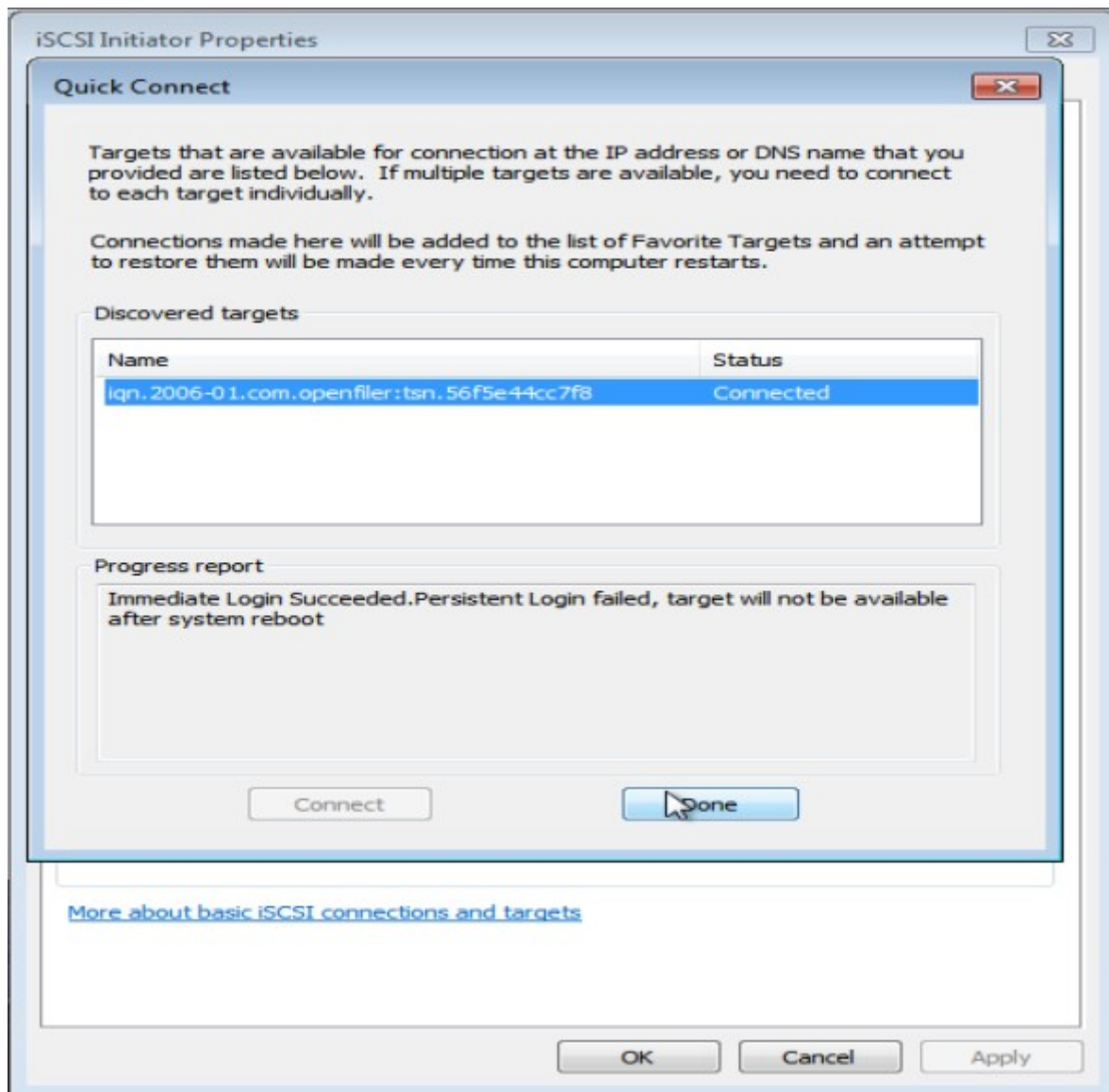
Step 20 : Go to control panel and open iSCSI initiator.



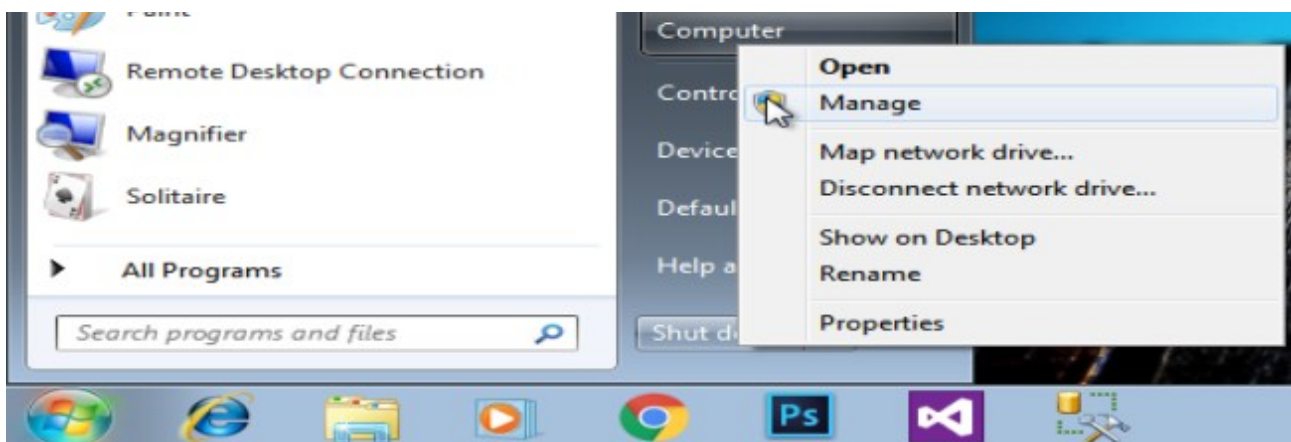
Step 21 : Enter the target ip address and click on **Quick connect**.



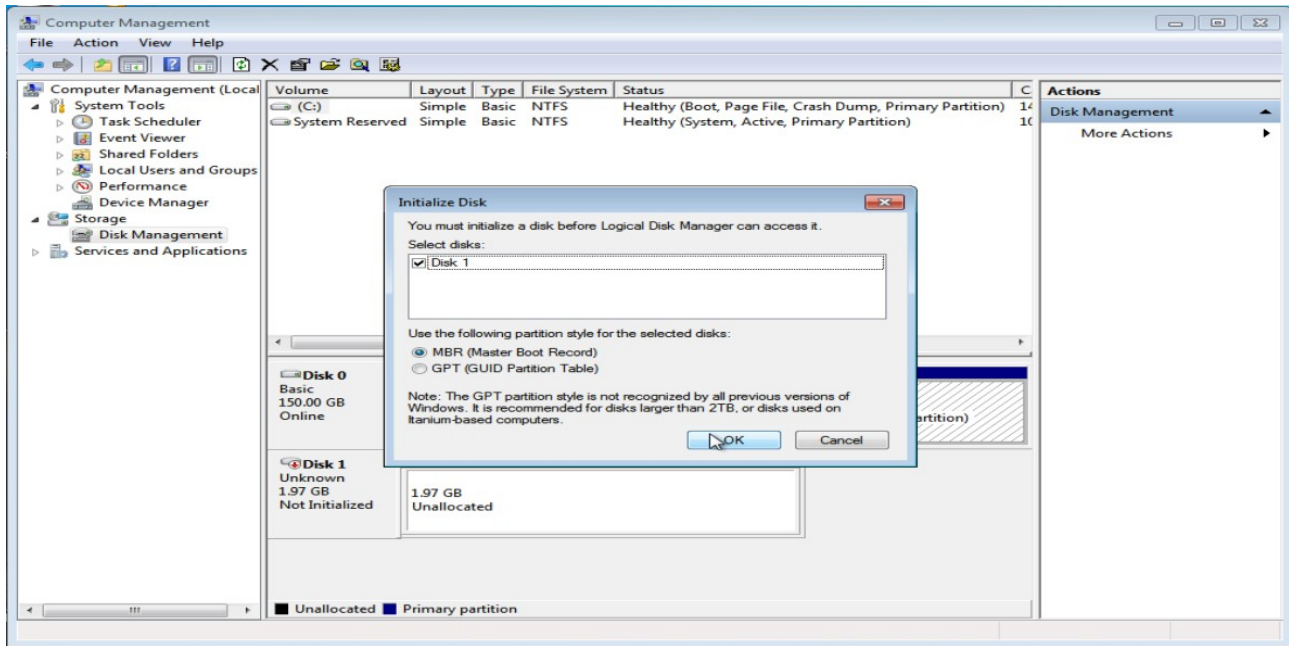
Step 22 : Your mapped iSCSI target names should appear here. Select the name and click Done.



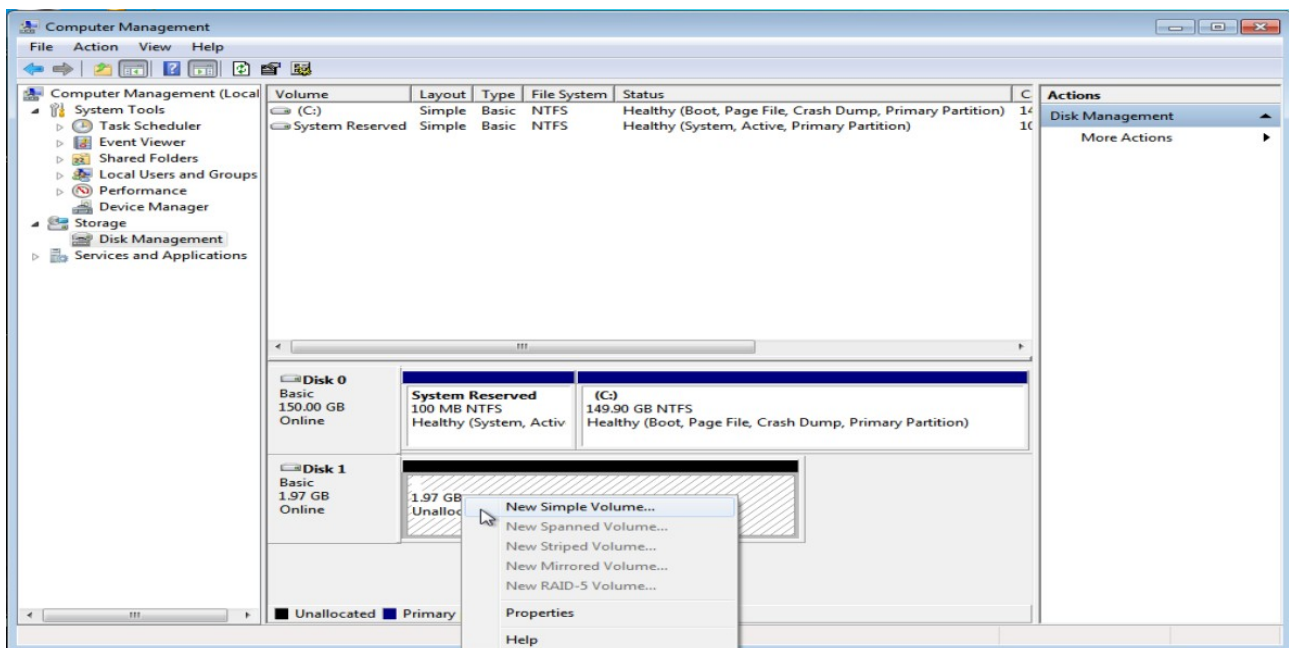
Step 23: Now open Computer Management window and check for the new disk added under Disk Management section. The new disk will be appear as unallocated space.



Step 24 :



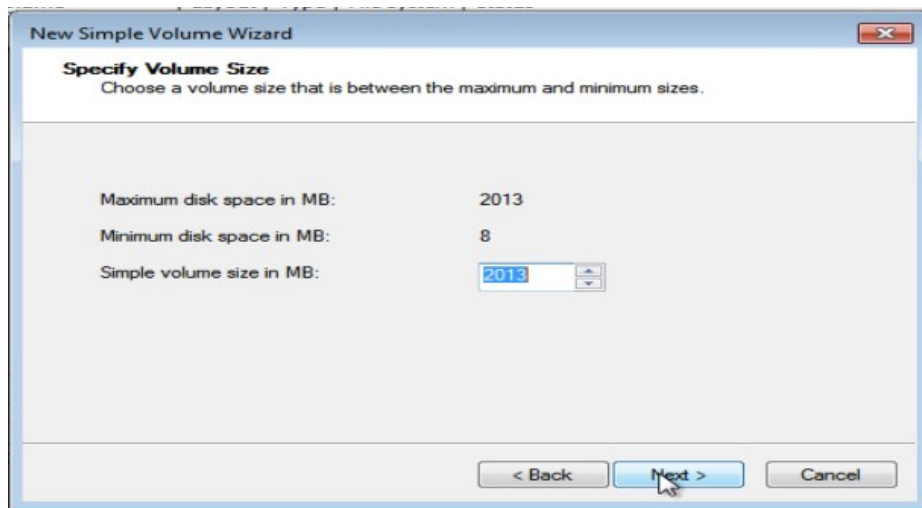
Step 25 : Perform the steps below to create a new volume to use from the unallocated space.



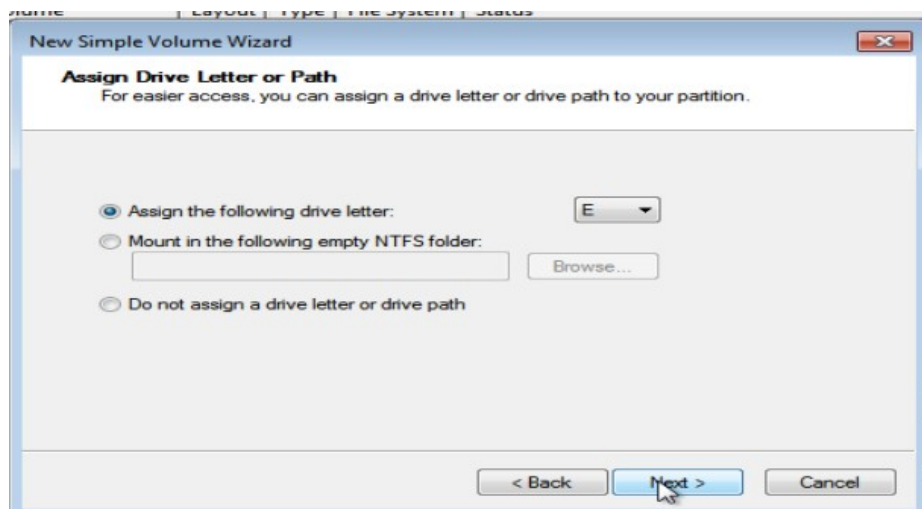
Step 26 :



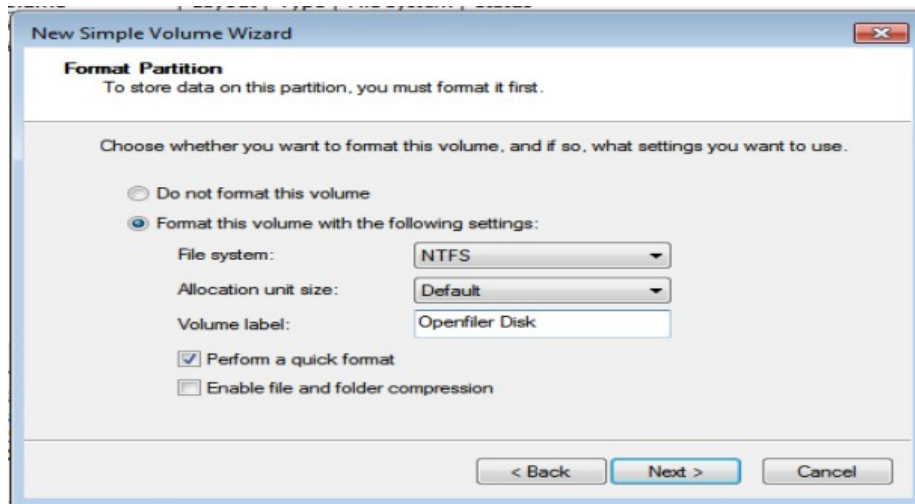
Step 27:



Step 28 :



Step 29:



Step 30 :



Step 31:

