openfiler

Openfiler Administration Guide

Version 2.9x

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About this Guide

Purpose of this Guide

This guide provides detailed information about the **Openfiler** Open Source Storage Management System.

Who should read this Guide

This guide is for administrators or users who have been assigned the task of managing and configuring **Openfiler**.

Typographical Conventions

This guide complies with the following typographical conventions:

Typeface	Meaning
Hyperlinked References	References to hyperlinked topics within and outside this guide.
Bold	Menus and menu options, input fields, radio buttons, check boxes, drop-down lists, tabs, buttons, links, and messages displayed on the page.
CAPS	Keys on the keyboard.
`Constant Width`	Program codes, files and directory names, function names, and sample outputs.
`Constant width`	Specific text entered by the user.
	A note, providing additional information about a certain topic.
	A warning.
	A checkpoint during the installation process, used to ensure that the installation is working as expected.
	An important message not to be ignored.

How to get in Touch

The following sections provide information on how to obtain support for the documentation and the software.

Documentation Support

Openfiler Ltd welcomes your comments and suggestions on the quality and usefulness of this document. For any questions, comments, or suggestions on the documentation, you can contact us by e-mail at info@**openfiler**.com.

Customer Support

If you have any problems, questions, comments, or suggestions regarding the **Openfiler** Opensource Storage Management product, contact us by e-mail at info@**openfiler**.com.

1 Installing Openfiler

This chapter provides detailed information on how to perform the Openfiler installation. The Openfiler installation can be done in two methods:

- Text Based Installation
- Graphical Installation

1.1 Text-based Installation

This section provides detailed information on how to install Openfiler using the text-based installation.

1.1.1 System Requirements

Openfiler is compatible with 64-bit industry standard server hardware. It can also be installed in a virtual machine environment as a guest OS in Citrix XenServer, Oracle Virtualbox and VMware vSphere/ESXi.

1.1.1.1 Hardware Requirements

- x64 based computer with at least 1GB RAM and 8GB storage for the OS image.
- At least one supported network interface card
- A CDROM or DVD-ROM drive if you are performing a local install
- A supported disk controller with data drives attached.

1.1.1.2 Bare Metal Installation

Minimum Specifications:

- 64-bit 1.6GHz or higher performance processor*
- 1GB or higher of RAM
- 512MB disk space for memory swap area
- 8.2 GB disk space for Openfiler OS installation
- 100 Mb Ethernet network interface
- Separate storage volumes/disks for data export

Recommended Specifications:

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

1.1.1.3 Virtualization Installation

VMware specifications:

- 64-bit VMware hypervisor
- VMware Player, VMware Server, VMware ESX compatible
- Symbios or Buslogic virtual SCSI disk driver
- IDE virtual disk driver
- 1GB minimum virtual RAM
- Virtual network interface

Citrix XenServer or Parallels specifications:

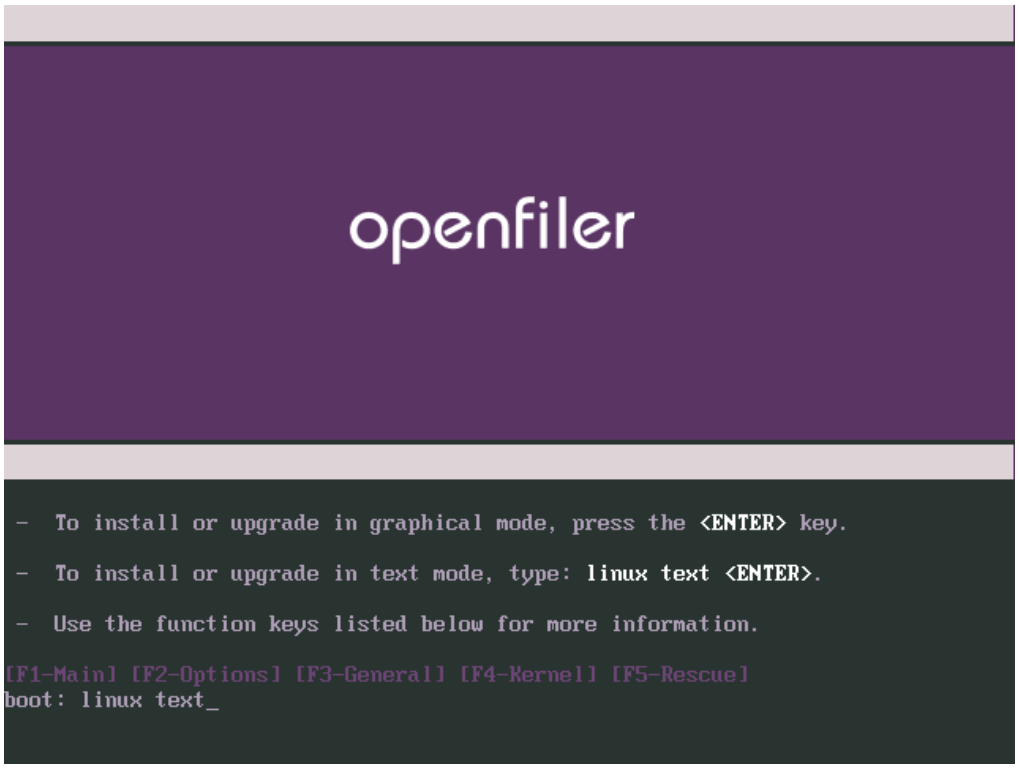
- 64-bit hypervisor / VMM
- Raw, LVM, or virtual block device
- 1GB minimum virtual RAM
- Virtual network interface

Note:

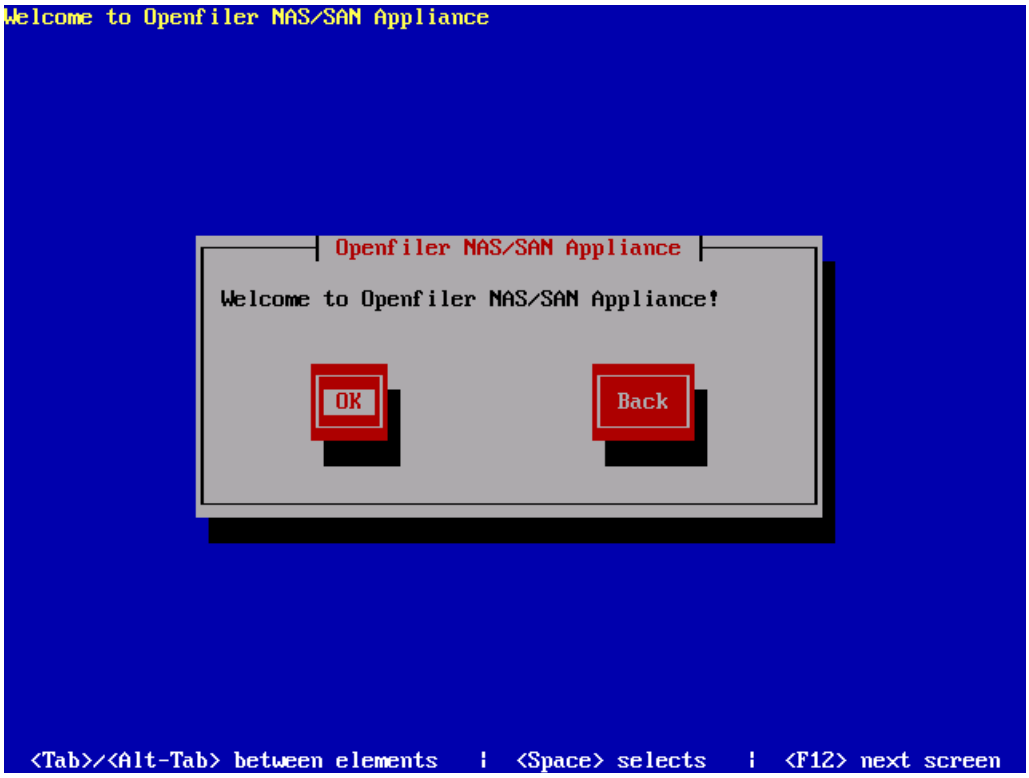
The installation process is described with screenshots for illustrative purposes. If you are unable to proceed at any point with the installation process or you make a mistake, use the Back button to return to previous points in the installation process. Any errors or intractable problems with the installation process should be reported either to the Openfiler Users mailing list or, alternatively, if you feel you have found a bug please use the bug tracking system. If you report a bug, be sure to enter a valid email address so that you can keep track of any updates to it right up to resolution. You *must* first register with the bug tracker in order to be able to post a new bug.

1.1.2 Starting the Installation

To begin the installation, insert the Openfiler disk into your CD/DVD-ROM drive and ensure your system is configured to boot off the CD/DVD-ROM drive. After the system POSTs, the installer boot prompt will come up. At this point, since we are performing a text-based installation, **type in "linux text" at the prompt** and hit the Enter key to proceed.

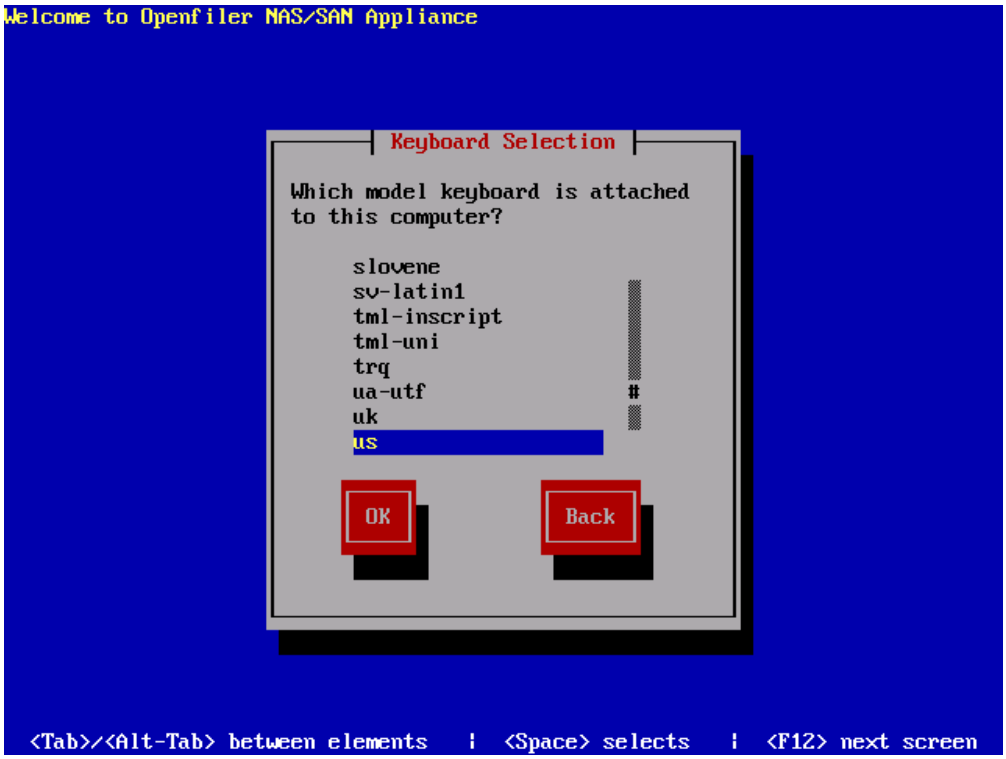


After a few moments, the first screen of the installer will be presented. The first screen of the installer is depicted below. Navigation between options is done using the arrow keys and the "Tab" key on the keyboard. Use the tab or arrow keys to move between form options and action buttons. Navigate to the "OK" button and hit Enter to proceed.



1.1.2.1 Keyboard Selection

This screen deals with keyboard layout selection. Use the arrow keys on your keyboard to select keyboard layout from the list. Once you are satisfied with your selection, use the Tab key on your keyboard to navigate to the "OK" button then hit Enter on your keyboard.



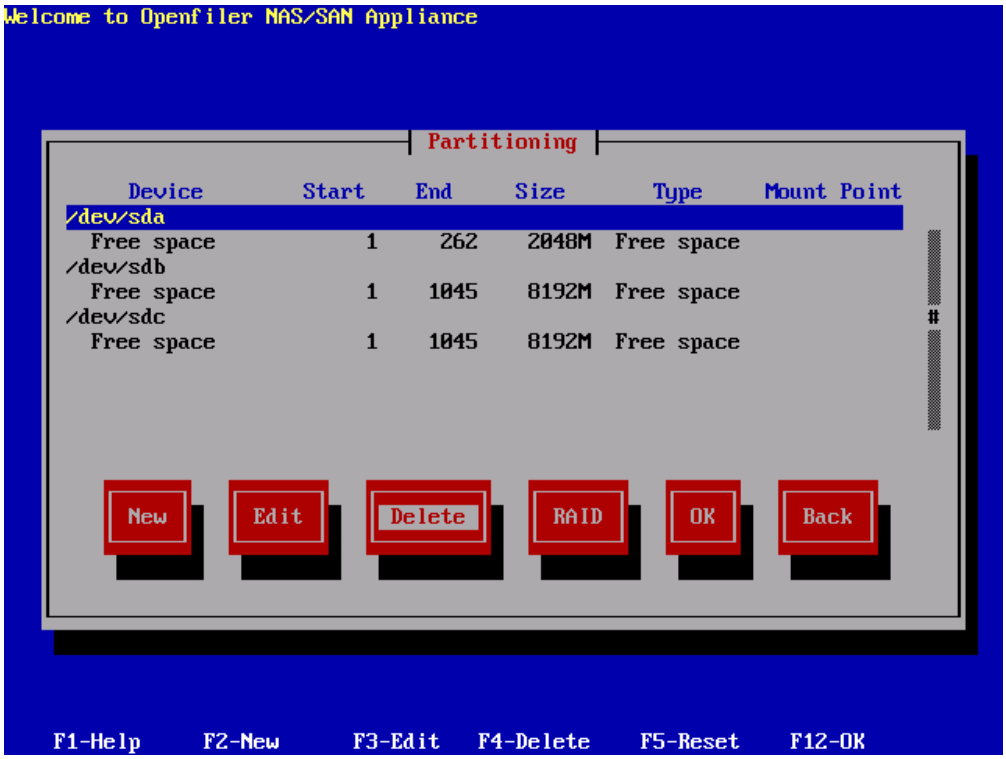
1.1.2.2 Disk Partitioning Setup

Next comes the disk partitioning. You must select Disk Druid manual disk partitioning as it ensures you will end up with a bootable system and with the correct partitioning scheme. ***Openfiler does not support automatic partitioning and you will be unable to configure data storage disks in the Openfiler graphical user interface if you select automatic partitioning.*** Highlight the "Disk Druid" button by navigating to it with keyboard arrow keys or the keyboard Tab button. Once it is highlighted, hit Enter to proceed.

1.1.2.3 Disk Setup

On the disk setup screen, if you have any existing partitions on the system, please delete them. ***DO NOT DELETE ANY EXISTING OPENFILER DATA PARTITIONS UNLESS YOU NO LONGER REQUIRE THE DATA ON THEM***. To delete a partition, highlight it in the list of partitions using the Tab / arrow keys, then navigate to the action buttons using the Tab key. Once the Delete button is highlighted, hit Enter to perform the desired action.

You should now have a clean disk on which to create your partitions. The following illustrates a configuration with three SCSI disks ready to be partitioned:

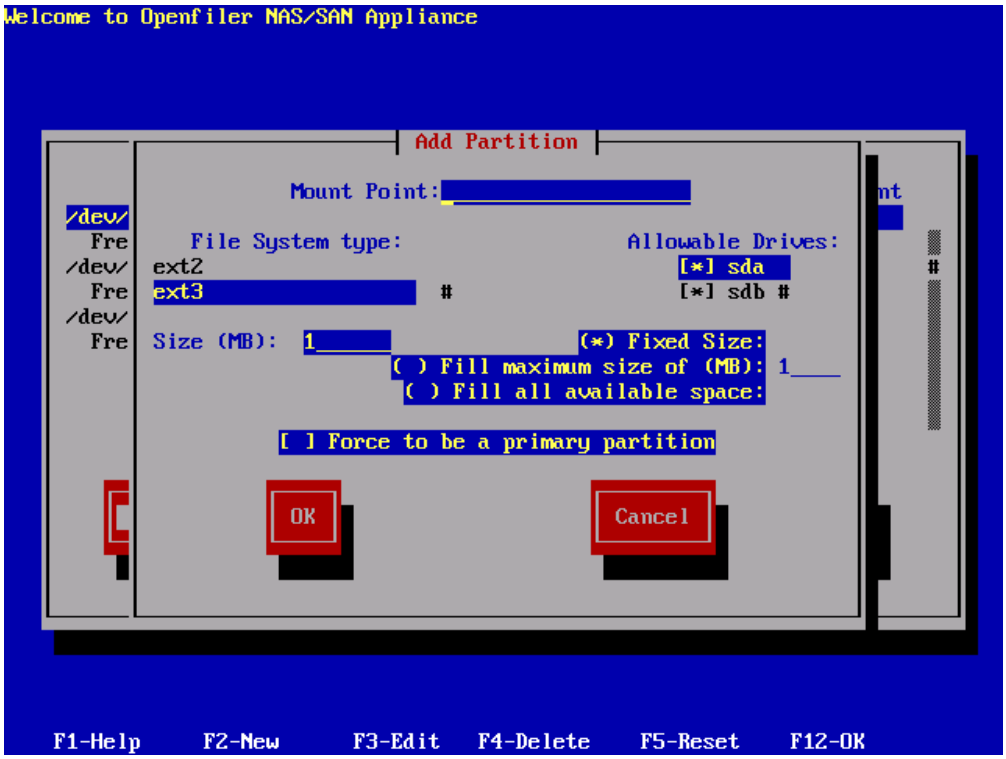


You need to create three partitions on the system in order to proceed with the installation:

- "**/boot**" **-** this is where the kernel will reside and the system will boot from
- "**swap**" - this is the swap partition for memory swapping to disk
- "/"- this is the system root partition where all system applications and libraries will be installed

1.1.2.4 Create /boot Partition

You will be presented with a form with several fields and checkboxes. Enter the partition mount path "/boot" and the select the disk on with to create the partition. In the illustrated example, this disk is *hda* (the first IDE hard disk). Your setup will very likely be different as you may have several disks of different types. You should make sure that only the first disk is checked and no others. If you are installing on a SCSI-only system, this disk will be designated *sda*. If you are installing on a system that has both IDE and SCSI disks, please select *hda* if you intend to use the IDE disk as your boot drive.



The following is a list of all entries required to create the boot partition:

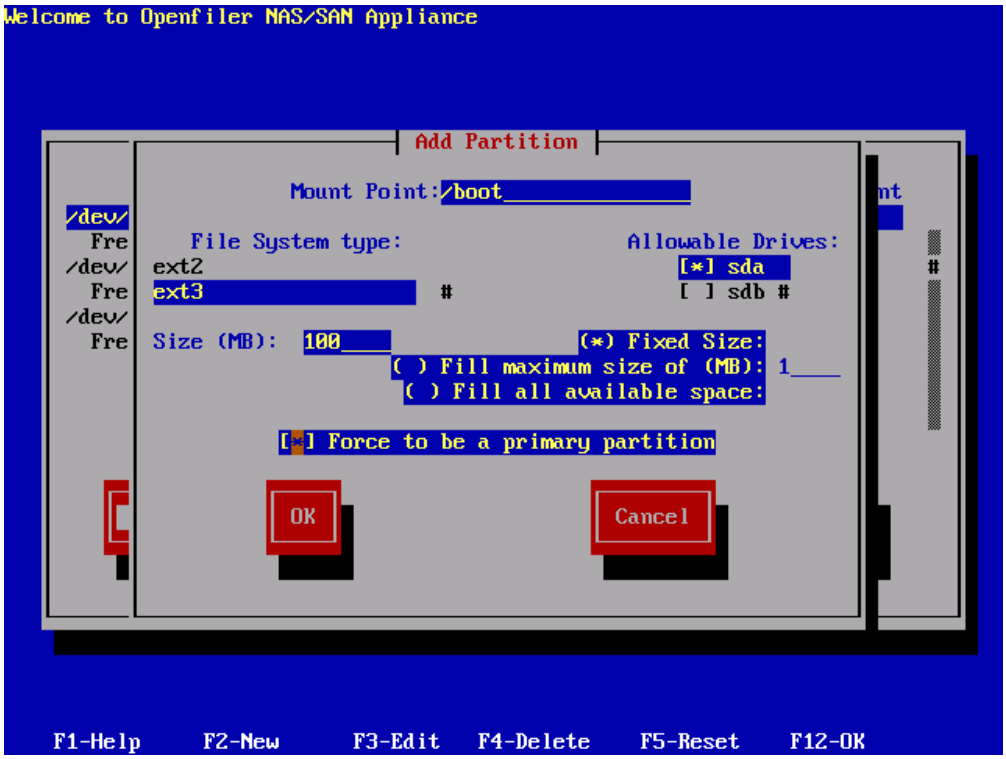
- Mount Point: /boot
- Filesystem Type: ext3
- Allowable Drives: select *one* disk only. This should be the first IDE (*hda*) or first SCSI disk (*sda*)
- Size(MB): 100 (this is the size in Megabytes, allocate 100MB by entering "100")
- Additional Size Options: select Fixed Size radiobutton from the 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 boot partition:

- Navigate to the *New* action button using the keyboard arrow keys and hit enter
- In the new dialog window, type in "/boot" in the Mount Point form field
- Use the tab key to navigate to the "Allowable Drives" dropdown list and select only the first drive using **space bar** or Enter key on your keyboard
- Use the tab key to navigate to the next form field (Size) and type in "100" (for 100MB)

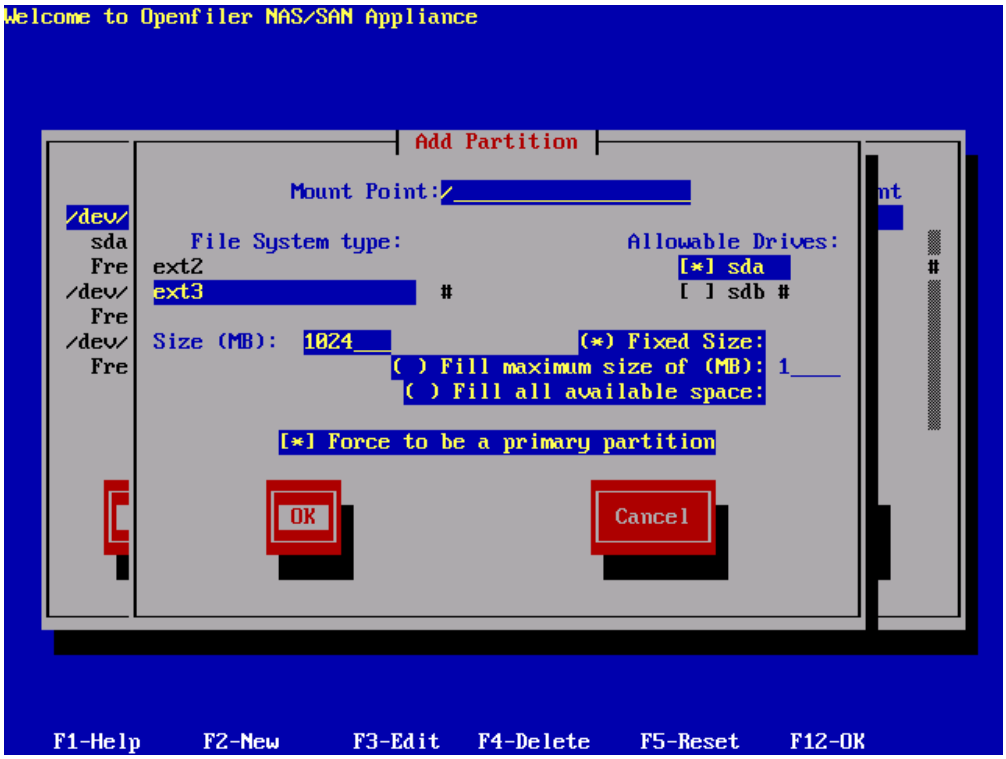
- Use the tab key to navigate to the next form field and ensure "Fixed Size" is checked and the other options in that section are not
- Use the tab key to navigate to the next form field and ensure "Force to be primary partition" is checked
- Use the tab key to navigate to the *OK* action button and hit Enter, which will create the new partition

After configuration, your settings should resemble the following illustration:



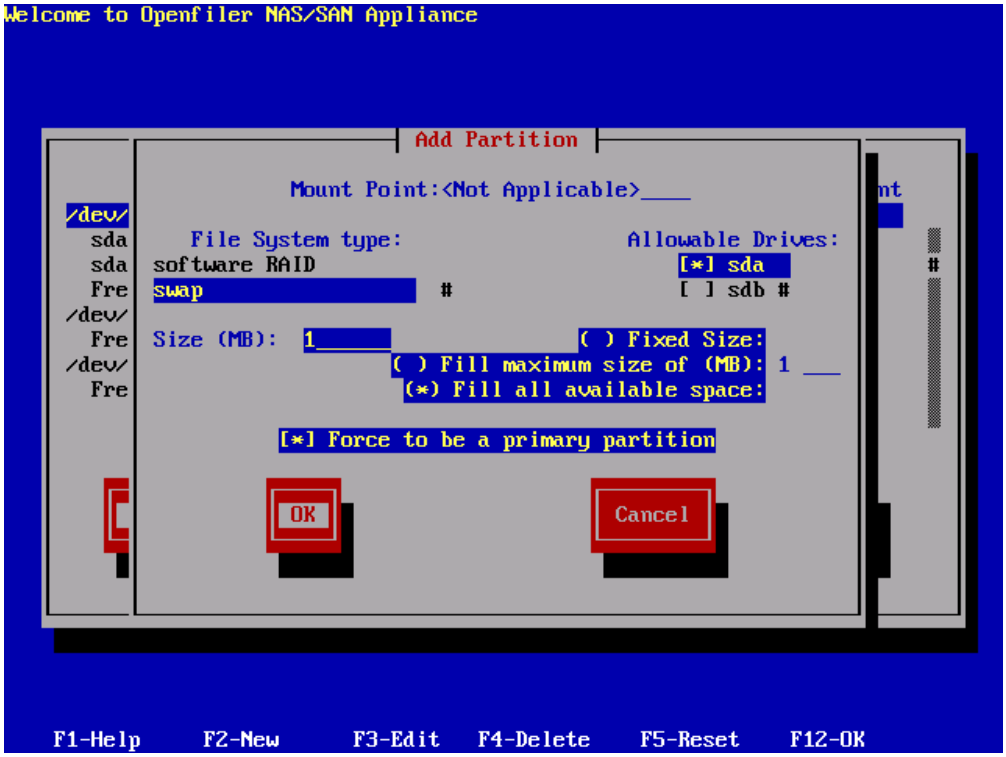
1.1.2.5 Create / (root) Partition

Proceed by creating a *root* partition. Click on the *New* button. You will be presented with the same form as previously when creating the boot partition. 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.

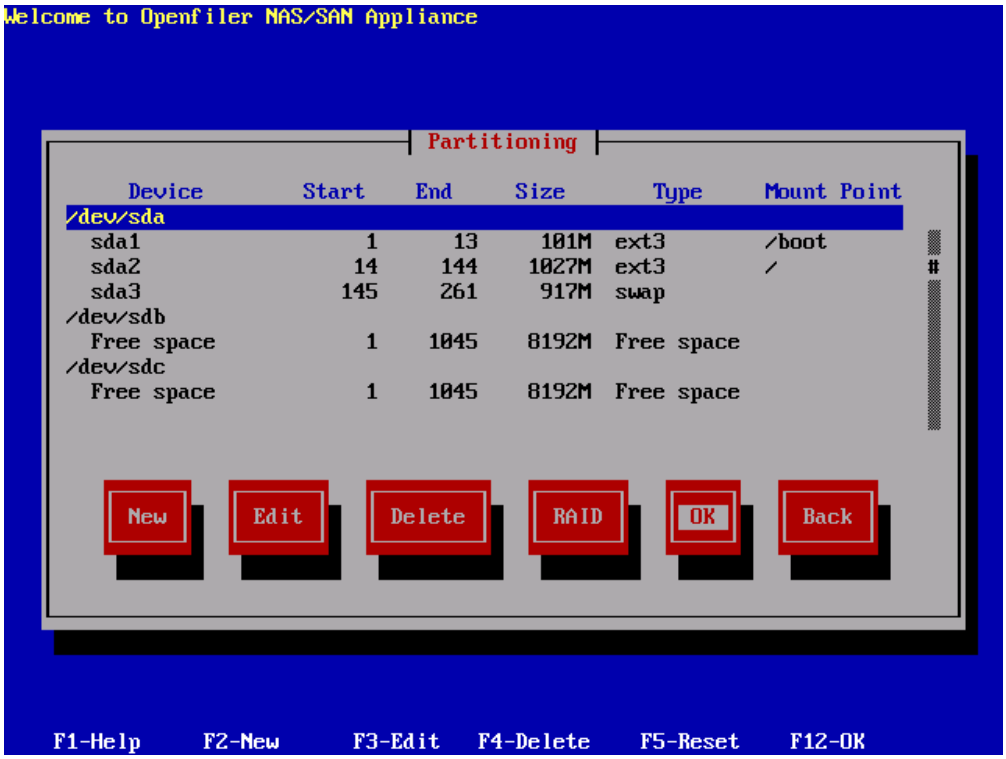


1.1.2.6 Create Swap Partition

Proceed by creating a *swap* partition. Navigate to the *New* action button and hit Enter. You will be presented with the same form as previously when creating the boot and root partitions. The details are identical to what was entered for the *boot* partition except this time the File System Type: should *be* ***swap*** (mount point will automatically be disabled for that filesystem type). Use the drop down list to select a swap partition type. The Size(MB): of the partition should be at least 1024MB and need not exceed 2048MB.



Complete the creation of the swap partition as normal. The partition scheme should now resemble the following depiction:



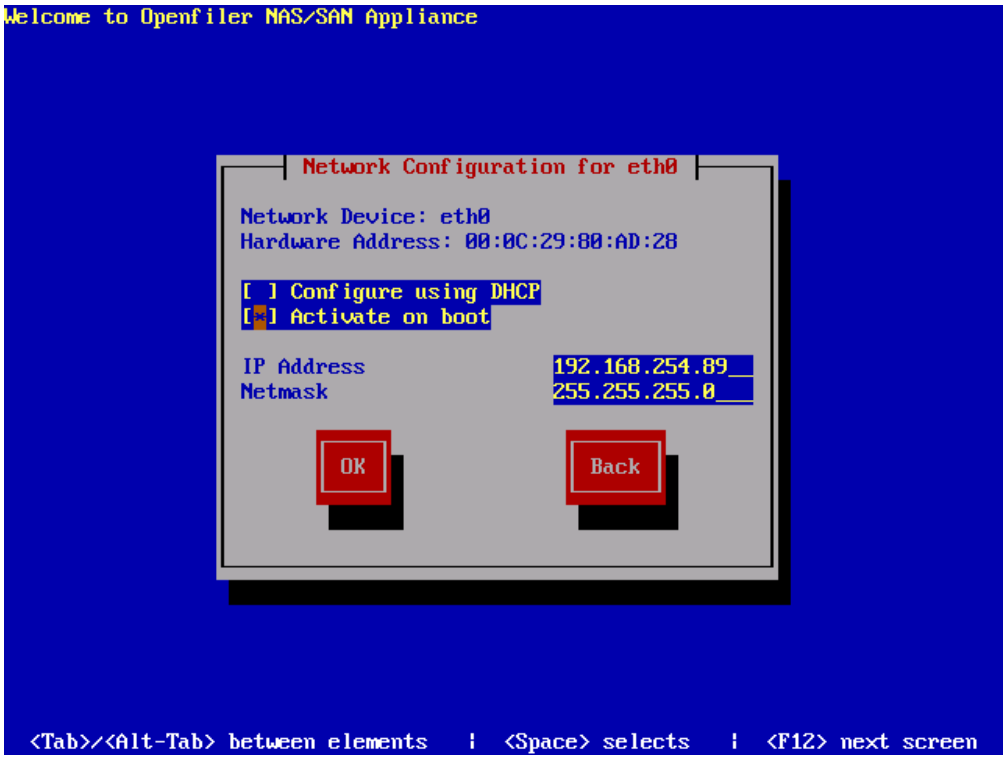
You have now completed the partitioning tasks of the installation process and should click Next to proceed to the next step.

1.1.3 Network Configuration

In this section you will configure network devices, system hostname and DNS parameters. You will need to configure at least one network interface card in order to access the Openfiler web interface and to serve data to clients on a network. In the unlikely event that you will be using DHCP to configure the network address, you can simply select *OK* and proceed to the next stage of the installation process.

If on the other hand you wish to define a specific IP address and hostname, uncheck the "Configure using DHCP" option. Network interface devices are designated eth*X* where *X* is a number starting at 0. The first network interface device is therefore *eth0*. If you have more than one network interface device, they will all be listed in the Network Devices section.

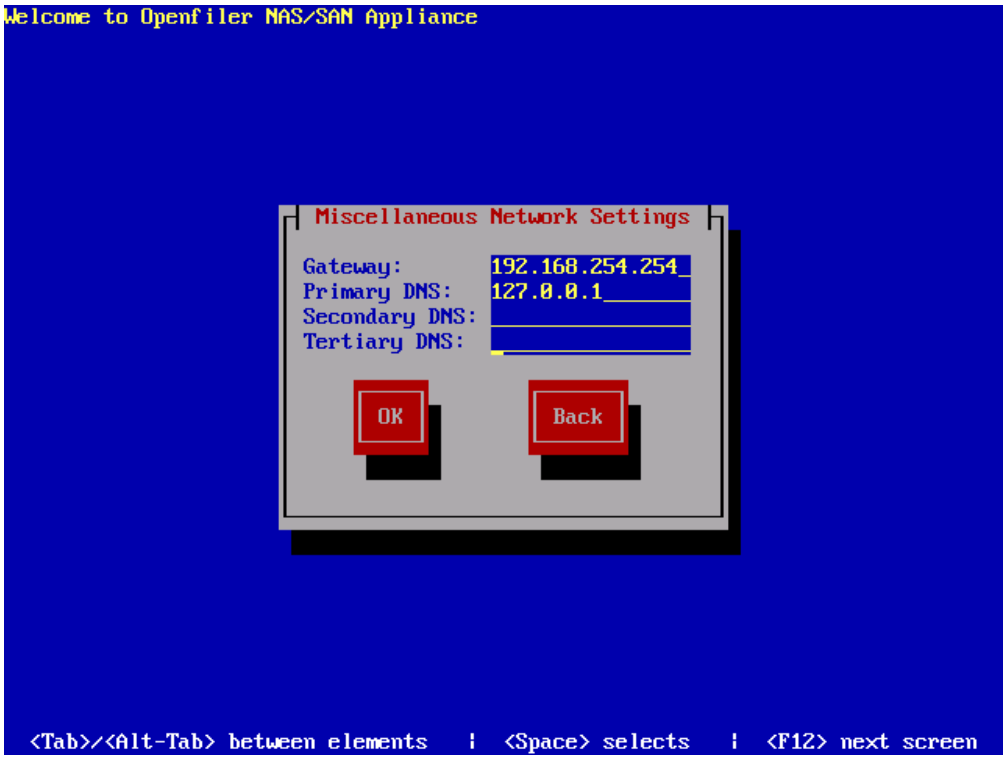
When you deselect DHCP support, you then have the ability to configure the network device in question with options to enter a network IP address and Netmask in the appropriate form fields. Enter your desired settings and select OK to proceed.

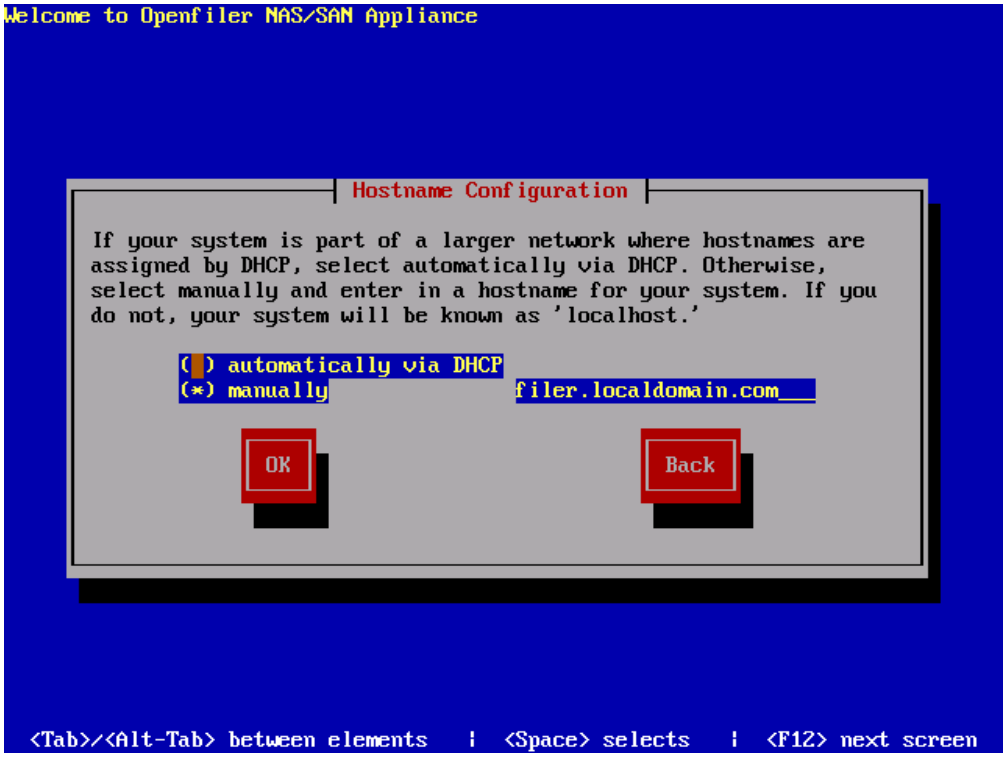


Once you have configured a network IP address, you may now enter a hostname for the system. The default hostname *localhost.localdomain* is not suitable and you will need to enter a proper hostname for the system. This will be used later when you configure the system to participate on your network either as an Active Directory / Windows NT PDC client or as an LDAP domain member server. You will also, at this point, need to configure gateway IP address and DNS server IP addresses. To complete this task you will need the following information:

- Desired hostname - this is the name you will call the system. Usually this will be a fully qualified hostname e.g homer.the-simpsons.com .
- Gateway IP address - this is the IP address of your network gateway to allow routing to the Internet
- Primary DNS Server - this is the DNS server on your network. Note that if you intend to use Active Directory or LDAP as your authentication mechanism, you will need to assign a functional DNS IP address so that the authentication mechanism is able to resolve the authentication server hostnames.
- Secondary/Tertiary DNS Server - enter a second and third DNS server if they are available on your network.

The following illustration shows an example where a hostname has been assigned, and gateway IP, primary and secondary DNS information has also been entered.

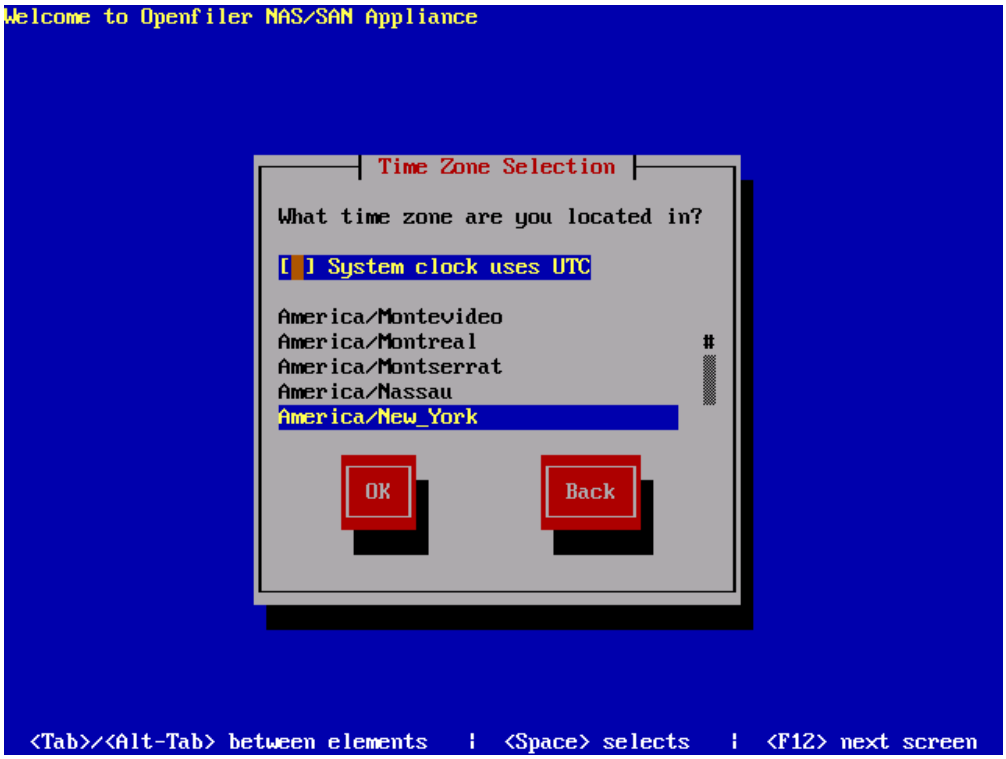

Welcome to Openfiler NAS/SAN Appliance
Miscellaneous Network Settings
Gateway: 192.168.254.254
Primary DNS: 127.0.0.1
Secondary DNS:
Tertiary DNS:
OK
Back
<Tab>/<Alt-Tab> between elements | <Space> selects | <F12> next screen


Welcome to Openfiler NAS/SAN Appliance
Hostname Configuration
If your system is part of a larger network where hostnames are assigned by DHCP, select automatically via DHCP. Otherwise, select manually and enter in a hostname for your system. If you do not, your system will be known as 'localhost.'
( ) automatically via DHCP
(*) manually
filer.localdomain.com
OK
Back
<Tab>/<Alt-Tab> between elements | <Space> selects | <F12> next screen

Once you are satisfied with your entries, please proceed to the next section of the installation process.

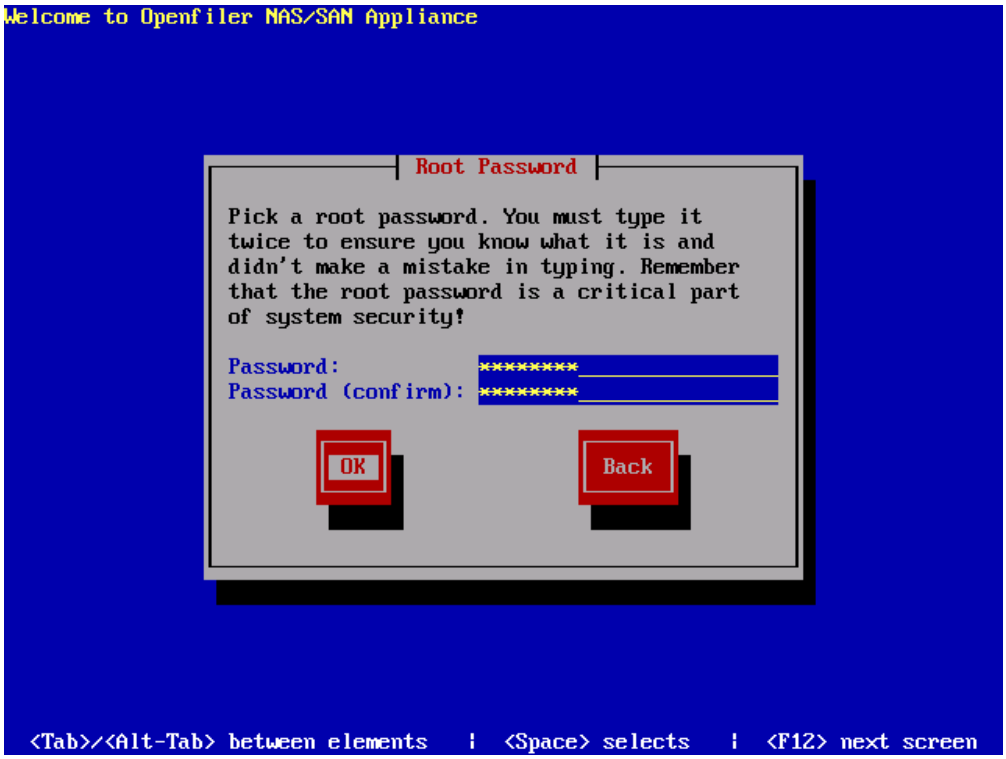
1.1.4 Time Zone Selection

Set the default system time zone. You can achieve this by following the instructions on the left side of the screen. If your system BIOS has been configured to use UTC, check the UTC checkbox at the top of the screen and select *OK* to proceed.



1.1.5 Set Root Password

You need to configure a root password for the system. The root password is the superuser administrator password. With the root account, you can log into the system to perform any administrative tasks that are not offered via the web interface. Select a suitable password and enter it twice in the provided textboxes. When you are satisfied with your entries, select *OK* to proceed with the installation process.

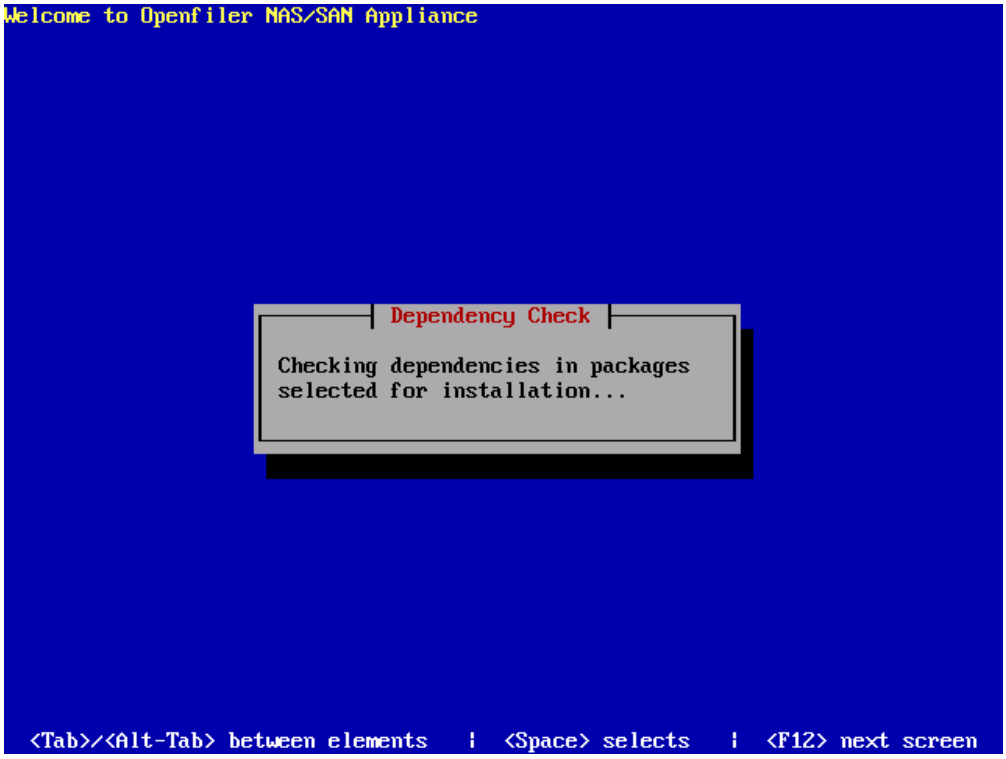


Note:

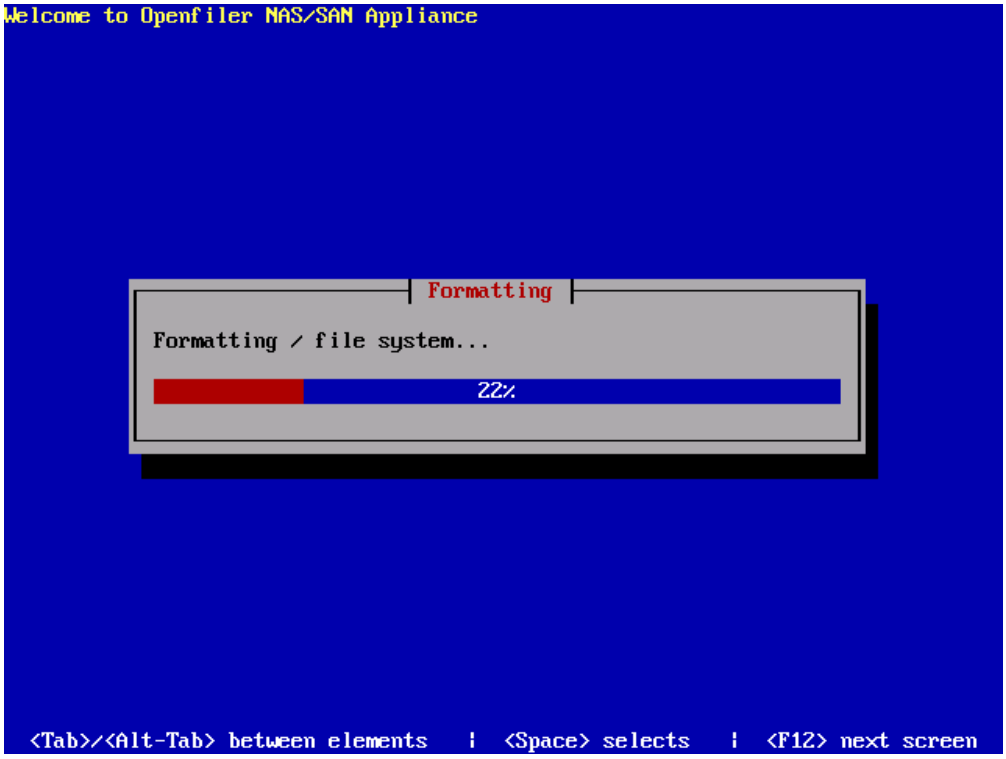
The root password is meant for logging into the console of the Openfiler server. The default username and password for the Openfiler web management GUI are: "openfiler" and "password" respectively.

You cannot go back to previous screens once you have gone past this point. The installer will erase any data on the partitions you defined in the partitioning section.

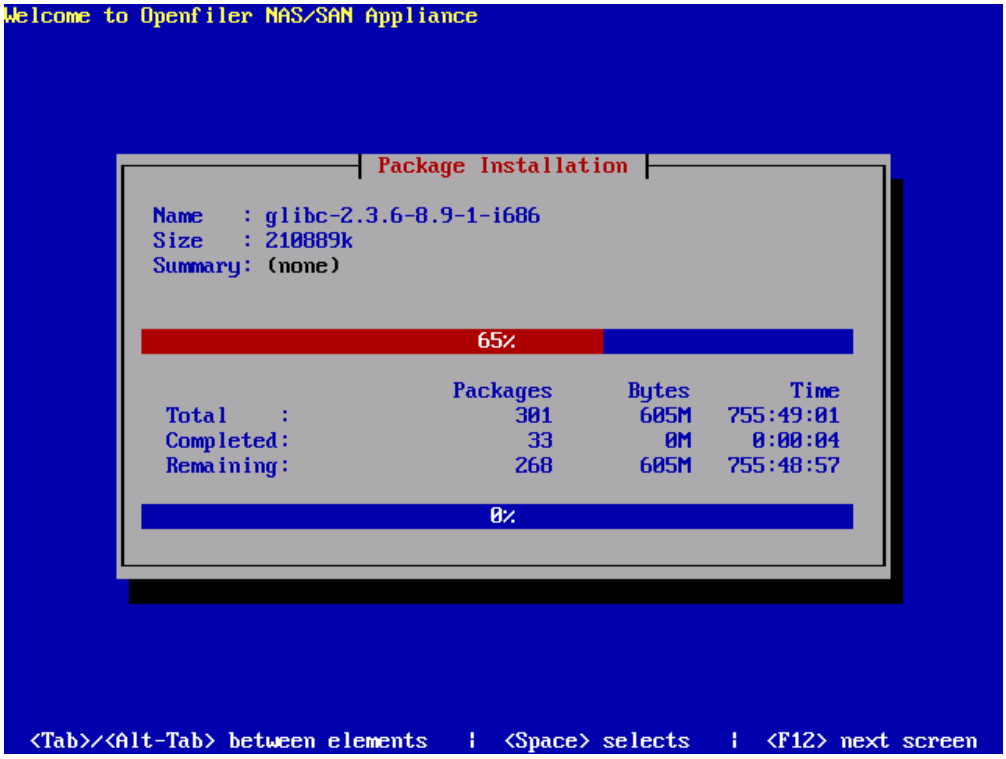
1.1.5.1 Checking dependencies:



1.1.5.2 Formatting file systems:

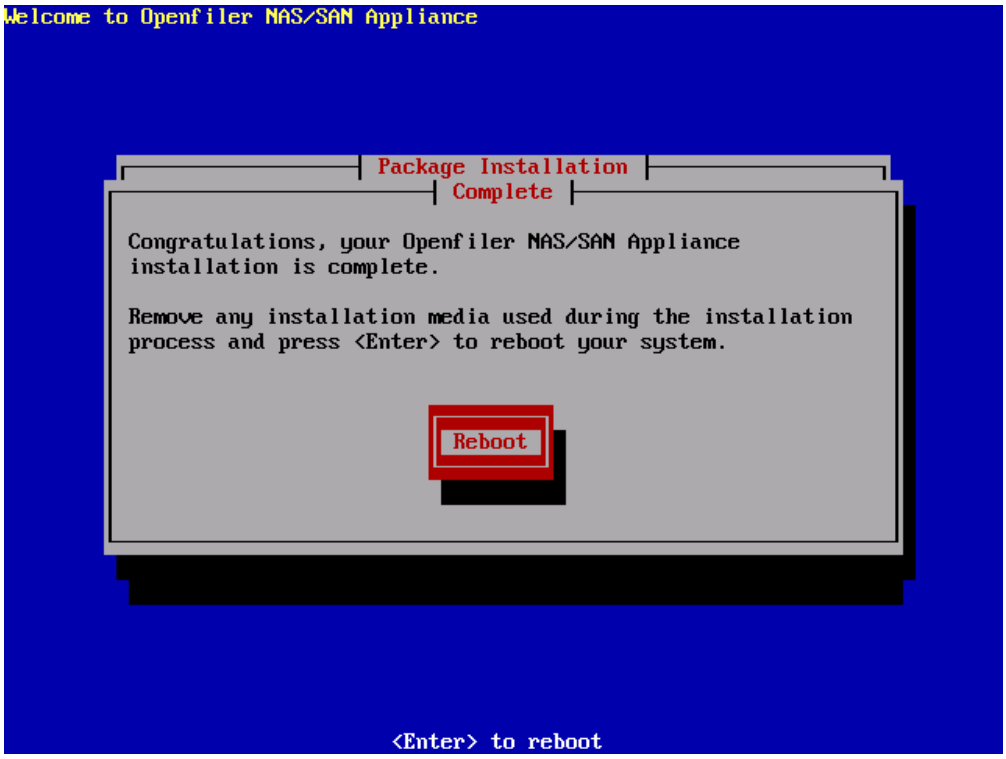


1.1.5.3 Package Installation:



1.1.6 Installation Complete

Once the installation has completed, you will be presented with a congratulatory message. At this point you simply need to click the Reboot button to finish the installer and boot into the installed Openfiler system.



Note:

After you select Reboot remove the installation CD from the CD/DVD-ROM drive.

Once the system boots up, start configuring Openfiler by pointing your browser at the host name or IP address of the Openfiler system. The interface is accessible from https port 446. e.g.. https://homer.the-simpsons.com:446

Management Interface: https://<ip of openfiler host>:446

Administrator Username: Openfiler

Administrator Password: password

1.2 Graphical Installation

This section provides detailed information on how to install Openfiler using the standard graphical-based installation method.

1.2.1 Introduction

This document describes the process of installing Openfiler using the default graphical installation interface. If you experience any problems with the graphical install track, such as a garbled screen due to the installer not being able to auto-detect your graphics hardware, please try a text-based install.

Total time for installation is about 15 - 20 minutes including software installation to disk.

1.2.2 System Requirements

Openfiler has the following hardware requirements to be successfully installed:

- x64 based computer with at least 1GB RAM and 8.2GB storage for the OS image.
- At least one supported network interface card
- A CDROM or DVD-ROM drive if you are performing a local install
- A supported disk controller with data drives attached.

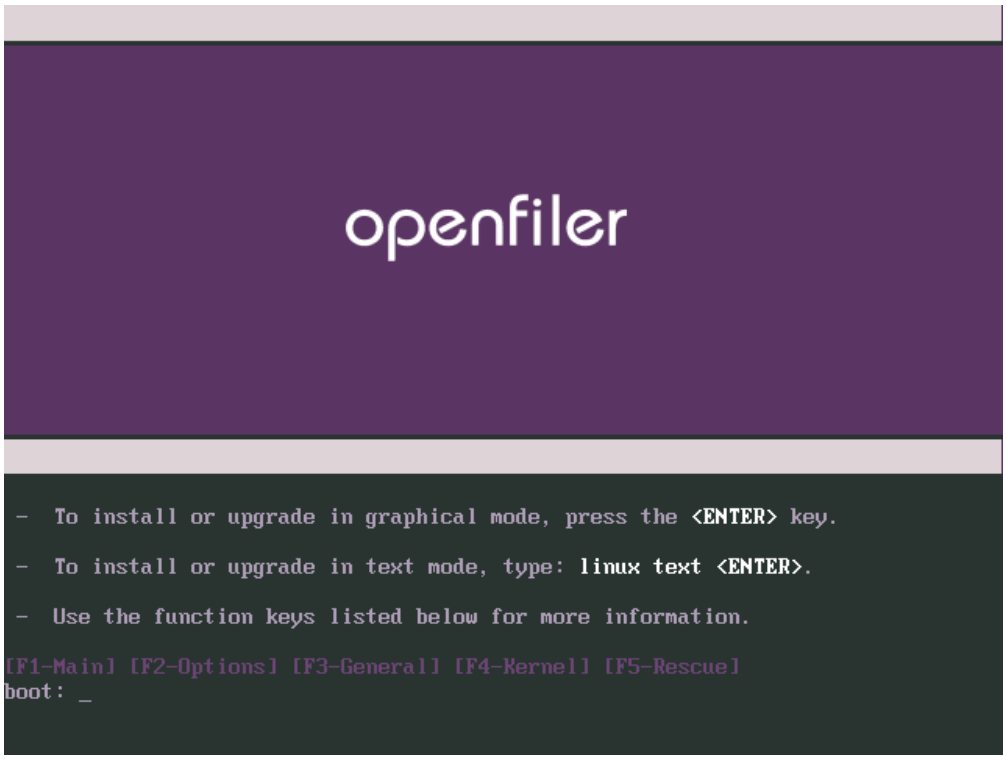
Note:

The installation process is described with screenshots for illustrative purposes. If you are unable to proceed at any point with the installation process or you make a mistake, use the Back button to return to previous points in the installation process. Any errors or intractable problems with the installation process should be reported either to the Openfiler Users mailing list or, alternatively, if you feel you have found a bug please use the bug tracking system. If you report a bug, be sure to enter a valid email address so that you can keep track of any updates to it right up to resolution. You *must* first register with the bug tracker in order to be able to post a new bug.

1.2.3 Starting the Installation

To begin the installation, insert the Openfiler disk into your CD/DVD-ROM drive and ensure your system is configured to boot off the CD/DVD-ROM drive. After the system

POSTs, the installer boot prompt will come up. At this point, just hit the Enter key to proceed.



After a few moments, the first screen of the installer will be presented. If at this point your screen happens to be garbled, it is likely that the installer has been unable to automatically detect your graphics subsystem hardware. You may restart the installation process in *text-mode* and proceed accordingly in that case. The first screen of the installer is depicted below. The next step is to click on the Next button to proceed with the installation.

1.2.4 Keyboard Selection

This screen deals with keyboard layout selection. Use the scroll bar on the right to scroll up and down and select your desired keyboard layout from the list. Once you are satisfied with your selection, click the Next button to proceed.

1.2.5 Disk Partitioning Setup

Next comes the disk partitioning. You must select manual disk partitioning as it ensures you will end up with a bootable system and with the correct partitioning scheme. ***Openfiler does not support automatic partitioning and you will be unable to configure data storage disks in the Openfiler graphical user interface if you select automatic partitioning.*** Click the Next button once you have selected the correct radiobutton option.

1.2.5.1 Disk Setup

On the disk setup screen, if you have any existing partitions on the system, please delete them. ***DO NOT DELETE ANY EXISTING OPENFILER DATA PARTITIONS UNLESS YOU NO LONGER REQUIRE THE DATA ON THEM***. To delete a partition, highlight it in the list of partitions and click the Delete button. You should now have a clean disk on which to create your partitions.

You need to 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
- "**swap**" - this is the swap partition for memory swapping to disk
- "/"- this is the system root partition where all system applications and libraries will be installed

1.2.5.2 Create /boot Partition

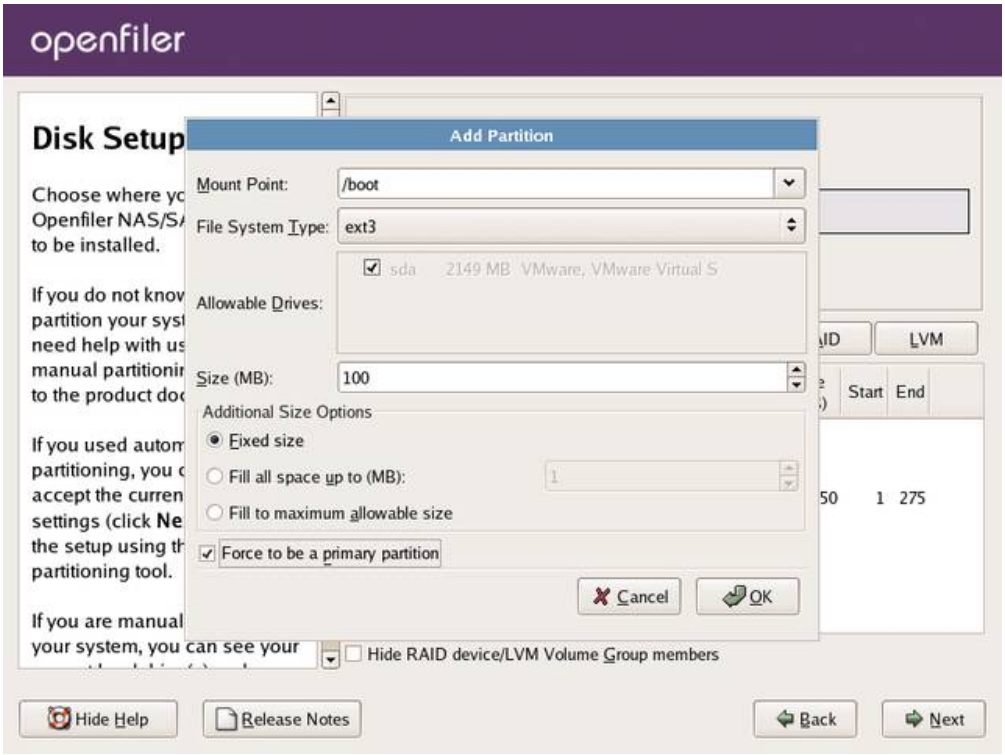
Proceed by creating a boot partition. Click on the New button. You will be presented with a form with several fields and checkboxes. Enter the partition mount path "/boot" and the select the disk on with to create the partition. In the illustrated example, this disk is *hda* (the first IDE hard disk). Your setup will very likely be different as you may have several disks of different types. You should make sure that only the first disk is checked and no others. If you are installing on a SCSI-only system, this disk will be designated *sda*. If you are installing on a system that has both IDE and SCSI disks, please select *hda* if you intend to use the IDE disk as your boot drive.

The following is a list of all entries required to create the boot partition:

- Mount Point: /boot

- Filesystem Type: ext3
- Allowable Drives: select *one* disk only. This should be the first IDE (*hda*) or first SCSI disk (*sda*)
- Size(MB): 250 (this is the size in Megabytes, allocate 250MB by entering "250")
- Additional Size Options: select Fixed Size radiobutton from the options.
- Force to be a primary partition: checked (select this checkbox to force the partition to be created as a primary partition)

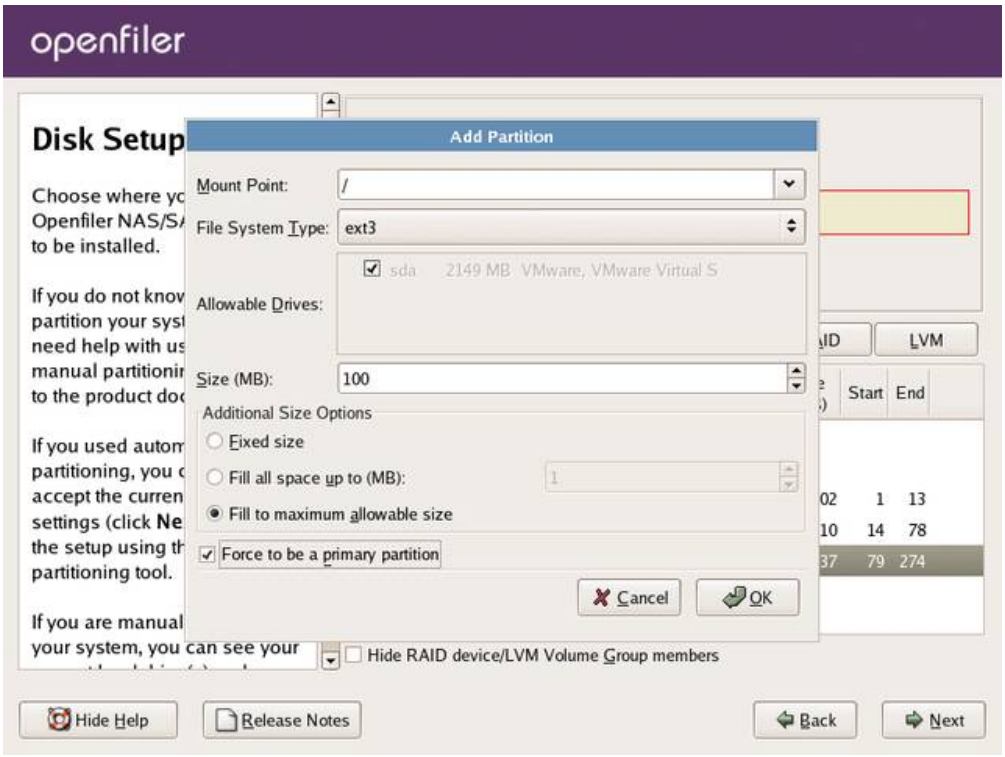
After configuration, your settings should resemble the following illustration:



Once you are satisfied with your entries, click the OK button to create the partition.

1.2.5.3 Create / (root) Partition

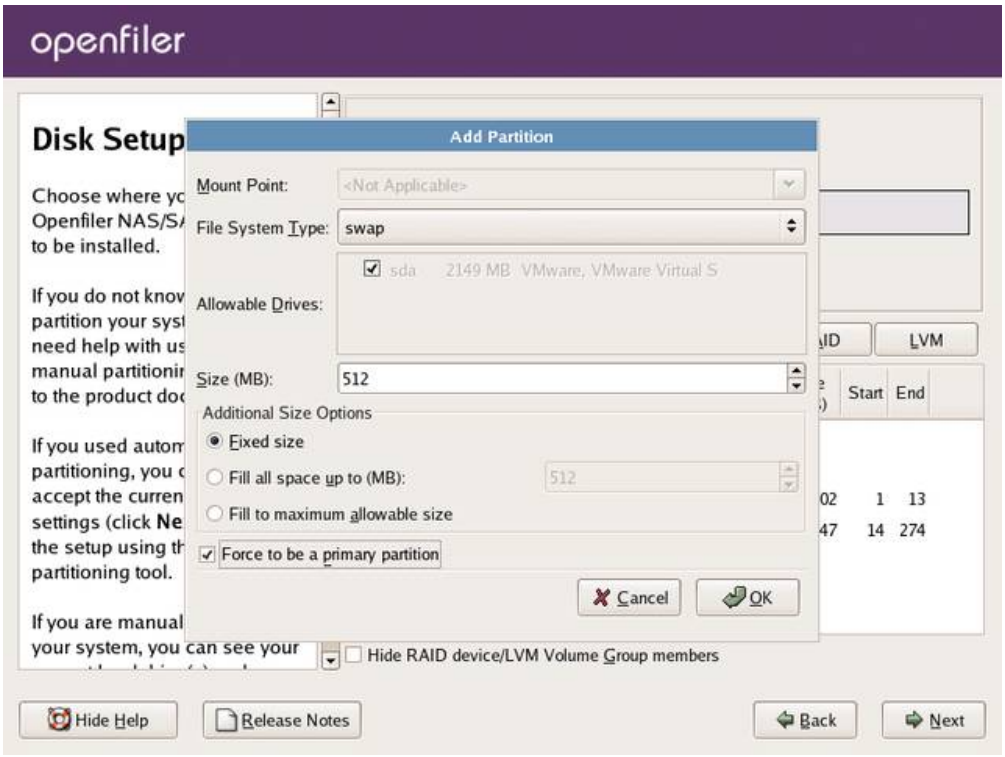
Proceed by creating a *root* partition. Click on the New button. You will be presented with the same form as previously when creating the boot partition. The details are identical to what was entered for the */boot* partition except this time the Mount Point: should be "/" and the Size(MB): should be 8704MB or greater.



Once you are satisfied with your entries, click the OK button to proceed.

1.2.5.4 Create Swap Partition

Proceed by creating a *swap* partition. Click on the New button. You will be presented with the same form as previously when creating the boot and root partitions. The details are identical to what was entered for the *boot* partition except this time the Mount Point: should *swap*. Use the drop down list to select a swap partition type. The Size(MB): of the partition should be at least 1024MB and need not exceed the total RAM capacity of the system or virtual machine.

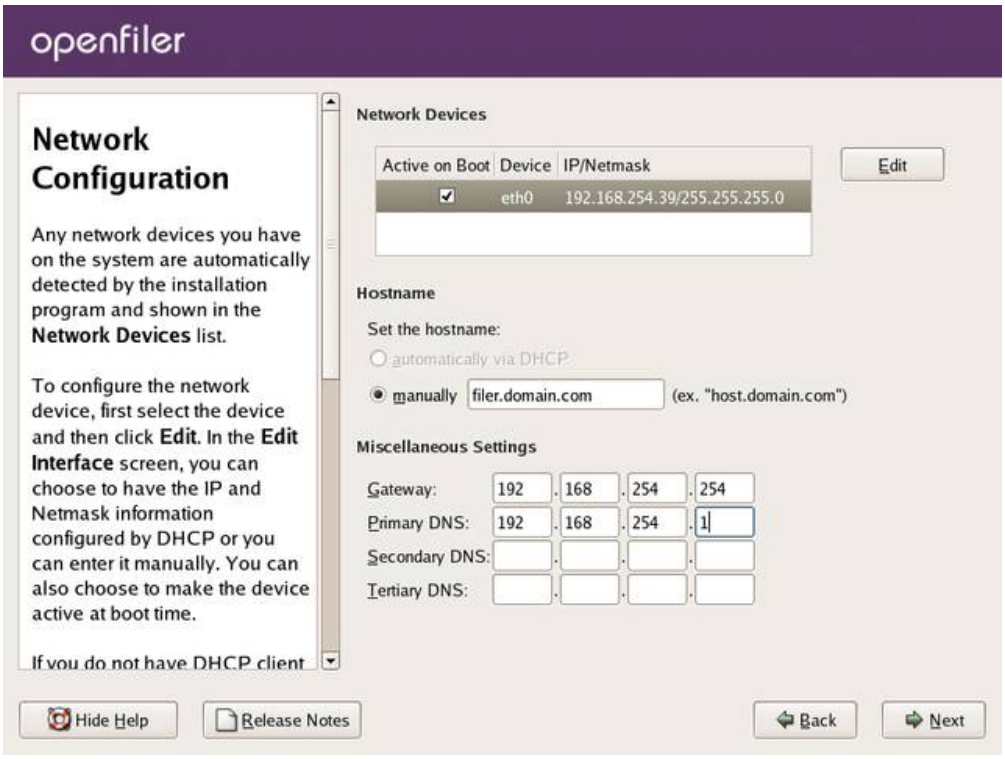


Once you are satisfied with your entries, proceed by clicking the OK button to create the partition. You should now have a set of partitions ready for the Openfiler Operating System image to install to. Your disk partition scheme should resemble the following:

You have now completed the partitioning tasks of the installation process and should click Next to proceed to the next step.

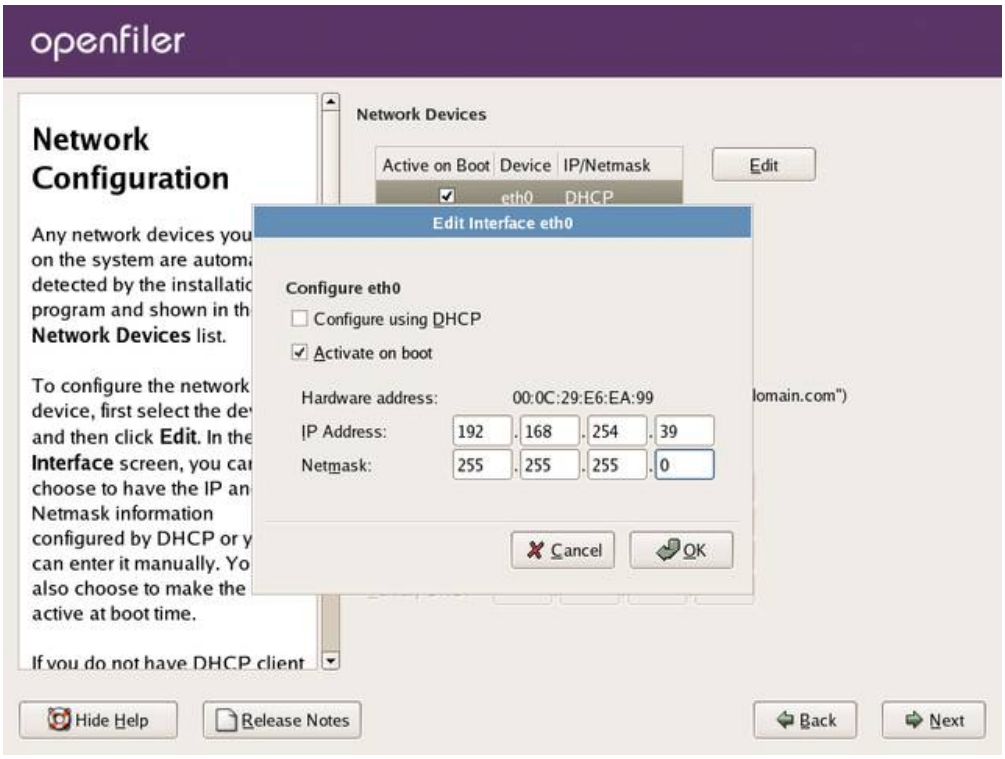
1.2.6 Network Configuration

In this section you will configure network devices, system hostname and DNS parameters. You will need to configure at least one network interface card in order to access the Openfiler web interface and to serve data to clients on a network. In the unlikely event that you will be using DHCP to configure the network address, you can simply click Next and proceed to the next stage of the installation process.



If on the other hand you wish to define a specific IP address and hostname, click the Edit button at the top right corner of the screen in the Network Devices section. Network interface devices are designated eth*X* where *X* is a number starting at 0. The first network interface device is therefore *eth0*. If you have more than one network interface device, they will all be listed in the Network Devices section.

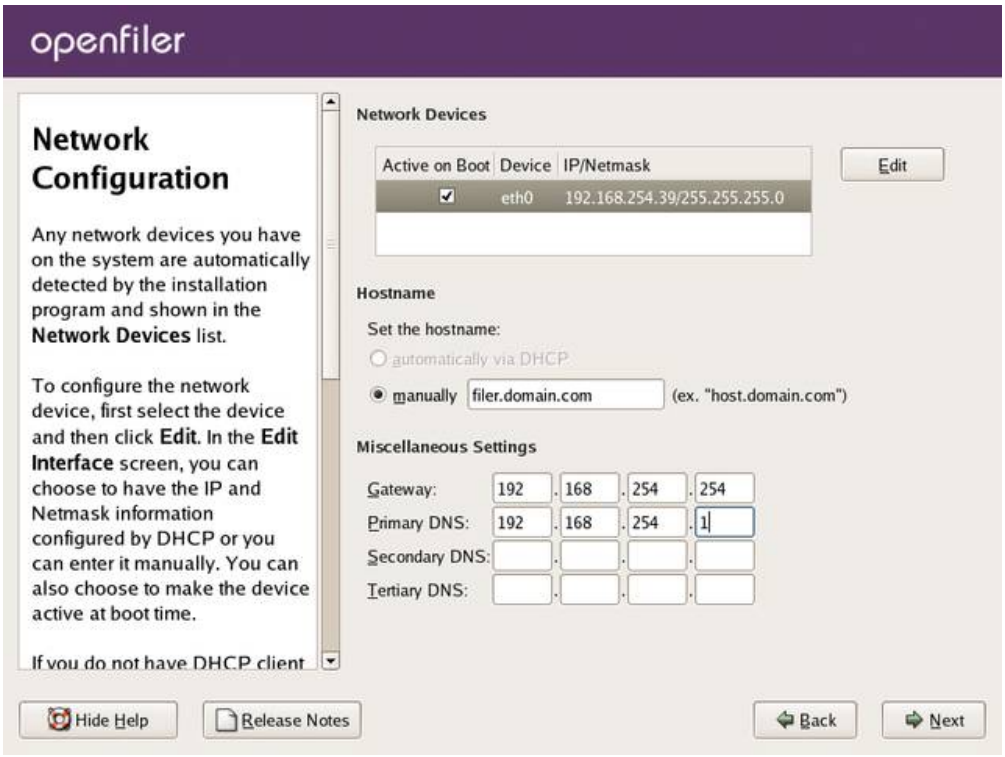
When you click the Edit button, a new form will popup for you to configure the network device in question. As you do not wish to use DHCP for this interface, uncheck the Configure Using DHCP checkbox. This will then allow you to enter a network IP address and Netmask in the appropriate form fields. Enter your desired settings and click OK to proceed.



Once you have configured a network IP address, you may now enter a hostname for the system. The default hostname *localhost.localdomain* is not suitable and you will need to enter a proper hostname for the system. This will be used later when you configure the system to participate on your network either as an Active Directory / Windows NT PDC client or as an LDAP domain member server. You will also, at this point, need to configure gateway IP address and DNS server IP addresses. To complete this task you will need the following information:

- Desired hostname - this is the name you will call the system. Usually this will be a fully qualified hostname e.g homer.the-simpsons.com .
- Gateway IP address - this is the IP address of your network gateway to allow routing to the Internet
- Primary DNS Server - this is the DNS server on your network. Note that if you intend to use Active Directory or LDAP as your authentication mechanism, you will need to assign a functional DNS IP address so that the authentication mechanism is able to resolve the authentication server hostnames.
- Secondary/Tertiary DNS Server - enter a second and third DNS server if they are available on your network.

The following illustration shows an example where a hostname has been assigned, and gateway IP, primary and secondary DNS information has also been entered.



Once you are satisfied with your entries, please proceed by clicking the Next button.

1.2.7 Time Zone Selection

Set the default system time zone. You can achieve this by following the instructions on the left side of the screen. If your system BIOS has been configured to use UTC, check the UTC checkbox at the bottom of the screen and click Next to proceed.

1.2.8 Set Root Password

You need to configure a root password for the system. The root password is the superuser administrator password. With the root account, you can log into the system to perform any administrative tasks that are not offered via the web interface. Select a suitable password and enter it twice in the provided textboxes. When you are satisfied with your entries, click Next to proceed with the installation process.

NB: the root password is meant for logging into the console of the Openfiler server. The default username and password for the Openfiler web management GUI are: "openfiler" and "password" respectively.

1.2.9 About To Install

This screen informs you that installation configuration has been completed and the installer is awaiting your input to start the installation process which will format disks, copy data to the system and configure system parameters such as setting up the boot loader and adding system users. Click Next if you are satisfied with the entries you have made in the previous screens.

Note:

You cannot go back to previous screens once you have gone past this point. The installer will erase any data on the partitions you defined in the partitioning section.

1.2.10 Installation

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.


openfiler
Installing Packages
We have gathered all the information needed to install Openfiler NAS/SAN Appliance on the system. It may take a while to install everything, depending on how many packages need to be installed.
Openfiler NAS/SAN Appliance
Formatting / file system...
Created by
rBuilder
Online
Hide Help
Release Notes
Back
Next


openfiler
Installing Packages
We have gathered all the information needed to install Openfiler NAS/SAN Appliance on the system. It may take a while to install everything, depending on how many packages need to be installed.
Openfiler NAS/SAN Appliance
Transferring install image to hard drive...
Created by
rBuilder
Online
Hide Help
Release Notes
Back
Next


openfiler
Installing Packages
We have gathered all the information needed to install Openfiler NAS/SAN Appliance on the system. It may take a while to install everything, depending on how many packages need to be installed.
Openfiler NAS/SAN Appliance
Created by
rBuilder
Online
Installing mkinitrd-4.2.15-16-0.1.i386 (551 KB)
(none)
Hide Help
Release Notes
Back
Next

1.2.11 Installation Complete

Once the installation has completed, you will be presented with a congratulatory message. At this point you simply need to click the Reboot button to finish the installer and boot into the installed Openfiler system.

Note:

After you click Reboot remove the installation CD from the CD/DVD-ROM drive.

Once the system boots up, start configuring Openfiler by pointing your browser at the host name or IP address of the Openfiler system. The interface is accessible from https port 446. e.g.. https://homer.the-simpsons.com:446.

Management Interface: https://<ip of openfiler host>:446

Administrator Username: openfiler

Administrator Password: password

2 Getting Started

2.1 Introduction to Openfiler

Welcome to the **Openfiler** Storage Configuration Centre Administration Guide. This Centre is an interface designed to simplify the management of storage resources in heterogeneous networks.

Openfiler empowers storage administrators to simplify the management of storage resources in the enterprise via an intuitive browser-based interface. **Openfiler** is ideal for multi-platform networks where workstations/servers run disparate operating systems such as Microsoft® Windows® 98/XP/2000, Mac OS9/X®, UNIX® and Linux®. An important feature of **Openfiler** is that it bridges the Storage Area Network (SAN) and Network Attached Storage (NAS) paradigms on a network so that the entire scope of storage management tasks on an enterprise network can potentially be managed from one single console.

The main beneficiaries of **Openfiler** are storage and network administrators whose jobs are becoming more difficult due to the proliferation of data on enterprise networks. There is data on workstations, servers, in SAN islands and on NAS appliances scattered all over the network. The administrator is tasked with managing these distinct storage resources - bring all users in a certain department into a single storage domain; provide staff responsible for Management Information System (MIS) with more space for their Oracle-based business intelligence applications; and bring in block-based storage volumes from SAN into the file-based NAS environment to increase storage capacity for IP clients on the network. These are just some of the challenges that administrators face on a daily basis, and **Openfiler** is designed to make solving them as simple as "point and click".

2.2 Logging on to Openfiler

This section provides details about how to log on to **Openfiler**.

▼ To log on to Openfiler:

1. In the web browser, type the **Openfiler** URL and press ENTER. The **Openfiler Login** page is displayed, as shown in the following figure.

Figure 1: Login Page

2. Enter the appropriate **Username** and **Password** and click the **Login** button. **Openfiler** displays the **Home** page, as shown in the following figure.

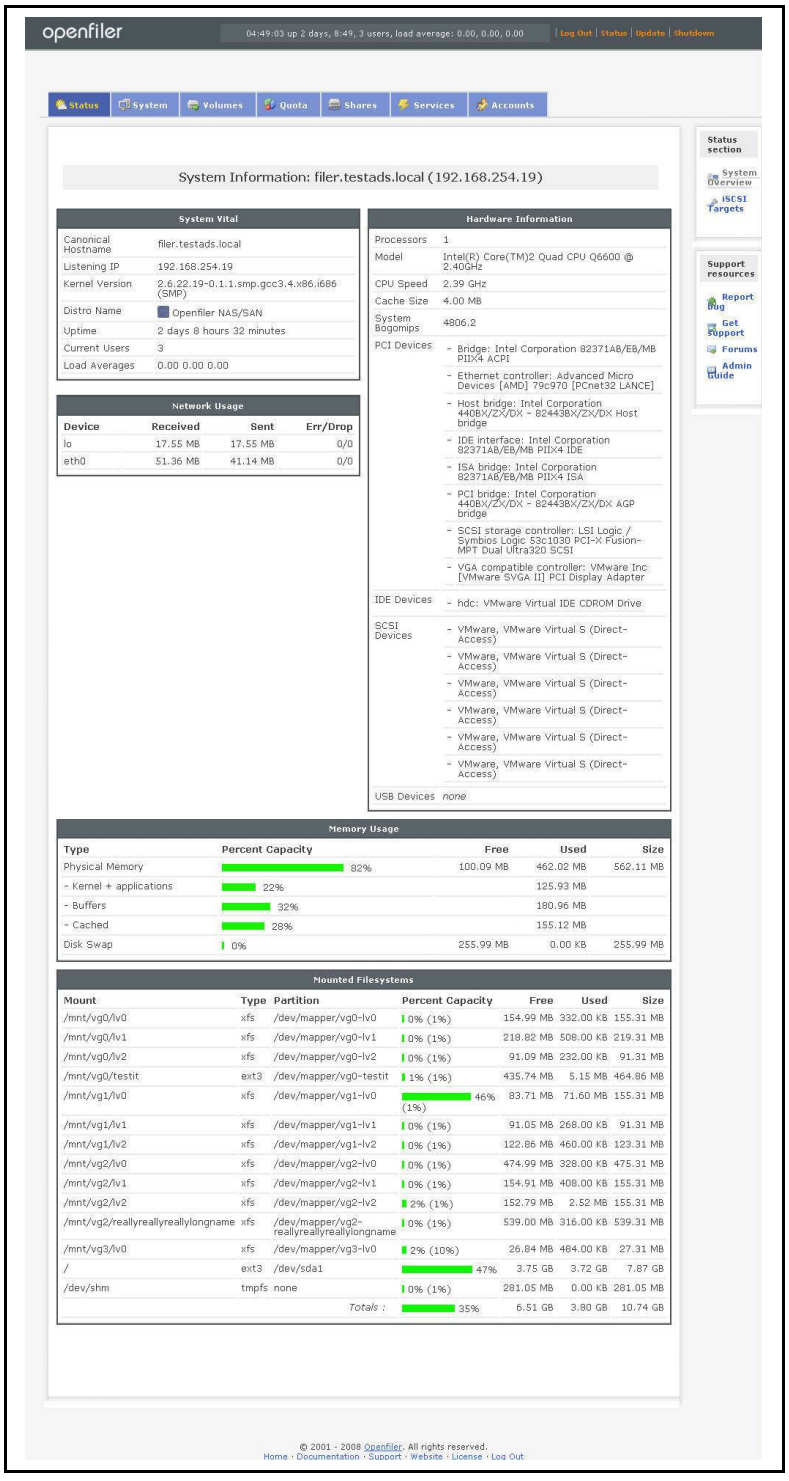


Figure 2: Home page

Note:

The **Openfiler** GUI is accessed by pointing a browser to the hostname or IP address of the **Openfiler** appliance. The GUI runs on port 446 using the HTTPS protocol. e.g

https://mysan:446

https://192.168.1.31:446

The default credentials for accessing the **Openfiler** GUI are:

Username: username

Password: password

It is recommended to change the administrator password immediately after the first log on to **Openfiler** by accessing the Accounts->Admin Password context.

2.3 Understanding the Openfiler Interface

A typical **Openfiler** page can be divided into six main sections, namely the **Title Bar**, **Tabs**, **Work Area**, **Menu**, **Support** and **Footer**, as shown in the following figure.

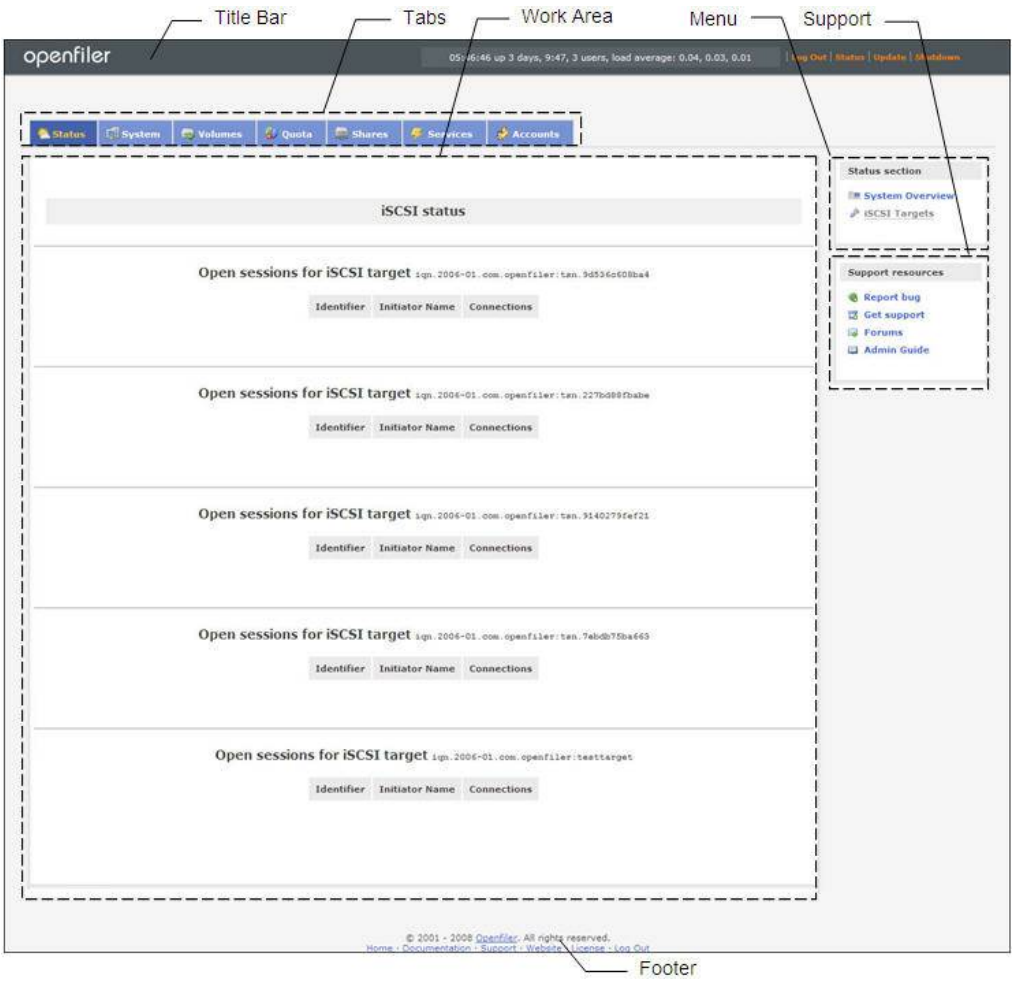


Figure 3: Interface Page

2.3.1 Title Bar

The top strip of the **Openfiler** page is the Title Bar. It displays quick access links to system-wide functions such as **Log out**, **Status**, **Update** and **Shutdown**.

2.3.2 Tabs

Tabs help the user to navigate through the various functions of **Openfiler**, namely:

- Status
- System
- Volumes
- Quota
- Shares
- Services
- Accounts

2.3.3 Work Area

The Work Area is a rectangular space where all the contents are displayed based on your selection of Tabs and the Menu.

2.3.4 Menu

The vertical bar on the right side is the section that contains the menus. The Menu displays the respective the configuration contexts available for each tab that is selected.

2.3.5 Support

This section displays the various support resources available for **Openfiler**, namely:

- Report bug
- Get support
- Forums
- Admin Guide

2.3.6 Footer

This is the bottom area of the application. **Openfiler** displays the access links to copyright details, **Homepage**, **Documentation**, **Support**, **Openfiler Website**, **License** details and **Log out**.

3 Status Section

Status page is displayed by default when you login to **Openfiler**. This Status tab has two menu options, System Overview and iSCSI targets. System overview gives an overview of the system at any given point. iSCSI shows the connections details in your **Openfiler**.

3.1 System Overview

System Overview provides a status snapshot of the system at any given point of time. The page consists of five different sections, i.e. System Vital, Hardware Information, Network Usage, Memory Usage and Mounted Filesystems.

System Vital section displays details such as Canonical Hostname, the IP Address, Kermel version and the current users of this application.

Network Usage section displays the device name, received and sent memory and error or drop details.

Hard Information section provides the number and name of the processors, CPU speed, cache memory size, and PCI, IDE and SCSI Devices.

Memory Section gives the total memory available, the percentage of memory used and the free memory available.

Mounted Filesystem section provides details of the mounted files, like type of file, partition details, capacity in percentage, free and used memory and the size of the mounted file.

3.1.1 Viewing the System Overview

This section provides details on how to view the system overview.

▼ To view the system overview:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Status** tab. **Openfiler** displays the **System Overview** page, as shown in the following figure.

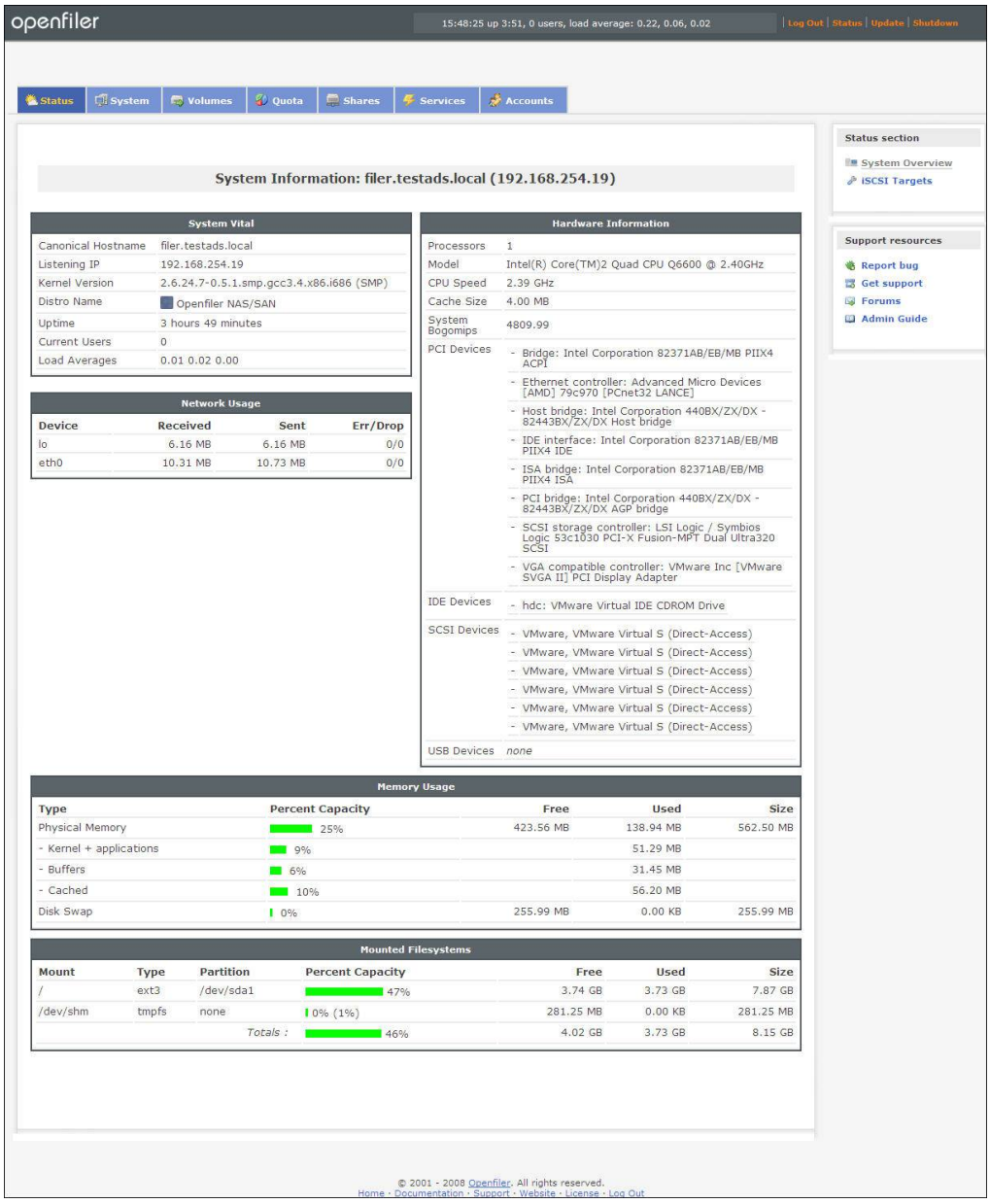


Figure 4: System Overview

Note:

The default page displayed after login is the **System Overview** page. The user can also click the **Status** link on the **Title Bar** to view this page.

3.2 iSCSI Targets

iSCSI Targets page shows the details of the connections coming into your **Openfiler** system, namely, Identifier- the unique identification code, Initiator Name and the number of connections coming to the iSCSI target.

3.2.1 Viewing iSCSI Targets

This section provides details about how to view iSCSI Targets.

▼ To view iSCSI Targets:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Status** tab. **Openfiler** displays the **System Overview** page as shown in Figure 4.
3. Click **iSCSI Targets** menu. **Openfiler** displays **iSCSI Targets** page, as shown in the following figure.

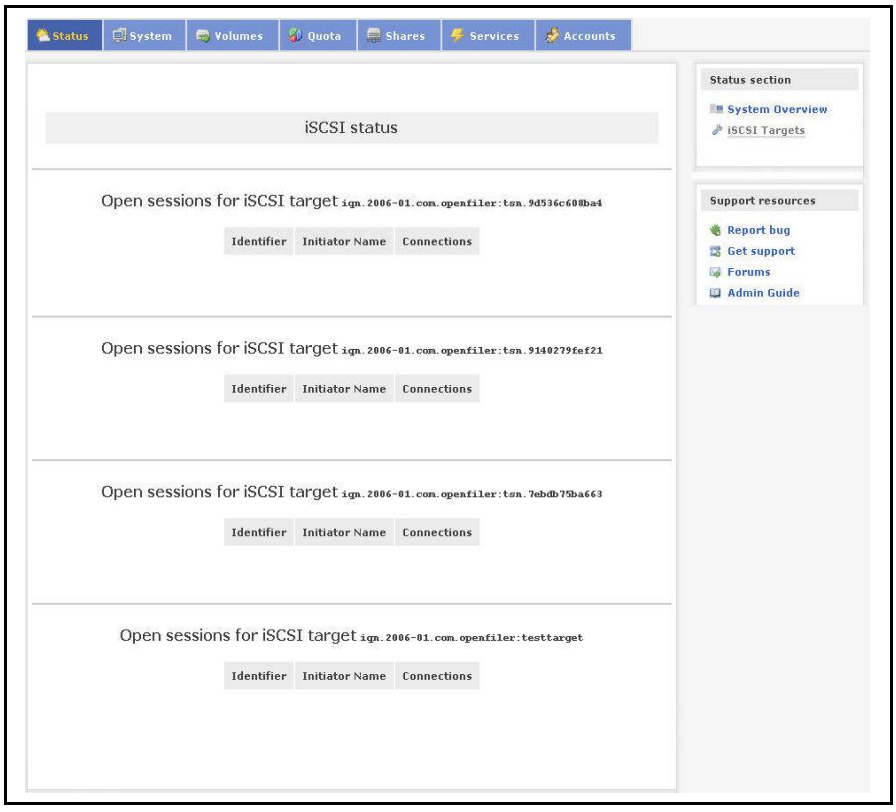


Figure 5: iSCSI Target

4 Managing System

This chapter deals with out-of-the-box **Openfiler** set-up and configuration. The system tab allows you to set up the network, the HA Cluster, the system time and time zone, and configure the UPS. This tab also has the option to configure the notification, restart or reboot, and to update the system.

4.1 Network Setup

This section provides details about the network setup configuration of **Openfiler**. This section covers three basic configurations namely, Network Configuration, Network Interface Configuration and Network Access Configuration.

Network Configuration and Network Interface Configuration are for setting up of the **Openfiler** server itself whereas the network access configuration sets the access control for users of **Openfiler**.

Network configuration is done while installing the system. This section allows the user to set up the hostname, primary and secondary DNS and gateway IP.

Network Interface Configuration deals with the configuration of interfaces. You can also view or edit the existing configuration.

Network Access Configuration deals with setting access control for other users. **Openfiler** allows limited access to the system services using the network host mask and also can prevent access to iSCSI and the like. This control is based on the incoming or outgoing IP address.

For cases where network configuration is not performed during installation, (e.g for Xen or VMware virtual machines) and there is no DHCP server available on the network; perform the following steps to configure the network:

Note:

For cases where network configuration is not performed during installation, (e.g for Xen or VMware virtual machines) and there is no DHCP server available on the network; perform the following steps to configure the network:

1) Log in as "root" <enter>

2) type: ifconfig eth0 <ip address>

e.g ifconfig eth0 192.168.1.23

3) Proceed to log in at https://192.168.1.23:446

4) Access the System tab to complete network configuration settings such as DNS and gateway information.

4.1.1 Viewing Network Setup

This section provides details about how to view Network Setup in **Openfiler**.

▼ To view Network Setup:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **System** tab. **Openfiler** displays the **Network Setup** page, as shown in the following figure.

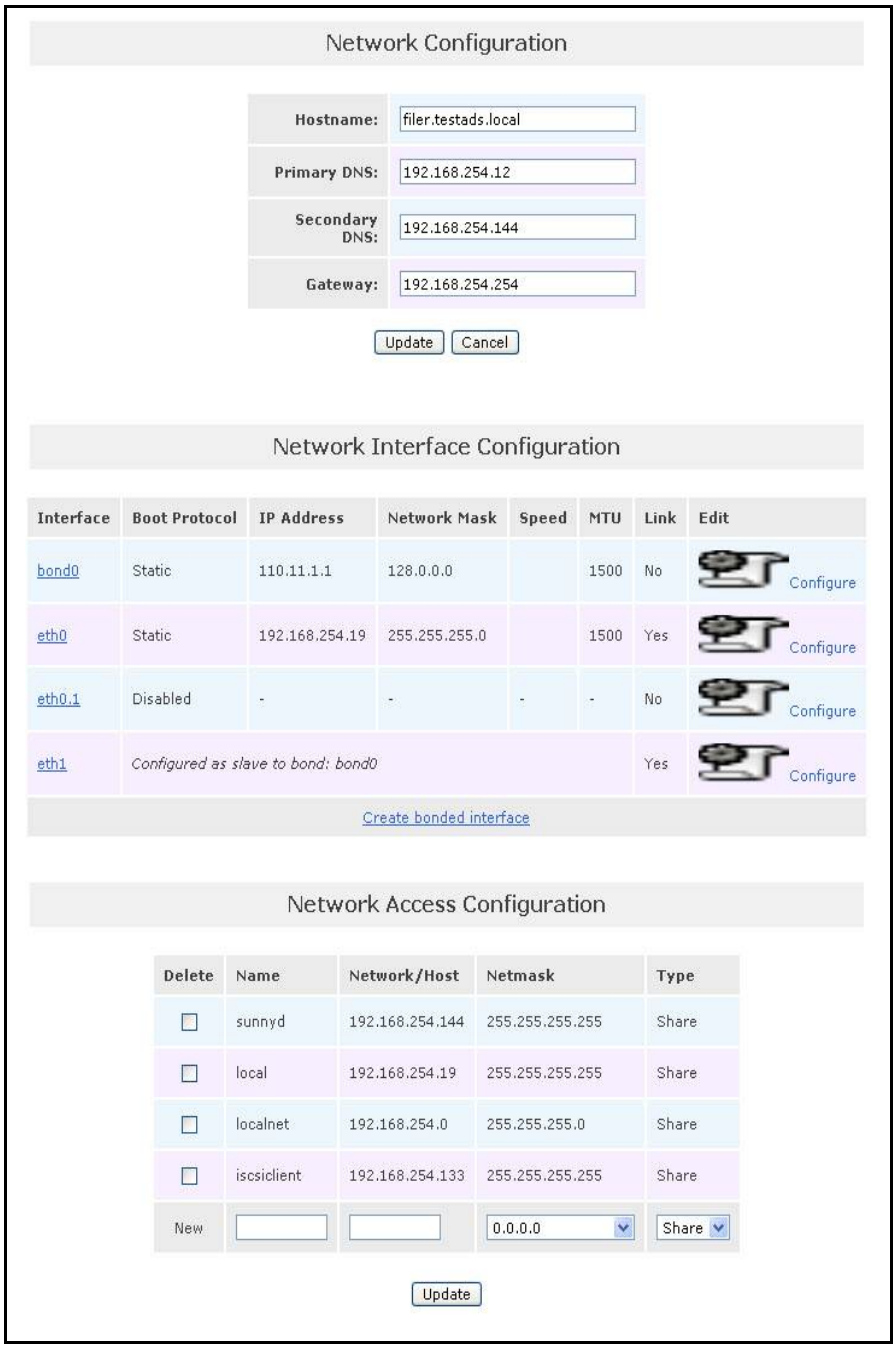


Figure 6: Network Setup Page

Field	Description
Network Configuration	
Host Name	This field displays the host name.
Primary DNS	This field displays the IP address of the primary Domain Naming Service.
Secondary DNS	This field displays the IP address of the secondary Domain Naming Service.
Gateway	This field displays the gateway of the network.
Network Interface Configuration	
Interface	This field displays the interface name.
Boot Protocol	This field displays the boot protocol of the interface.
IP Address	This field displays the IP address of the interface.
Network Mask	This field displays the network mask of the interface.
Speed	This field displays the connection speed for the interface
MTU	This field displays the Maximum Transit Unit value for the interface.
Link	This field displays the network link status for the interface.
Network Access Configuration	
Name	This field displays the network access configuration name.
Network/Host	This field displays the network address or host of the interface.
Netmask	This field displays the netmask of the interface.
Type	This field displays the type of interface. There are two typesnamely, Share and UPS.

Table 1: Network Setup

Note:

The default page displayed after clicking the **System** tab is the **Network Setup** page.

4.1.2 Modifying Network Configuration

This section provides details about how to modify the Network Configuration in **Openfiler**.

▼ To modify Network Configuration:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **System** tab. **Openfiler** displays the **Network Setup** page, as shown in Figure 6. The **Network Configuration** section in the **Network Setup** page is as shown in the following figure.

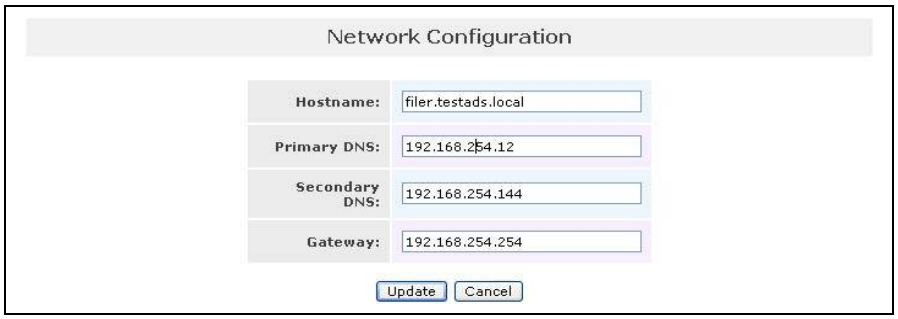


Figure 7: Network Configuration

3. Modify the appropriate details and click the **Update** button.
   OR
   Click the **Cancel** button to cancel the changes.

4.1.3 Viewing Network Interface

This section provides details about how to view a network interface configuration in **Openfiler**.

▼ To view network interface:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **System** tab. **Openfiler** displays the **Network Setup** page, as shown in Figure 6. The available network interface is displayed in the **Network Interface Configuration** section of the **Network Setup** page, as shown in the following figure.

Figure 8: Network Interface Configuration

3. Click the appropriate **Interface** link. **Openfiler** displays the **Network Interface Details** page, as shown in the following figure.

Figure 9: Network Interface Details

4. View the interface details and click anywhere outside the popup dialogue to close the popup.

Note:

To know more about how to add a VLAN and Virtual Interface to a network refer to **Adding a VLAN** and **Adding a Virtual Interface** sections, respectively. VLAN configuration requires hardware support. Check with your network hardware vendor for VLAN configuration support.

4.1.3.1 Adding a VLAN

This section provides details about how to add a Virtual Local Area Network (VLAN) interface configuration.

▼ To add a VLAN:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **System** tab. **Openfiler** displays the **Network Setup** page, as shown in Figure 6. The available network interface is displayed in the **Network Interface Configuration** section of the **Network Setup** page, as shown in Figure 8.
3. Click the appropriate **Interface** link. **Openfiler** displays the **Network Interface Details** page, as shown in Figure 9.
4. Click the **Add VLAN** link. **Openfiler** displays the **VLAN Interface Configuration** page, as shown in the following figure.

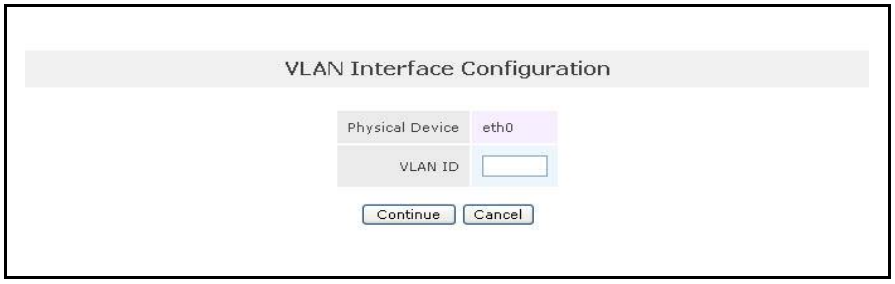


Figure 10: VLAN Interface Configuration

5. Enter an appropriate **VLAN ID** and click the **Continue** button.
   OR
   Click the **Cancel** button to cancel the process.

4.1.3.2 Adding a Virtual Interface

This section provides details about how to add a virtual interface

▼ **To add a virtual interface:**

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **System** tab. **Openfiler** displays the **Network Setup** page, as shown in Figure 6. The available network interface is displayed in the **Network Interface Configuration** section of the **Network Setup** page, as shown in Figure 8.
3. Click the appropriate **Interface** link. **Openfiler** displays the **Network Interface Details** page, as shown in Figure 9.
4. Click the **Add Virtual Interface** link to add a virtual interface. **Openfiler** adds it to the selected interface.

4.1.4 Editing/Configuring a Network Interface

This section provides details about how to edit a network interface configuration.

▼ **To edit/configure a Network Interface:**

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **System** tab. **Openfiler** displays the **Network Setup** page, as shown in Figure 6. The **Network Interface Configuration** section in the **Network Setup** page is displayed as shown in the following figure.

Figure 11: Network Interface Configuration

3. Click the  icon corresponding to the interface to be edited. **Openfiler** displays the edit page, as shown in the following figure.

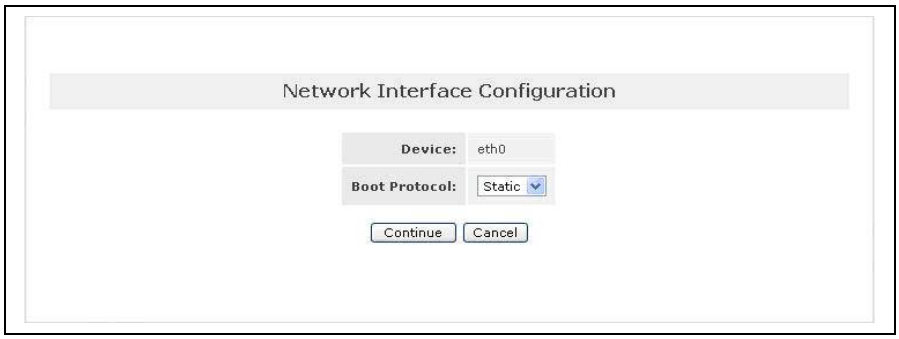


Figure 12: Network Interface Configuration

4. Select the appropriate Boot Protocol from the drop-down list and click the **Continue** button. **Openfiler** displays the **Network Interface Configuration** page as shown in the following figure.
   OR
   Click the **Cancel** button to cancel the process.

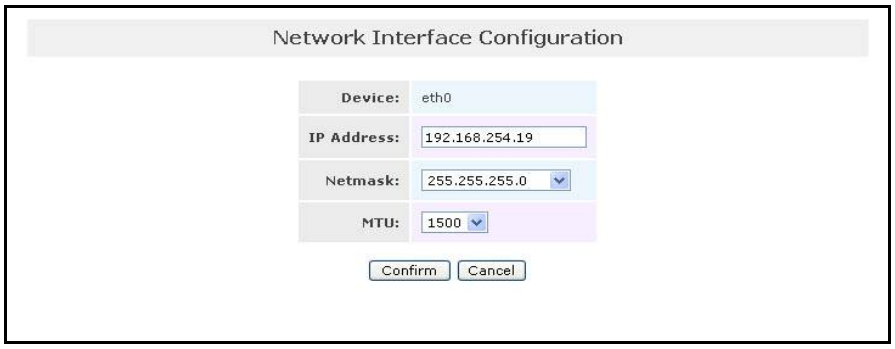


Figure 13: Network Interface Configuration

5. Enter the appropriate details in the respective fields and click the **Confirm** button. **Openfiler** saves the changes and displays the page as shown in the following figure.
   OR
   Click the **Cancel** button to cancel the process.

Figure 14: Network Interface Configuration

6. Click the **Return to Network Page** link to go to the Network Interface page.

4.1.5 Creating a Bonded Interface

This section describes how to create a bonded interface. The Linux bonding driver provides a method for aggregating multiple network interfaces into a single logical "bonded" interface. The behavior of the bonded interfaces depends upon the mode; generally speaking, modes provide either hot standby or load balancing services. Additionally, link integrity monitoring may be performed

▼ To create a bonded interface:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **System** tab. **Openfiler** displays the **Network Setup** page, as shown in Figure 6. The **Network Interface Configuration** section in the **Network Setup** page is as shown in Figure 11.
3. Click the **Create bonded interface** link. **Openfiler** displays the **Network Boding Configuration** page, as shown in the following figure.

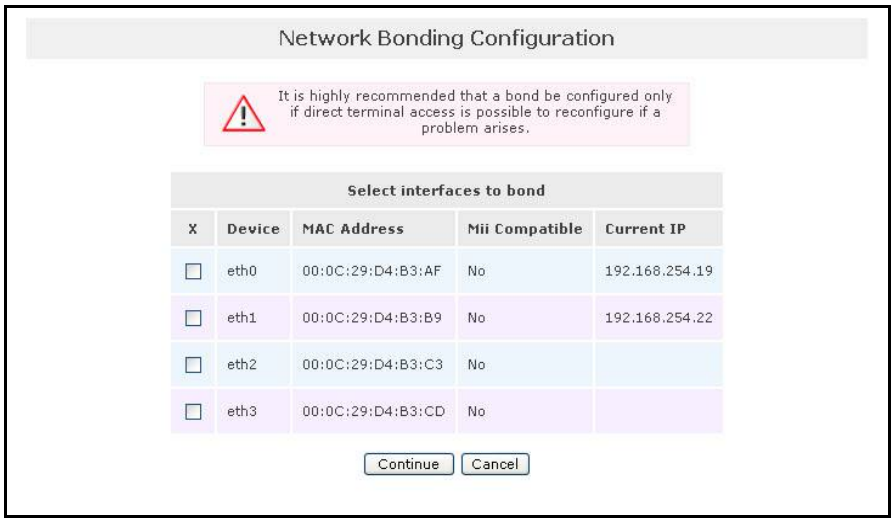


Figure 15: Network Bonding Configuration

Field	Description
Device	This field displays the device name.
MAC Address	This field displays the MAC address of the interface.
Mii Compatible	This field displays whether the interface supports auto configuration via the MII Standard.
Current IP	This field displays the current IP address of the interface.

Table 2: Network Bonding Configuration

4. Select the appropriate interface and click the Continue button. **Openfiler** displays the **Network Bonding Configuration** page, as shown in the following figure.

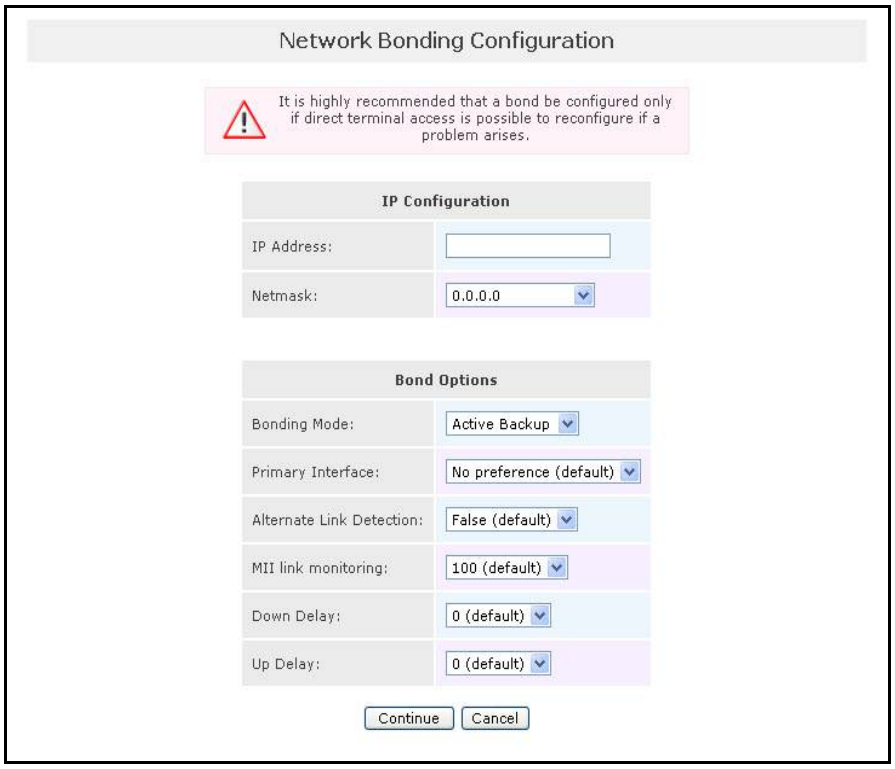


Figure 16: Network Bonding Configuration

Field	Description
IP Configuration	
IP Address	This field displays the host name.
Netmask	Select an appropriate netmask from the drop-down list .
Bonding Options	

Field	Description
Bonding Mode	Select an appropriate Bonding Mode from the drop-down list. By default **balance-rr** will be selected. The available options are: ≅ Balance-rr (Round-robin policy): Transmit packets in sequential order from the first available slave through the last. This mode provides load balancing and fault tolerance. ≅ Active Backup: Only one slave in the bond is active. A different slave becomes active if, and only if, the active slave fails. The bond's MAC address is externally visible on only one port (network adapter) to avoid confusing the switch. ≅ Balance XOR: Transmit based on the selected transmit hash policy. The default policy is a simple [(source MAC address XOR'd with destination MAC address) modulo slave count]. Alternate transmit policies may be selected via the xmit_hash_policy option. ≅ Broadcast: transmits everything on all slave interfaces. This mode provides fault tolerance ≅ 802.3ad (IEEE 802.3ad Dynamic link aggregation): Creates aggregation groups that share the same speed and duplex settings. Utilizes all slaves in the active aggregator according to the 802.3ad specificationBalance-tlb (Adaptive transmit load balancing): channel bonding that does not require any special switch support. The outgoing traffic is distributed according to the current load (computed relative to the speed) on each slave. Incoming traffic is received by the current slave. If the receiving slave fails, another slave takes over the MAC address of the failed receiving slave. ≅ Balance-alb (Adaptive load balancing): includes balance-tlb plus receive load balancing (rlb) for IPV4 traffic, and does not require any special switch support. The receive load balancing is achieved by ARP negotiation. The bonding driver intercepts the ARP Replies sent by the local system on their way out and overwrites the source hardware address with the unique hardware address of one of the slaves in the bond such that different peers use different hardware addresses for the server.
Primary Interface	Select an appropriate primary interface from the drop-down list, which specifies which slave is the primary device. The specified slave will always be the active slave while it is available. Alternate device is used, only when the primary is offline.
Alternate Link Detection	Select appropriate link detection from the drop-down list. The available options are **True** and **False**. The default option selected is **False**.
MII link monitoring	Select an appropriate MII link monitoring frequency from the drop-down list.
Down Delay	Select an appropriate Down Delay from the drop-down list. The default option selected is '**0**'.
Up Delay	Select an appropriate Up Delay from the drop-down list.

Field	Description
	The default option selected is '**0**'.

Table 3: Network Bonding Configuration

5. Enter the appropriate details and click the **Continue** button.
   OR
   Click the **Cancel** button to cancel the process.

Note:

Bonding configuration can occur whether or not direct terminal access is available. However, it is recommended that configuration be done only in cases where a misconfigured bond brings down remote access and no other mechanism, aside from direct terminal access, is available to recover from the misconfiguration.

4.1.6 Adding a new Network Access Entry

This section explains how to add a new network access to the configuration.

▼ To add a new Network Access Entry:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **System** tab. **Openfiler** displays the **Network Setup** page, as shown in Figure 6. The **Network Access Configuration** section in the **Network Setup** page is displayed as shown the following figure.

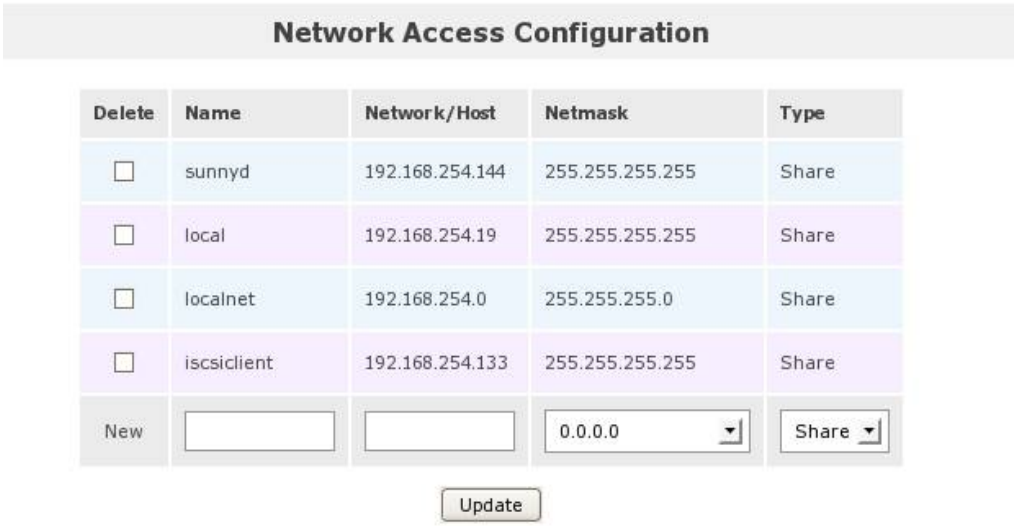


Figure 17: Network access configuration

3. Enter the appropriate details in the respective fields, corresponding to **New**, and click the **Update** button.

Note:

When adding a network access entry for iSCSI initiators, be sure to enter the full network IP address of the initiator host and hostmask for the network IP address. For eg. 192.168.1.23/255.255.255.255

4.1.7 Deleting a Network Access Entry

This section explains how to delete a network access configuration.

▼ To delete a Network Access Entry:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **System** tab. **Openfiler** displays the **Network Setup** page, as shown in Figure 6. The **Network Access Configuration** section in the **Network Setup** page is displayed as shown in Figure 17.
3. Select the appropriate **Delete** check box and click the **Update** button.

4.2 Setting up the Clock

It is imperative that the system time is set correctly before users are allowed to store data on the system. The administrator has the option of setting the system time manually or using a remote network time protocol (NTP) server. If the system running **Openfiler** has a route to the internet, it is better to set the system time using a time server. If not, the system time must be set manually. The user can also set the system time zone.

4.2.1 Setting the system clock manually

This section provides details about how to set the system time manually.

▼ To set the system clock:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **System** tab. **Openfiler** displays the **Network Setup** page, as shown in Figure 6.
3. On the menu bar, click the **Clock Setup** link. **Openfiler** displays the **Set System Clock Manually** page, as shown in the following figure.

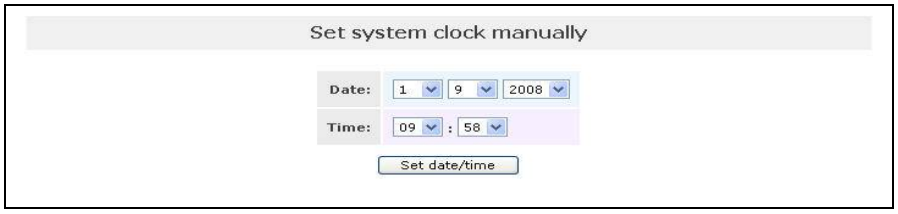


Figure 18: Set System Clock Manually

Field	Description
Date	Select the appropriate options, given in dd/mm/yyyy format, from the drop-down list.
Time	Select the appropriate options, given in Hrs/Mints format, from the drop-down list.

Table 4: System Clock Settings

4. Select the appropriate options and click the **Set date/time** button.

4.2.2 Synchronizing the System Clock with NTP timeserver

This section explains how to synchronize the system clock with the network time protocol (NTP) server.

▼ To synchronize the system clock with NTP timeserver:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **System** tab. **Openfiler** displays the **Network Setup** page, as shown in Figure 6.
3. On the menu bar, click the **Clock Setup** link. **Openfiler** displays the **Keep System Clock Synchronized with NTP Server** page, as shown in the following figure.

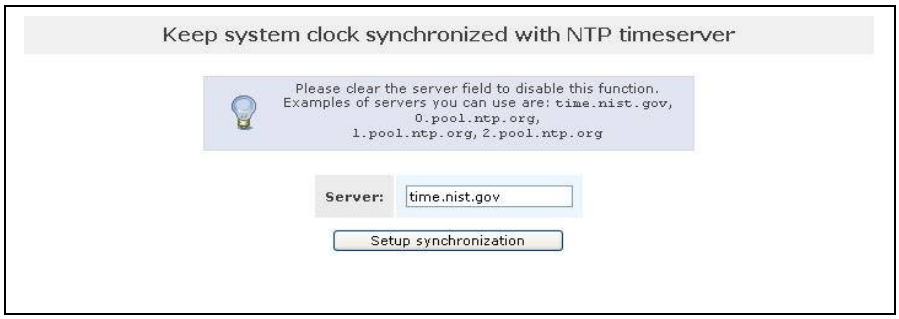


Figure 19: Keep System clock synchoronized with NTP timeserver

4. Enter the appropriate data in the **Server** field and click the **Setup synchronization** button to synchronize the system clock.

Note:

Clear the **Server** field to disable the synchronization function.

For example, the servers you can use are: time.nist.gov, 0.pool.ntp.org, 1.pool.ntp.org, and 2.pool.ntp.org.

4.2.3 Setting Time zone

This section explains how to set up the system time zone in **Openfiler**.

▼ To set the time zone:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click on the **System** tab. **Openfiler** displays the **Network Setup** page, as shown in Figure 6.
3. On the menu bar, click the **Clock Setup** link. **Openfiler** displays the **Timezone** page, as shown in the following figure.

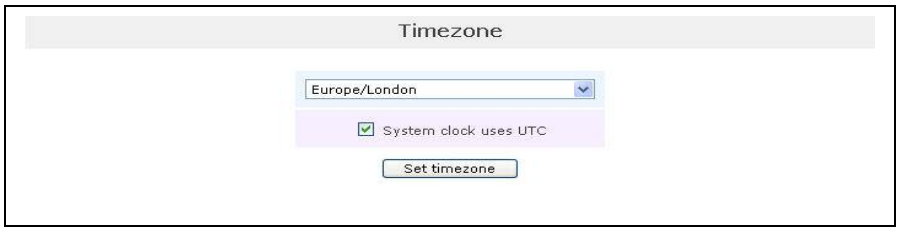


Figure 20: Timezone

4. Select the appropriate time zone from the drop-down list and click the **Set timezone** button.

4.3 Managing UPS

In this chapter, you will learn how to configure a Uninterrupted Power Supply (UPS) device and edit the existing UPS configuration.

4.3.1 Configuring a UPS device

This section provides a detailed description on how to configure a UPS device.

▼ To configure a UPS device:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **System** tab. **Openfiler** displays the **Network Setup** page, as shown in Figure 6.
3. On the menu bar, click the **UPS Management** link. **Openfiler** displays the **Uninterruptible Power Supply Device Configuration** page, as shown in the following figure.

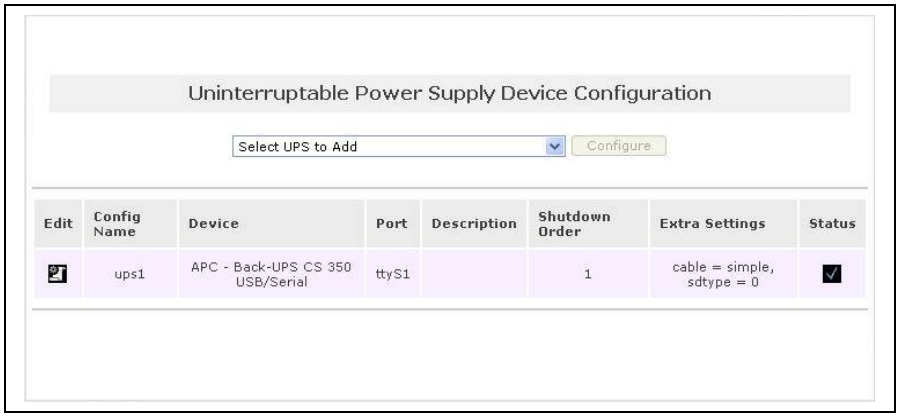


Figure 21: UPS Device configuration

Field	Description
Config Name	This field displays the configuration name of the UPS.
Device	This field displays the device name.
Port	This field displays the port name.
Description	This field displays the device description. e.g. Primary UPS.
Shutdown Order	This field displays the order in which the system shuts down.
Extra Settings	This field displays the extra settings.

Field	Description
Status	This field displays the status of the UPS.

Table 5: UPS Device Configuration

4. Select the appropriate UPS from the drop-down list corresponding to the **Configure** button and then click the **Configure** button. **Openfiler** displays the configuration page.

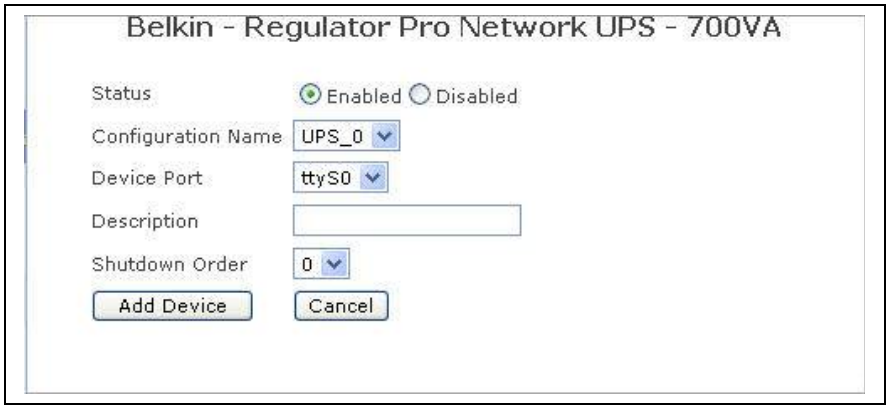


Figure 22: UPS Configuration

Field	Description
Status	Select the appropriate radio button. The available options are **Enabled** and **Disabled**.
Configuration Name	Select the appropriate configuration name from the drop-down list.
Device Port	Select the device port from the drop-down list.
Description	Enter the device description.
Shutdown Order	Select the appropriate order in which you want the system to be shut down, from the drop-down list.

Table 6: UPS Configuration

5. Enter the appropriate details and click the **Add Device** button.
   OR
   Click the **Cancel** button to cancel the process.

4.3.2 Editing a UPS configuration

This section provides details about how to edit a UPS configuration in **Openfiler**.

▼ To edit a UPS configuration

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click on the **System** tab. **Openfiler** displays the **Network Setup** page, as shown in Figure 6.
3. On the menu bar, click the **UPS Management** link. **Openfiler** displays the **Uninterruptible Power Supply Device Configuration** page, as shown in Figure 21.
4. Click the appropriate  icon corresponding to the **UPS Device** to be edited. **Openfiler** displays the UPS editing page, as shown in the following figure.

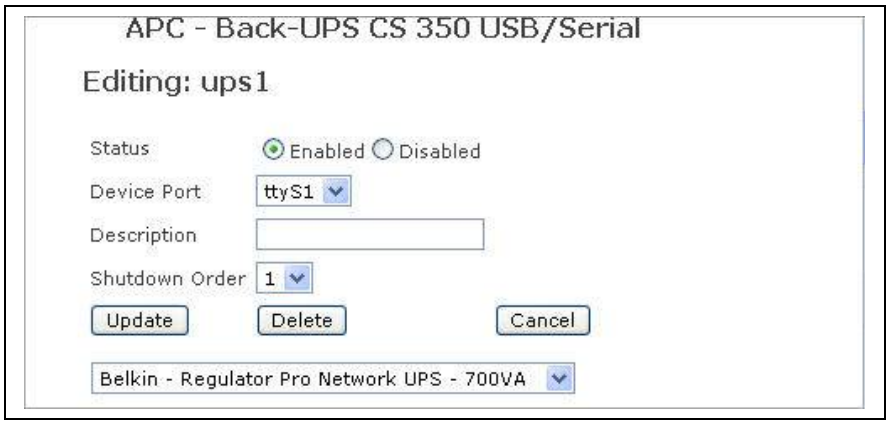


Figure 23: UPS Configuration

5. Make the necessary changes and click the **Update** button.
   OR
   Click the **Cancel** button to cancel the process.
   OR
   Click the **Delete** button to delete the UPS device.

4.4 Shutting down/Rebooting the System

This option enables the administrator to shutdown the system immediately or after a specified time interval. The administrator can elect to have file/systems checked on startup.

▼ To shutdown or reboot the system:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **System** tab. **Openfiler** displays the **Network Setup** page, as shown in Figure 6.
3. On the menu bar, click the **Shutdown/Reboot** link. **Openfiler** displays the **Shutdown the System** page, as shown in the following figure.

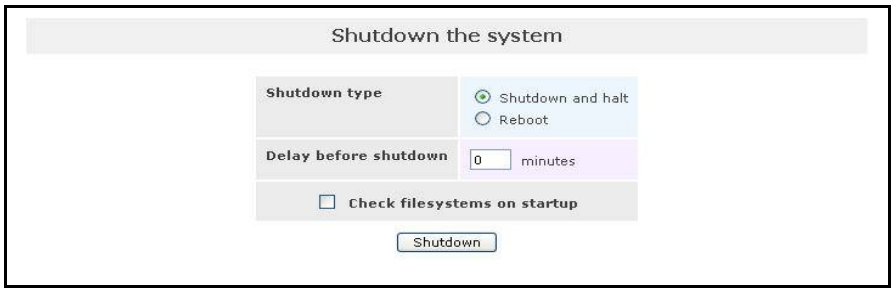


Figure 24: Shutdown the system

Field	Description
Shutdown type	There are two shutdown options: ≅ Shutdown and halt: ≅ Reboot: Select this radio button to reboot the system.
Delay before shutdown	Enter in minutes the time lag before shutdown commences.
Check filesystem on startup	This field displays the port name.

Table 7: Shutdown/Reboot the System

4. Enter the appropriate details in the respective fields.
5. Click the **Shutdown** button to shutdown or reboot the system.

Note:

You can also access the Shutdown page by clicking the **Shutdown** link on the title bar.

4.5 Managing Notification Configuration

This option helps you to send notifications to the users about any events taking place during the software raid.

▼ To view notification configuration:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **System** tab. **Openfiler** displays the **Network Setup** page, as shown in Figure 6.
3. On the menu bar, click the **Notification** link. **Openfiler** displays the **Notification Configuration** page, as shown in the following figure.

Figure 25: Notification Configuration

4. Enter the appropriate details in the respective fields and click the **Send Test Message** button to send a test message.
   OR
   Click the **Update Information** button to update the changes.

4.6 Updating the System

The System Update tab helps the user to update the system at any given point of time.

▼ To update the system:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **System** tab. **Openfiler** displays the **Network Setup** page, as shown in Figure 6.
3. On the menu bar, click the **System Update** link. **Openfiler** displays the **System Update** page, as shown in the following figure.

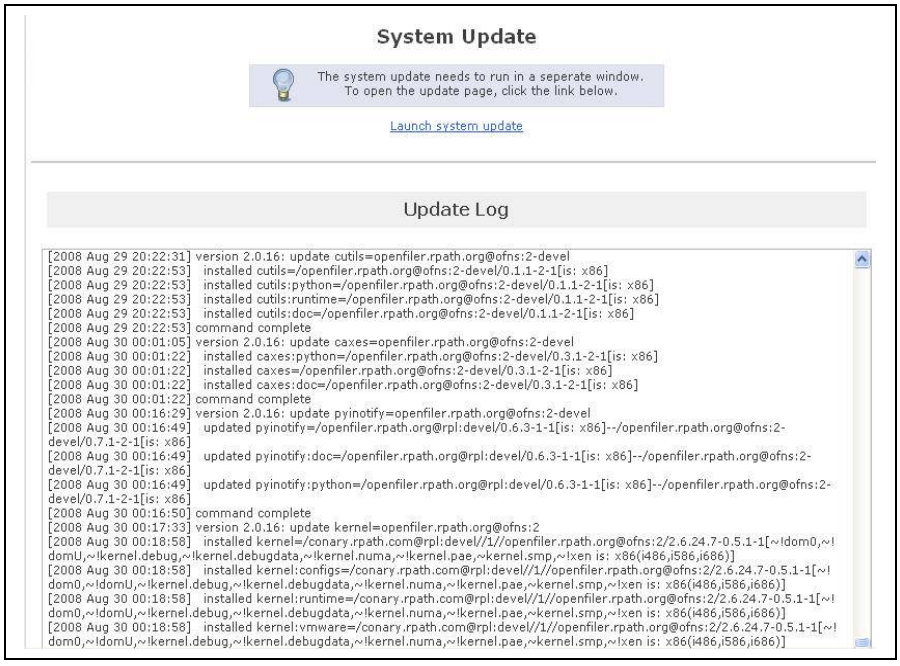


Figure 26: System Update

4. Click the **Launch system update** link to run the system update in a new window. **Openfiler** displays the **System Update** window, as shown in the following figure.

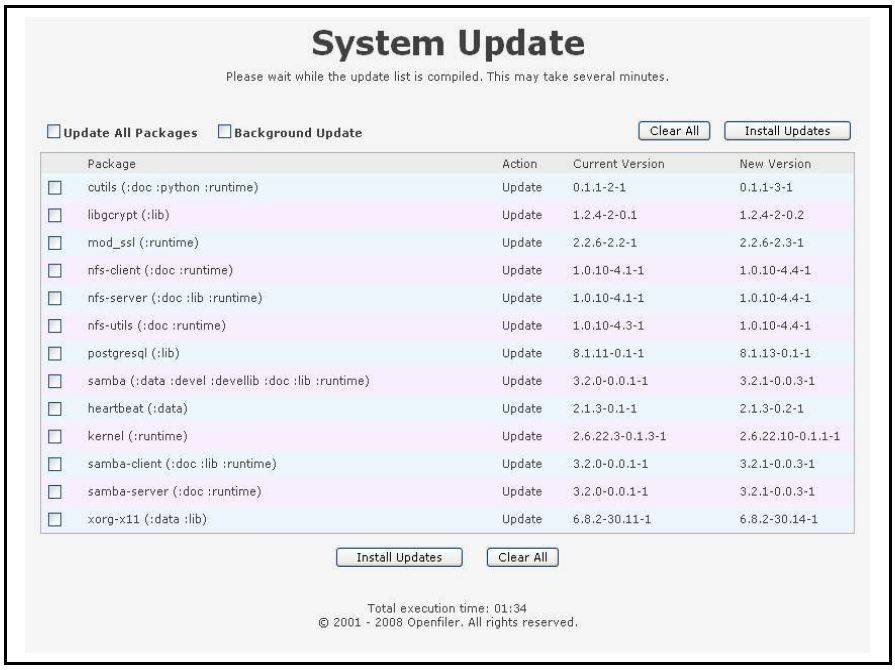


Figure 27: System Update

Note:

You can also update the system by clicking the **Update** link on the title bar.

4.7 Backup/Restore

This tab allows you to take a backup of the configuration or necessary data and to restore the configuration, when required.

4.7.1 Viewing Backup Configuration

▼ To view the backup configuration:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **System** tab. **Openfiler** displays the **Network Setup** page, as shown in Figure 6.
3. On the menu bar, click the **Backup/Restore** link. **Openfiler** displays the **Backup Configuration** page, as shown in the following figure.

Figure 28: Backup Configuration

4. Click the **Download** button to perform an instant backup snapshot.

4.7.2 Restoring the Configuration

▼ To restore the configuration:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **System** tab. **Openfiler** displays the **Network Setup** page, as shown in Figure 6.
3. On the menu bar, click the **Backup/Restore** link. **Openfiler** displays the **Restore Configuration** page, as shown in the following figure.

Figure 29: Restore configuration

4. Click the **Browse** button to search and select the document and then click the **Upload** button to upload it. **Openfiler** displays a confirmation message in the **Restore Confirmation** page, as shown in the following figure.

Figure 30: Restore configuration

5. Click the **Yes** button to continue the uploading process.
   OR
   Click the **No** button to cancel the process.

4.8 Managing Secure Console

This tab allows you to access the command line of the **Openfiler** system in the Java applet embedded in your system browser.

▼ To view the secure console:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **System** tab. **Openfiler** displays the **Network Setup** page, as shown in Figure 6.
3. On the menu bar, click the **Secure Console** link. **Openfiler** displays the **Secure Console** page, as shown in the following figure.

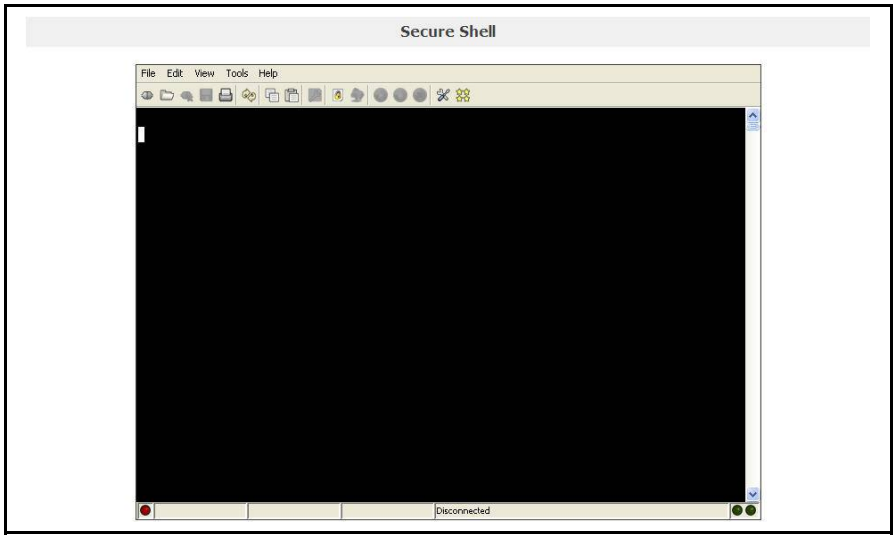


Figure 31: Secure Shell

5 Managing Volumes

This section deals with advanced volume management such as volume group creation and snapshot administration. Volume management deals with creating logical volumes (volume slices) and from existing volume groups. In order to use volume groups in the Openfiler GUI, they must be created first at the command line or should have been created during installation process. Logical volume can be deleted from a volume group if it is not in use. You can also modify its description and size in the volume group. Snapshot is a read-only point-in-time view of an existing logical volume. The snapshot preserves data as it was at that particular time. The original can be changed without affecting the snapshot data.

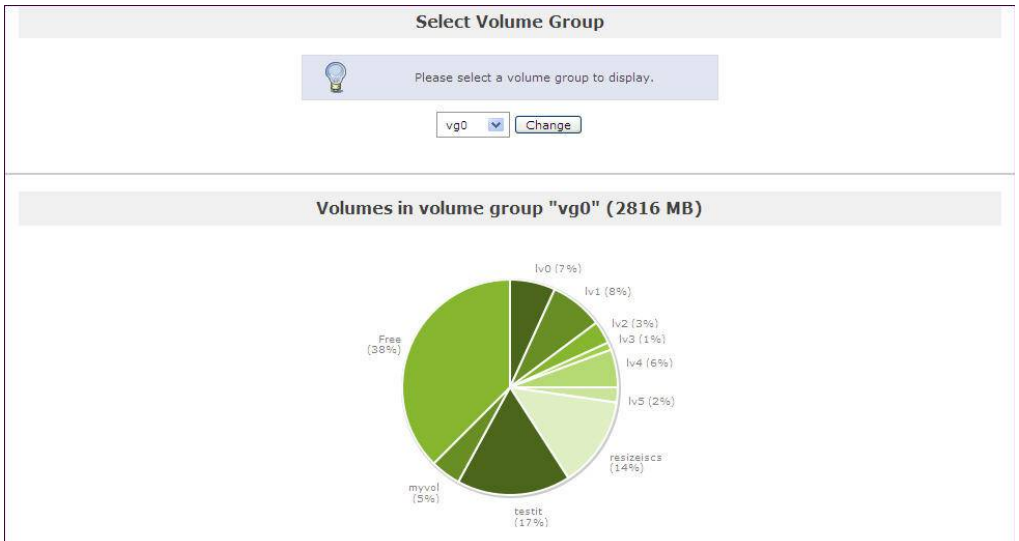
5.1 Managing Volumes

5.1.1 Viewing Volume Group

This section explains how to view volumes in volume group.

▼ To view volume group:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Volume** tab. **Openfiler** displays the **Volume** page as shown in the following figure.



Volume name	Volume description	Volume size	File system type	File system size	FS used space	FS free space	Delete	Properties	Snapshots
lv0	lv0	192 MB	XFS	Not available	Not available	Not available	Delete	Edit	Create
lv1	lv1	224 MB	XFS	Not available	Not available	Not available	Delete	Edit	Create
lv2	lv2	96 MB	XFS	Not available	Not available	Not available	Delete	Edit	Create
lv3	lv3	32 MB	iSCSI	Not applicable	Not applicable	Not applicable	*In use*	Edit	Create
lv4	lv4	160 MB	iSCSI	Not applicable	Not applicable	Not applicable	*In use*	Edit	Create
lv5	lv5	64 MB	iSCSI	Not applicable	Not applicable	Not applicable	*In use*	Edit	Create
resizeiscsi	resizeiscsi	384 MB	iSCSI	Not applicable	Not applicable	Not applicable	Delete	Edit	Create
testit	testit	480 MB	Ext3	Not available	Not available	Not available	Delete	Edit	Create
myvol	myvol	128 MB	XFS	124M	4.3M	120M	Delete	Edit	Create
0 MB allocated to snapshots									
1056 MB of free space left									

Figure 32: Select Volume Group

3. Select a volume group from the drop-down list and click **Change**.
4. Volumes in that group will be displayed.

5.1.2 Adding a Volume

A logical volume (volume slice) is the fundamental storage unit within which shares are created. A logical volume is a slice of a total disk space available. Logical volumes allow the administrator to physically separate different organizational units or applications on the storage appliance. This section provides details about how to add a new volume slice in a volume group.

▼ To add a volume in a volume group:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Volume** tab. **Openfiler** displays the **Volume** page as shown in Figure 32.
3. On the menu bar, click the **Add Volume** link. **Openfiler** displays the **Select Volume Group** page as shown in the following figure.

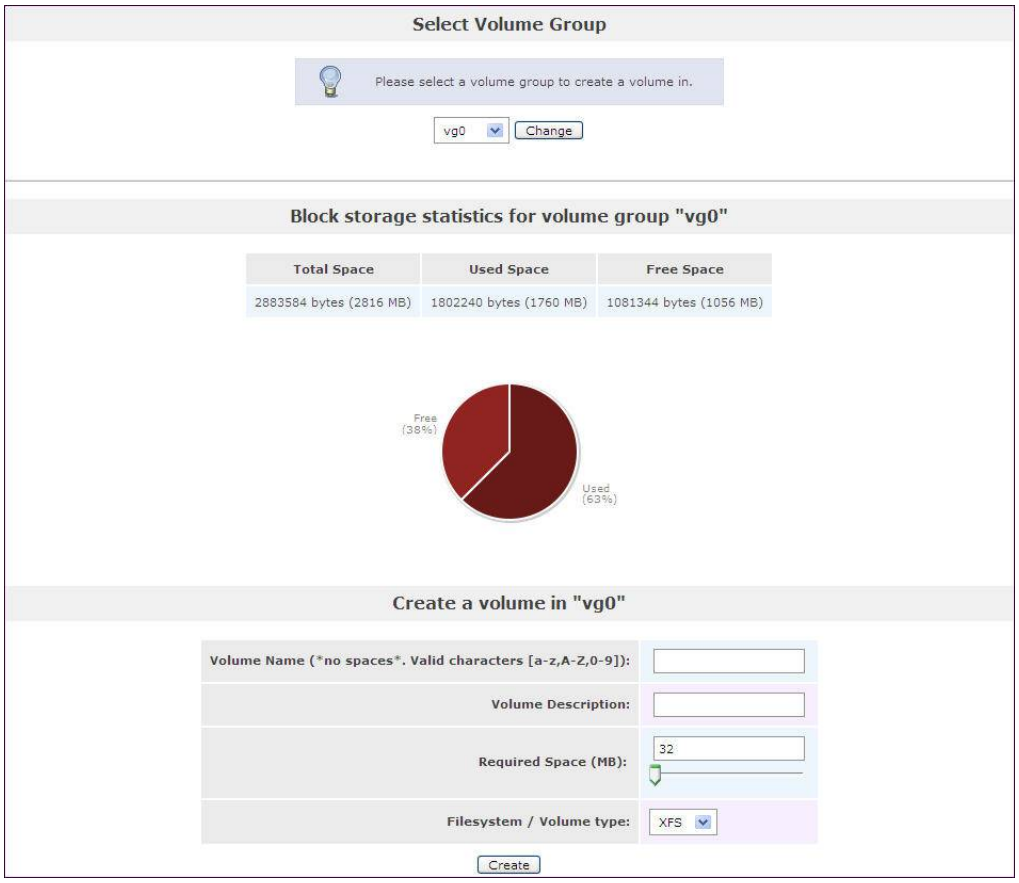


Figure 33: Create a Volume

Field	Description
Volume Name	Enter the desired name for the volume slice that is to be created. This field is the on –disk filesystem unixname and it should not contain space between two characters. This should resemble the name one would give to a file on the filesystem.
Volume Description	Enter the volume description. This field allows you to set the logical name to describe the volume in the Shares section where shares are created within the volumes.
Required Space	Enter the required space in MB. You can also move the slider below the field, to enter the required space.
Filesystem / Volume Type	Select the filesystem /volume type from the drop down list.

Table 8: Creating a Volume

4. Select the volume group from the drop-down list and click the **Change** button.
5. Enter/select the appropriate details in the respective fields in the **Create a volume** section
6. Click the **Create** button to create the volume slice.

5.1.2.1 Deleting Volume from Volume Group

This section explains how to delete a volume from a volume group.

▼ To delete volume from volume group:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Volume** tab. **Openfiler** displays the **Volume** page as shown in Figure 32.
3. Select a volume group from the drop-down list and click **Change**. **Openfiler** displays **Volumes in volume group** page as shown in the following figure.

Volume name	Volume description	Volume size	File system type	File system size	FS used space	FS free space	Delete	Properties	Snapshots
lv0	lv0	160 MB	XFS	Not available	Not available	Not available	*Snapshots exist*	Edit	Manage
lv1	lv1	96 MB	XFS	Not available	Not available	Not available	Delete	Edit	Create
lv2	lv2	128 MB	XFS	Not available	Not available	Not available	Delete	Edit	Create
lv3	lv3	192 MB	iSCSI	Not applicable	Not applicable	Not applicable	*In use*	Edit	Create
lv4	lv4	192 MB	iSCSI	Not applicable	Not applicable	Not applicable	*In use*	Edit	Create
lv5	lv5	128 MB	iSCSI	Not applicable	Not applicable	Not applicable	*In use*	Edit	Create
0 MB allocated to snapshots									
736 MB of free space left									

Figure 34: Volumes in volume group

4. Click the appropriate **Delete** link in the delete a volume from the volume group.

Note:

You cannot delete a volume being used.

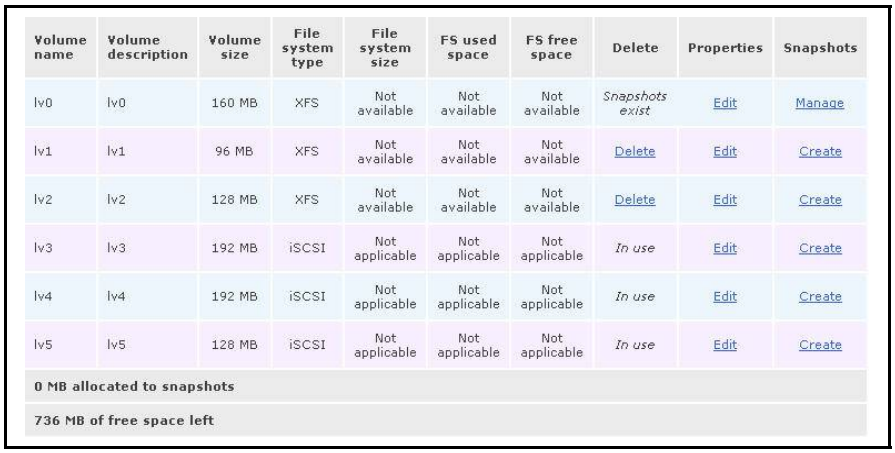
5.1.2.2 Editing Volume in Volume Group

This section explains how to modify properties of volume in a volume group by changing its description and size.

▼ To edit volume in volume group:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Volume** tab. **Openfiler** displays the **Volume** page as shown in Figure 32.

3. Select volume group from the drop-down list and click **Change**. **Openfiler** displays **Volumes in volume group** page as shown in following figure.



Volume name	Volume description	Volume size	File system type	File system size	FS used space	FS free space	Delete	Properties	Snapshots
lv0	lv0	160 MB	XFS	Not available	Not available	Not available	*Snapshots exist*	Edit	Manage
lv1	lv1	96 MB	XFS	Not available	Not available	Not available	Delete	Edit	Create
lv2	lv2	128 MB	XFS	Not available	Not available	Not available	Delete	Edit	Create
lv3	lv3	192 MB	iSCSI	Not applicable	Not applicable	Not applicable	*In use*	Edit	Create
lv4	lv4	192 MB	iSCSI	Not applicable	Not applicable	Not applicable	*In use*	Edit	Create
lv5	lv5	128 MB	iSCSI	Not applicable	Not applicable	Not applicable	*In use*	Edit	Create
0 MB allocated to snapshots									
736 MB of free space left									

Figure 35: Volumes in volume group

4. Click **Edit** link in the **Properties** column of the particular volume. **Openfiler** displays **Edit properties of volume** page as shown in the following figure.

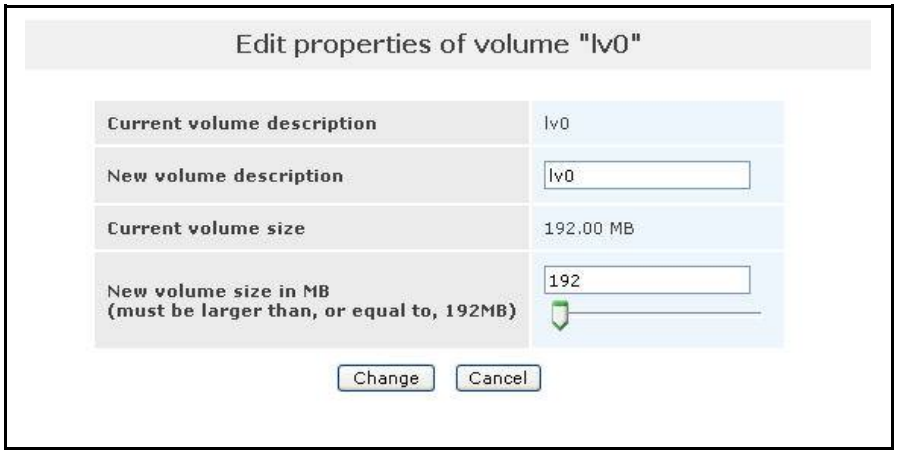


Figure 36: Edit Properties of a Volume

Field	Description
Current volume description	This field displays the current volume description.
New volume description	Enter the new volume description.
Current volume size	This field displays the current volume size in MB.
New volume size in MB	Enter the new volume size in MB. You can also set the value by moving the slider.

Table 9: Editing a Volume Properties

5. Enter the appropriate details in the respective fields.
6. Click **Change** button to modify properties of volume.
   OR
   Click **Cancel** button to cancel the process.

Note:

New volume size must be larger than or equal to the current volume size.

5.1.2.3 Snapshot

A snapshot is a read-only point-in-time copy of an existing volume slice (logical volume). The snapshot preserves the data on the logical volume as it was at the point the snapshot of the logical volume was taken. Changes can be made to the original logical volume, known as the snapshot source volume, without affecting the data on the snapshot. Snapshots have the advantage that changes can continue to be made to the source volume while a backup is taken of the point-in-time frozen copy of the source. The snapshot can also be used to access data that might have been accidentally deleted from the source volume - it provides a means of historical data rollback.

Snapshots are made of entire logical volumes and can be enabled for sharing to users on the network. If the administrator enables sharing of a snapshot, all the shared folders located on the snapshot will be enabled for sharing on the network. The access control enabled for the shares on the source volume of the snapshot at the time the snapshot was taken, will persist and be static for the lifetime of the snapshot even if access control is changed on the source volume of the snapshot.

▼ To create a snapshots:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Volume** tab. **Openfiler** displays the **Volume** page as shown in Figure 32.
3. Click the **Create** link of the volume in Snapshot column. **Openfiler** displays the page as shown in the following figure.

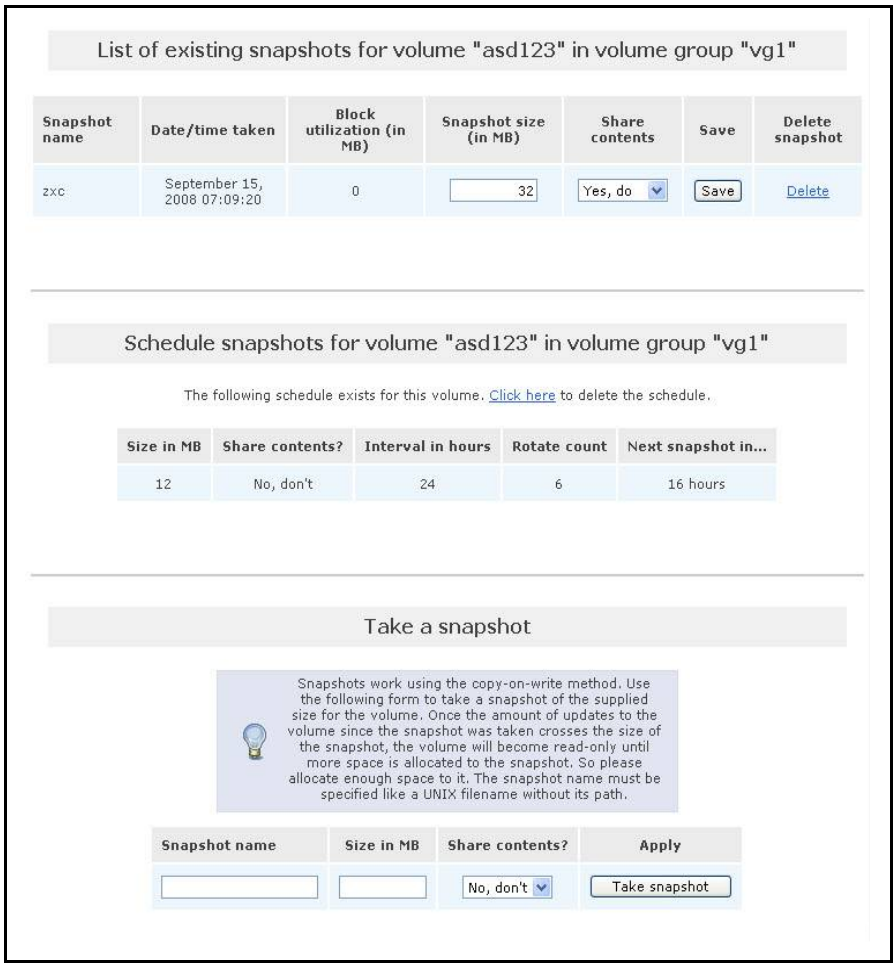


Figure 37: Snapshot

Field	Description
Snapshot name	Enter a succinct and descriptive name for the snapshot. It should not contain space between two characters.
Size in MB	Enter the desired size of the snapshot in MB. Bear in mind that the snapshot will be disabled automatically when it fills up. It is therefore important that enough space is allocated to the snapshot to take into account all the changes that will be made to the source volume during the lifetime of the snapshot.
Share contents	Select the appropriate sharing policy from the drop-down list. If the snapshot is enabled for sharing, all shares enabled for sharing on the source volume will be enabled for sharing on the snapshot using the access control policy that was active on the source volume at the time the snapshot is created.

Table 10: Snapshots

4. Enter/select the appropriate details in the respective fields.
5. Click the **Take snapshot** button to take the snapshot.

5.2 Managing Volume Group

A volume group is created by combining one or more physical volumes to create one large virtual volume. The capacity of the volume group is equal to the combined capacity of all the physical volumes allocated to the volume group. Additional volume groups can be created in the same way using a different set of physical volumes.

5.2.1 Volume Group Management

This section explains how to view a volume group management.

▼ To view volume group management:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Volume** tab. **Openfiler** displays the **Volume** page as shown in Figure 32.
3. On the menu bar, click the Volume Groups link. **Openfiler** displays the **Volume Group Management** page as shown in the following figure.

Volume Group Management

Volume Group Name	Size	Allocated	Free	Members	Add physical storage	Delete VG
bigvg	1.97 GB	448.00 MB	1.53 GB	View member PVs	Add PVs	VG contains volumes
newvol	32.00 MB	32.00 MB	0 bytes	View member PVs	Add PVs	VG contains volumes
vg3	64.00 MB	64.00 MB	0 bytes	View member PVs	Add PVs	VG contains volumes
vg1	1.59 GB	1.25 GB	352.00 MB	View member PVs	Add PVs	VG contains volumes
vg0	2.75 GB	1.72 GB	1.03 GB	View member PVs	Add PVs	VG contains volumes
test	124.00 MB	0 bytes	124.00 MB	View member PVs	Add PVs	Delete

Figure 38: Volume Group management

5.2.1.1 Viewing member PVs

This section explains how to view the member PVs of a particular volume group.

▼ To view member PVs:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Volume** tab. **Openfiler** displays the **Volume** page as shown in Figure 32.
3. On the menu bar, click the **Volume Groups** link. **Openfiler** displays the **Volume Group Management** page as shown in Figure.

Volume Group Management

Volume Group Name	Size	Allocated	Free	Members	Add physical storage	Delete VG
bigvg	1.97 GB	448.00 MB	1.53 GB	View member PVs	Add PVs	*VG contains volumes*
newvol	32.00 MB	32.00 MB	0 bytes	View member PVs	Add PVs	*VG contains volumes*
vg3	64.00 MB	64.00 MB	0 bytes	View member PVs	Add PVs	*VG contains volumes*
vg1	1.59 GB	1.25 GB	352.00 MB	View member PVs	Add PVs	*VG contains volumes*
vg0	2.75 GB	1.72 GB	1.03 GB	View member PVs	Add PVs	*VG contains volumes*
test	124.00 MB	0 bytes	124.00 MB	View member PVs	Add PVs	Delete

Figure 39: Volume Group management

4. Click the **View member PVs** link in the **Members** field of a volume group.
5. **Openfiler** displays the **Member PVs** page as shown in the following figure.

Member PVs of VG "vg3"

Device	Size
/dev/sdd8	61.75 MB
/dev/sdf2	46.07 MB

Close Window

Figure 40: Member PVs

6. Click the **Close Window** link after viewing.

5.2.1.2 Adding PVs

A physical volume in the context of the Logical Volume Manager (LVM) is a block device (disk) that has been initialized with LVM metadata. A block device can be any local or imported disk unit that is to be used exclusively as a volume group object i.e it can not be used for any other purpose.This section explains how to add physical volume(s) to a volume group.

▼ To add a physical volume:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed. Click the **Volume** tab. **Openfiler** displays the **Volume** page as shown in Figure 32.
2. On the menu bar, click the **Volume Groups** link. **Openfiler** displays the **Volume Group Management** page as shown in Figure .

Figure 41: Volume Group management

3. Click the **Add PVs** link in the **Add physical storage** field of a volume group. **Openfiler** displays the **Add PVs** page as shown in the following figure.

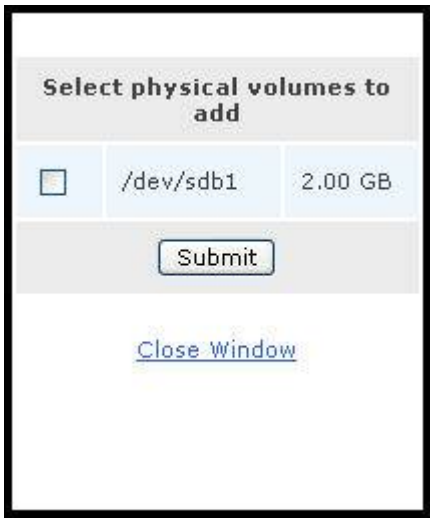


Figure 42: Add PVs

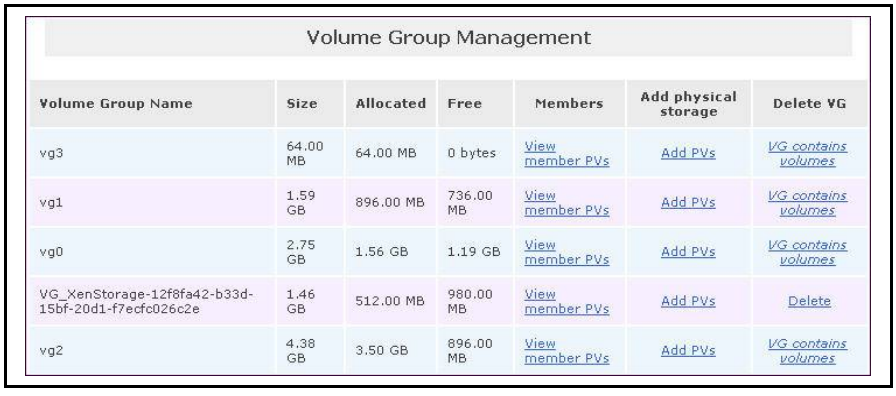
4. Select the check box and click the **Submit** button to add the selected physical volume.
   OR
   Click the **Close Window** button to exit.

5.2.1.3 Deleting Volume Group

This section explains how to delete a volume group.

▼ To delete a volume group:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed. Click the **Volume** tab. **Openfiler** displays the **Volume** page as shown in Figure 32.
2. On the menu bar, click the **Volume Groups** link. **Openfiler** displays the **Volume Group Management** page as shown in Figure.



Volume Group Management

Volume Group Name	Size	Allocated	Free	Members	Add physical storage	Delete VG
vg3	64.00 MB	64.00 MB	0 bytes	View member PVs	Add PVs	VG contains volumes
vg1	1.59 GB	896.00 MB	736.00 MB	View member PVs	Add PVs	VG contains volumes
vg0	2.75 GB	1.56 GB	1.19 GB	View member PVs	Add PVs	VG contains volumes
VG_XenStorage-12f8fa42-b33d-15bf-20d1-f7ecfc026c2e	1.46 GB	512.00 MB	980.00 MB	View member PVs	Add PVs	Delete
vg2	4.38 GB	3.50 GB	896.00 MB	View member PVs	Add PVs	VG contains volumes

Figure 43: Volume Group Management

3. Click the **VG contains volumes** link, in the **Delete VG** field of a volume group to delete the volume group.

5.2.2 Creating a new Volume Group

A volume group is an aggregation of one or more physical volumes created by concatenating multiple physical volumes to create one large virtual volume. The capacity of the volume group is equal to the combined capacity of all the physical volumes allocated to the volume group. This section explains how to create a new volume group.

▼ To create a new volume group:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed. Click the **Volume** tab. **Openfiler** displays the **Volume** page as shown in Figure 32.
2. On the menu bar, click the **Volume Groups** link. **Openfiler** displays the **Volume Group Management** page as shown in Figure.

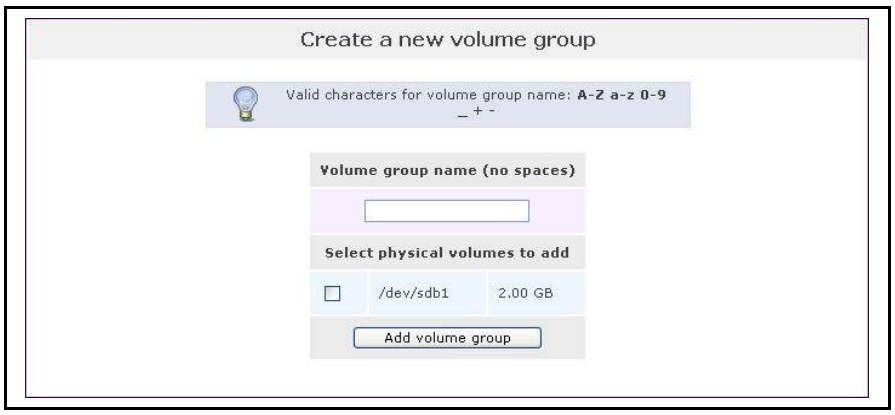


Figure 44: Create a new volume group

3. Enter the volume group name.
4. Select **physical volumes to add** by selecting the check box.
5. Click the **Add volume group** button.

Note:

A volume group name should not contain space between characters. Valid characters for a volume group name: A-Z, a-z, 0-9, _+-

Important

If there are no physical volumes, or all existing physical volumes are used, you can add a new physical volume to create a volume group.

5.3 Managing Block Devices

This section provides details about block device management. Using block devices, the administrator creates physical storage devices, allocates the device type and size, edits a disk, and views partitions of the devices.

5.3.1 Block Device Management

This section explains how to edit and view the partitions of a hard disk.

▼ To view block device management:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed. Click the **Volume** tab. **Openfiler** displays the **Volume** page as shown in Figure 32.
2. On the menu bar, click the **Block Devices** link. **Openfiler** displays the Block Device Management page, as shown in the following figure.

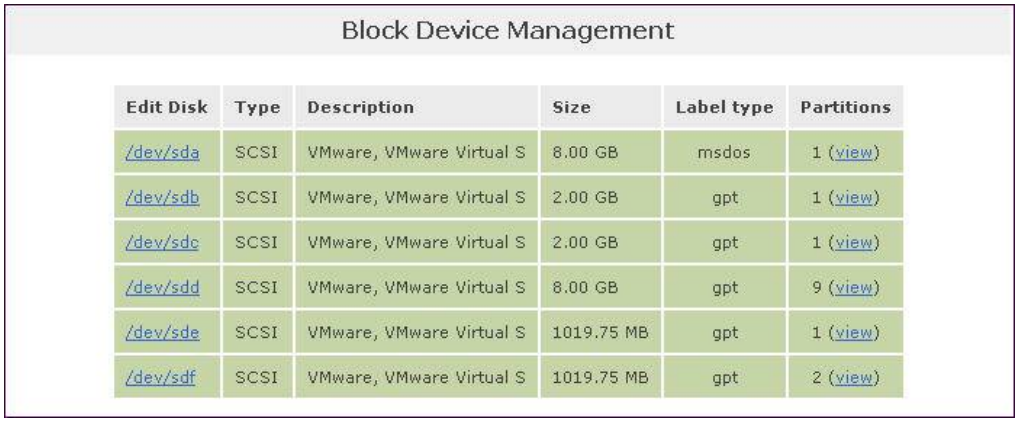


Figure 45: Block device management

Field	Description
Type	This field displays the device type.
Description	This field displays the device description.
Size	This field displays size of the disk.
Label Type	This field displays the type of the device label.

Table 11: Block Device Management

5.3.1.1 Editing a Disk

This section explains how to edit the partitions of a hard disk.

▼ **To edit a disk:**

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Volume** tab. **Openfiler** displays the **Volume** page as shown in Figure 32.
3. On the menu bar, click the **Block Devices** link. **Openfiler** displays the **Block Device Management** page as shown in Figure.

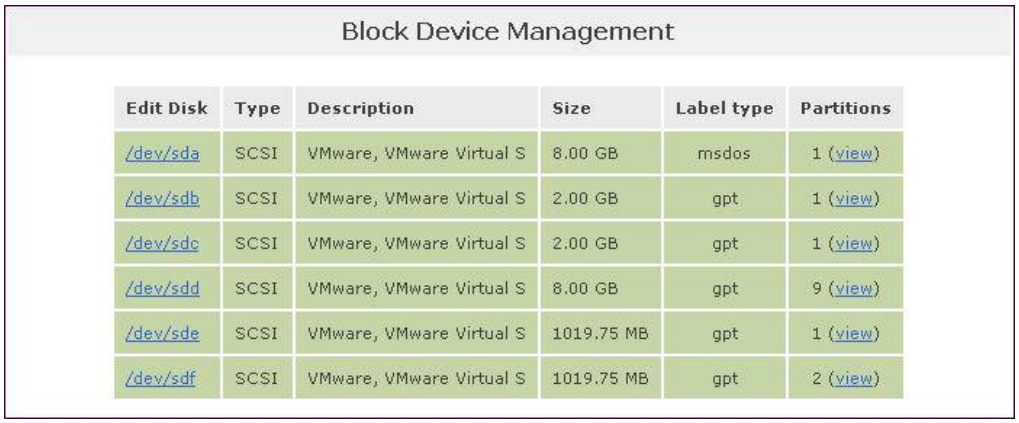


Figure 46: Block device management

4. Click the link of a disk in the **Edit Disk** column to edit the partition. **Openfiler** displays the **Edit Partition** page as shown in the following figure.

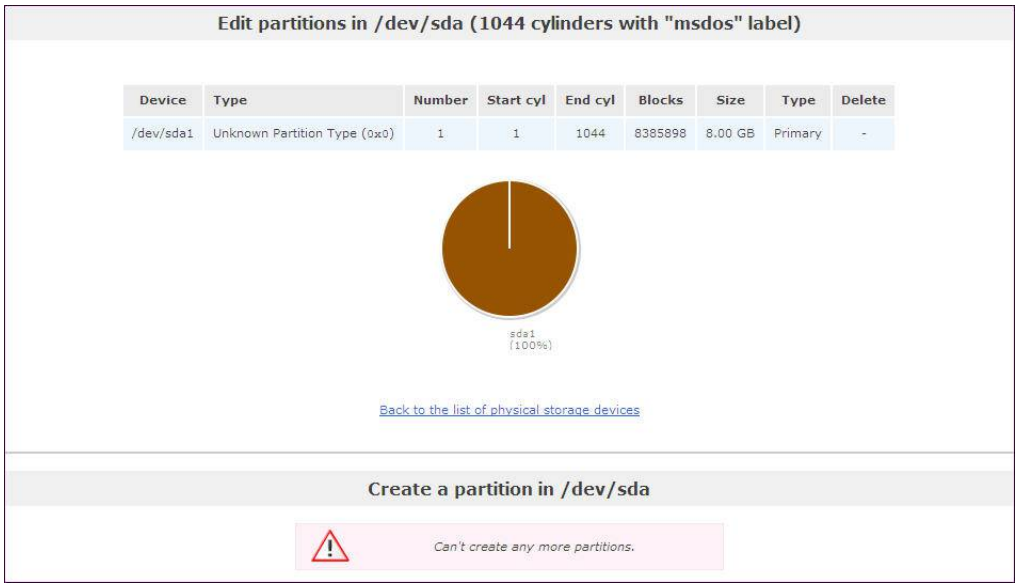


Figure 47: Edit Partition

5. Click the **Back to the list of physical storage devices** link to go back to the Block Device Management page.

5.3.1.2 Viewing Partitions

This section explains how to view partitions.

▼ To view the Partitions:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Volume** tab. **Openfiler** displays the **Volume** page as shown in Figure 32.
3. On the menu bar, click the **Block Devices** link. **Openfiler** displays the **Block Device Management** page as shown in the following figure.

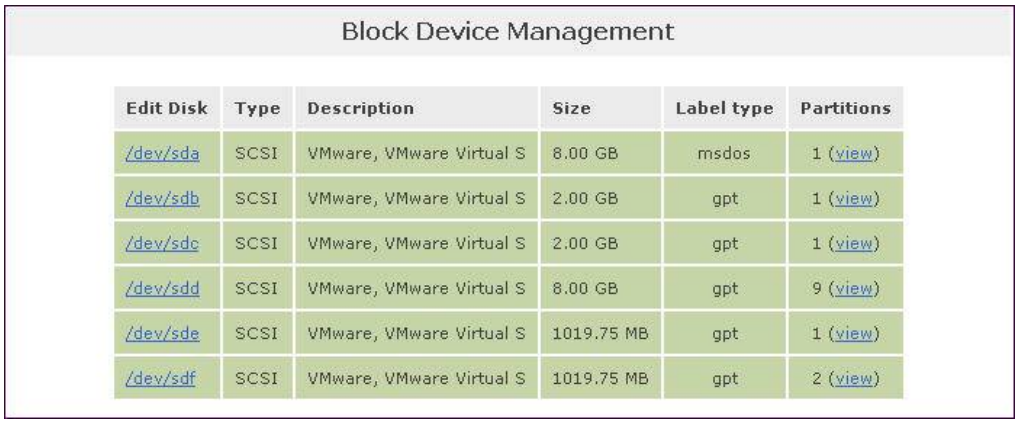


Figure 48: Block device management

4. Click the **View** link in the Partitions column. **Openfiler** displays the **Partitions** page as shown in the following figure.

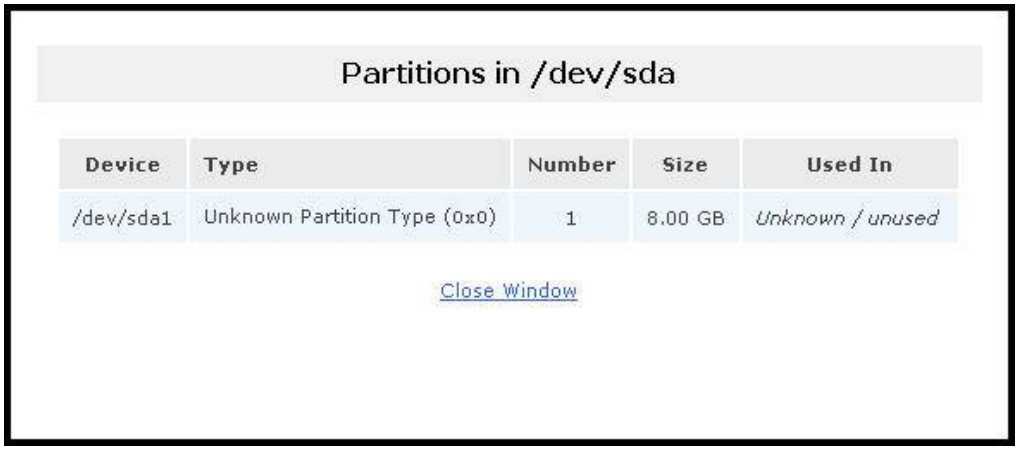


Figure 49: Partitions

5. Click the **Close Window** link to close the **Partitions** window after viewing**.**

5.4 Managing iSCSI Targets

This section provides details about how to manage iSCSI Targets. The iSCSI targets module consists of Target Configuration, managing LUN Mapping, setting Network ACL and CHAP Authentication. The administrator can add a new iSCSI target by selecting and setting a specific iSCSI target attribute.

5.4.1 Target Configuration

This section explains how to view or modify the target configuration settings.

▼ To view/modify Target Configuration:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Volume** tab. **Openfiler** displays the **Volume** page as shown in Figure 32.
3. On the menu bar, click the **iSCSI Targets** link. System displays the **Target Configuration** page as shown in the following figure.

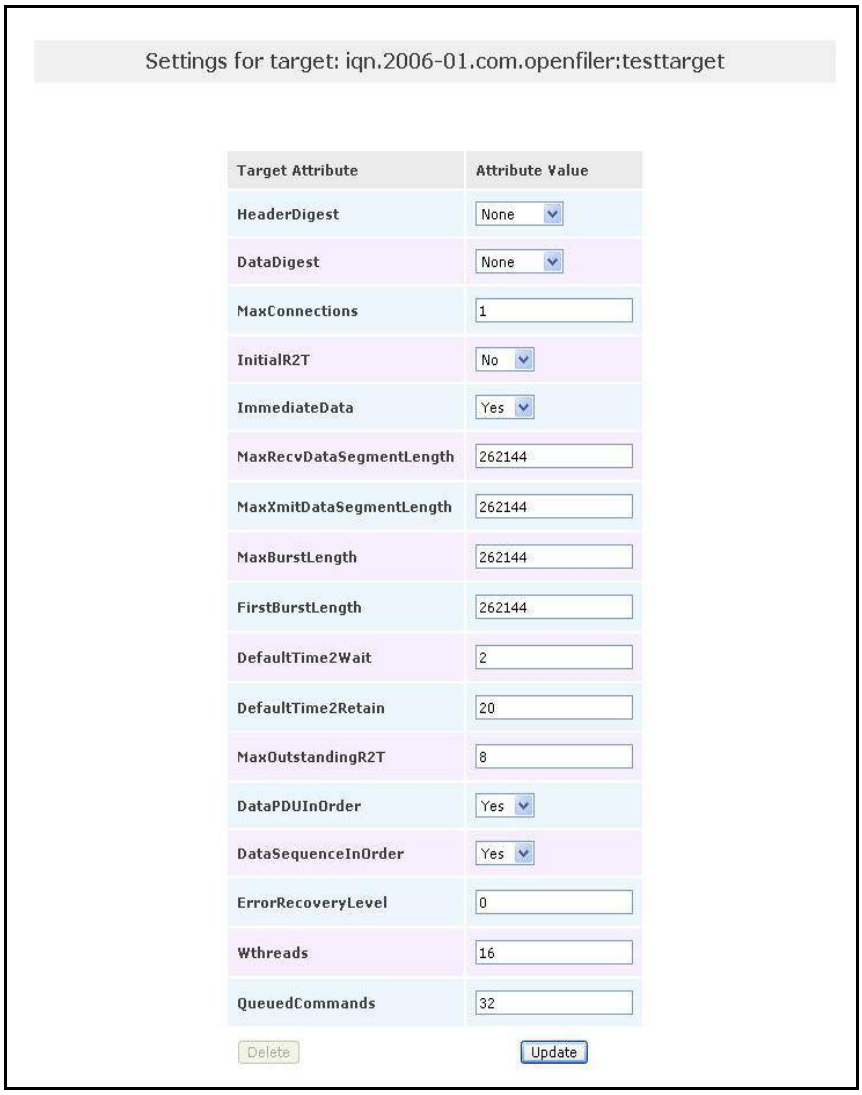


Figure 50: Target Configuration

Field	Description
Header Digest	Select the header digest from the drop-down list. The available options are CRC32C and None. If you select CRC32C and the initiator is configured accordingly , the integrity of an iSCSI PDU's header segment will be protected by a CRC32C checksum. By default None will be selected. Note that header digests are not supported during discovery sessions. This field is not mandatory.
DataDigest	Select the data digest from the drop-down list.

Field	Description
	If you select CRC32C and the initiator is configured accordingly , the integrity of an iSCSI PDU's data segment will be protected by a CRC32C checksum. By default None will be selected. Note that data digests are not supported during discovery sessions. This field is not mandatory.
MaxConnections	Enter the maximum number of connections. It has to be set to 1, which is selected always by default. This field is not mandatory.
InitialR2T	Select the initial R2T from the drop-down list. Available options are Yes and No. If "Yes" (default), is selected the initiator has to wait for the target to solicit SCSI data before sending it. Setting it to "No" allows the initiator to send a burst of **FirstBurstLength** bytes unsolicited right after and/or (depending on the setting of **ImmediateData**) together with the command. Thus setting it to "No" may improve performance. This field is not mandatory.
ImmediateData	Select the immediate data from the drop-down list. The available options are Yes and No. This allows the initiator to append unsolicited data to a command. To achieve better performance, this should be set to "Yes". The default is "No". This field is not mandatory.
MaxRecvDataSegment Length	Enter the maximum segment length of Recv data. It sets the maximum data segment length that can be received. The <*value*> should be set to multiples of PAGE_SIZE. Currently the maximum supported value is 64 * PAGE_SIZE, e.g. 262144 if PAGE_SIZE is 4kB. Configuring too large values may lead to problems allocating sufficient memory, which in turn may lead to SCSI commands timing out at the initiator host. The default value is 8192. This field is not mandatory.
MaxXmitDataSegment Length	Enter the maximum segment length of Xmit data. It sets the maximum data segment length that can be sent. The <*value*> actually used is the minimum of **MaxXmitDataSegmentLength** and the **MaxRecvDataSegmentLength** announced by the initiator. The <*value*> should be set to multiples of PAGE_SIZE. Currently the maximum supported value is 64 * PAGE_SIZE, e.g. 262144 if PAGE_SIZE is 4kB. Configuring too large values may lead to problems allocating sufficient memory, which in

Field	Description
	turn may lead to SCSI commands timing out at the initiator host. The default value is 8192. This field is not mandatory.
MaxBurstLength	Enter the maximum length of Burst. It sets the maximum amount of either unsolicited or solicited data the initiator may send in a single burst. Any amount of data exceeding this value must be explicitly solicited by the target. The <*value*> should be set to multiples of PAGE_SIZE. Configuring too large values may lead to problems allocating sufficient memory, which in turn may lead to SCSI commands timing out at the initiator host. The default value is 262144. This field is not mandatory.

Table 12: Target Configuration

4. Enter/select the appropriate details in the respective fields.
5. Click the **Update** button to update the target configuration.
   OR
   Click the **Delete** button to clear the target configuration.

5.4.1.1 Adding a new iSCSI Target

This section explains how to add a new iSCSI target.

▼ To add a new iSCSI target:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Volume** tab. **Openfiler** displays the **Volume** page as shown in Figure 32.
3. On the menu bar, click the **iSCSI Targets** link. System displays the **Add new iSCSI Target** page as shown in the following figure.

Figure 51: Add new iSCSI Target

Field	Description
Target IQN	Enter the target IQN.

Table 13: Adding a new iSCSI Target

4. Enter the appropriate data in the respective fields.
5. Click the **Add** button to add a new iSCSI target.

5.4.2 LUN Mapping

This section explains how to view or unmap a LUN from a target.

▼ To view/unmap the LUN:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Volume** tab. **Openfiler** displays the **Volume** page as shown in Figure 32.
3. On the menu bar, click the **iSCSI Targets** link. System displays the **iSCSI Target** page as shown in Figure.
4. Click the **LUN Mapping** tab. **Openfiler** displays the **LUNs mapped to target** page as shown in the following figure.

Figure 52: LUNs mapped to target

5. Click the **Unmap** button to unmap a LUN from the target.

5.4.2.1 Mapping a New LUN to a target

This option allows you to map a new LUN to a target.

▼ **To map a new LUN to a target :**

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Volume** tab. **Openfiler** displays the **Volume** page as shown in Figure 32.
3. On the menu bar, click the **iSCSI Targets** link. System displays the **Add new iSCSI Target** page as shown in Figure 52.
4. Click the **LUN Mapping** tab. **Openfiler** displays the **Map New LUN to Target** page as shown in the following figure.

Figure 53: Map New LUN to Target

Field	Description	
Name	This field displays the LUN name.	
LUN Path	This field displays the LUN Path.	
R/W Mode	Select the R/W mode from the drop-down list.	
	WT	Write-through I/O. Enable write-through caching. Select this mode if storage array does not have battery-backup or UPS is not employed.
	WB	Write-back I/O. Enable write-back caching Select this mode if storage array has battery-backup or UPS is employed.
	RO	Read-only I/O. Set read-only support on LUN. Initiator will be able to read from but not write to data store. Set this option when exporting a snapshot that is meant for read-only on the initiator.
SCSI Serial No	This field displays the SCSI serial number.	
SCSI Id	This field displays the SCSI ID number.	
Transfer Mode	Select the transfer mode from the drop-down list.	
	BlockIO	This mode performs direct block I/O with the device, bypassing the page-cache for all operations. This allows for efficient handling of non-aligned sector transfers (virtualized environments) and large block transfers (media servers). This mode works ideally with high-end storage HBAs and for applications that either do not need caching between application and disk or need the large block throughput. NB: this option does not support write-back caching R/W mode.
	FileIO	Cache I/O operations using page-cache.

Table 14: Map New LUN to a Target

5. Enter/select the appropriate details in the respective fields.
6. Click the **Map** button to map a new LUN to target.

5.4.3 Managing Network ACL

This section explains how to update the network ACL settings.

▼ To manage network ACL:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Volume** tab. **Openfiler** displays the **Volume** page as shown in Figure 32.
3. On the menu bar, click the **iSCSI Targets** link. System displays the **Add new iSCSI Target** page as shown in Figure 52.
4. Click the **Network ACL** tab. **Openfiler** displays the **Network ACL** page as shown in the following figure.

Figure 54: Network ACL

Field	Description
Name	This field displays the network name.
Network/Host	This field displays the network/host IP address.
Netmask	This field displays the sub Netmask address.
Access	Select the access from the drop-down list. Allow option will allow the iSCSI host to access the network, where Deny will deny the access.

Table 15: Network ACL

5. Enter/select the appropriate details in the respective fields.
6. Click the **Update** button to update the network ACL settings.

5.4.4 CHAP Authentication

Challenge Handshake Authentication Protocol (CHAP) support provides a security mechanism for controlling access to iSCSI targets on the Openfiler storage appliance. CHAP specifies a one-way or two-way (mutual) authentication system based on the participating peers - intiator(s) and target – sharing a secret key.

- **One-way CHAP** – with this CHAP level, the target will authenticate the initiator for incoming connections to access the storage LUNs mapped to the target. Access authorization is granted to initiators based on whether or not they authenticate successfully. Multiple passkeys can be defined, one for each initiator, using the *Incoming User* option of the *User Type* parameter.

- **Mutual CHAP** – with this CHAP level, the target will authenticate the initiator(s) for incoming connections and the initiator(s) will authenticate the target before authorizing it to provide storage . Only one passkey can be defined for the target using the *Outgoing User* option of the *User Type* parameter. This passkey must be added to the corresponding configuration parameter on each initiator that will be accessing the target.

▼ To authenticate using CHAP:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed. Click the **Volume** tab. **Openfiler** displays the **Volume** page as shown in Figure 32.
2. On the menu bar, click the **iSCSI Targets** link. System displays the **Add new iSCSI Target** page as shown in Figure 52.
3. Click the **CHAP Authentication** tab. **Openfiler** displays the **CHAP Authentication Settings** page as shown in the following figure.

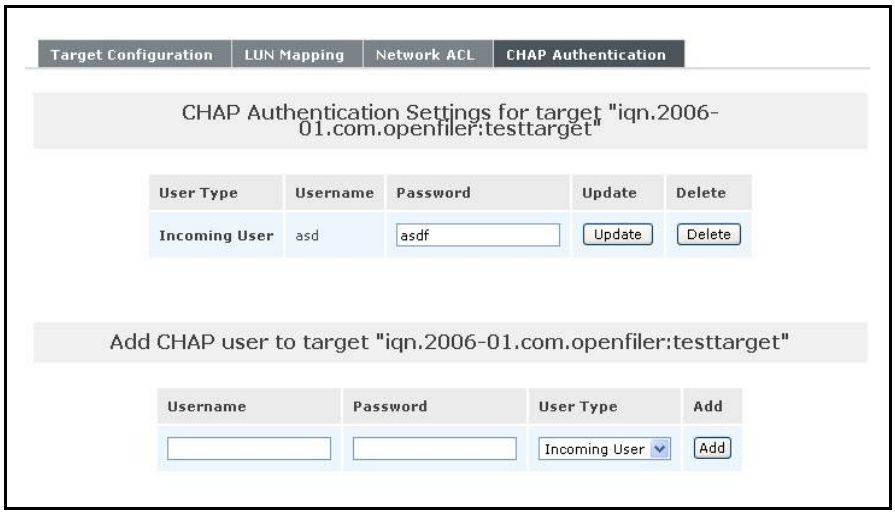


Figure 55: CHAP Authentication Settings

Field	Description
Username	Enter the name of the user.
Password	Enter the password.
User Type	Select the user type from the drop-down list.

Table 16: CHAP Authentication

4. Change the password and click the **Update** button to update the changes.
5. Click the **Delete** button to delete the CHAP.

5.4.4.1 Adding a CHAP User to a target

This section explains how to add a CHAP User to target.

▼ To add a CHAP User to a target:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Volume** tab. **Openfiler** displays the **Volume** page as shown in Figure 32.
3. On the menu bar, click the **iSCSI Targets** link. System displays the **Add new iSCSI Target** page as shown in Figure 52.
4. Click the **CHAP Authentication** tab. **Openfiler** displays the **Add CHAP user to target** page as shown in the following figure.

Figure 56: Add CHAP user to target

Field	Description
Username	Enter the name of the user.
Password	Enter the password.
User Type	Select the user type from the drop-down list.

Table 17: Adding a CHAP user to a Target

5. Enter/select the appropriate details in the respective fields.
6. Click the **Add** button to add CHAP User to target.

5.5 Software RAID

RAID devices are virtual devices created from two or more real block devices. This allows to be combined into a single device to hold a single filesystem. Some RAID level includes redundancy and so can survive some degree of service failure.

This section provides details about how to create a new RAID array and manage the existing software RAID in the software RAID management system.

▼ To manage software RAID:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed. Click the **Volume** tab. **Openfiler** displays the **Volume** page as shown in Figure 32.
2. On the menu bar, click the **Software RAID** link. **Openfiler** displays the **Software RAID Management** page as shown in the following figure.

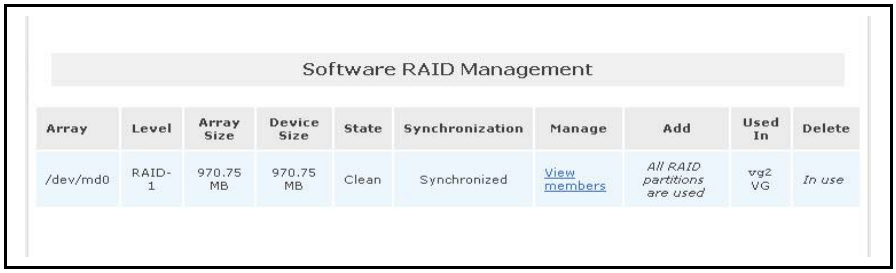


Figure 57: Software RAID Management

3. Click the **View members** link to view the member devices of the array. **Openfiler** displays the **Member devices of array** page as shown in the following figure.

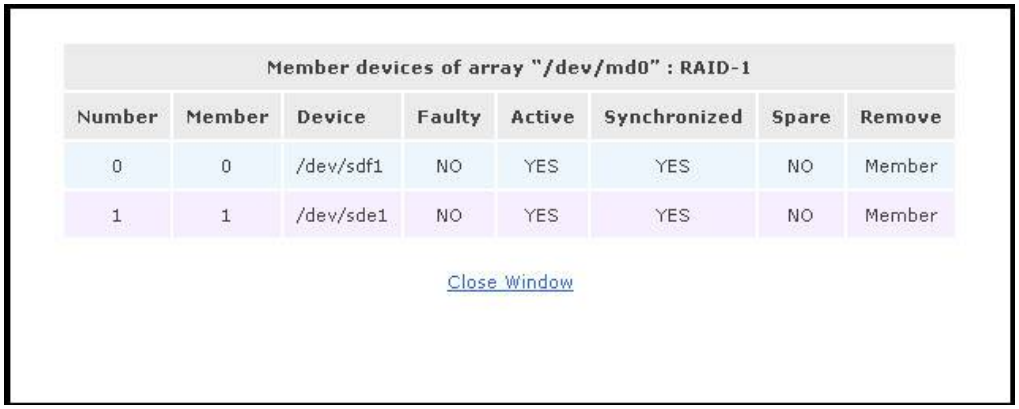


Figure 58: Member devices of array

4. Click the **Close Window** link to close the page.

5.5.1 Creating a New RAID Array

This option allows you to create a new RAID array.

▼ To create a new RAID array

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed. Click the **Volume** tab. **Openfiler** displays the **Volume** page as shown in Figure 32.
2. On the menu bar, click the **Software RAID** link. **Openfiler** displays the **Create a new RAID array** page as shown in the following figure.

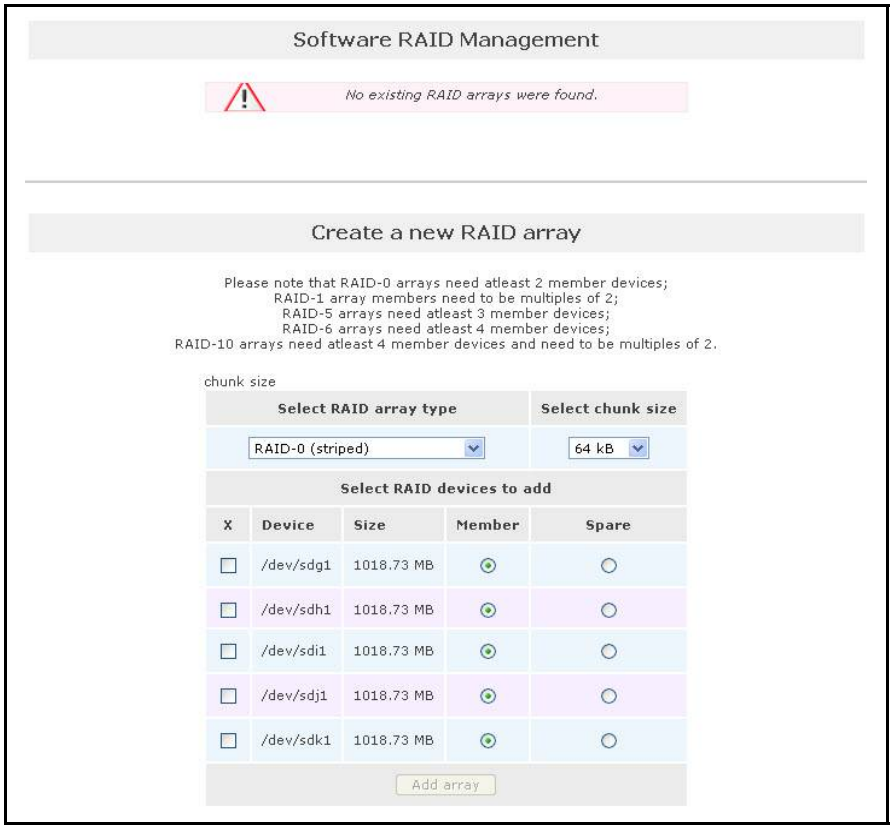


Figure 59: Create a new RAID array

Field	Description
Select RAID array type	Select the appropriate RAID array type from the drop-down list. RAID-0 arrays require at least two member devices; RAID-1 array members need to be multiples of 2; RAID-5 array needs at least 3 member devices; RAID-6 arrays require minimum 4 member devices; RAID-10 arrays require minimum 4 member devices and need to be multiples of 2.
Select chunk size	Select the RAID device size from the drop-down list. It specifies the chunk size in kilobytes. By default 64 KB is selected. The chunk size is important for performance and should be tuned to the average application I/O request size. For big I/Os the chunk size should be small in order to spread the load across as many disks as possible and for small I/Os the chunk size, conversely, should be set to a larger size to reduce latency.
X	Select the appropriate check box in the X column to select the respective devices.
Device	This field displays comma separated list of device names or device name patterns. Only one with names which match one entry in the list will be used to assemble the array.
Size	This field displays the size of the constructed RAID array.
Member	Specify the number of members to expect the array to have by selecting the member radio button(s).
Spare	This field specifies the number of spare devices to expect the array to have. Select the radio button(s) to set as spare device.

Table 18: Creating a New RAID Array

3. Select/enter the appropriate details in the respective fields and click the **Add Array** button to add new RAID array.

6 Managing Quota

By default, storage space on the **Openfiler** appliance must be allocated on a per-group and per-volume slice basis. This means that once group and host access control have been configured, quota allocation to the configured volume slices can take place. Quota allocation in this case is a physical resource limit on the filesystem of the amount of storage resources a group is allowed to consume. The administrator should bear in mind that quota allocation is taking place at the volume slice level and not at the share level. This has two implications:

- If a group is given access to two or more shares that reside on different volumes slices, quota allocation for that group must be done for each volume slice separately.
- If a group is given access to two or more shares that reside on the same volume slice, quota allocation applies for all shares on that volume slice combined.

The edit quota section allows you to allocate quota at the block and file level. The block level quota allocation sets a physical limit on the amount of space a group can consume on the volume slice. The file level quota allocation sets a physical limit on the number of files and directories a group is allowed on the volume slice. By default, both the block level and the file level allocations are set to zero for all groups.

6.1 Managing Group Quota

The Group Quota page allows you to set per volume quotas for individual groups accessing Storage resource on **Openfiler** appliance. At least on volume must exist to Group Quota to be visible. The administrator sets privileges for the group quota. To select all groups, click the **x** link on the table header. You can assign the quota individually by selecting the checkbox.

6.1.1 Selecting a Volume

The select volume section allows the administrator to select the target volume slice for quota information display and space allocation. This section provides a detailed description on how to select and change a volume in **Group Quota**.

▼ To select a volume:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Quota** tab. **Openfiler** displays the **Group Quota** page, as shown in the following figure.

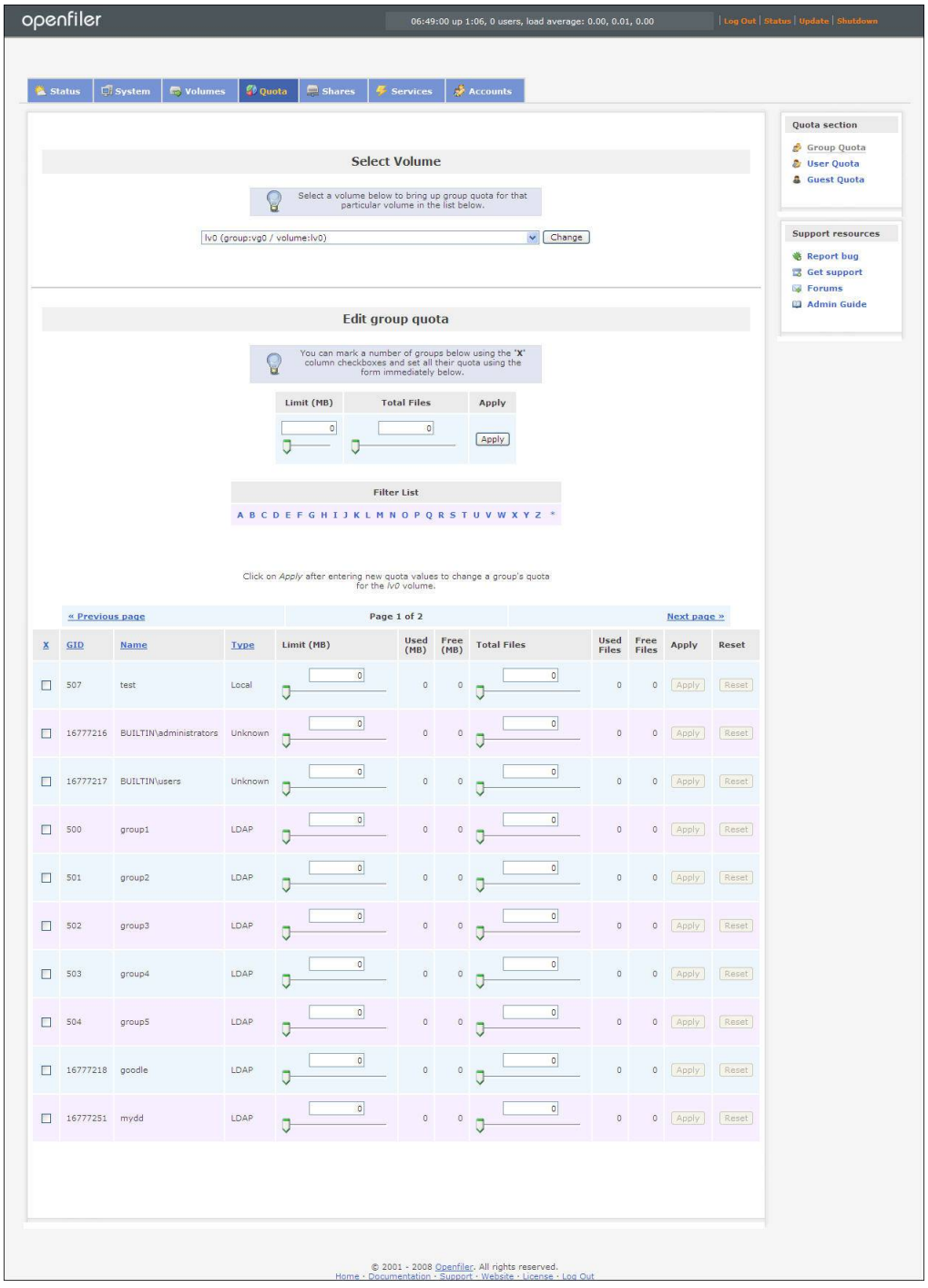


Figure 60: Group Quota

3. The **Select Volume** section in the **Group Quota** page is as shown in the following figure.

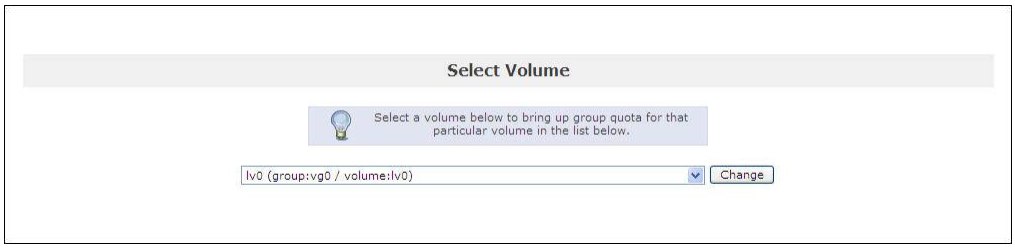


Figure 61: Select Volume

4. Select the appropriate volume from the drop-down list and click the **Change** button.

6.1.2 Editing a Group Quota

The edit quota option allows allocation of quota at the block and file level. Block level quota allocation places a physical limit on the amount of space a group can consume on the volume slice. File level quota allocation places a physical limit on the number of files and directories a group is allowed on the volume slice.

The Edit Quota section lists all groups that have been imported from the directory servers configured. Quota allocation for groups can be done individually, where block and file level quota is allocated for each group respectively or it can be batched, whereby several group can be selected at a time and quota allocated for all selected group simultaneously.This section provides a detailed description on how to edit **Group Quota**.

▼ To edit a Group Quota:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Quota** tab. **Openfiler** displays the **Group Quota** page, as shown in Figure 60. The **Edit group quota** section in the **Group Quota** page is as shown in the following figure.

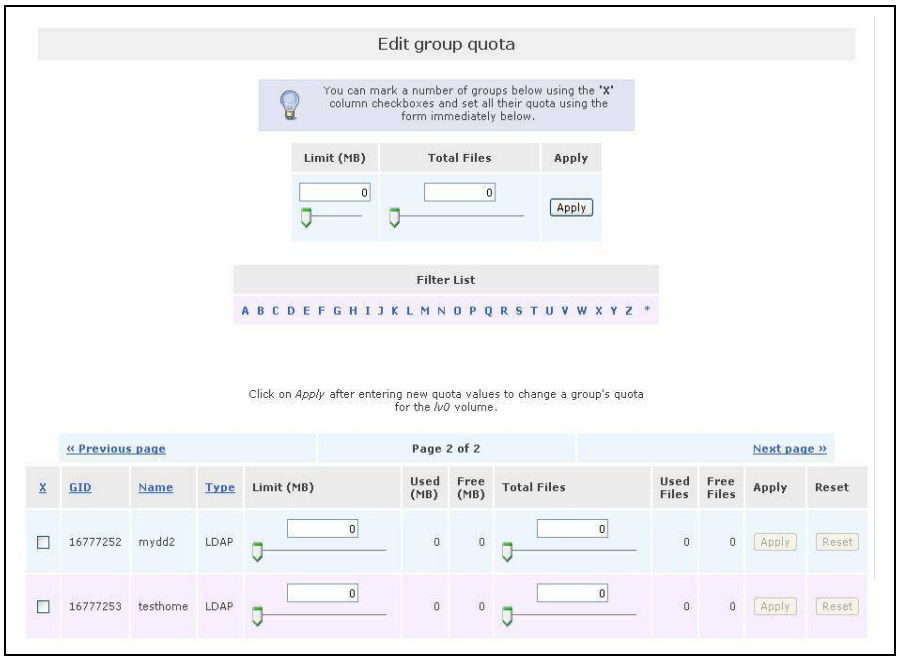


Figure 62: Edit Group Quota

Field	Description
Limit (MB)	Enter an appropriate limit, in MB, for the selected group(s). OR Move the slide bar, located below the respective field, to set the limit for the selected group(s). **Note**: To set the limit for an individual group, use the **Limit (MB)** field corresponding to that group in the list.
Total Files	Enter an appropriate total files limit, for the selected group(s), OR Move the slide bar, located below the respective field, to set the total files for the selected group(s). **Note**: To set the total files limit for an individual group, use the **Total Files** field corresponding to that group in the list.
Filter List	Click any alphabet from the filter list to list the group quota, starting with the selected alphabet.
X	Select the appropriate corresponding check box(s) to select a group(s).
GID	This field displays the group ID. Click the **GID** link to sort the data by group ID.
Name	This field displays the group name.

Field	Description
	Click the **Name** link to sort the data by name.
Type	This field displays the group type. Click the **Type** link to sort the data by group quota type.
Used (MB)	This field displays the used disk space in MB.
Free (MB)	This field displays the free disk space for the group in MB.
Total Files	Enter an appropriate total files limit, for the selected group. OR Move the slide bar, located below the respective field, to set the total files limit for the selected group.
Used Files	This field displays the number of files that belong to the group.

Table 19: Editing a Group Quota

3. Enter/select the appropriate details and click the corresponding **Apply** button to save the changes.
   OR
   Click the corresponding **Reset** button to reset the changes.

6.2 Managing User Quota

This section shows you how to manage user quota. The administrator sets privileges for the user quota. To select all groups, click the **x** link on the table header. You can assign the quota individually by selecting the checkbox.

6.2.1 Selecting a Volume

This section provides a detailed description on how to select and change a volume in **User Quota**.

▼ To select a Volume:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Quota** tab. **Openfiler** displays the **Group Quota** page, as shown in Figure 60.
3. On the menu bar, click the **User Quota** link. **Openfiler** displays the **User Quota** page, as shown in the following figure.

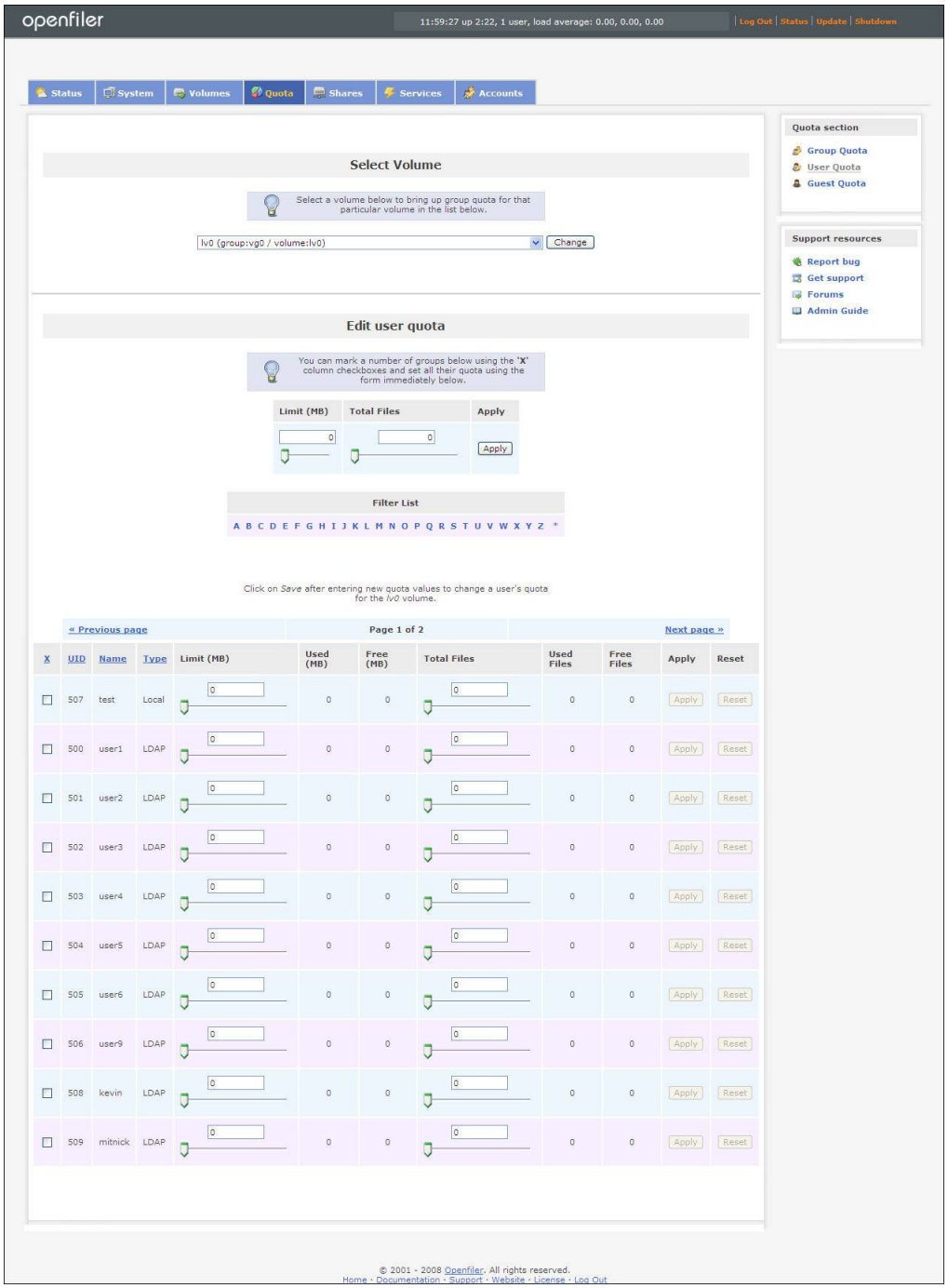


Figure 63: User Quota

4. The **Select Volume** section in the **User Quota** page is as shown in the following figure.

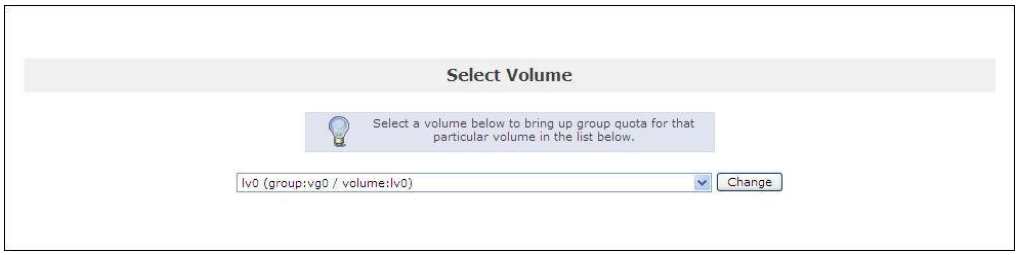


Figure 64: Select Volume

5. Select the appropriate volume from the drop-down list and click the **Change** button.

6.2.2 Editing a User Quota

This section provides a detailed description on how to edit a **User Quota**.

▼ To edit a User Quota:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Quota** tab. **Openfiler** displays the **Group Quota** page, as shown in Figure 60.
3. On the menu bar, click the **User Quota** link. **Openfiler** displays the **User Quota** page, as shown in Figure 63.The **Edit user quota** section in the **User Quota** page is as shown in the following figure.

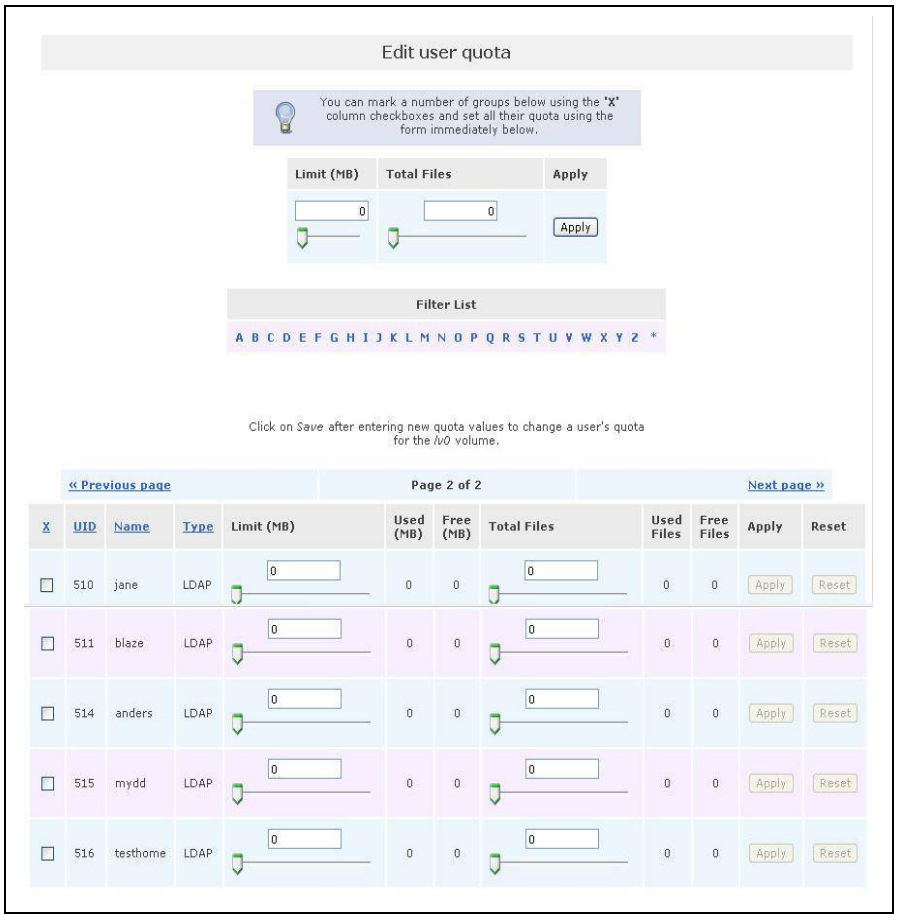


Figure 65: Edit User Quota

Field	Description
X	Select the appropriate corresponding check box(s) to select a user(s).
UID	This field displays the user ID. Click the **UID** link to sort the data by user ID.
Name	This field displays the user name. Click the **Name** link to sort the data by name.
Type	This field displays the type of user quota. Click the **Type** link to sort the data by user quota type.
Limit (MB)	Enter an appropriate limit, in MB, for the selected User(s). OR Move the slide bar, located below the respective field, to set the limit for the selected User(s). **Note**: To set the limit for an individual user, use the **Limit**

Field	Description
	(MB) field corresponding to that user in the list.
Total Files	Enter an appropriate total files limit, for the selected user(s). OR Move the slide bar, located below the respective field, to set the total files for the selected user(s). **Note**: To set the total files limit for an individual user, use the **Total Files** field corresponding to that user in the list.
Filter List	Click any alphabet from the filter list to list the user quota, starting with the selected alphabet.
Used (MB)	This field displays the used quota in MB.
Free (MB)	This field displays the free user quota in MB.
Total Files	Enter an appropriate total files limit, for the selected user. OR Move the slide bar, located below the respective field, to set the total files limit for the selected user.
Used Files	This field displays the number of used files.
Free Files	This field displays the number of free files available.

Table 20: Editing a User Quota

4. Enter/select the appropriate limits and then click the corresponding **Apply** button to save the changes.
   OR
   Click the corresponding **Reset** button to reset the changes.

6.3 Managing Guest Quota

This section shows you how to manage guest quota. The administrator sets privileges for the guest quota. To select all groups click the **x** link on the table header. You can assign the quota individually by selecting the checkbox.

6.3.1 Selecting a Volume

This section provides a detailed description on how to select and change a volume in **Guest Quota**.

▼ To select a Volume:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Quota** tab. **Openfiler** displays the **Group Quota** page, as shown in Figure 60.
3. On the menu bar, click the **Guest Quota** link. **Openfiler** displays the **Guest Quota** page, as shown in the following figure.

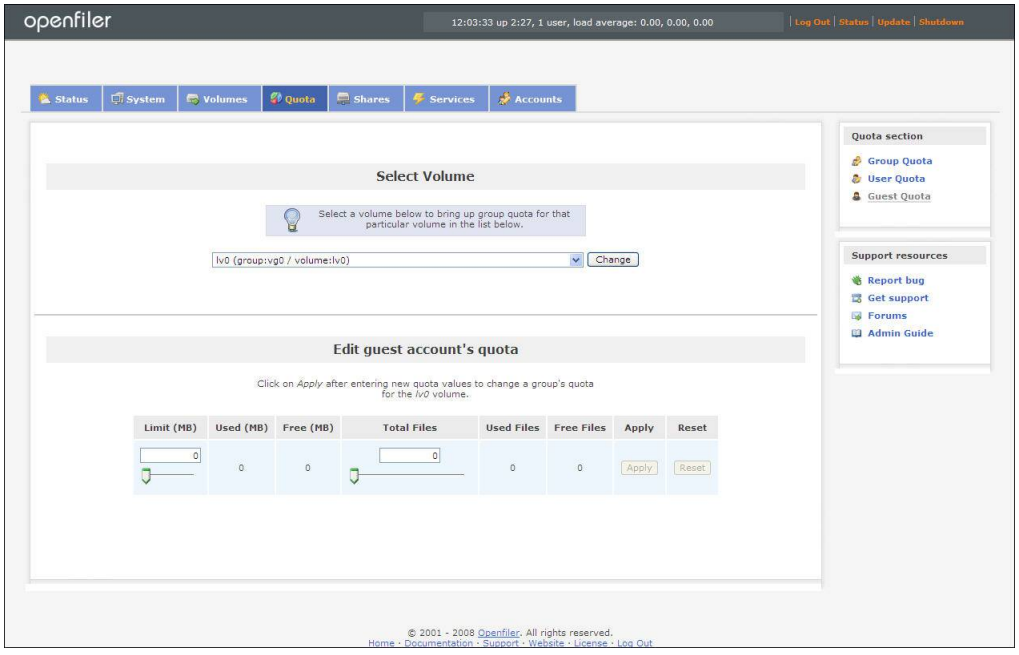


Figure 66: Guest Quota

4. The **Select Volume** section in the **Guest Quota** page is as shown in the following figure.

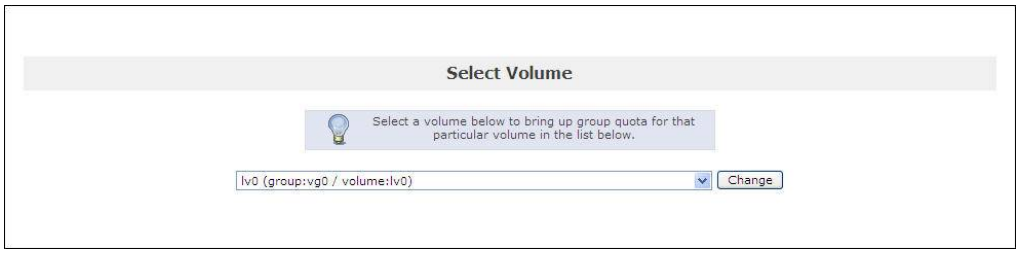


Figure 67: Select Volume

5. Select the appropriate volume from the drop-down list and click the **Change** button.

6.3.2 Editing a Guest Quota

This option allows you to edit a guest quota.

▼ To edit a Guest Quota:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Quota** tab. **Openfiler** displays the **Group Quota** page, as shown in Figure 60.
3. On the menu bar, click the **Guest Quota** link. **Openfiler** displays the **Guest Quota** page, as shown in Figure 66. The **Edit guest account's quota** section in the **Guest Quota** page is as shown in the following figure.

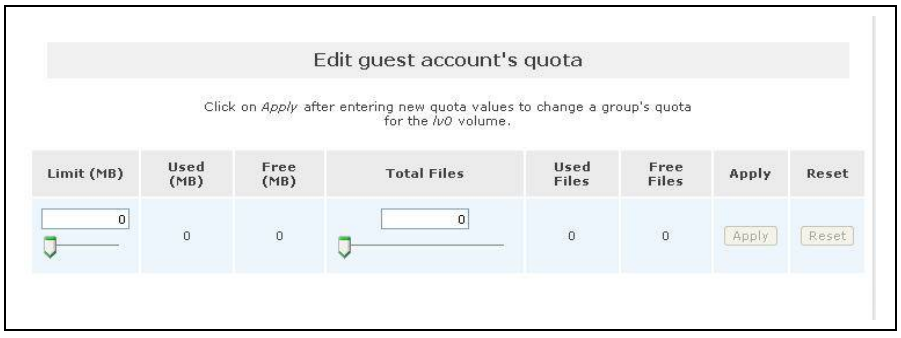


Figure 68: Edit Guest Account's Quota

Field	Description
Limit (MB)	Enter an appropriate limit, in MB, for the selected guest account. OR Move the slide bar, located below the respective field, to set the limit for the selected guest.
Used (MB)	This field displays the total space used by the guest, in MB .
Free (MB)	This field displays the total free space available for the guest, in MB.
Total Files	Enter an appropriate total files limit, for the selected guest. OR Move the slide bar, located below the respective field, to set the total files limit for the selected guest.
Used files	This field displays the total number of files used by the guest.
Free files	This field displays the total free files available for the guest.

Table 21: Editing a Guest Quota

4. Enter/select the appropriate limits and then click the corresponding **Apply** button to save the changes.
   OR
   Click the corresponding **Reset** button to reset the changes.

7 Managing Shares

A shared resource, or share, is a local resource on a server that is accessible to windows clients on the network. In **Openfiler**, a share is typically a location in a volume slice that can be exported with the support of any one of the **Openfiler** network file system protocols. Shares can be created and edited in the Shares page by clicking on the Shares tab. The default shares page lists all existing volume slices. Once shares are created within the volumes, the default shares page will show all existing volume slices, their folders and sub folders and any shares created within these folders and sub folders. Each share is identified by a name on the network. Shares and directories are independent entities. Removing a share does not affect the underlying directory.

7.1 Managing Shares

This section provides details about how the administrator can manage existing network shares by viewing, editing and deleting them.

7.1.1 Viewing Existing Shares

This section explains how to view existing shares.

▼ To view existing shares:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Shares** tab. **Openfiler** displays the **Network Shares** page, as shown in the following figure.

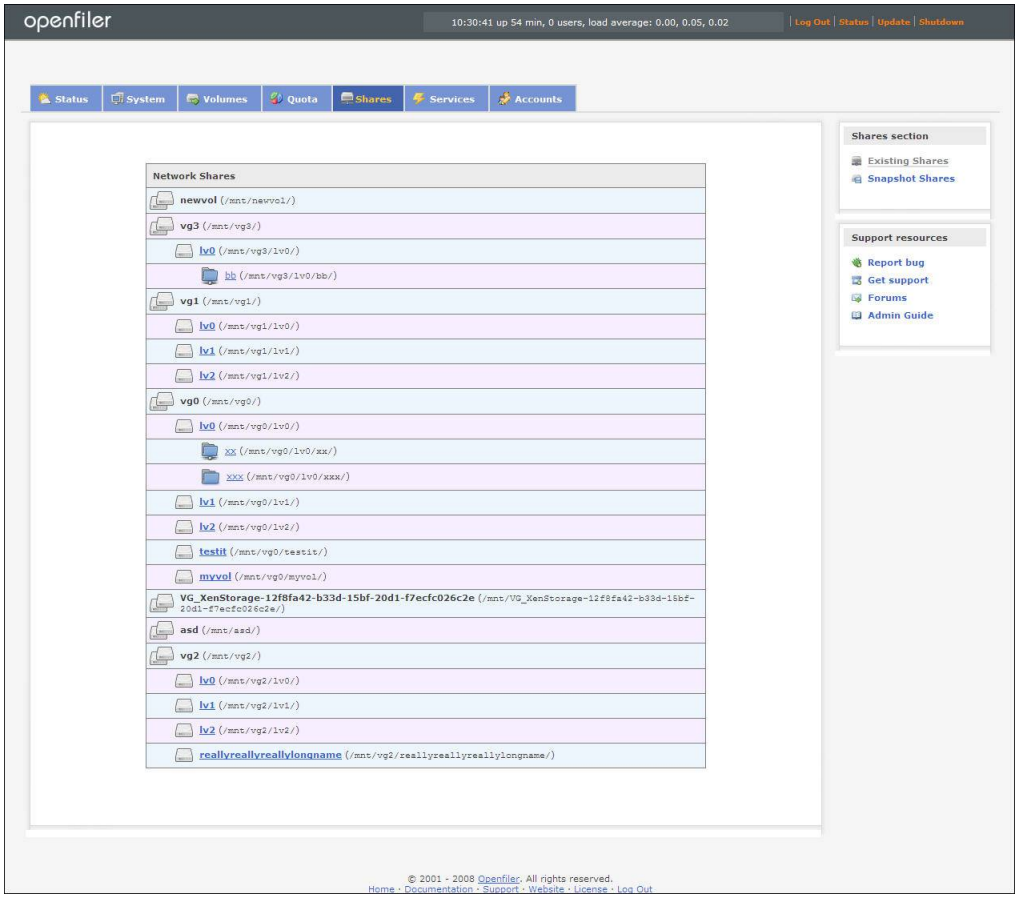


Figure 69: Network Shares

7.1.2 Creating a Share

A share is a location in a volume slice that can be exported via any one of the **Openfiler**-supported network filesystem protocols. Shares can be created and edited in the Shares screen by clicking on the Shares tab. The default Shares screen lists all existing volume slices. Once shares are created within the volumes, the default Shares screen will show all existing volume slices, their folders and sub-folders, and any shares created within these folders and sub-folders. Shares are created within volume slices. Clicking on a volume slice link will open a dialog to enter the name of a sub-folder of the volume slice, which can subsequently be converted to a share.

Clicking on the identifier for a share will open a new page "Edit Shares". The Edit Shares page is divided into three sections. There is a section for renaming a share identifier and description, one for setting group access control, and the final section for setting network access control and services for the share. All the three sections are explained as a separate sections.

▼ To create a share:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Shares** tab. **Openfiler** displays the **Network Shares** page, as shown in Figure 69.
3. Click on a volume slice link from the **Network Shares** list. **Openfiler** displays a window, as shown in the following figure.

Figure 70: Create a Share-creating a Folder

4. Enter the appropriate folder name and click the **Create Sub-folder** button. This share will be added to the existing share.
5. Click on the newly created folder name link. **Openfiler** displays a pop-up window as shown in the following figure.

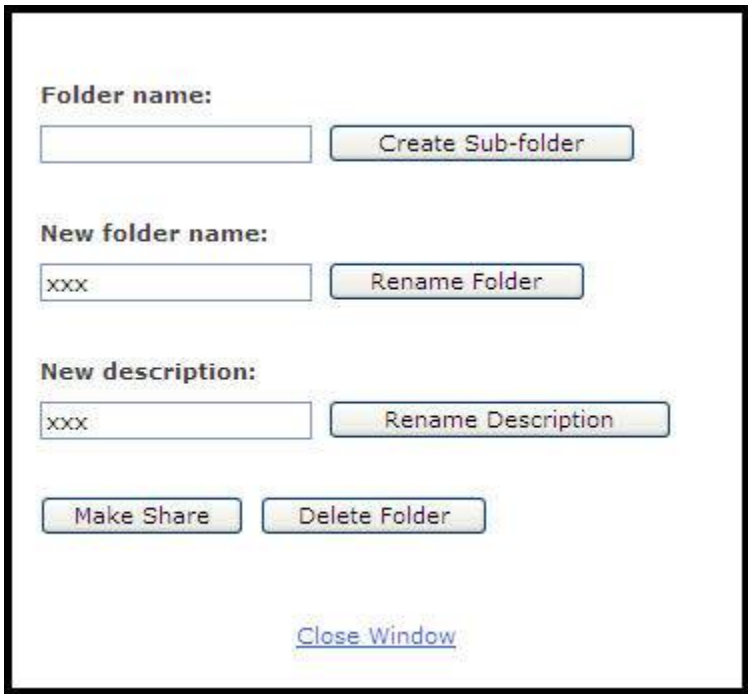
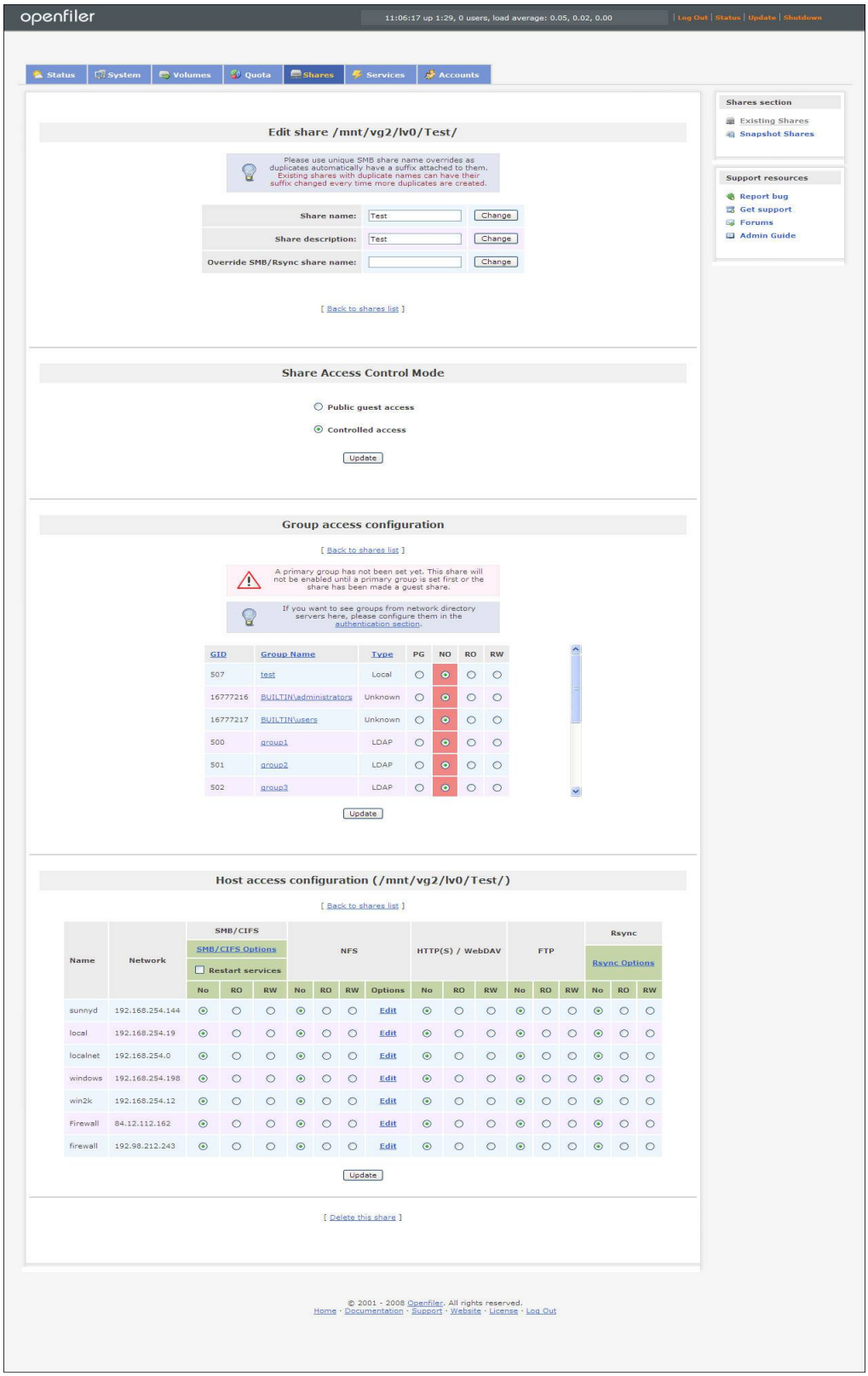


Figure 71: Create Network Shares

Field	Description
Folder Name	Enter the new identifier for the share.
New Folder Name	Enter the new folder name.
New Description	Enter the new description to change the description of the share.

Table 22: Creating Shares

6. Enter the appropriate data in the respective fields.
7. Click the **Make Share** button to create a new share. **Openfiler** displays the **Edit Network Shares** page, as shown in the following figure
   OR
   Click the **Delete Folder** button to delete the share folder.


openfiler
11:06:17 up 1:29, 0 users, load average: 0.05, 0.02, 0.00
Log Out | Status | Update | Shutdown
Status System Volumes Quota Shares Services Accounts
Shares section
Existing Shares
Snapshot Shares
Support resources
Report bug
Get support
Forums
Admin Guide
Edit share /mnt/vg2/lv0/Test/
Please use unique SMB share name overrides as duplicates automatically have a suffix attached to them. Existing shares with duplicate names can have their suffix changed every time more duplicates are created.
Share name: Test Change
Share description: Test Change
Override SMB/Rsync share name: Change
[Back to shares list]
Share Access Control Mode
Public guest access
Controlled access
Update
Group access configuration
[Back to shares list]
A primary group has not been set yet. This share will not be enabled until a primary group is set first or the share has been made a guest share.
If you want to see groups from network directory servers here, please configure them in the authentication section.
GID Group Name Type PG NO RO RW
507 test Local
16777216 BUILTIN\administrators Unknown
16777217 BUILTIN\users Unknown
500 group1 LDAP
501 group2 LDAP
502 group3 LDAP
Update
Host access configuration (/mnt/vg2/lv0/Test/)
[Back to shares list]
Name Network SMB/CIFS NFS HTTP(S) / WebDAV FTP Rsync
SMB/CIFS Options
Restart services
Rsync Options
No RO RW No RO RW Options No RO RW No RO RW No RO RW
sunnyd 192.168.254.144 Edit
local 192.168.254.19 Edit
localnet 192.168.254.0 Edit
windows 192.168.254.198 Edit
win2k 192.168.254.12 Edit
Firewall 84.12.112.162 Edit
firewall 192.98.212.243 Edit
Update
[Delete this share]
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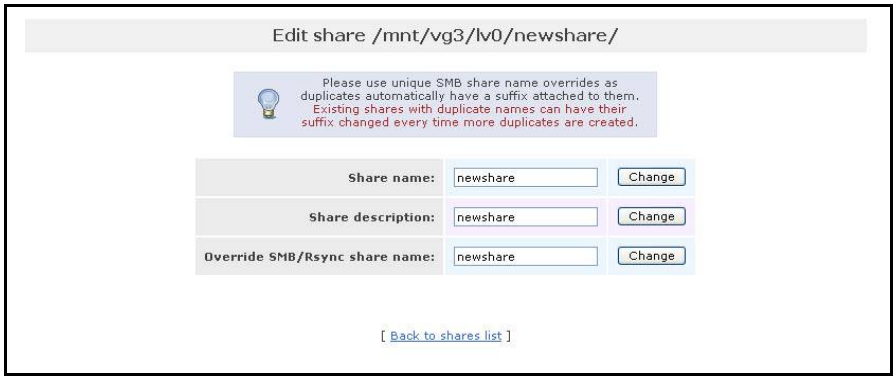
Home · Documentation · Support · Website · License · Log Out

Figure 72: Edit Network Shares

7.1.2.1 Edit Share

In this section you can rename a share identifier and change the description of the share.

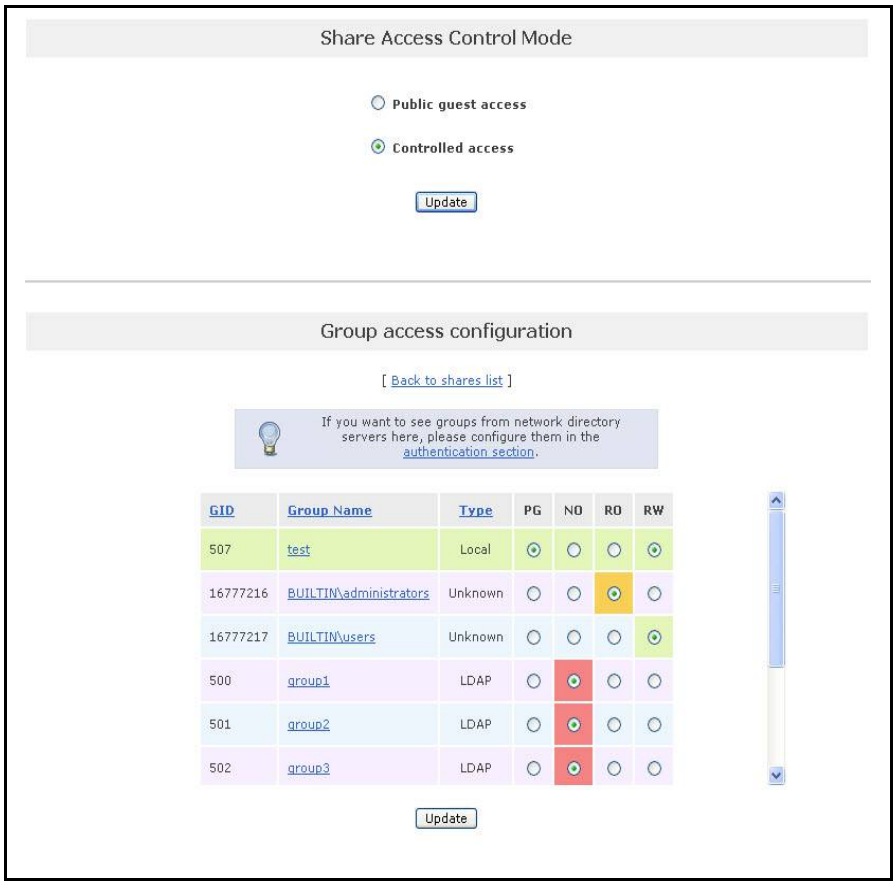


Field	Description
Share Name	Enter the share name in the text box.
Share Description	Enter the share description in the text box.
Override SMB/Rsync share name	Enter either SMB/Rsync share name in the text box.

Table 23: Editing a Share

7.1.2.2 Group Access Configurations

Access to shares is configured at the group level and network level. Security for a share can be loose or tight depending on the required security level for the share. For loose security, the share can be set to public access level. With public access, any user on the network, logged into a client machine that has network access will be able to access the share. With controlled access, only users that have been given specific access permissions will be able to access the share. To configure group access to a share, scroll down to the Group access configuration sub-section. There are two selectable radio-buttons. To allow guest access to the share, select the **Public guest access** radio-button and click the Update button. Once this setting has been applied, all users on any networks that have been given read or write access to the share will be able to access the share without having to authenticate with a directory/authentication server.



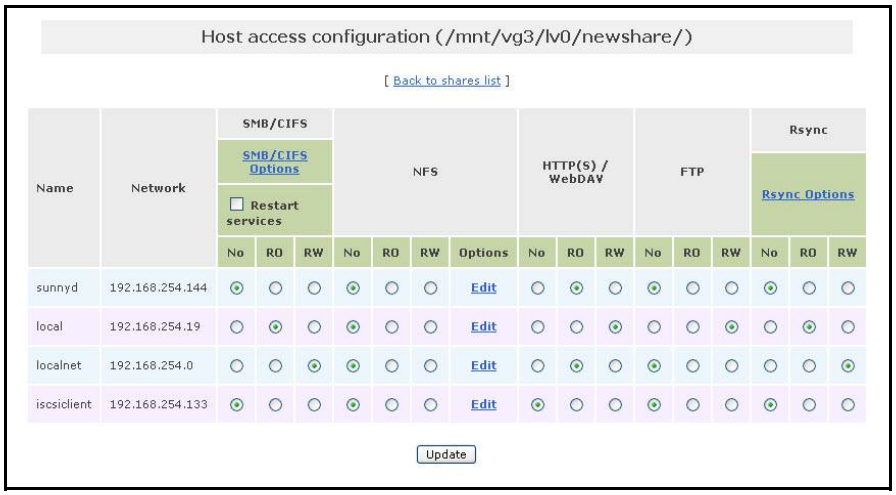
Field	Description
Share Access Control	
Public Guest Access	Select this radio button to allow guest access to the share. Once this setting has been applied, all users on any network that have been given read and write access to the share will be able to access the share without having to authenticate with a directory /authentication server.
Controlled Access	Select this radio button to restrict the access to the share. The controlled access mechanism works in conjunction with the list of groups that have been imported from the configured directory services.
Group Access Configuration	
GID	Enter the unique numerical group ID.
Group Name	Enter the descriptive name of the group.
Type	This field displays the type of directory server the group is in.
PG	Select this radio button to set the selected group as primary

Field	Description
	group. The primary group for share owns the share and has full access rights on it. This must be set for the share to be visible. Every share must have a primary group, of which there can be only one.
NO	This radio button determines which group(s) will not be allowed access to the share. By default, this will be selected for all groups.
RO	This radio button determines which group(s) has read only access to the shares.
RW	This radio button determines which group(s) has read and writes access to the share.

Table 24: Group Access Configuration

7.1.2.3 Host Access Configurations

Once access control to the share has been configured at the group-level, network-level access control has to be configured. The host access configuration section is for determining which hosts on the network are permitted access to shares. Groups that have been granted access rights to the share will only be able to access or view the share from a host that has been granted network-level access rights to the share. The Administrator can determine what share access protocols are permitted for each individual host or network. To configure network-level access control, scroll down to the Host access configuration sub-section of the Edit Share page.



Field	Description
Name	This field displays the name of networks and hosts that are permitted network access to the **Openfiler** appliance.
Network	This field displays the IP address of the networks and hosts that are permitted to the **Openfiler** appliance.
SMB/CIFS	Set the access control for SMB / CIFS. Network access control for SMB /CIFS allows for different settings depending on the desired effect for the share and source of the connection. There are three options for network access control and they are applied on a per-host or per-network basis. The options are: ≅ NO: If this radio button is selected, the network or host it applies to will not have any access to the share via SMB/CIFS protocol. ≅ RO: If this radio button is selected, the network or host it applies to will have read only access to the share via SMB/CIFS protocol. ≅ RW: If this radio button is selected, the network or host it applies to will have read and write access to the share via SMB/CIFS protocol.
NFS	Set the access control for the NFS. The administrator must ensure that any share exported via NFS has the correct level of security settings in line with the requirements of the network storage security policy. There are three options for NFS and they are applied on a per-network basis. The available options are: ≅ NO: If this radio button is selected, the network or host it applies to will not have any access to the share via NFS protocol. ≅ RO: If this radio button is selected, the network or host it applies to will have read only access to the share via NFS protocol. ≅ RW: If this radio button is selected, the network or host it applies to will have read and write access to the share via NFS protocol. You can edit the NFS settings by clicking the **Edit** link of the Option column.
HTTP(S) WebDAV	Access control via HHTP(s)/webDAV can be set on a per-host or per-network basis based on the access requirements for the share. There are three options available for HTTP(s)/Web/DAV network access control. The options are: ≅ NO: If this radio button is selected, the network or host it applies to will not have any access to the share via HTTP(S) and /or WebDAV protocol. ≅ RO: If this radio button is selected, the network or host it applies to will have read only access to the share via HTTP(S) and /or WebDAV protocol. ≅ RW: If this radio button is selected, the network or host it applies to will have read and write access to the share via HTTP(S) and

Field	Description
	/or WebDAV protocol.
FTP	Access control via FTP can be set on a per-host or per-network basis based on the access requirements for the share. The available options are: ≅ NO: If this radio button is selected, the network or host it applies to will not have any access to the share via FTP protocol. ≅ RO: If this radio button is selected, the network or host it applies to will have read only access to the share via FTP protocol. ≅ RW: If this radio button is selected, the network or host it applies to will have read and write access to the share via FTP protocol.
Rsync	Access control via Rsync can be set on a per-host or per-network basis based on the access requirements for the share. The available options are: ≅ NO: If this radio button is selected, the network or host it applies to will not have any access to the share via Rsync protocol. ≅ RO: If this radio button is selected, the network or host it applies to will have read only access to the share via Rsync protocol. ≅ RW: If this radio button is selected, the network or host it applies to will have read and write access to the share via Rsync protocol.

Table 25: Host Access Configuration

8. Enter/select the appropriate details in the respective fields.
9. Click the **Update** button in the respective section to update the changes that have been made to each section.
10. Click the **Back to Share list** link to go to the network shares page.

7.1.3 Editing a Share

This section explains how to edit an existing network share. The edit share page is divided in to three sections. There is section for remaining share identifier and description, one for setting group access control and the third one for setting network access control and services for the share.

▼ To edit a share:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Shares** tab. **Openfiler** displays the **Network Shares** page, as shown in Figure 69.
3. Click an appropriate network share link from the **Network Shares** list. **Openfiler** displays the **Edit Network Shared** pop-up window, as shown in the following figure.

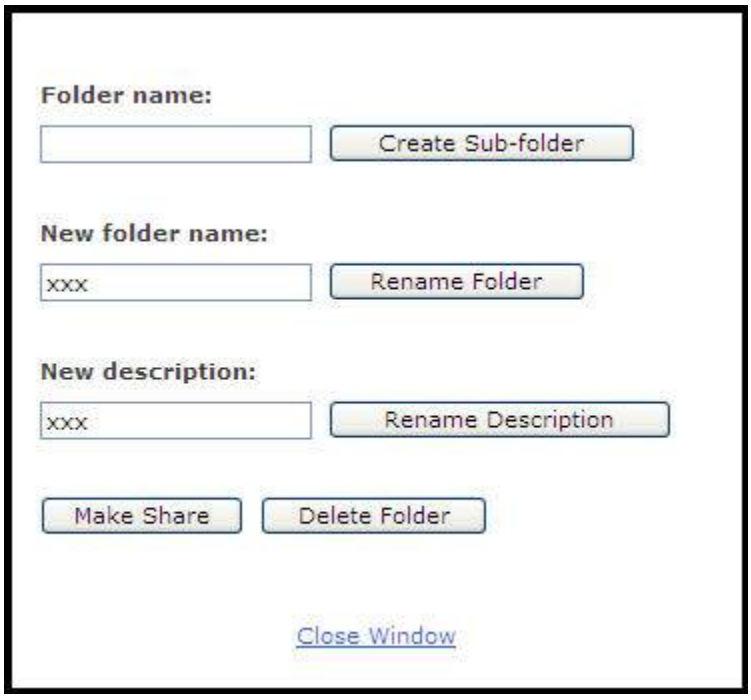


Figure 73: Edit Network Shares

4. Enter the appropriate data in the respective fields.
5. Click the **Make Share** button to create a new share. **Openfiler** displays the **Edit Network Shares** page, as shown in the following figure
   OR
   Click the **Delete Folder** button to delete the share folder.

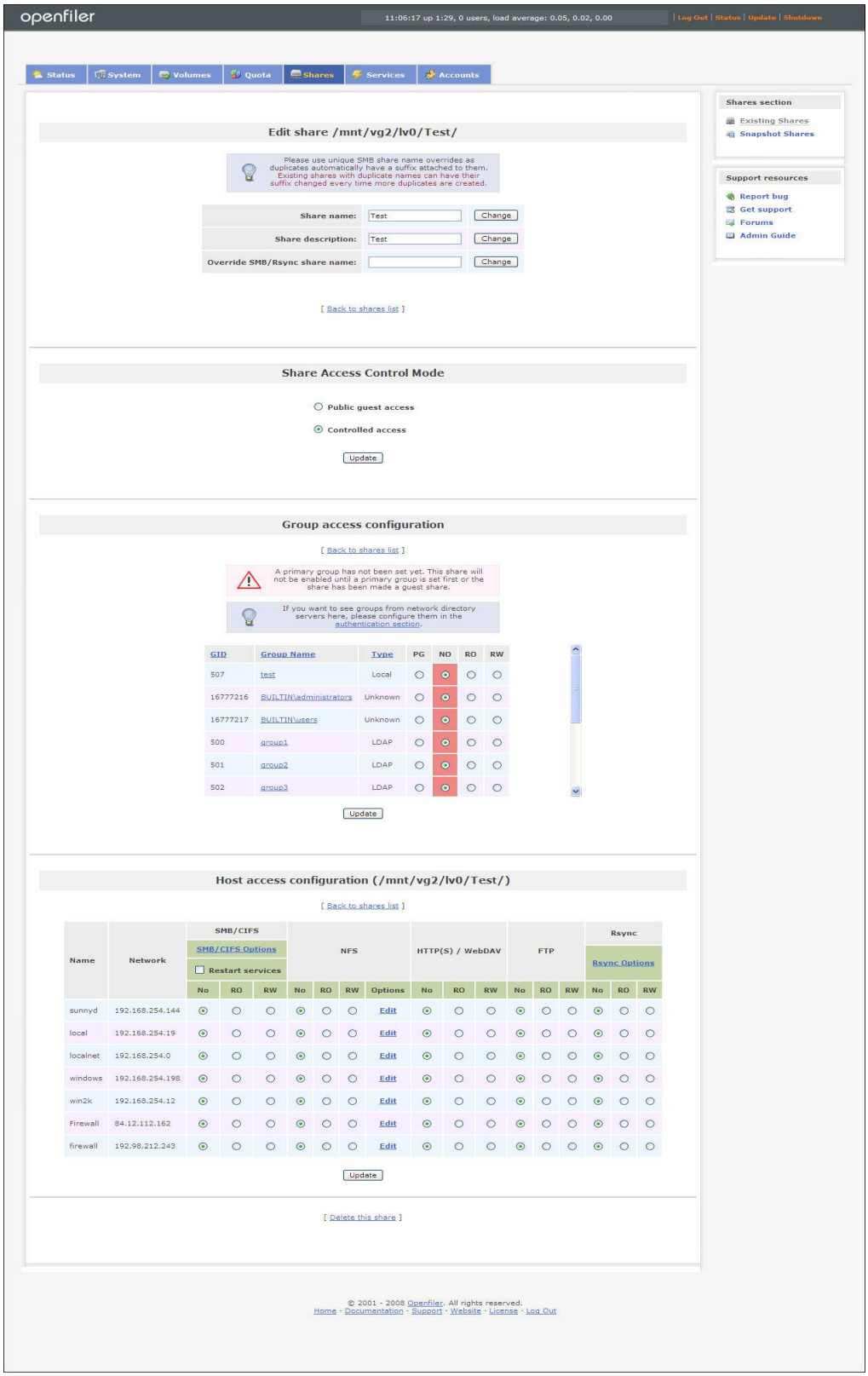

openfiler
11:06:17 up 1:29, 0 users, load average: 0.05, 0.02, 0.00
Log Out | Status | Update | Shutdown
Status System Volumes Quota Shares Services Accounts
Shares section
Existing Shares
Snapshot Shares
Support resources
Report bug
Get support
Forums
Admin Guide
Edit share /mnt/vg2/lv0/Test/
Please use unique SMB share name overrides as duplicates automatically have a suffix attached to them. Existing shares with duplicate names can have their suffix changed every time more duplicates are created.
Share name: Test Change
Share description: Test Change
Override SMB/Rsync share name: Change
[Back to shares list]
Share Access Control Mode
Public guest access
Controlled access
Update
Group access configuration
[Back to shares list]
A primary group has not been set yet. This share will not be enabled until a primary group is set first or the share has been made a guest share.
If you want to see groups from network directory servers here, please configure them in the authentication section.
GID Group Name Type PG NO RO RW
507 test Local
16777216 BUILTIN\administrators Unknown
16777217 BUILTIN\users Unknown
500 group1 LDAP
501 group2 LDAP
502 group3 LDAP
Update
Host access configuration (/mnt/vg2/lv0/Test/)
[Back to shares list]
Name Network SMB/CIFS SMB/CIFS Options Restart services NFS HTTP(S) / WebDAV FTP Rsync Rsync Options
No RO RW No RO RW Options No RO RW No RO RW No RO RW
sunnyd 192.168.254.144 Edit
local 192.168.254.19 Edit
localnet 192.168.254.0 Edit
windows 192.168.254.198 Edit
win2k 192.168.254.12 Edit
Firewall 84.12.112.162 Edit
firewall 192.98.212.243 Edit
Update
[Delete this share]
© 2001 - 2008 Openfiler. All rights reserved.
Home · Documentation · Support · Website · License · Log Out

Figure 74: Edit Network Shares

6. Make the necessary modification in each section.
7. Click the **Update** button in the respective section to update the changes that have been made to each section.

7.1.3.1 Viewing a Network Group List

Access to share is configured at the group level and network level. Security for a share can be loose or tight depending on the required security level for the share. This section provides a detailed description on how to view a network group list.

▼ To view a network group:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Shares** tab. **Openfiler** displays the **Network Shares** page, as shown in Figure 69.
3. Click an appropriate group name from the **Group Acess Configuration** list.**Openfiler** displays the **Members of the Group Group 1** page as shown in following figure.

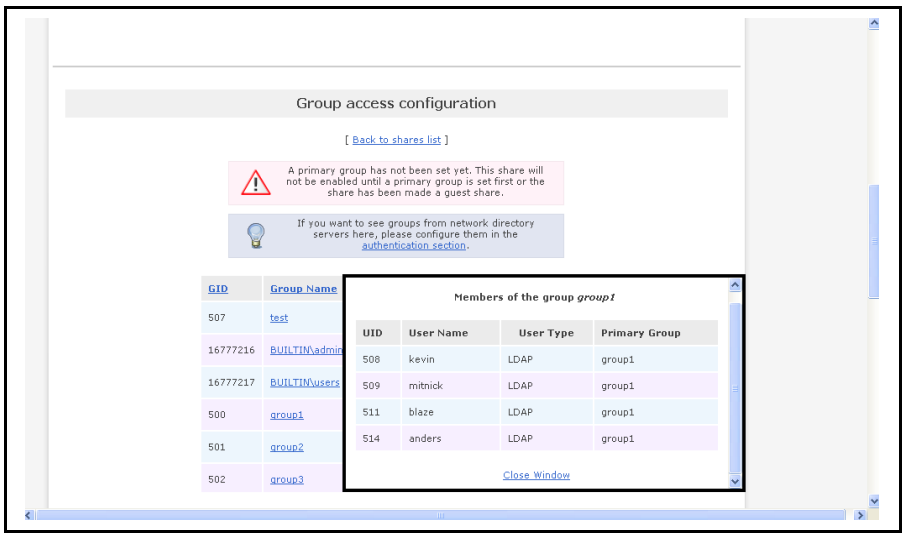


Figure 75: Group Access Configuration

4. Click the **Close Window** link to close the popup window.

7.1.3.2 Editing SMB/CIFS Share Options

Network access control for SMB/CIFS allows for different settings depending on the desired effect for the share and source of the connection. This section provides a detailed description on how to edit SMB/CIFS share.

▼ To edit a SMB/CIFS share:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Shares** tab. **Openfiler** displays the **Network Shares** page, as shown in Figure 69.
3. Click an appropriate network share link from the **Network Shares** list. **Openfiler** displays the **Edit Network** page.
4. In the **Host Access Configuration** section, click the **SMB/CIFS Options** link. **Openfiler** displays the **SMS Share Options** page as shown in following figure.

Figure 76: SMB Share Options

Field	Description
Enable Oplocks	Select the check box to enable oplocks. Oplocks are the way that SMB clients get permission from a server to locally cache file operations. If a server grants an oplock (opportunistic lock) then the client is free to assume that it is the only one accessing the file and it will aggressively cache file data. With some oplock types the client may even cache file open/close operations. This can give enormous performance benefits. If you enable this option on all read-only shares or shares that you know will only be accessed from one client at a time such as physically read-only media like CDROMs, you will see a big performance improvement on many operations. If you enable this option on shares where multiple clients may be accessing the files read-write at the same time you can get data corruption.
DOS Filemode	Select the check box to enable DOS filemode. Enabling this parameter allows a user who has write access to the file (by whatever means) to modify the permissions (including ACL) on it. Note that a user belonging to the group owning the file will not be allowed to change permissions if the group is only granted read access. Ownership of the file/directory may also be changed.
DOS Filetime Resolution	Select the check box to enable DOS filetime resolution. Under the DOS and Windows FAT filesystem, the finest granularity on time resolution is two seconds. Setting this parameter for a share causes Samba to round the reported time down to the nearest two second boundary when a query call that requires one second resolution is made to **smbd**(8).
Fake Directory Create Times	Select the check box to enable fake directory create times. NTFS and Windows VFAT file systems keep a create time for all files and directories. This is not the same as the ctime - status change time - that Unix keeps, so Samba by default reports the earliest of the various times Unix does keep. Setting this parameter for a share causes Samba to always report midnight 1-1-1980 as the create time for directories. This option is mainly used as a compatibility option for Visual C++ when used against Samba shares. Visual C++ generated makefiles have the object directory as a dependency for each object file, and a make rule to create the directory. Also, when NMAKE compares timestamps it uses the creation time when examining a directory. Thus the object directory will be created

Field	Description
	if it does not exist, but once it does exist it will always have an earlier timestamp than the object files it contains. However, Unix time semantics mean that the create time reported by Samba will be updated whenever a file is created or or deleted in the directory. NMAKE finds all object files in the object directory. The timestamp of the last one built is then compared to the timestamp of the object directory. If the directory's timestamp if newer, then all object files will be rebuilt. Enabling this option ensures directories always predate their contents and an NMAKE build will proceed as expected.
DOS Filetimes	Select the check box to enable DOS filetimes. Under DOS and Windows, if a user can write to a file they can change the timestamp on it. Under POSIX semantics, only the owner of the file or root may change the timestamp. By default, Samba runs with POSIX semantics and refuses to change the timestamp on a file if the user smbd is acting on behalf of is not the file owner. Setting this option to **yes** allows DOS semantics and **smbd**(8) will change the file timestamp as DOS requires.

Table 26: SMB Share Options

5. Make the necessary changes and click the **Update** button to update the modifications that have been made.

7.1.3.3 Editing Resync Share Options

This section provides a detailed description on how to edit the Resync share.

▼ To edit the Resync share:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Shares** tab. **Openfiler** displays the **Network Shares** page, as shown in Figure 69.
3. In the **Host Access Control** section, click an appropriate network share link from the **Network Shares** list. **Openfiler** displays the **Edit Network** page.
4. Click the **Rsync Options** link. **Openfiler** displays the **SMS Share Options** page as shown in following figure.

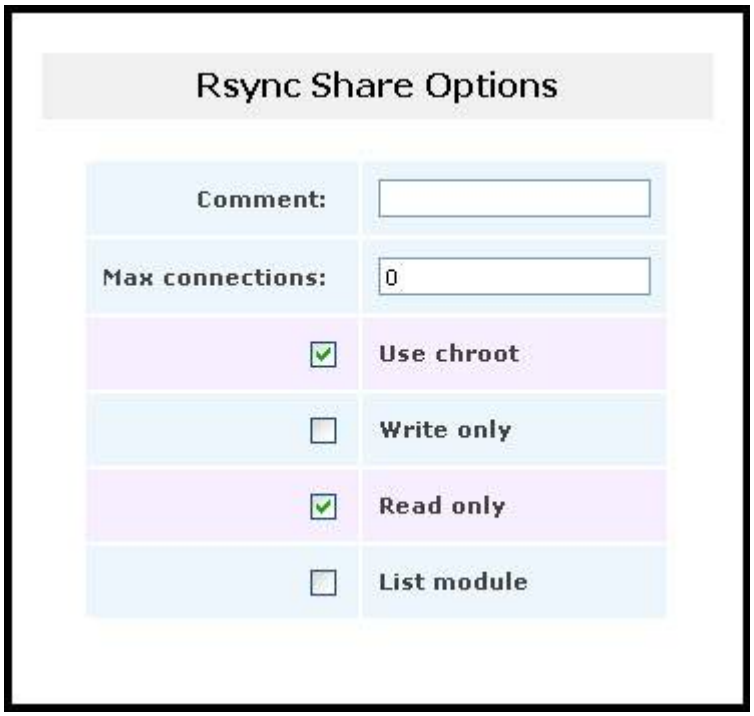


Figure 77: Rsync Share Options

Field	Description
Comments	Enter the comments in the text box. The "comment" option specifies a description string that is displayed next to the module name when clients obtain a list of available modules. The default is no comment.
Max Connections	Enter the max connections in the text box. This option allows you to specify the maximum number of simultaneous connections you will allow. Any clients connecting when the maximum has been reached will receive a message asking them to try later. The default is 0 which means no limit.
Use chroot	Select the check box to enable use chroot. If "use chroot" check box is selected, the rsync daemon will chroot to the "path" before starting the file transfer with the client. This has the advantage of extra protection against possible implementation security holes, but it has the disadvantages of requiring super-user privileges, of not being able to follow symbolic links that are either absolute or outside of the new root path, and of complicating the preservation of usernames and groups (see below). When "use chroot" is not selected, for security reasons, symlinks may only be relative paths pointing to other files

Field	Description
	within the root path, and leading slashes are removed from most absolute paths (options such as **--backup-dir**, **--compare-dest**, etc. interpret an absolute path as rooted in the module's "path" dir, just as if chroot was specified). By default this option is enabled.
Write Only	Select the check box to enable write only. The "write only" option determines whether clients will be able to download files or not. If "write only" is enabled, then any attempted downloads will fail. If "write only" is disabled, then downloads will be possible if file permissions on the daemon side allow them. By default this option will be disabled for all the modules.
Read Only	Select the check box to enable read only. This option determines whether clients will be able to upload files or not. If "read only" is selected, then any attempted uploads will fail. If "read only" is not selected, then uploads will be possible if file permissions on the daemon side allow them. By default Read only will be enabled for all modules.
List Module	Select the check box to list module. This option determines if this module should be listed when the client asks for a listing of available modules. By setting this to disable, you can create hidden modules. The default is for modules to be listable.

Table 27: Rsync Share Options

5. Make the changes and click the **Update** button to update the changes that have been made to the Rsync Share options.

7.1.3.4 Editing NFS Share Client Options

This section provides a detailed description on how to edit the NFS share.

▼ To edit the NFS share:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Shares** tab. **Openfiler** displays the **Network Shares** page, as shown in Figure 69.
3. Click an appropriate network share link from the **Network Shares** list. **Openfiler** displays the **Edit Network** page.
4. Click the **NFS Edit Options** link. **Openfiler** displays the **NFS Share Client Options** page as shown in following figure.

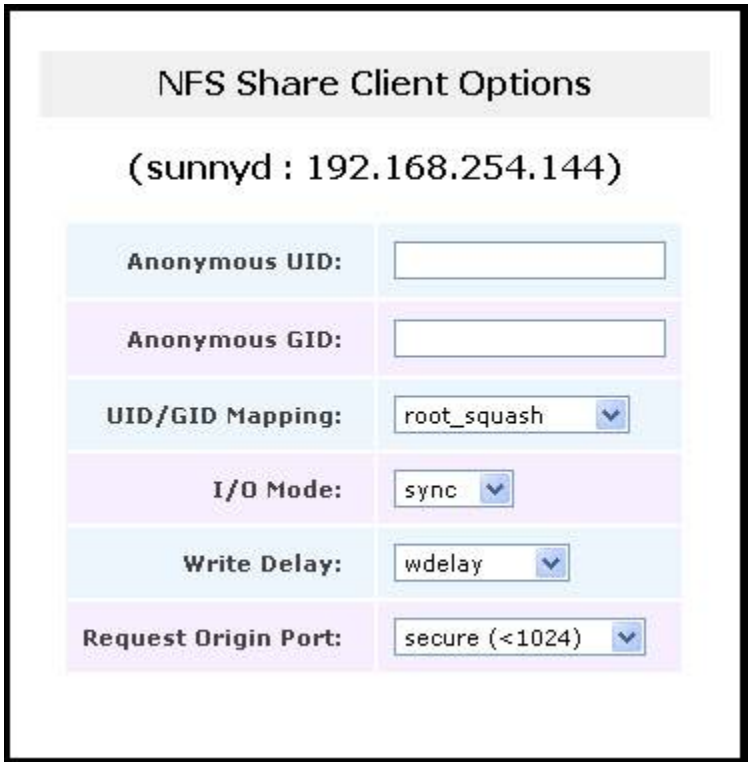


Figure 78: NFS Share Client Options

Field	Description
Anonymous UID	Enter the Anonymous UID in the text box.
Anonymous GID	Enter the Anonymous GID in the text box.
UID/GID Mapping	Select UID/GID mapping from the drop-down list.
I/O Mode	Select the I/O mode from the drop-down list.
Write Delay	Select the write delay option from the drop-down list.
Request Origin Port	Select the request origin port from the drop-down list.

Table 28: NFS Share Client Options

5. Click the **Update** button to edit the NFS Share.

7.1.4 Deleting a Share

This section provides a detailed description on how to delete a share.

▼ To delete a share:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Shares** tab. **Openfiler** displays the **Network Shares** page, as shown in Figure 69.
3. Select an appropriate network share name from the **Network Shares** list and click the **Delete this Share** link. **Openfiler** displays the **Delete this Share** page.

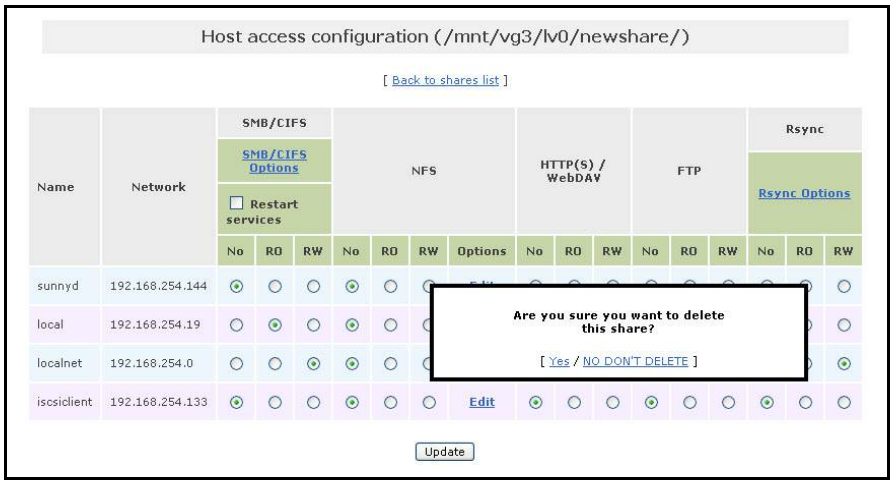


Figure 79: Deleting a Share

4. Click the **Yes** link to delete the selected share
   OR
   Click the **NO DON'T DELETE** link not to cancel the deletion.

7.2 Viewing Snapshot Shares

This section provides details about how to view snapshot shares.

▼ To view snapshot shares:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click the **Shares** tab. **Openfiler** displays the **Network Shares** page, as shown in Figure 69.
3. On the menu bar, click the **Snapshot Shares** link. **Openfiler** displays the **Network Shares Snapshots** page, as shown in the following figure.

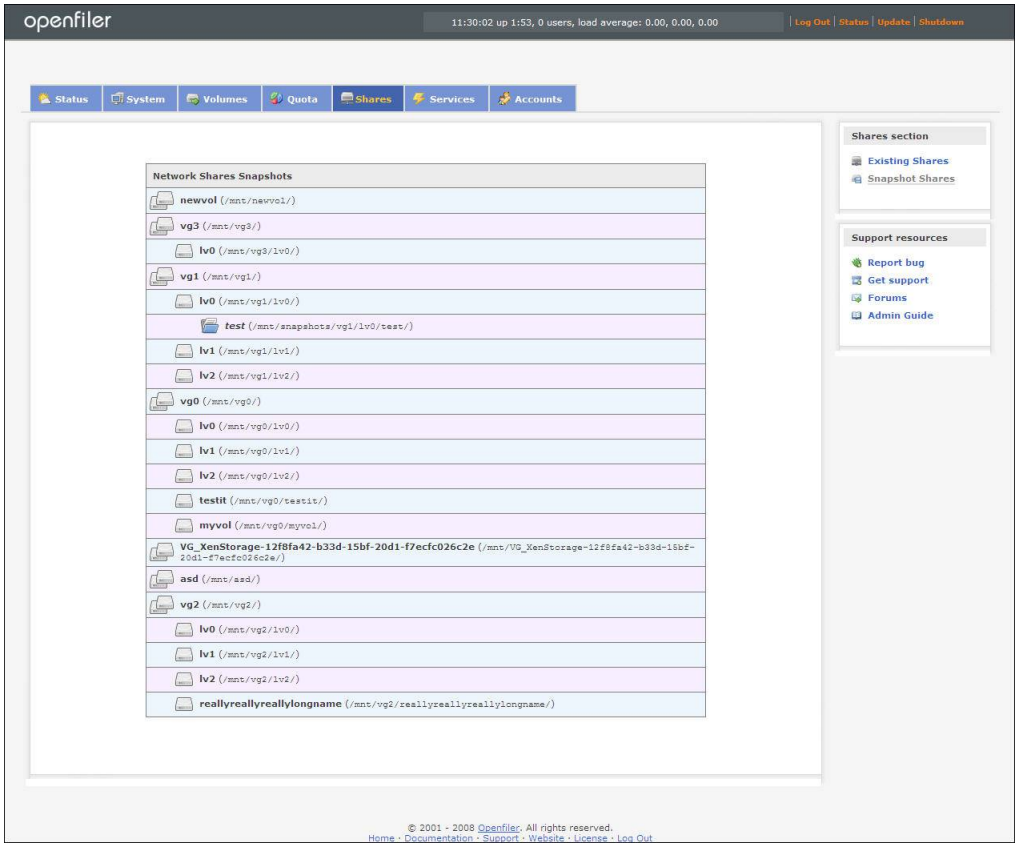


Figure 80: Network Shares Snapshots

8 Managing Services

File export services can be enabled after completing configuration tasks. Enabling a service means that any shares in the service list having that service configured as one of the supported protocols will be activated. Once the share is activated, any user on the network who has access to that share, can access the share only via the corresponding activated protocols.

Once a service is enabled the users in the network are able to access the shares to which they have access rights.

8.1 Service Management

This option allows you to start and stop system services. In this section you can enable or disable the system services. Enabling or disabling services add to the system boot up sequence so that the service starts or stops when the system reboots next time.

8.1.1 Modifying a Service Status

This section explains how to modify service status.

▼ To modify Service Status:

1. Log on to **Openfiler**. The Home page, as shown in Figure 2, is displayed.
2. Click the Services tab. **Openfiler** displays the Manage Services page, as shown in the following figure.

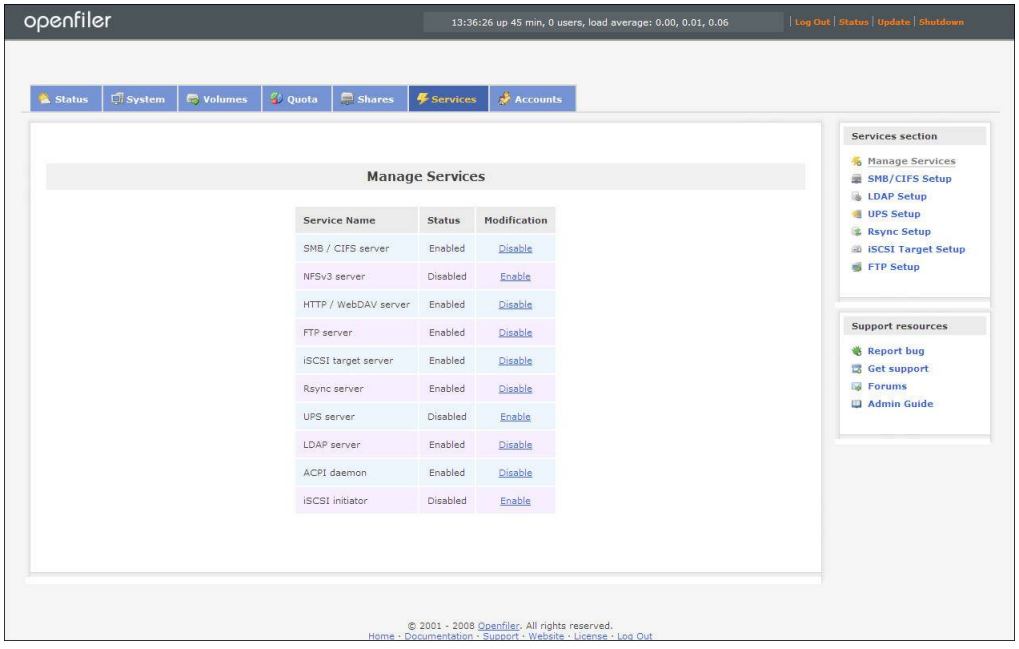


Figure 81: Manage Services

3. Click the appropriate **Enable** or **Disable** link to modify the service status.

8.2 SMB/CIFS Setup

Server Message Block (SMB) is used to provide shared access to files, printers, serial ports, and miscellaneous communications between nodes on a network. This section provides details about how to modify SMB settings.

8.2.1 Modifying SMB/CIFS Setup

This section explains how to modify SMB/CIFS setup.

▼ To modify SMB/CIFS setup:

1. Log on to **Openfiler**. The Home page, as shown in Figure 2, is displayed.
2. Click the Services tab. **Openfiler** displays the Manage Services page, as shown in Figure 81.
3. On the menu bar, click the SMB/CIFS Setup link. **Openfiler** displays the SMB settings page, as shown in the following figure.

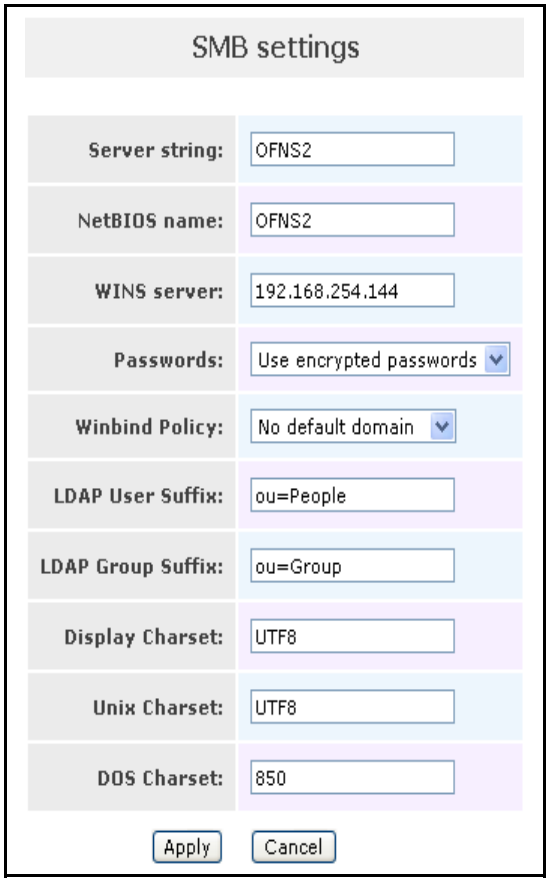


Figure 82: SMB Settings

Field	Description
Server String	Enter the service string. This controls what string will show up in the printer comment box in print manager and next to the IPC connection in net view. It can be any string that you wish to show to your users. It also sets what will appear in browse lists next to the machine name.
NetBIOS name	Enter the NetBIOS name. This field sets the NetBIOS name by which a Samba server is known. By default it is the same as the first component of the host's DNS name. If a machine is a browse server or logon server this name (or the first component of the hosts DNS name) will be the name that these services are advertised under.
WINS server	Enter the WINS server name. This specifies the IP address (or DNS name: IP address for preference) of the WINS server that **nmbd**(8) should register with. If you have a WINS server on your network then you should set this to the WINS server's IP. You should point this at your WINS server if you have a multi-subnetted network. If you want to work in multiple namespaces, you can give every wins server a 'tag'. For each tag, only one (working) server will be queried for a name. The tag should be separated from the IP address by a colon.
Passwords	Select the appropriate password from the drop-down list.
Winbind Policy	Select the appropriate winbind policy from the drop-down list.
LDAP User Suffix	Enter the LDAP user suffix. This parameter specifies where users are added to the tree. If this parameter is unset, the value of *ldap suffix* will be used instead. The suffix string is pre-pended to the *ldap suffix* string so use a partial DN.
LDAP Group Suffix	Enter the LDAP group suffix. This parameter specifies the suffix that is used for groups when these are added to the LDAP directory. If this parameter is unset, the value of *ldap suffix* will be used instead. The suffix string is pre-pended to the *ldap suffix* string so use a partial DN.
Display Charset	Enter the display charset. This option specifies the charset that samba will use to print

Field	Description
	messages to stdout and stderr. The default value is "LOCALE", which means automatically set, depending on the current locale. The value should generally be the same as the value of the parameter *unix charset*.
Unix Charset	Enter the unix charset. Specifies the charset the unix machine Samba runs on uses. Samba needs to know this in order to be able to convert text to the charsets other SMB clients use. This is also the charset Samba will use when specifying arguments to scripts that it invokes.
DOS Charset	Enter the DOS charset. This option specifies which charset Samba should talk to DOS clients. The default depends on which charsets you have installed.

Table 29: SMB/CIFS Setup

4. Enter the appropriate details and click the **Apply** button to set SMB/CIFS.
   OR
   Click the **Cancel** button to reset the modified details.

8.3 LDAP Setup

The Lightweight Directory Access Protocol (LDAP) is used to modify directory services running over TCP/IP. This section provides details about how to backup, delete, restore, and repair LDAP files .

8.3.1 Viewing the LDAP Setup

This section explains how to view the local LDAP setup.

To view the LDAP setup:

1. Log on to **Openfiler**. The Home page, as shown in Figure 2, is displayed.
2. Click the Services tab. **Openfiler** displays the Manage Services page, as shown in Figure 81.
3. On the menu bar, click the **LDAP Setup** link. **Openfiler** displays the Local LDAP Settings page, as shown in the following figure.

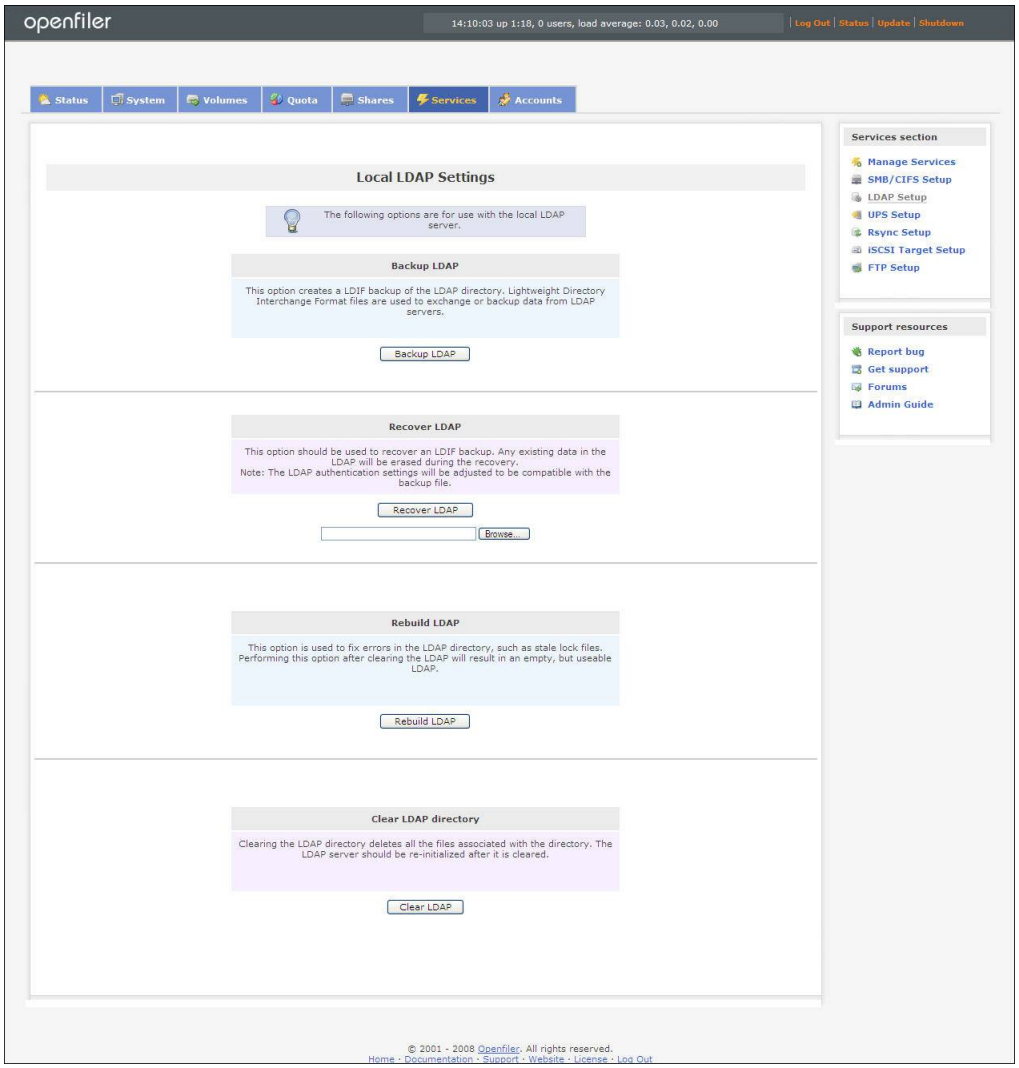


Figure 83: Local LDAP Settings

8.3.2 LDAP Backup

This section explains how to make a backup copy of LDAP file.

▼ To backup LDAP:

1. Log on to **Openfiler**. The Home page, as shown in Figure 2, is displayed.
2. Click the Services tab. **Openfiler** displays the Manage Services page, as shown in Figure 81.
3. On the menu bar, click the LDAP Setup link. **Openfiler** displays the Local LDAP Settings, as shown in Figure 83. The Backup LDAP section in Local LDAP Settings page is as shown in the following figure.

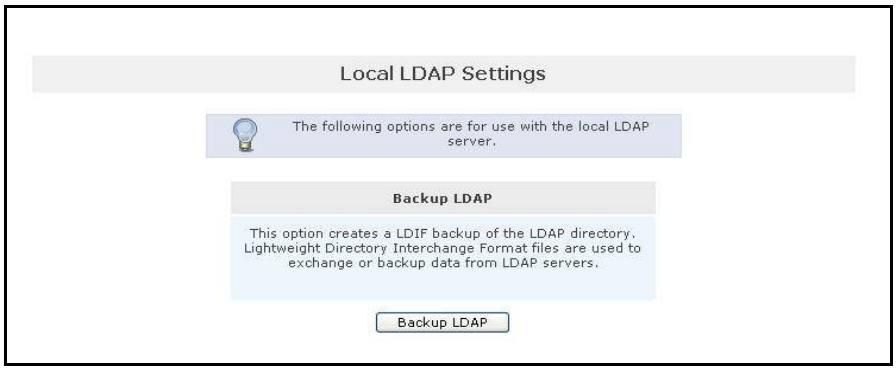


Figure 84: Local LDAP Settings

4. Click the **Backup LDAP** button. **Openfiler** displays the file download page, as shown in the following figure.

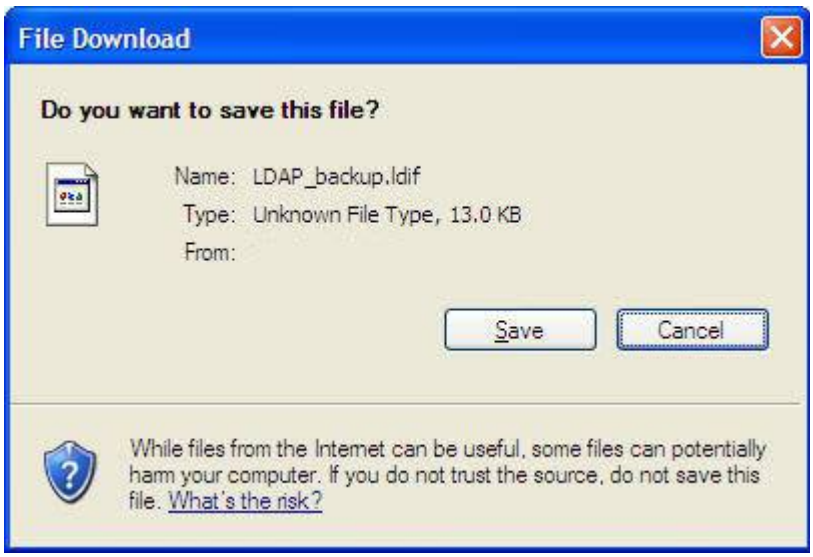


Figure 85: LDAP Backup

5. Click the **Save** button to save the LDAP file to a preferred location.
   OR
   Click the **Cancel** button to cancel the backup process.

8.3.3 Recovering LDAP

This section explains how to recover the LDAP backup files.

▼ To recover LDAP:

1. Log on to **Openfiler**. The Home page, as shown in Figure 2, is displayed.

2. Click the Services tab. **Openfiler** displays the Manage Services page, as shown in Figure 81.
3. On the menu bar, click the LDAP Setup link. **Openfiler** displays the Local LDAP Settings, as shown in Figure 83. The Recover LDAP section in Local LDAP Settings page is as shown in the following figure.

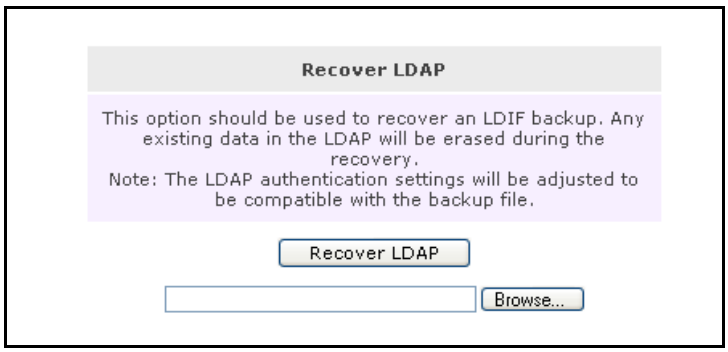


Figure 86: Recover LDAP

4. Click the **Browse** button to locate and select the backup LDAP file and then click the **Recover LDAP** button to recover the LDAP backup file.

8.3.4 Rebuilding LDAP

This section explains how to rebuild LDAP.

▼ To rebuild LDAP:

1. Log on to **Openfiler**. The Home page, as shown in Figure 2, is displayed.
2. Click the Services tab. **Openfiler** displays the Manage Services page, as shown in Figure 81.
3. On the menu bar, click the LDAP Setup link. **Openfiler** displays the Local LDAP Settings, as shown in Figure 83. The Rebuild LDAP section in Local LDAP Settings page is as shown in the following figure.

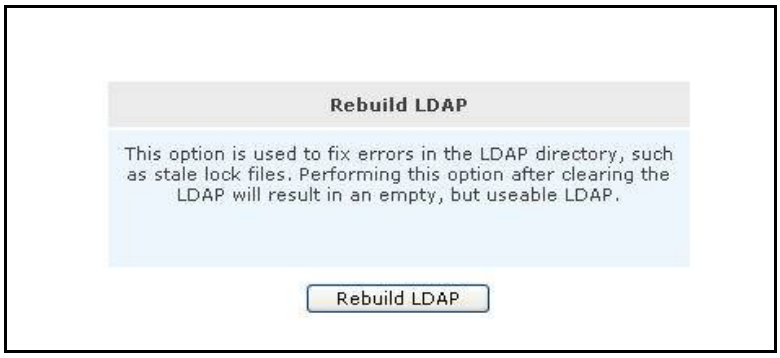


Figure 87: Rebuild LDAP

4. Click the Rebuild LDAP button to rebuild the LDAP files.

8.3.5 Deleting LDAP

This section explains how to delete LDAP directories.

▼ To delete LDAP:

1. Log on to **Openfiler**. The Home page, as shown in Figure 2, is displayed.
2. Click the Services tab. **Openfiler** displays the Manage Services page, as shown in Figure 81.
3. On the menu bar, click the LDAP Setup link. **Openfiler** displays the Local LDAP Settings, as shown in Figure 83. The Clear LDAP directory section in Local LDAP Settings page is as shown in the following figure.

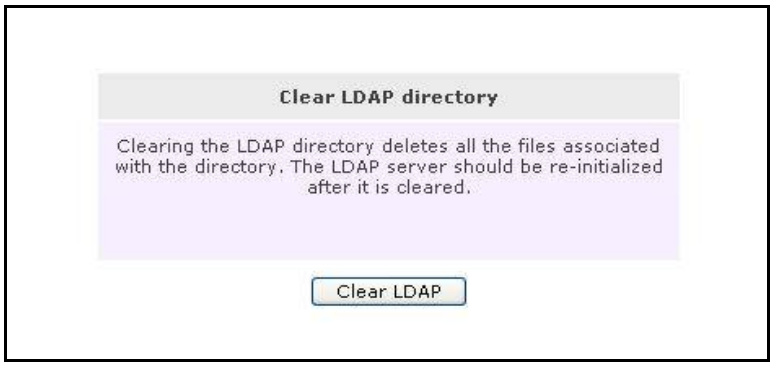


Figure 88: Clear LDAP Derectory

4. Click Clear LDAP. **Openfiler** displays a confirmation message, as shown in the following figure.

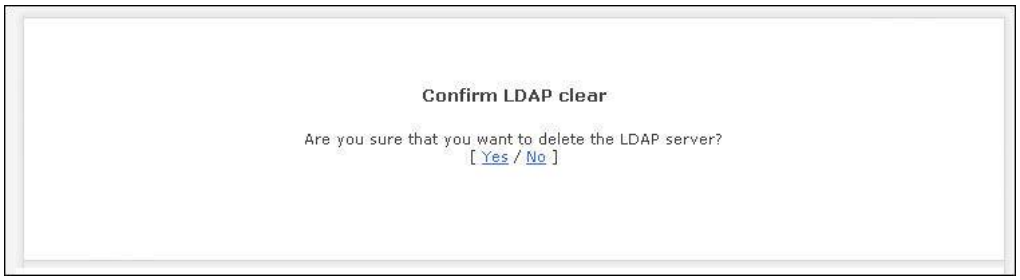


Figure 89: confirm LDAP clear

5. Click **Yes** to confirm the deletion.
   OR
   Click **No** to cancel the process.

8.4 UPS Setup

This section provides details about how to configure the service mode and the access control, add or delete a UPSD user, and add or delete a UPS System Monitoring Entry.

8.4.1 Configuring Service Mode

This section explains how to configure the service mode.

▼ To configure Service Mode:

1. Log on to **Openfiler**. The Home page, as shown in Figure 2, is displayed.
2. Click the Services tab. **Openfiler** displays the Manage Services page, as shown in Figure 81.
3. On the menu bar, click the UPS Setup link. **Openfiler** displays the UPS Settings page as shown in the following figure.

Figure 90: UPS Settings

4. Click **Configuring Service Mode** link. **Openfiler** displays the Configuring Service Mode page as shown in the following figure.

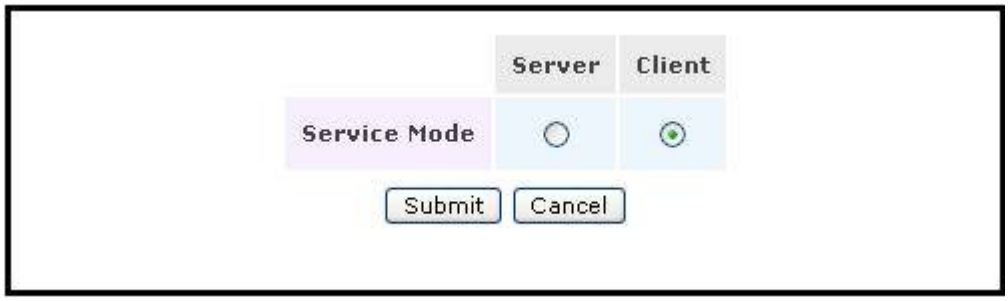


Figure 91: Configuring Service mode

5. Select the appropriate service mode and click the **Submit** button.
   OR
   Click the **Cancel** button to cancel the settings.

8.4.2 Configuring Access Control

This section explains how to configure access control.

▼ To configure access control:

1. Log on to **Openfiler**. The Home page, as shown in Figure 2, is displayed.
2. Click the Services tab. **Openfiler** displays the Manage Services page, as shown in Figure 81.
3. On the menu bar, click the UPS Setup link. **Openfiler** displays the UPS Settings page as shown in Figure 90.
4. On the UPS Settings page, click the Configure Access Control link. **Openfiler** displays the Configure Access Control page as shown in the following figure.

Figure 92: Configure Access Control

8.4.3 Adding a UPSD User

This section explains how to add a UPSD user.

▼ To add a UPSD user:

1. Log on to **Openfiler**. The Home page, as shown in Figure 2, is displayed.
2. Click the Services tab. **Openfiler** displays the Manage Services page, as shown in Figure 81.
3. On the menu bar, click the UPS Setup link. **Openfiler** displays the UPS Settings page as shown in Figure 90.
4. On the UPS Settings page, click the Add UPSD User link. **Openfiler** displays the Add UPSD User page as shown in the following figure.

Figure 93: Add UPSD User

Field	Description
Username	Enter the name of the user.
Password	Enter the password.
UPSMon Mode	Select the UPSMon Mode from the drop-down list.

Table 30: Adding a UPSD User

5. Click the **Submit** button to add a UPSD user.
   OR
   Click the **Cancel** button to clear the fields.

8.4.4 Deleting a UPSD User

This section explains how to delete a UPSD user.

▼ To delete a UPSD User:

1. Log on to **Openfiler**. The Home page, as shown in Figure 2, is displayed.

2. Click the Services tab. **Openfiler** displays the Manage Services page, as shown in Figure 81.
3. On the menu bar, click the UPS Setup link. **Openfiler** displays the UPS Settings page as shown in Figure 90.
4. On the UPS Settings page, click the Delete UPSD User link. **Openfiler** displays the Delete UPSD User page as shown in the following figure.

Figure 94: Delete UPSD User

5. Click the Submit button to delete the UPSD user.
   OR
   Click the Cancel button to cancel the process.

8.4.5 Adding a UPS System Monitoring Entry

This section explains how to add a UPS System Monitoring Entry.

▼ To add a UPS System Monitoring Entry:

1. Log on to **Openfiler**. The Home page, as shown in Figure 2, is displayed.
2. Click the Services tab. **Openfiler** displays the Manage Services page, as shown in Figure 81.
3. On the menu bar, click the UPS Setup link. **Openfiler** displays the UPS Settings page as shown in Figure 90.
4. On the UPS Settings page, click Add UPS System Monitoring Entry link. **Openfiler** displays the Add UPS System Monitoring Entry page as shown in the following figure.

Figure 95: Add UPS System Monitoring Entry

Field	Description
Select UPS	Select the UPS from the drop-down list.
Hostname	This field displays the host name.
Select Username	Select the name of the user from the drop-down list.
Select Num.PSUs	Select the Num PSUs from the drop-down list.

Table 31: UPS System Monitoring Entry

5. Enter the appropriate data in the respective fields.
6. Click the **Submit** button to add a UPS System Monitoring Entry.
   OR
   Click the **Cancel** button to cancel the process.

8.4.6 Deleting a UPS System Monitoring Entry

This section explains how to delete a UPS System Monitoring Entry.

▼ To delete a UPS system monitoring entry:

1. Log on to **Openfiler**. The Home page, as shown in Figure 2, is displayed.
2. Click the Services tab. **Openfiler** displays the Manage Services page, as shown in Figure 81.
3. On the menu bar, click the UPS Setup link. **Openfiler** displays the UPS Settings page as shown in Figure 90.
4. On the UPS Settings page, click the Delete UPS System Monitoring Entry link. **Openfiler** displays the Delete UPS System Monitoring Entry page as shown in the following figure.

Figure 96: Delete UPS System Monitoring Entry

5. Click the Submit button to delete the UPS System Monitoring Entry.
   OR
   Click the Cancel button to cancel the deletion.

8.5 Managing Rsync Setup

This section explains how to manage the Rsync settings.

▼ To manage the Rsync Setup:

1. Log on to **Openfiler**. The Home page, as shown in Figure 2, is displayed.
2. Click the Services tab. **Openfiler** displays the Manage Services page, as shown in Figure 81.
3. On the menu bar, click the Rsync Setup link. **Openfiler** displays the Rsync settings page as shown in the following figure.

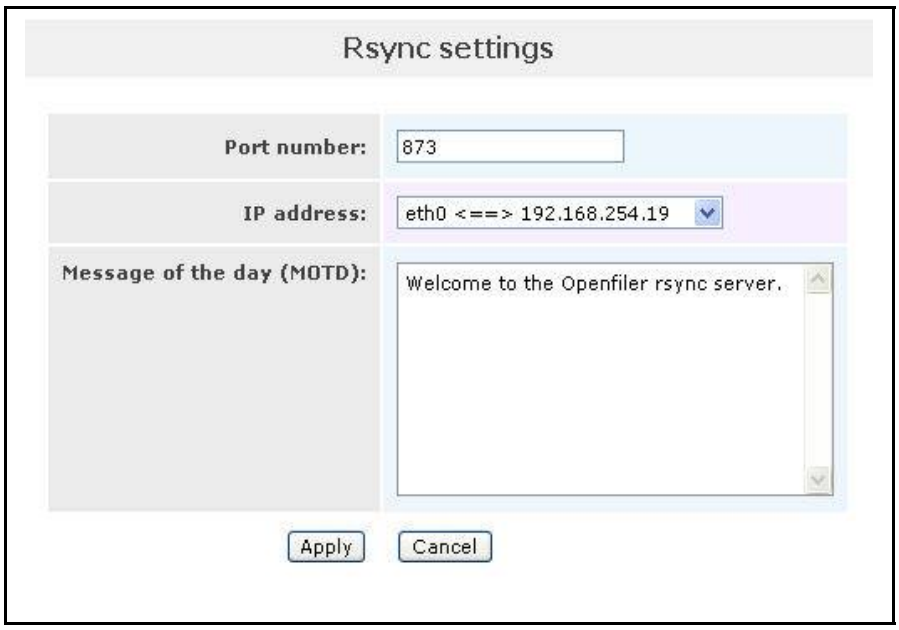


Figure 97: Rsync Settings

Field	Description
Port number	Enter the port number.
IP address	Select the IP address from the drop-down list.
Message of the day (MOTD)	Enter the message for the day in the text field.

Table 32: Rsync Settings

4. Click the **Apply** button to set the Rsync settings.
   OR
   Click the **Cancel** button to clear the fields.

8.6 iSCSI Target Setup

iSCSI is a protocol that allows clients to send SCSI commands to storage devices in remote servers. This section explains how to add a discovery CHAP user and modify the iSNS sever settings.

8.6.1 Adding a Discovery CHAP user

This section explains how to add a discovery chap user.

▼ To add a Discovery CHAP User:

1. Log on to **Openfiler**. The Home page, as shown in Figure 2, is displayed.
2. Click the Services tab. **Openfiler** displays the Manage Services page, as shown in Figure 81.
3. On the menu bar, click the **iSCSI Target Setup** link. **Openfiler** displays the Add Discovery CHAP user page as shown in the following figure.

Figure 98: Add Discovery CHAP user

Field	Description
Username	Enter the name of the user.
Password	Enter the password.
User Type	Select the user type from the drop-down list.

Table 33: Discovery CHAP User

4. Enter the appropriate data in the respective fields. Click the **Add** button to add a discovery CHAP user.

8.6.2 Managing iSNS Server

This section explains how to manage iSNS server settings.

▼ To manage iSNS Server:

1. Log on to **Openfiler**. The Home page, as shown in Figure 2, is displayed.
2. Click the Services tab. **Openfiler** displays the Manage Services page, as shown in Figure 81.
3. On the menu bar, click the iSCSI Target Setup link. **Openfiler** displays the iSNS Server page as shown in the following figure.

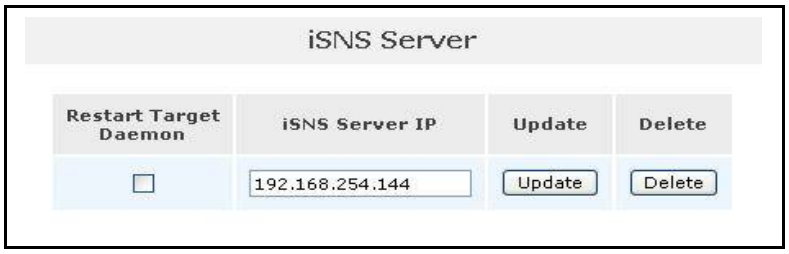


Figure 99: iSNS Server

Field	Description
Restart Target Daemon	Select the Restart Target Daemon checkbox.
iSNS Server IP	Type the iSNS server IP address.

Table 34: iSNS Server

4. Click the **Update** button to update the iSNS server settings.
5. Click the **Delete** button to delete the iSNS server settings.

8.7 Setting up FTP

This section explains how to modify FTP server settings.

▼ To set up FTP:

1. Log on to **Openfiler**. The Home page, as shown in Figure 2, is displayed.
2. Click the Services tab. **Openfiler** displays the Manage Services page, as shown in Figure 81.
3. On the menu bar, click the FTP Setting link. **Openfiler** displays the FTP Settings page as shown in the following figure.

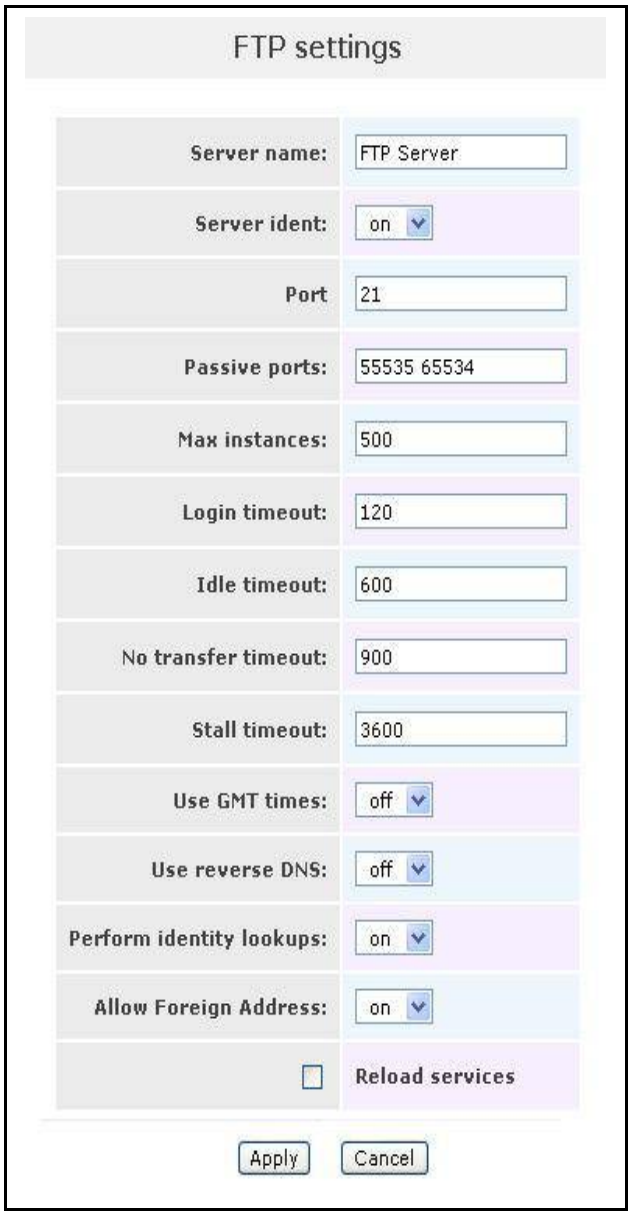


Figure 100: FTP Settings

Field	Description
Server name	Enter the name of the server.
Server ident	Select the server identity from the drop-down list.
Port	Enter the port number.
Passive ports	Enter the passive port number.
Max instances	Enter the maximum number of instances.
Login timeout	Enter the login timeout.

Field	Description
Idle timeout	Enter the idle timeout.
No transfer timeout	Enter the no transfer timeout.
Stall timeout	Enter the stall timeout.
Use GMT times	Select the use GMT times from the drop-down list.
Use reverse DNS	Select the use reverse DNS from the drop-down list.
Perform identity lookups	Select the perform identity lookups from the drop-down list.
Allow Foreign Address	Select allow foreign address from the drop-down list.

Table 35: FTP Settings

4. Click the **Apply** button to update FTP settings.
   OR
   Click the **Cancel** button to clear FTP settings.

9 Managing Accounts

Openfiler imports user and group information from central directory servers such as Light-weight Directory Access Protocol (LDAP), Network Information System (NIS) and Windows Domain Controllers. Authentication of users is also done from central directory or authentication servers. One or more user directories can be combined with one or more authentication mechanisms. It is the responsibility of the administrator to ensure that there are no clashes between UID and GID entries among different directories, if more than one information and authentication mechanism is to be used.

9.1 Authentication

9.1.1 Viewing/Modifying User Information Configuration – Standard View

This section provides details about how to view/modify user information configuration in standard view. Standard view is sufficient for most authentication configuration requirements.

▼ To view/modify user information configuration – standard view:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click **Accounts** tab. **Openfiler** displays the **Authentication** page, as shown in the following figure.

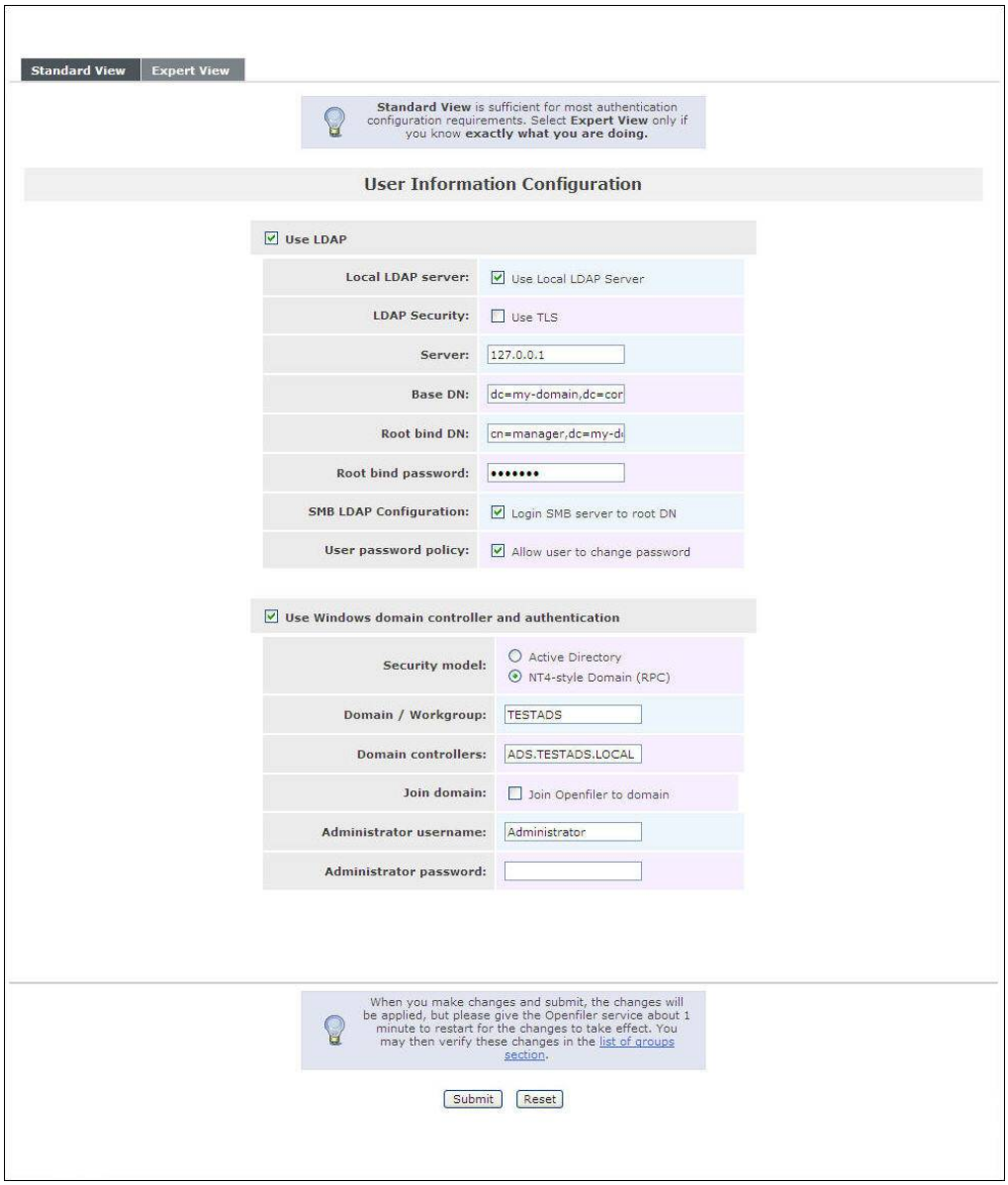


Figure 101: User Information Configuration-Standard View

9.1.1.1 LDAP Authentication

This section of the User Information Configuration explains how to view or modify LDAP settings.

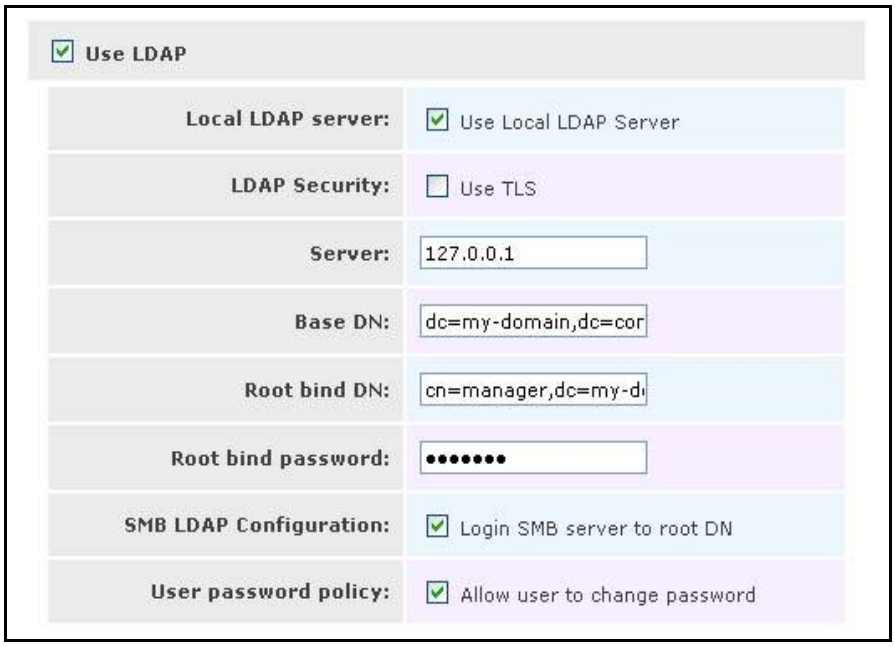


Figure 102: User Information Configuration (LDAP)-Standard View

Field	Description
LDAP	
Use LDAP	Select the Use LDAP check box.
Local LDAP server	Select the Local LDAP server check box.
LDAP Security	Select the LDAP Security check box.
Server	Enter the LDAP server.
Base DN	Enter the base DN.
Root bind DN	Enter the root bind DN.
Root bind password	Enter the root bind password.
SMB LDAP Configuration	Select the SMB LDAP Configuration check box.
User password policy	Select the User password policy check box.

Table 36: User Information Configuration (LDAP)-Standard View

9.1.1.2 Windows Domain Controller and Authentication

This section explains how to configure windows domain controller and authentication.

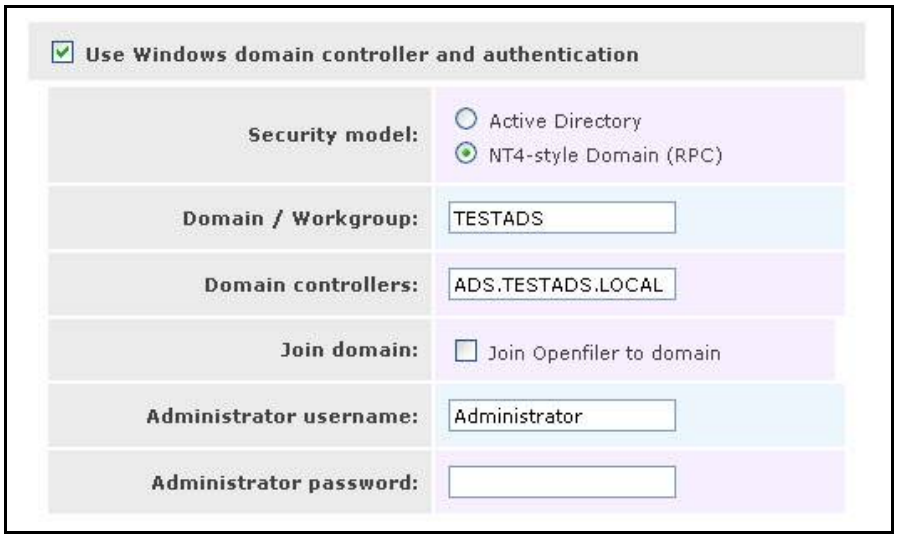


Figure 103: User Information Configuration (Windows Domain controller and Authentication)- Standard View

Field	Description
Windows Domain Controller and Authentication	
Use Windows domain controller and authentication	Select the Use Windows domain controller and authentication check box.
Security model	Select the appropriate security model.
Domain / Workgroup	Enter the name of the domain / workgroup.
Domain controllers	Enter the domain controllers.
Join domain	Select the Join domain check box.
Administrator username	Enter the username of the administrator.
Administrator password	Enter the password of the administrator.

Table 37: User Information Configuration (Windows Domain controller and Authentication)- Standard View

3. View/modify the appropriate details and click the **Submit** button.
   OR
   Click the **Reset** button, to reset the fields.

Note:

Standard View is sufficient for most authentication configuration requirements. Only advanced users should select Expert View.

After making the required modifications and clicking the Submit button, **Openfiler** takes about one minute to restart and reflect the changes. The changes can be verified in the list of groups section.

9.1.2 Viewing/Modifying User Information Configuration – Expert View

This section provides details about how to view/modify user information configuration in expert view. Only advanced users should select this option.

▼ To view/modify user information configuration – expert view:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click **Accounts** tab. **Openfiler** displays the **Authentication** page, as shown in Figure 101.
3. Click **Expert View** tab. **Openfiler** displays the **Authentication** page, as shown in the following figure.

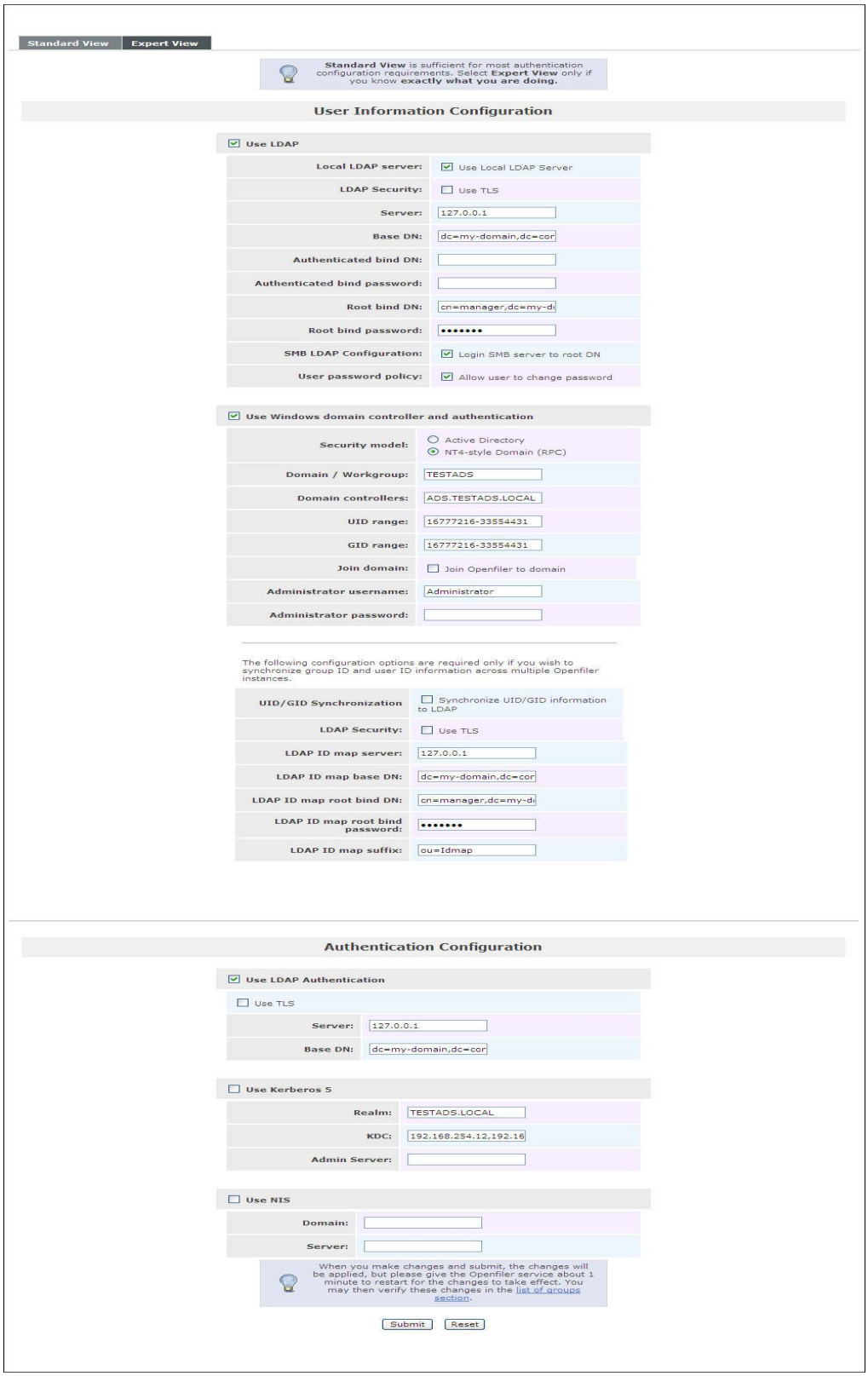

Standard View
Expert View
Standard View is sufficient for most authentication configuration requirements. Select Expert View only if you know exactly what you are doing.
User Information Configuration
Use LDAP
Local LDAP server:
Use Local LDAP Server
LDAP Security:
Use TLS
Server:
127.0.0.1
Base DN:
dc=my-domain,dc=cor
Authenticated bind DN:
Authenticated bind password:
Root bind DN:
cn=manager,dc=my-d
Root bind password:
SMB LDAP Configuration:
Login SMB server to root DN
User password policy:
Allow user to change password
Use Windows domain controller and authentication
Security model:
Active Directory
NT4-style Domain (RPC)
Domain / Workgroup:
TESTADS
Domain controllers:
ADS.TESTADS.LOCAL
UID range:
16777216-33554431
GID range:
16777216-33554431
Join domain:
Join Openfiler to domain
Administrator username:
Administrator
Administrator password:
The following configuration options are required only if you wish to synchronize group ID and user ID information across multiple Openfiler instances.
UID/GID Synchronization
Synchronize UID/GID information to LDAP
LDAP Security:
Use TLS
LDAP ID map server:
127.0.0.1
LDAP ID map base DN:
dc=my-domain,dc=cor
LDAP ID map root bind DN:
cn=manager,dc=my-d
LDAP ID map root bind password:
LDAP ID map suffix:
ou=Idmap
Authentication Configuration
Use LDAP Authentication
Use TLS
Server:
127.0.0.1
Base DN:
dc=my-domain,dc=cor
Use Kerberos 5
Realm:
TESTADS.LOCAL
KDC:
192.168.254.12,192.16
Admin Server:
Use NIS
Domain:
Server:
When you make changes and submit, the changes will be applied, but please give the Openfiler service about 1 minute to restart for the changes to take effect. You may then verify these changes in the list of groups section.
Submit
Reset

Figure 104: User Information Configuration-Expert View

9.1.2.1 Viewing/Modifying LDAPAuthentication in Expert view

This section of the User Information Configuration explains how to view or modify LDAP settings in Expert view.

Figure 105: User Information Configuration (LDAP)-Expert View

Field	Description
User Information Configuration	
LDAP	
Use LDAP	Select the Use LDAP check box if user and group information should be imported from the LDAP server.
Local LDAP server	Select the Local LDAP server check box.
LDAP Security	Select the TLS check box if Transport Layer Security is to be used for the communications with the LDAP Server.
Server	Enter the LDAP server name as an IP address or a fully qualified system hostname.

Field	Description
Base DN	Enter the LDAP search base DN.
Authenticated bind DN	Enter the authenticated bind DN as a distinguished name in LDAP format.
Authenticated bind password	Enter the authenticated bind password. Bind DN and Bin Password are used when performing LDAP operations.
Root bind DN	Enter the administrator bind DN as a distinguished name in LDAP format. This will use when performing LDAP operations. This is applicable when using LDAP for SMB/CISF client authentication.
Root bind password	Enter the corresponding password for the administrator bind DN. This is applicable when using LDAP for SMB/CISF client authentication.
SMB LDAP Configuration	Select the Login SMB server to root DN check box at least once when applying new directory changes so that the SMB/CISF server can log into LDAP directory server using the Root Bind DN. This is applicable when using LDAP for SMB/CISF client authentication.
User password policy	Select the User password policy check box.

Table 38: User Information Configuration (LDAP)-Expert View

9.1.2.2 Viewing/Modifying Windows Domain Controller and Authentication

This section of the User Information Configuration explains how to view or modify LDAP settings in Expert view.

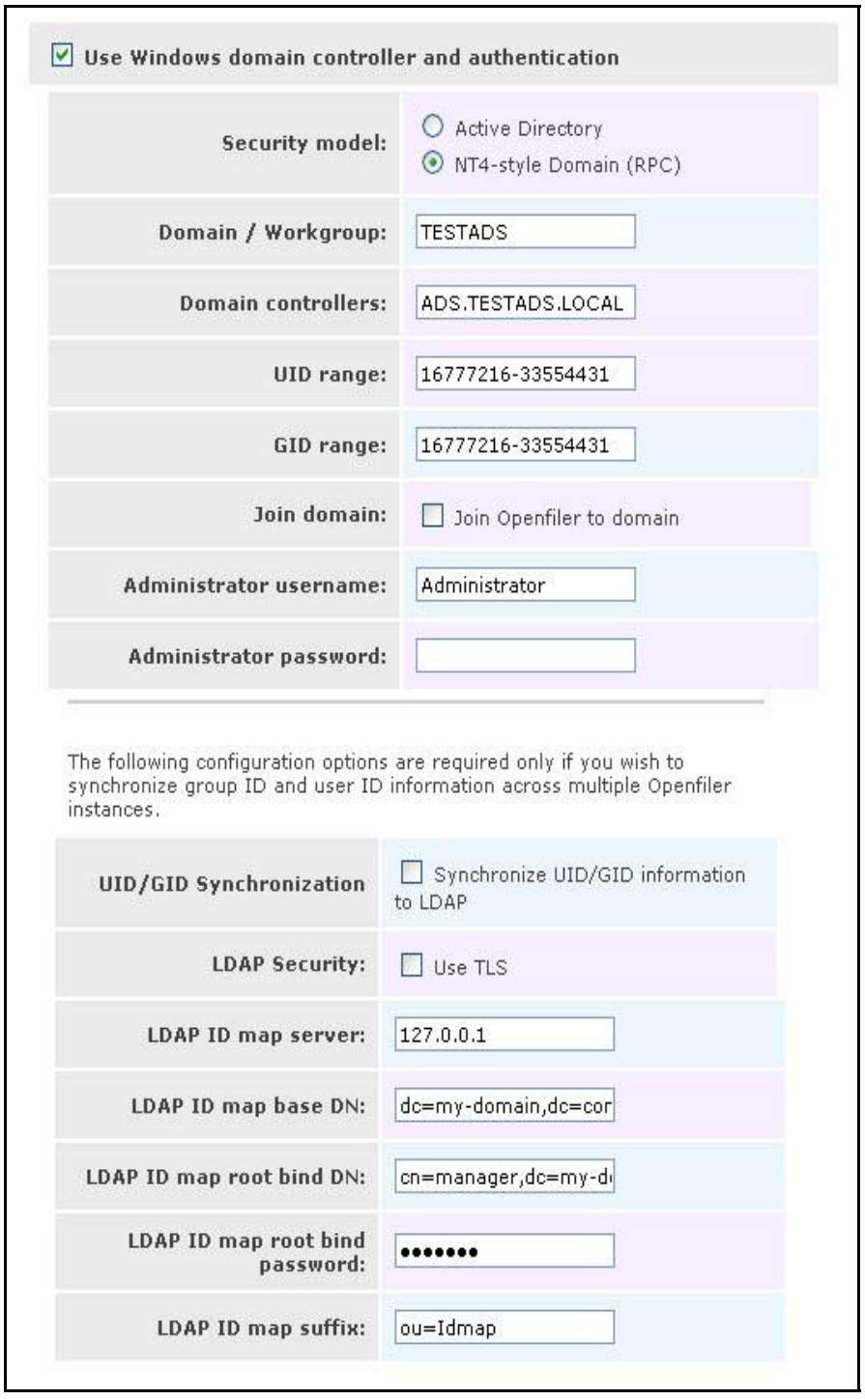


Figure 106: User Information Configuration (Windows Domain Control and Authentication)- Expert View

Field	Description
User Information Configuration	
Windows Domain Controller and Authentication	
Use Windows domain controller and authentication	Select the Use Windows domain controller and authentication check box if users and groups in a Windows domain are to be allowed access to the storage resource on the **Openfiler** appliance.
Security model	Select the appropriate security model from the options. **Openfiler** supports both standard NT4 domain controllers as well as native and mixed mode Active Directory authentication.
Domain / Workgroup	Enter the domain / work group. This field must be entered with the domain name only when using mixed-mode or NT4-style Domain. Otherwise leave this field empty.
Domain controllers	Enter the IP address or fully qualified hostname of the domain controllers (PDC or AD)from which user information should be imported.
UID range	Enter the UID range. Set the range of user ID mappings from Windows to Unix. If more than one user information protocol is selected in addition to using the Windows Domain controller and authentication, then care must be taken to ensure that the range will not clash with UIDs and GIDs in one of the other user authentication method.
GID range	Enter the GID range. The group list is imported from the network domain controller(s) and mapped to the local group IDs.
Join domain	Select the join domain check box to register the **Openfiler** appliance with the domain controller.
Administrator username	Enter the administrator username of the domain controller for the domain which the **Openfiler** is to join.
Administrator password	Enter the administrator password of the domain controller for the domain which the **Openfiler** is to join.
Synchronize Group ID and User ID information	
UID/GID Synchronization	Select the UID/GID Synchronization check box.
LDAP Security	Select the LDAP security check box.
LDAP ID map server	Enter the LDAP ID map server name.
LDAP ID map base DN	Enter the LDAP ID map base DN.
LDAP ID map root bind DN	Enter the LDAP ID map root bind DN.
LDAP ID map root bind	Enter the LDAP ID map root bind password.

Field	Description
password	
LDAP ID map suffix	Enter the LDAP ID map suffix.

Table 39: User Information Configuration (Windows Domain Control and Authentication)-Expert View

9.1.2.3 Viewing/Modifying Authentication Configuration

This section of the User Information Configuration explains how to view or modify authentication configuration in Expert view.

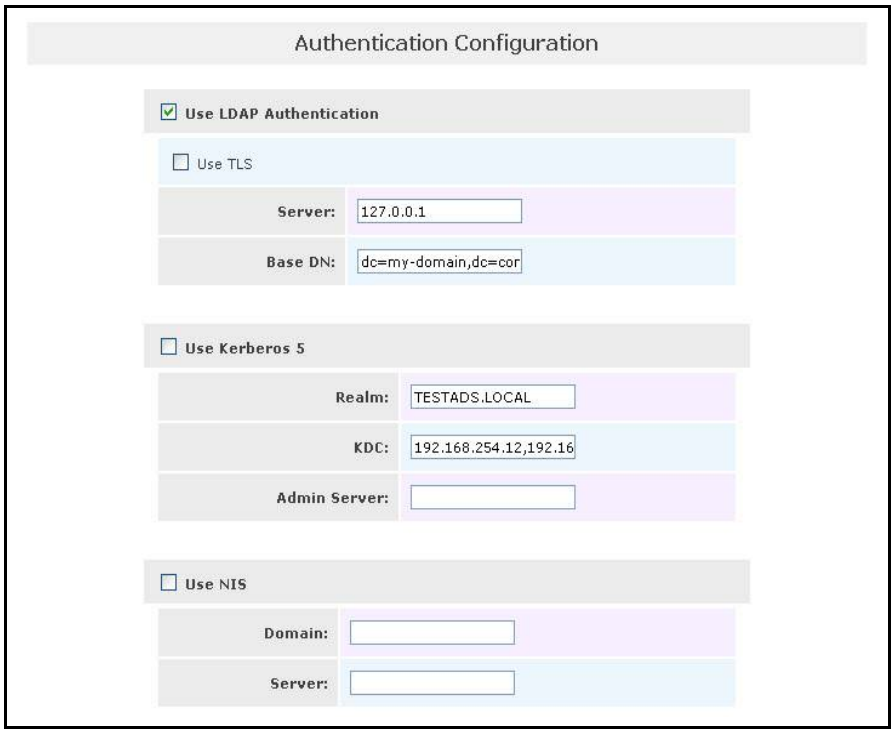


Figure 107 User Information Configuration (Authentication Configuration)-Expert View

Field	Description
Authentication Configuration	
Use LDAP Authentication	Select the Use LDAP Authentication check box. This should be selected if LDAP is to be the authentication mechanism.
Use TLS	Select the Use TLS check box. This check box disables or enables the use of Transparent Layer Security when communicating with the LDAP server.

Field	Description
Server	Enter the IP address or fully qualified hostname of the LDAP server.
Base DN	Enter the base DN. It specifies the retrieval of user information by its Distinguished Name.
Use Kerberos 5	Select the Use Kerberos 5 check box if Kerberos is to be used as the authentication method.
Realm	Enter the realm for the Kerberos server. The realm is analogous to do a domain in NIS and is the network that uses Kerberos for authentication. A realm can consist of more than one server.
KDC	Enter the Key Distribution Center. The KDC is the server responsible for issuing Kerberos tickets.
Admin Server	Enter the list of Kerberos administration servers separating by comma.
Use NIS	Select the Use NIS check box.
Domain	Enter the domain name.
Server	Enter the server name.

Table 40: User Information Configuration (Authentication Configuration)-Expert View

4. View/modify the appropriate details in each section and click the **Submit** button.
   OR
   Click the **Reset** button, to reset the fields.

Note:

Standard View is sufficient for most authentication configuration requirements. Only advanced users should select Expert View.

After making the required modifications and clicking the Submit button, **Openfiler** takes about one minute to restart and reflect the changes. The changes can be verified in the list of groups section

9.2 Administration

The Administration tab allows you to manage groups and users.

9.2.1 Group Administration

Administrator can add a new group, edit a group, add a new user to a group and delete a user from a group.

9.2.1.1 Viewing Groups

This section provides details about how to view the list of groups.

▼ To view groups:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click **Accounts** tab. **Openfiler** displays the **Authentication** page, as shown in Figure 101.
3. On the menu, click the **Administration** link. **Openfiler** displays the **Administration** page, as shown in the following figure.

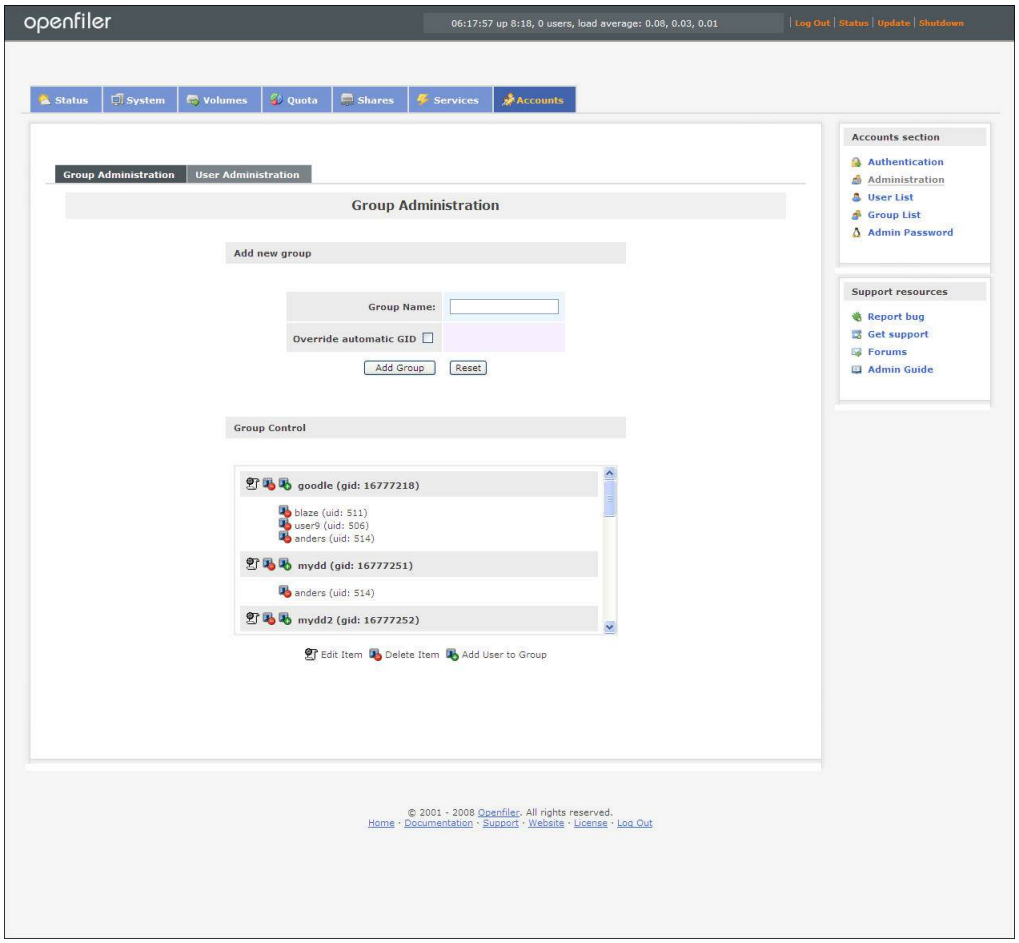


Figure 108: Administration

9.2.1.2 Adding a new Group

This section provides details about how to add a new group.

▼ To add a new group:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click **Accounts** tab. **Openfiler** displays the **Authentication** page, as shown in Figure 101.
3. On the menu, click the **Administration** link. **Openfiler** displays the **Administration** page, as shown in Figure 108. The **Add New Group** section is as shown in the following figure.

Figure 109: Administration

Field	Description
Group Name	Enter the group name.
Override automatic GID	Select the Override automatic GID check box.

Table 41: Adding a New Group

4. Enter/select the appropriate data in the respective fields and click the **Add Group** button.
   OR
   Click the **Reset** button to reset the group name.

9.2.1.3 Managing Groups

This section provides details about how to manage groups. This option allows you to edit or delete a group and to add new users to a group.

▼ To manage group:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click **Accounts** tab. **Openfiler** displays the **Authentication** page, as shown in Figure 101.
3. On the menu, click the **Administration** link. **Openfiler** displays the **Administration** page, as shown in Figure 108. The **Group Control** section is as shown in the following figure.

Figure 110: Group Control

4. Click the icon corresponding to a group to edit the group.
5. Click the icon corresponding to a group/user to delete the group or a user from the group, respectively.
6. Click the icon corresponding to a group to add a new user to the group.

9.2.2 User Administration

9.2.2.1 Viewing User Administration

This section provides details about how to view user administration information.

▼ **To view user administration:**

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click **Accounts** tab. **Openfiler** displays the **Authentication** page, as shown in Figure 101.
3. On the menu, click the **Administration** link. **Openfiler** displays the **Administration** page, as shown in Figure 108.

4. Click the **User Administration** tab. **Openfiler** displays the **User Administration** page, as shown in the following figure.

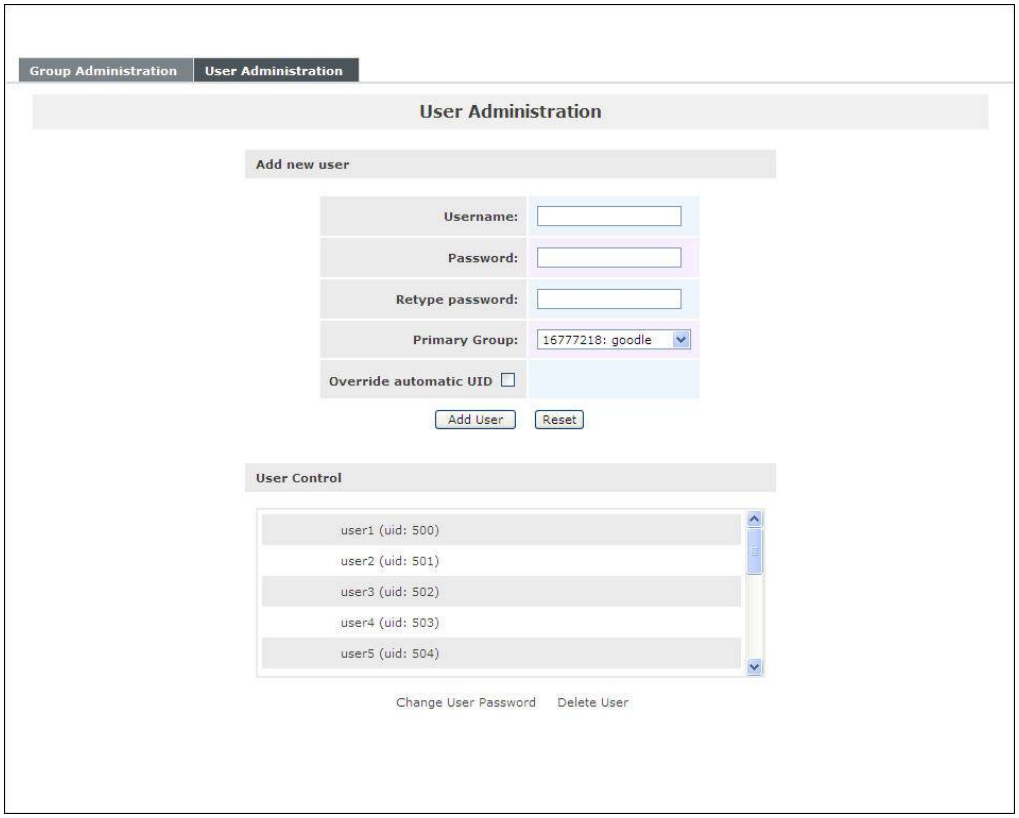


Figure 111: User Administration

9.2.2.2 Adding a new User

This section provides details about how to add a new user.

▼ To add a new user:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click **Accounts** tab. **Openfiler** displays the **Authentication** page, as shown in Figure 101.
3. On the menu, click the **Administration** link. **Openfiler** displays the **Administration** page, as shown in Figure 108.
4. Click the **User Administration** tab. **Openfiler** displays the **User Administration** page, as shown in Figure 111. The **Add New User** section is as shown in the following figure.

Figure 112: Add New User

Field	Description
Username	Enter the name of the user.
Password	Enter the password.
Retype password	Re-enter the password.
Primary Group	Select the primary group from the drop-down list.
Override automatic UID	Select the Override automatic UID check box.

Table 42: Adding a New User

5. Enter/select the appropriate data in the respective fields and click the **Add User** button.
   OR
   Click the **Reset** button to reset the fields.

9.2.2.3 Managing Users

This section provides details about how to manage user details.

▼ **To manage user:**

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.

2. Click **Accounts** tab. **Openfiler** displays the **Authentication** page, as shown in Figure 101.
3. On the menu, click the **Administration** link. **Openfiler** displays the **Administration** page, as shown in Figure 108.
4. Click the **User Administration** tab. **Openfiler** displays the **User Administration** page, as shown in Figure 111. The **User Control** section is as shown in the following figure.

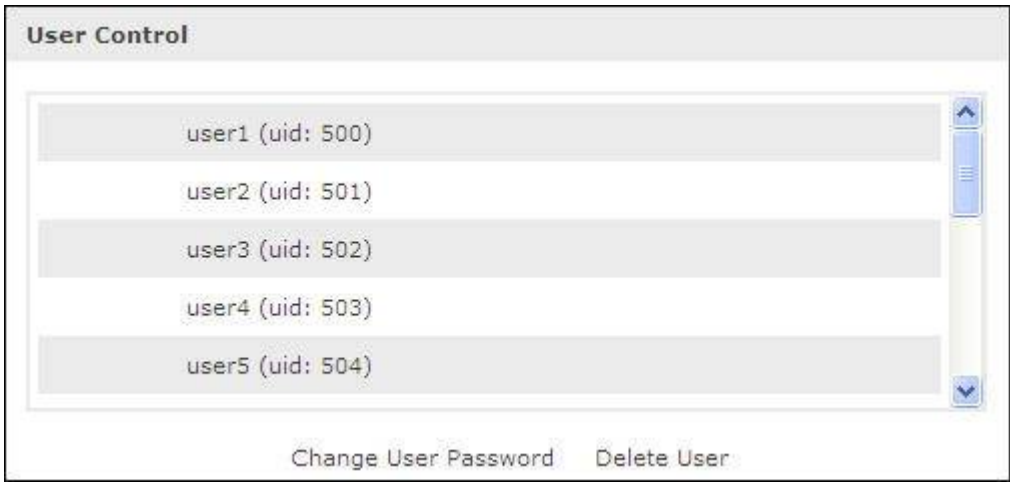


Figure 113: User Control

9.3 Viewing the User List

This section provides details about how to view the list of available users.

▼ To view the user list:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click **Accounts** tab. **Openfiler** displays the **Authentication** page, as shown in Figure 101.
3. On the menu, click the **User List** link. **Openfiler** displays the **List of users** page, as shown in the following figure.

List of users

The following is a list of users available to the system.

« Previous page | Page 1 of 2 | Next page »

UID	User Name	User Type	Primary Group	Group Type
507	test	Local	test	Local
500	user1	LDAP	group1	LDAP
501	user2	LDAP	group2	LDAP
502	user3	LDAP	group3	LDAP
503	user4	LDAP	group4	LDAP
504	user5	LDAP	group5	LDAP
505	user6	LDAP	N/A	N/A
506	user9	LDAP	group1	LDAP
508	kevin	LDAP	group1	LDAP
509	mitnick	LDAP	group1	LDAP

Figure 114: List of Users

Field	Description
UID	This field displays the user ID. Click the **UID** link to sort data in the ascending order of user ID.
Username	This field displays the user name. Click the **User Name** link to sort data in the ascending order of user name.
User Type	This field displays the user type. Click the **User Type** link to sort data in the ascending order of user type.
Primary Group	This field displays the primary group. Click the **Primary Group** link to sort data in the ascending order of primary group.
Group Type	This field displays the group type. Click the **Group Type** link to sort data in the ascending order of user ID.

Table 43: List of Users

4. Click the **Previous page** or **Next page** links to navigate to the previous or next page, respectively.

9.4 Viewing the Group List

This section provides details about how to view the list of available groups.

▼ To view the group list::

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click **Accounts** tab. **Openfiler** displays the **Authentication** page, as shown in Figure 101.
3. On the menu, click the **Group List** link. **Openfiler** displays the **List of groups** page, as shown in the following figure.

List of groups

The following is a list of groups available to the system.

« Previous page | Page 1 of 2 | Next page »

GID	Group Name	Group Type
507	test	Local
16777216	BUILTIN\administrators	Unknown
16777217	BUILTIN\users	Unknown
500	group1	LDAP
501	group2	LDAP
502	group3	LDAP
503	group4	LDAP
504	group5	LDAP
16777218	goodle	LDAP
16777251	mydd	LDAP

Figure 115: List of Groups

Field	Description
GID	This field displays the group ID. Click the **GID** link to sort data in the ascending order of group ID.
Group Name	This field displays the group name. Click the **Group Name** link to sort data in the ascending order of group name.
Group Type	This field displays the group type. Click the **Group Type** link to sort data in the ascending order of group type.

Table 44: Group List

4. Click the **Previous page** or **Next page** links to navigate to the previous or next page, respectively.
5. Click the **Group Name** link. **Openfiler** displays the **Members of the group** page, as shown in the following figure.

Figure 116: Members of the Group

6. Click the **Close Window** link to close the window.

9.5 Changing Admin Password

This option allows you to change the administrator password. In order to do this, the current administrator password is required for security reasons.

▼ To change admin password:

1. Log on to **Openfiler**. The **Home** page, as shown in Figure 2, is displayed.
2. Click **Accounts** tab. **Openfiler** displays the **Authentication** page, as shown in Figure 101.
3. On the menu, click the **Admin Password** link. **Openfiler** displays the **Change Administrator Password** page, as shown in the following figure.

Figure 117: Change Administrator Password

Field	Description
Current Password	Enter the current password.
New Password	Enter the new password.
Confirm New Password	Re-enter the new password in confirmation.

Table 45: changing Administrator Password

4. Enter the appropriate details in the respective fields and click the **Submit** button.
   OR
   Click the **Clear** button to clear the fields.

10 Advanced Configuration

10.1 Fibre Channel Target Setup

This section outlines the steps required to configure Openfiler as a Fibre Channel (FC) target using local storage on the Openfiler SAN appliance. Please note that Openfiler only supports target-mode with Qlogic chipsets.

Local storage on an Openfiler SAN appliance can be configured to be exported to Fibre Channel initiators in an FC SAN fabric. This can be achieved by installing an FC HBA – currently Qlogic 2xxx-series chipsets only – in the Openfiler SAN appliance and running through a few configuration steps.

This section provides the information for systems administrators to achieve this functionality. Please note that at this time, FC target configuration - unlike iSCSI target configuration or file-level (CIFS, NFS..) share configuration – has to be done almost entirely at the command line.

As there is a potential for causing data loss if the wrong commands are applied to existing storage components or volumes on an Openfiler SAN appliance, administrators attempting to perform this configuration should be forewarned of the risks. It is therefore assumed that the administrator is comfortable with working at the Linux/Unix command line.

At this time, if an Openfiler SAN appliance is acting as an FC target , it cannot simultaneously be an FC initiator.

10.1.1 Components

The following physical components are required for FC target export from Openfiler SAN to an FC initiator:

1) The Openfiler SAN appliance with integrated storage for export
2) Qlogic 23xx, 24xx and 25xx based FC HBA integrated in the Openfiler SAN appliance
3) (Optional for FC-SW topology) Fibre Channel switch
4) The FC initiator system with any industry standard FC HBA integrated
5) Copper or Fiber interconnect cable between Openfiler FC HBA and Initiator FC HBA in FC-P2P or FC-SW topology (FC-AL topology is not recommended but should also work)

10.1.2 Assumptions

The configuration steps described in this document show using examples of the various subsystems involved in exporting storage via FC. All items and subsystems referenced here should be substituted with the corresponding items in your environment. To that end, the following assumptions are made:

10.1.2.1 On Initiator

- WWN of FC HBA: 21:00:00:e0:8b:92:85:1a (210000e08b92851a)
- FC SCSI bus rescan script or tool (e.g. on linux rescan-scsi-bus.sh)

10.1.2.2 On Target

- WWN of FC HBA: 21:00:00:e0:8b:92:85:1b
- RAID array designated as second SCSI disk (***/dev/sdb***)
- The Openfiler OS image is on a separate disk (e.g ***/dev/sda***)
- The first partition on ***/dev/sdb***, to be designated ***/dev/sdb1***, will be used for volume group
- Logical Volume Group to be designated ***datavg***
- FC storage export Logical Volume to be designated ***datalv***
- FC storage export ACL groupname to be designated ***Default***

It as also assumed that a connection has been established between the initiator (client wishing to consume FC storage from Openfiler SAN) and target (Openfiler SAN appliance) either directly via FC-PTP or indirectly via FC-SW. Use whatever tools are available on the initiator and/or switch to confirm this before proceeding.

10.1.3 Configuration Outline

Assuming a fresh installation of the Openfiler Fibre Channel Target Plugin, the following are the steps to use to successfully configure Fibre Channel storage.

1. Create a logical volume (LV) to expose on a Fibre Channel target
2. Create a virtual disk (vDisk) to map as an FC LUN
3. Add an FC target host LUN Mask Group
4. Map a vDisk to a FC target LUN Mask Group
5. Add initiators to a FC target LUN Mask Group

10.1.4 Configuration

10.1.4.1 Create A Logical Volume

To create a logical volume to be assigned as a vLUN for Fibre Channel:

1. Browse to the **Volumes** tab
2. Select the desired volume group in the **Select Volume Group** select box
3. Click the **Change** button
4. Click the **Add Volume** link on the right hand side
5. In the Add Volume page:
    1. Scroll down to the **Create a volume in <volume_group_name>** section
    2. Enter a desired volume name in the **Volume Name** field
    3. Enter a suitable description for the volume in the **Volume Description** field
    4. Enter the desired capacity of the volume in the **Required Space (MB)** field
    5. Select **block (Fibre Channel,FC,etc)** in the **Filesystem / Volume** type field
    6. Click the **Create** button

Illustration 1: Select a volume group (VG)

Illustration 2: Add a logical volume (LV)

10.1.1.1 vDisk Creation

Once a Logical Volume has been created to be assigned as a Fibre Channel LUN:

1. Browse to the **Volumes → FC Target** page.
2. Click the **HBAs** link on the left hand side
3. Select the **vdisk_blockio** HBA
4. Click the **Add VDisk** button
    1. Enter a unique **Device Alias.** This can be any string up to 10 characters with no spaces
    2. Select **vdisk_blockio** in the **HBA** select box
    3. Select the desired logical volume (LV) in the **Block Device** select box
    4. Click the **Submit** button

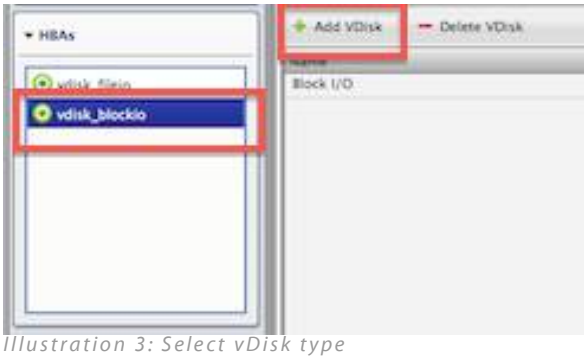


Illustration 3: Select vDisk type

Illustration 4: Add a vDisk

10.1.1.2 FC LUN Mask Group

Every FC target must have a host mask group to share LUN access to initiators based on the initiator WWPN. Target LUNs are mapped to specific host mask groups which contain initiators. Before mapping LUNs to initiators, create a LUN Mask Group:

1. Browse to the **Volumes → FC Target** page
2. Click the desired target on the left hand side
3. Click the **Add LUN Mask Group** button on the right hand side
4. Enter an identifier for the LUN mask group in the **New Mask Group Name** field
5. Click the **Submit** button

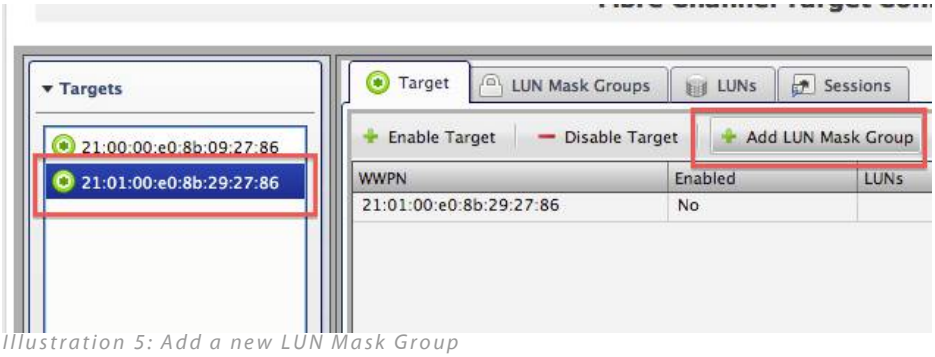


Illustration 5: Add a new LUN Mask Group

Illustration 6: New LUN Mask Group Properties

10.1.1.3 FC Mask Group LUN Mapping

Once a LUN mask group has been created, vDisk devices can be mapped to the mask group which are then accessible by any initiators in the mask group for the specific target:

To map a vDisk to an FC Target LUN Mask Group:

1. Browse to the **Volumes → Fibre Channel** page
2. Select the desired target on the left hand side
3. Select the **LUNs** tab on the right hand side
4. Click the **Map LUN** button
5. Select the desired mask group in the **Select Mask Group** select box
6. Assign a LUN ID in the **New Mask Group LUN** Properties field (LUN ID must be unique)
7. Select the desired vDisk in the **Select An Available Device** table
8. Click the **Submit** button

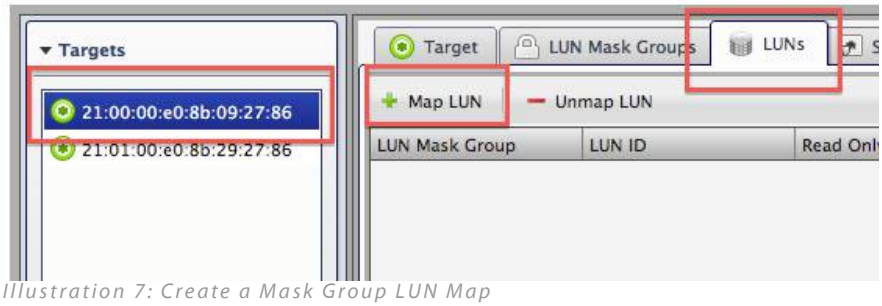


Illustration 7: Create a Mask Group LUN Map

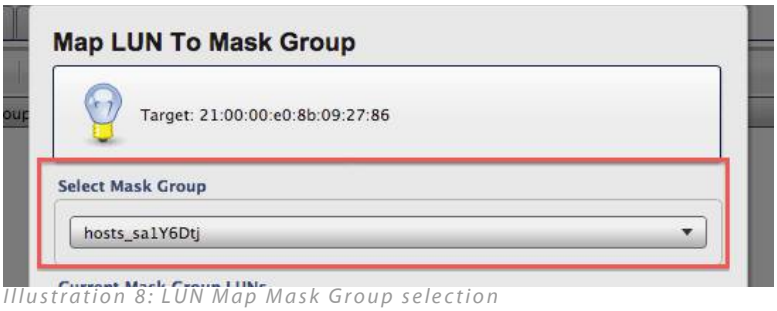
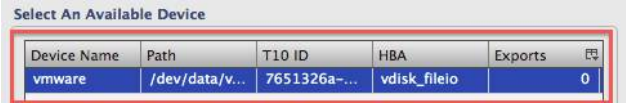


Illustration 8: LUN Map Mask Group selection

Illustration 9: Mask Group LUN Map LUN ID



10.1.1.4 FC Mask Group Host LUN Masking

To allow an Fibre Channel initiator to access a target and its LUNs:

1. Browse to the **Volumes → Fibre Channel** page
2. Select the desired Fibre Channel target on the left hand side
3. Select the **LUN Mask Groups** tab on the right hand side
4. Click the **Map Initiator** button
5. Select the desired mask group in the **Mask Group** select box
6. Enter an initiator WWPN in the **New Initiator WWN** form field
7. Click the **Submit** button

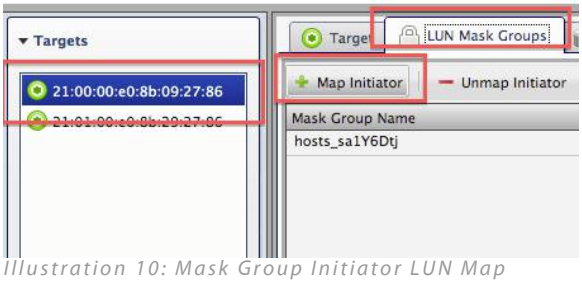


Illustration 10: Mask Group Initiator LUN Map

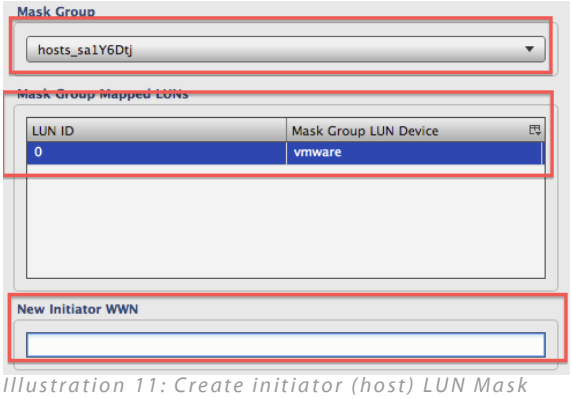


Illustration 11: Create initiator (host) LUN Mask

10.2 Advanced iSCSI Target Configuration Outline

Assuming a fresh installation of the Openfiler Advanced iSCSI Target Plugin, the following are the steps to use to successfully configure iSCSI storage.

1. Create a logical volume (LV) for iSCSI
2. Assign an LV as a iSCSI virtual LUN (vLUN)
3. Create an iSCSI target
4. Map an iSCSI vLUN to an iSCSI target
5. Add initiators to an iSCSI target to perform LUN masking
6. Assign a target portal interface to an iSCSI target
7. Mask vLUNs to initiators

10.2.1 Create A Logical Volume

To create a logical volume to be assigned as a vLUN for iSCSI:

1. Browse to the **Volumes** tab
2. Select the desired volume group in the **Select Volume Group** select box
3. Click the **Change** button
4. Click the **Add Volume** link on the right hand side
5. In the Add Volume page:
    1. Scroll down to the **Create a volume in <volume_group_name>** section
    2. Enter a desired volume name in the **Volume Name** field (no spaces or dashes)
    3. Enter a suitable description for the volume in the **Volume Description** field
    4. Enter the desired capacity of the volume in the **Required Space (MB)** field
    5. Select **block (iSCSI,FC,etc)** in the **Filesystem / Volume** type field
    6. Click the **Create** button

Illustration 12: Select a volume group (VG)

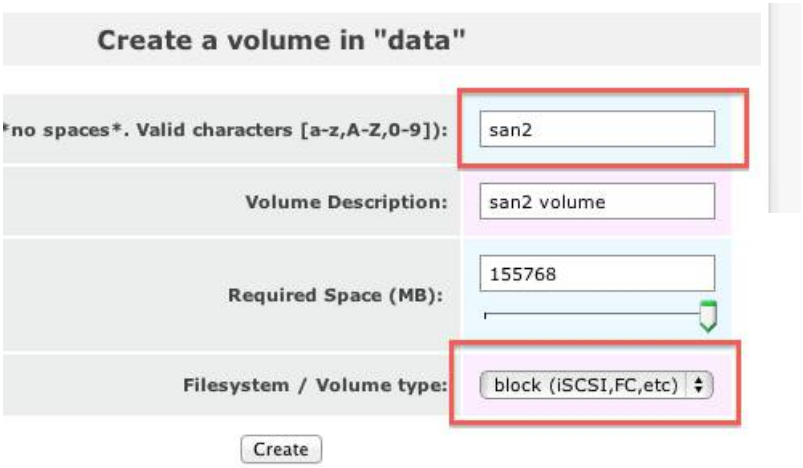


Illustration 14: Add Block Logical Volume

10.2.2 iSCSI vLUN Assignment

Once a Logical Volume has been created to be assigned as an iSCSI vLUN:

1. Browse to the **Volumes → Advanced iSCSI** page.
2. Click the **HBAs** link on the left hand side
3. Click the **block** link
4. Click the **Map HBA Volume** button
    1. Enter a unique **Device Alias.** This can be any string up to 10 characters with no spaces
    2. Select **block** in the **HBA** select box
    3. Click the **Map HBA Volume** button
    4. Select the desired **Logical Volume** in the **Devices** list by clicking on its row
    5. Click the Submit button

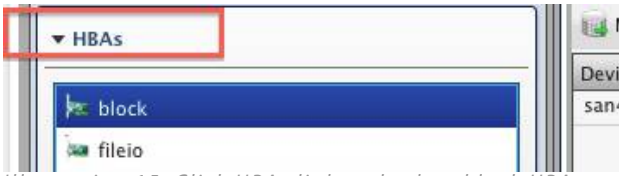


Illustration 15: Click HBAs link and select block HBA

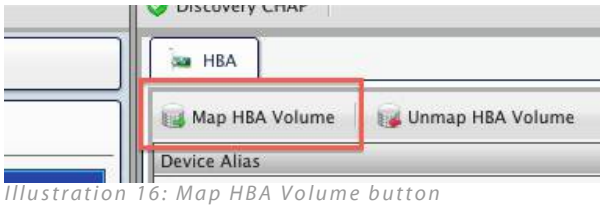


Illustration 16: Map HBA Volume button

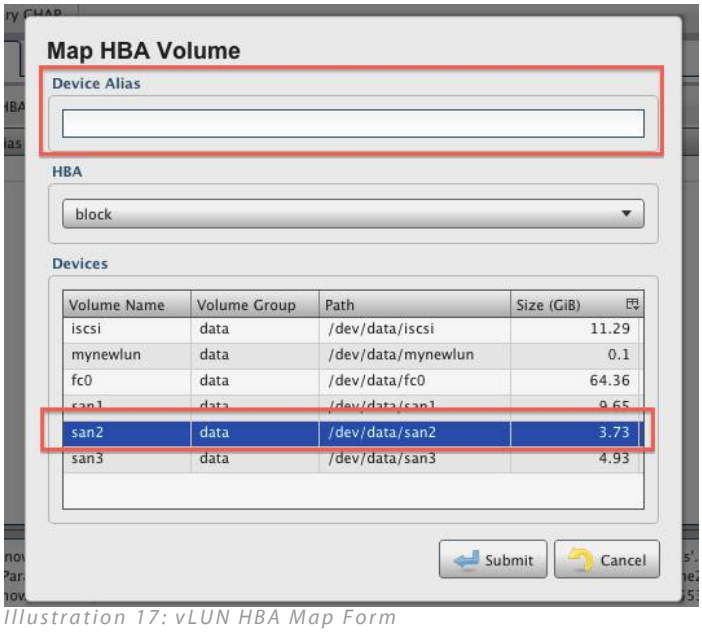


Illustration 17: vLUN HBA Map Form

10.2.3 iSCSI Target Creation

To create a new iSCSI target:

1. Browse to the **Volumes → Advanced iSCSI** page
2. Click the **Add Target** button on the left hand side
3. Enter a new target name or leave the default as is
4. Click the **Submit** button

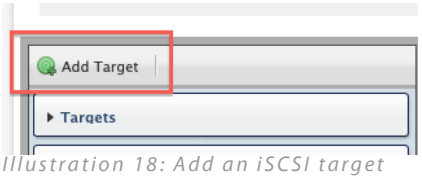


Illustration 18: Add an iSCSI target

10.2.4 iSCSI vLUN Mapping

To map a vLUN to an iSCSI target:

1. Browse to the **Volumes → Advanced iSCSI** page
2. Select the desired target on the left hand side
3. Select the **Target LUNs** tab on the right hand side
4. Click the **Map Target LUN** button
5. Select the desired vLUN in the **Available Devices** table

Illustration 19: iSCSI Target vLUN mapping

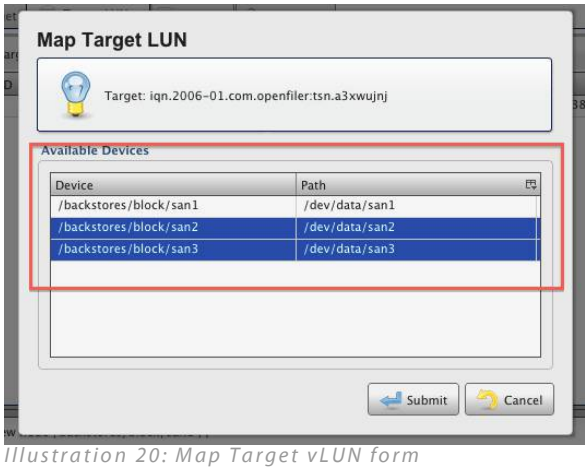
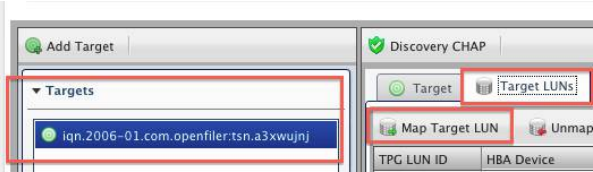


Illustration 20: Map Target vLUN form



10.2.5 iSCSI Initiator ACL

To add an initiator that will access the iSCSI target:

1. Browse to the **Volumes → Advanced iSCSI** page
2. Select the desired iSCSI Target on the left hand side
3. Select the **Target** tab on the right hand side
4. Click the **Add Initiator** button
5. Use the default or enter the desired IQN in the **Initiator** field
6. Click the **Submit** button

Illustration 21: Add Initiator ACL button

Illustration 22: Add Initiator ACL form

10.2.6 iSCSI LUN Masking

To allow an iSCSI initiator to access a target and its vLUNs:

1. Browse to the **Volumes → Advanced iSCSI** page
2. Select the desired iSCSI target on the left hand side
3. Select the **Initiators** tab on the right hand side
4. Click the **Add LUN Mask** button
5. Select the Initiator IQN to mask a vLUN to in the **Initiator** select box
6. Select the desired vLUN or vLUNs to mask by highlighting the vLUN(s) in the **Available LUNs** table
7. Click the **Submit** button

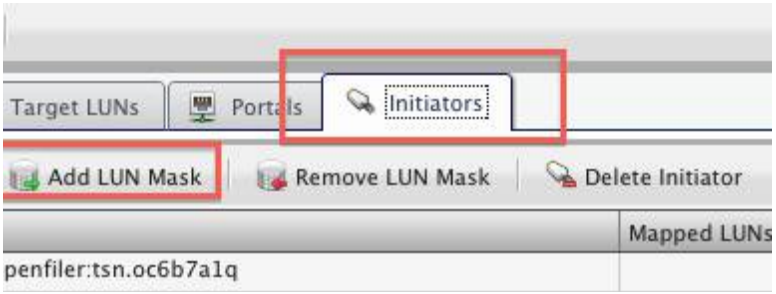


Illustration 23: Initiators tab and Add LUN Mask button

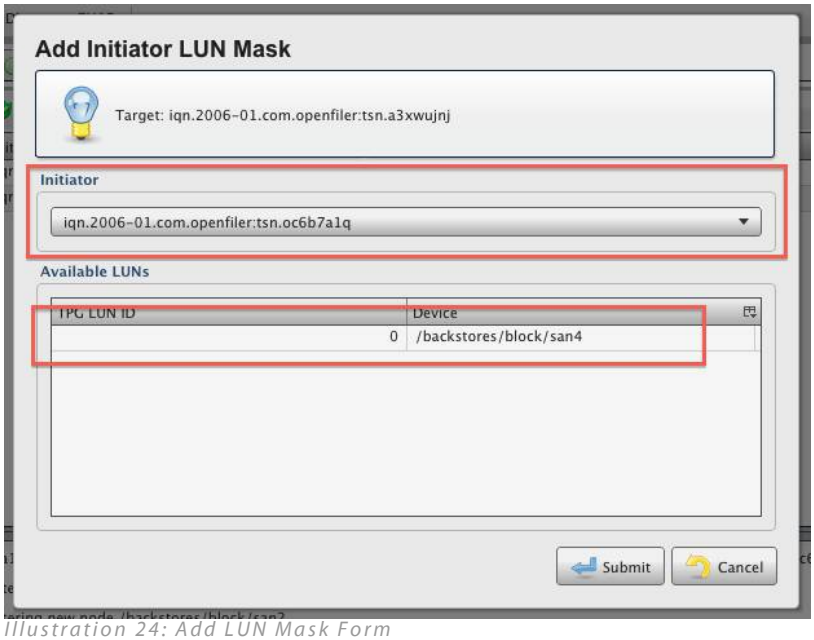


Illustration 24: Add LUN Mask Form

10.2.7 Add an iSCSI Portal

To add an iSCSI portal so that initiators may access targets and vLUNs:

1. Browse to the **Volumes → Advanced** iSCSI page
2. Select the desired iSCSI target on the left hand side
3. Select the **Portals** tab on the right hand side
4. Click the **Add Portal** button
5. Select desired IP address in the **Portal Details → IP Address** select box
6. Set the port number in the **Portal Details → Port field** (3260 is default iSCSI port number)
7. Click the **Submit** button

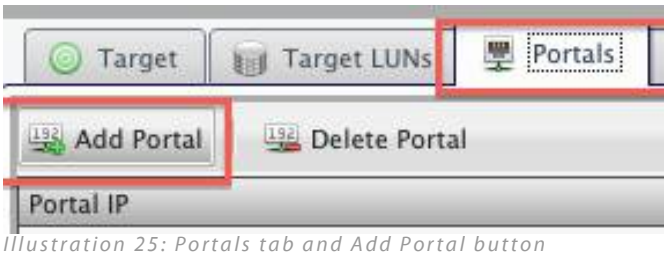


Illustration 25: Portals tab and Add Portal button

Illustration 26: Add Target Portal form

10.2.8 Extended Configuration

Due to the nature of the access control mechanism in the Advanced iSCSI Target Plugin, it is not possible for unauthorised initiators to access target LUNs. However, it is indeed possible to configure CHAP for both initiators and targets such that only authenticated connections may be created between initiators and targets. The CHAP authentication capability provides for bi-directional authentication such that it is impossible for a target to spoof an initiator into connecting to it to use its exported LUNs.

Discovery CHAP ensures that only authenticated systems may view the list targets configured on a target portal IP. Connection CHAP forces only authenticated initiators to be able to connect to discovered targets and access LUNs exported over that target portal. Bear in mind that there are specific constraints that must be adhered to when configuring CHAP. Misconfiguration can lead to hours of unnecessary debugging.

Note that the iSCSI specification requires passwords to be between 12 and 16 characters in length. Some iSCSI implementations do not enforce this requirement, however the Microsoft family of OS products, including Hyper-V, do. You should ensure that your passwords meet this constraint.

10.2.8.1 Discovery CHAP

When discovery CHAP is enabled, only authenticated initiators can view the list of target portals groups available on the SAN. You may also configure bi-directional discovery CHAP so that the target has to authenticate itself to the initiator.

Note that bidirectional (mutual) CHAP for target discovery has a global authentication mechanism in that all initiators must use the same credentials to authenticate a target. This is different to how connection CHAP is managed whereby each initiator has its own credentials when a target needs to authenticate to an initiator to prove its authenticity and create a connection.

10.2.8.2 Authenticate An Initiator

To authenticate an initiator to a target portal group for discovery:

1. Browse to the **Volumes → Advanced iSCSI page**
2. Click the **Discover CHAP** button on the right hand side
3. Tick the **Check to Enable Discovery CHAP** checkbox
4. Enter the desired username in the **Username** field
5. Enter the desired password in the **Password** field
6. Re-enter the desired password in the **Re-enter Password** field
7. Click the **Submit** button

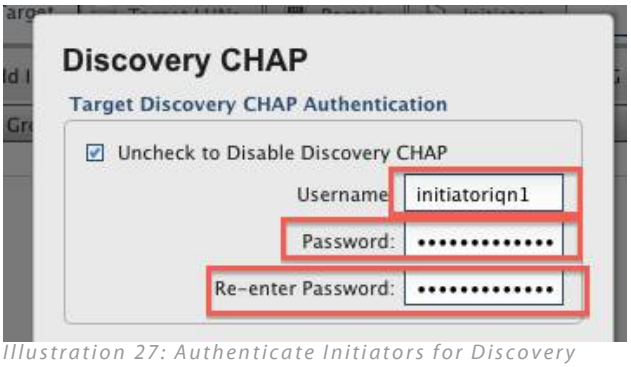


Illustration 27: Authenticate Initiators for Discovery

10.2.8.3 Authenticate A Target (optional)

Note that for mutual (bi-directional) authentication, you must also select **Enable Discovery CHAP** in the **Discovery CHAP** dialog box and enter valid credentials. The following assumes that discovery CHAP is already enabled for initiator to target discovery. You may perform configuration of target and initaitor CHAP authentication simultaneously in one step.

If you wish to enable bi-direction authentication for target portal group discovery:

1. Browse to the **Volumes → Advanced iSCSI page**
2. Click the **Discover CHAP** button on the right hand side
3. Tick the **Check to Enable Mutual Discovery CHAP** checkbox (**Enable Discovery CHAP** needs to be configured already, or should be configured before proceeding)
4. Enter the desired username in the **Username** field
5. Enter the desired password in the **Password** field
6. Re-enter the desired password in the **Re-enter Password** field
7. Click the **Submit** button

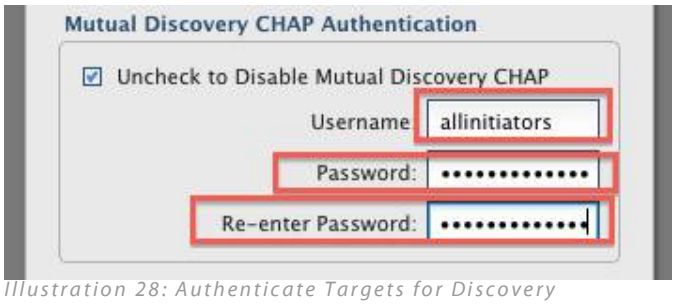


Illustration 28: Authenticate Targets for Discovery

10.2.8.4 Login CHAP

Login CHAP specifies a mechanism whereby initiators and targets can be authenticated when a connection is made to specific target portals after the discovery phase. In doing so, it is impossible for initiators to connect to a spoofed target portal and vice-versa.

Where Login CHAP differs from Discovery CHAP is that authentication credentials are unique for each initiator → target nexus. When authenticating an initiator against a target, enableTarget Login CHAP. When authenticating a target against an initiator, enable Mutual Login CHAP.

10.2.8.5 Target Login CHAP

To configure Target Login CHAP:

1. Browse to the **Volumes → Advanced iSCSI page**
2. Select the desired target on the right hand side
3. Select the **Initiators** tab on the right hand side
4. Click the **Login CHAP** button
5. Select the desired initiator in the **Initiator** drop-down field
6. Select the **Check to Enable Login CHAP** checkbox
7. Enter the desired username in the **Username** field
8. Enter the desired password in the **Password** field
9. Re-enter the desired password in the **Re-enter Password** field
10. Click the **Submit** button

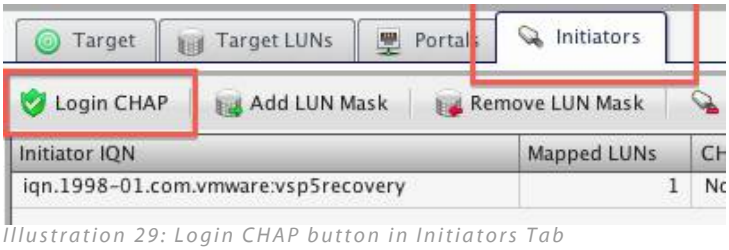


Illustration 29: Login CHAP button in Initiators Tab

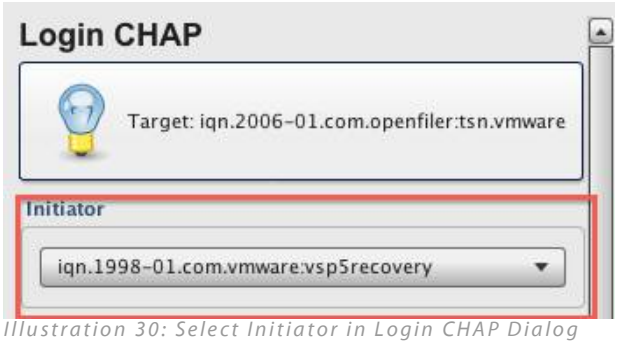


Illustration 30: Select Initiator in Login CHAP Dialog

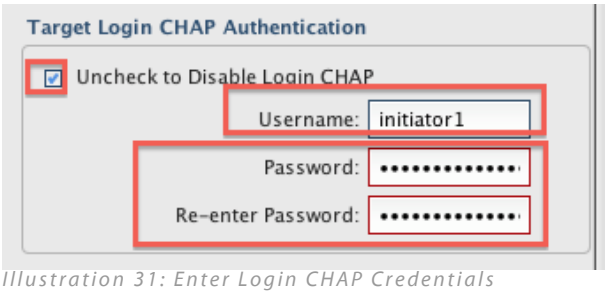


Illustration 31: Enter Login CHAP Credentials

10.2.8.6 Mutual Login CHAP

Mutual CHAP login allows initiators to authenticate targets. ***Mutual CHAP requires that Target CHAP is also configured.***

To configure Mutual CHAP:

1. Browse to the **Volumes → Advanced iSCSI page**
2. Select the desired target on the right hand side
3. Select the **Initiators** tab on the right hand side
4. Click the **Login CHAP** button
5. Select the desired initiator in the **Initiator** drop-down field
6. Select the **Check to Enable Mutual Login CHAP** checkbox (Target CHAP Login must already be configured or should be configured at this stage)
7. Enter the desired username in the **Username** field
8. Enter the desired password in the **Password** field
9. Re-enter the desired password in the **Re-enter Password** field
10. Click the **Submit** button

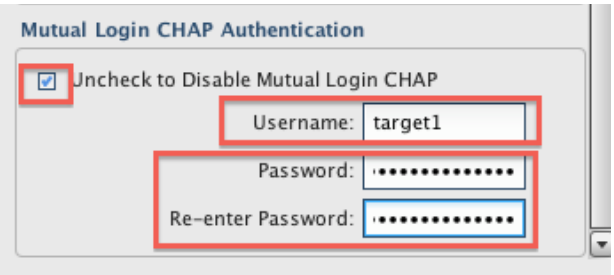


Illustration 32: Mutual CHAP Configuration

10.2.8.7 Target Parameters

Each enabled target can be customised with a set of target parameters. Parameter settings are unique to each target. Initiators parameters must match configured target parameters.

To configure target parameters:

1. Browse to the **Volumes → Advanced iSCSI page**
2. Select the desired target on the right hand side
3. Select the **Target** tab on the right hand side
4. Click the **TPG Parameters** button
5. Enter your desired settings in the form dialog window
6. Click the **Submit** button

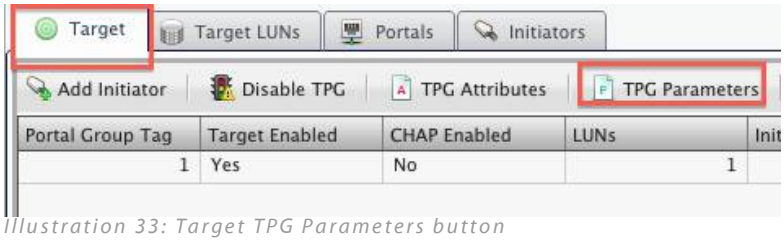


Illustration 33: Target TPG Parameters button

11 Appendix

11.1 RAID Overview

RAID technology allows you to have data written to multiple sets of disks at the same time, thereby reducing the risk of an individual disk failure destroying data. That is a rather simplistic definition of what RAID does. In reality, over the years since RAID was introduced, the technology has gone through multiple protocol revisions, enhancements and extensions to the point that it can mean different things to different people depending on application contexts.

RAID technology is divided into several protocols or levels which, alone or combined, serve to increase data integrity, throughput, availability and capacity. A RAID level basically specifies how disk sets are arranged and the pattern in which data is written, read and verified for integrity (for the RAID levels that support data integrity). RAID is not a function of the disks themselves - rather it is implemented at the disk controller level (hardware RAID) or in the operating system (software RAID).

Hardware RAID controllers are intelligent disk controllers, usually with a dedicated microprocessor performing the complex RAID algorithms. Software RAID on the other hand depends on the host system microprocessor to perform RAID calculations and would therefore reduce the raw processing power available to run applications. The benefit of hardware RAID over software RAID is that it does not impinge on the host system microprocessor - leaving it to perform regular computational tasks instead. Another advantage conferred by hardware RAID circuitry is the ability to hot-swap or hot-plug failed disks from a RAID array. What this means is that for the RAID levels that can survive one or more disk failures, the ability to replace the failing disk(s) while the system is still running in invaluable for mission critical applications.

The following are the most commonly used RAID levels. Others exist but are not in widespread use and are mostly dedicated to very specific application scenarios.

11.1.1 RAID Levels

11.1.1.1 RAID 0

RAID 0, also known as **Striping**, is not redundant at all and is not RAID in a pedantic sense. What RAID 0 does is to increase performance significantly by breaking up data blocks into smaller equally sized chunks which are then distributed across two or more physical disks. The performance enhancement is brought about by the fact that data is being written to or read from all disks in the array or RAID set nearly simultaneously as opposed to sequentially from a single disk. In general, the higher the number of disks in the RAID 0 array, the better the performance. Another advantage of RAID 0 is that the total capacity of all disks in the RAID set is available to use for data storage.

The performance and capacity advantages do come at a price however. In fact, following on from our initial example in the introduction above, a single disk failure in a RAID 0 array will render all data in the array irretrievable - with the only recourse being restoration from backups. And as there are now more disks being used simultaneously, the chances of a failure occurring increase.

RAID 0 is excellent for applications that require ultimate I/O performance with a caveat of the ability to commit less dynamic data to longer term storage at certain intervals. Applications such as image editing, pre-press and digital rendering can benefit greatly form RAID 0 I/O performance and capacity characteristics.

11.1.1.2 RAID 1

RAID 1 or **Mirroring** is the opposite of RAID 0. Rather than chunking data bits and spreading them across two or more physical disks, mirroring writes identical data bits to two or more physical disks so that in the event of a disk failure, at least one disk in the RAID set still has a complete copy of the data. RAID 1 confers true redundancy and is generally achieved and implemented as a mirror of two disks. Mirrors can however be created with disks numbering multiples of two. The main disadvantages of RAID 1 are that cost and capacity. Cost doubles and capacity is halved in comparison to a single disk non-RAID configuration. Performance on writes can also slightly degrade as the data needs to be written at least twice for the write operation to be considered complete.

RAID 1 is excellent for applications where data integrity is absolutely critical and the inconvenience of restoring from backups is to be avoided at all cost. Accounting and financial applications are two typical application scenarios where RAID 1 would be ideal.

11.1.1.3 RAID 0+1

This RAID level, as the name suggests, combines the attributes of RAID 0 and RAID 1 to gain benefits of both levels; performance and redundancy. RAID 0+1 requires a minimum of four disks to implement and is a mirrored stripe set. That is to say, a RAID 1 array is layered over two RAID 0 arrays. While getting the performance benefits of RAID 0, RAID 0+1 increases reliability as well by keeping a mirror of the data striped data. Naturally, as multiple copies of the data is kept, the cost of the solution is double that of a RAID 0 array. A major disadvantage of this RAID level is that a single drive failure will cause the array to become a RAID 0 array.

11.1.1.4 RAID 3

RAID 3 uses byte level striping with parity information stored on a dedicated disk. RAID 3 has very high read and write data transfer rates and single disk failures do not impact throughput significantly. RAID 3 stripes data blocks and stores the striped information in the exact same location on the individual disks that make up the array - so parallel I/O is not possible as data requests require seeks on all disks simultaneously to the same position.

RAID 3 is excellent for media applications such as image editing, digital pre-press and live streaming. The total capacity of a RAID 3 array is *sum(N-1)* and requires a minimum of three disks to implement.

11.1.1.5 RAID 4

RAID 4 algorithm is similar to RAID 3 except that striping is done at the block rather than byte level. This has the advantage of blocks requests being serviced by a single disk if the controller supports that functionality. With single disk block request serving, multiple block requests may be services simultaneously in parallel so long as the individual blocks reside on separate disks.

The total capacity of a RAID 4 array is **sum(N-1)** and requires a minimum of three disks to implement.

11.1.1.6 RAID 5

RAID 5 or **Striping with Parity** is implemented with a minimum of three disks. In a typical three-disk RAID 5 array the data is striped across two disks and parity information is written to the third. This scheme is extended to any further number of disks in the array. For every stripe of data that is written to disks on a RAID 5 array, a special parity bit is calculated and stored in a round-robin fashion. The parity information is therefore distributed and any disk in the array can fail and data can then be restored from the remaining set of disks in the array using the parity information. The total capacity available in a RAID 5 array is *sum(N - 1)*, where **N** is the number of disks in the set.

A RAID 5 array cannot handle more than a single disk failure without being corrupted. If two disks fail within a short time of one another, i.e insufficient time has elapsed for the parity calculations to rebuild the data blocks of the failed disk before another failure occurs, then the array and its data will be lost. It is useful therefore to have a dedicated hot-spare* disk in the array so that a rebuild can start immediately upon a disk failure. With such a configuration, in the event of a single disk failure the RAID controller will rebuild the data on the failed disk on the hot-spare disk using the available parity information on the remaining array members. Once the rebuild has finished, the array will operate as normal.

In terms of disks, a RAID 5 array is cheaper to implement than a RAID 0+1 array. RAID 5 data reads are also slightly faster than single (standalone) disk reads. The main disadvantage of RAID 5 compared to RAID 0+1 or RAID 0 is that a disk failure has medium to significant impact on throughput performance. RAID 5 also consumes a lot of resources in rebuild operations, meaning implementation in software as opposed to a dedicated hardware controller would impact the host system processor and applications more than is desired.

RAID 5 is an excellent option for general file and application servers, database servers and web/email/news servers. To that end, RAID 5 is the most commonly deployed RAID level in network server environments.

11.1.1.7 RAID 6

RAID 6 is an extension of RAID 5 and provides added redundancy by using two parity sets instead of one. The advantage here is that up to two disks can fail in the array without compromising data integrity. RAID 6 requires a minimum of four disks as opposed to three disks for RAID 5. As it requires quite powerful computational resources, few hardware RAID controllers have this algorithm implemented. However it is quite common in software RAID implementations that make use of the host system processing facilities. The total storage capacity for RAID 6 arrays is **sum(N - 2)** where **N** is the number of disks in the set.

Like RAID 5, RAID 6 is great for database servers, file and print applications and web and email serving. It provides an excellent amount of fault-tolerance with very little overhead when compared to other resilient RAID levels such as RAID 5 and RAID 10.

11.1.1.8 RAID 10

RAID 10 is a nested RAID level and can be described as **striped mirroring.** Like RAID 0+1, RAID 10 provides the benefits of both resiliency and performance. Multiple RAID 1 arrays are grouped into a single RAID 0 array and the striping of blocks is mirrored via the child arrays. A RAID 10 array can lose all but one drive in each of the child RAID 1 arrays without compromising data integrity. However, if all the drives in one child RAID 1 array should be lost, the entire RAID 10 array will be compromised as would be the case for a single drive loss in a RAID 0 array.

RAID 10 is very popular for high transaction applications such as databases as write speeds are very good with quite acceptable levels of data security and integrity. The total capacity of a RAID 10 array is **sum(N/2)** where **N** is the number of drives in the array and **count(N)** is even.

11.1.1.9 RAID 50

Like RAID 10, RAID 50 is a nested RAID level. It consists of striping (RAID 0) over two or more RAID 5 arrays. RAID 50 gives an added performance boost over RAID 5 with the caveat of being twice as expensive (assuming two RAID 5 sets are being combined into a RAID 50). RAID 50 provides better performance than RAID 5 with limited loss in capacity. RAID 50 is able to achieve high data transfer rates as a result of the RAID 5 segments and good I/O rates for small requests due to the RAID 0 striping layered over the RAID 5 segments.

RAID 50 suffers from a similar intolerance as RAID 10 in terms of degradation of a child RAID 5 set. A failed child RAID 5 set, which can occur if two drives from within the same RAID 5 set fail, in a RAID 50 array will bring down the entire array resulting in loss of all data.

11.2 Troubleshooting

11.2.1 Active Directory Integration

Most problems related to active directory (AD) integration are a result of misconfiguration. When trying to integrate Openfiler into an AD domain, ensure the following:

1. ***Do NOT*** select Expert View unless there is a specific reason for doing so.
2. The Use Windows domain controller and authentication checkbox is selected and ***no other authentication mechanism checkboxes are selected*** (e.g Use LDAP).
3. The Active Directory security model radio button is selected.
4. System time is synchronized with the AD connection server. This is best achieved using network time protocol (NTP) configured against a time server on the local network or using a global NTP server on the Internet if a local NTP server is not available.
5. Domain ADS realm is accurate and entered in ***uppercase*** only.
6. The Domain/Workgroup name is accurate and entered in ***uppercase*** only.
7. Domain controllers are entered as canonical hostname in ***uppercase*** only.
8. Openfiler appliance NetBIOS name is set explicitly in the ***Services->SMB Settings*** section and is less than 16 characters in length. The NetBIOS name should be ***uppercase***.
9. DNS has been properly configured in the S***ystem->Network Configuration*** section.

11.2.2 ISCSI Target Configuration

When configuring iSCSI targets, ensure that a working connection has been made before attempting to set CHAP authentication for either target discovery sessions or target connection. The following points should also be noted:

1. iSCSI target configuration cannot be affected unless the iSCSI target service is running.
2. When exporting targets to Vmware ESX, if the VMware management network is on a different IP subnet from the VMKernel / switch network, both networks ***must*** be enabled for network ACL before the iSCSI target can be accessed from the VMware initiator.
3. An iSCSI target with LUNs mapped cannot be deleted. In order to delete an iSCSI target, you must first unmap all LUNs mapped to that target.
4. When troubleshooting performance issues, ensure that Ethernet frame size (MTU) settings are identical on the initiator and the Openfiler appliance network interface.
5. When setting CHAP passkeys, ensure that the password entry is at least 12 and less than or equal to 16 characters.

11.2.3 CIFS Share Access

When trying to debug client access problems to CIFS shares, use the following guidelines:

1. Ensure that a primary group has been set for the share.
2. Set a unique override for the share name as the automatically generated unique name – which is a concatenation of the directory names that make up the filesystem path to the share – could cause file access paths to exceed 255 characters.
3. Ensure that the client is on a network that has been configured for access to the share in the network ACL section for the share.
4. Ensure that the UID on the client trying to access the share is within a group with access rights to the share.
5. Rebooting the client may be necessary before it can access the CIFS share(s) for the first time.

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