

# FreeNAS

FreeNAS Setup and User guide  
(For FreeNAS 0.684b - draft)

**\*\*DRAFT\*\***

Olivier Cochard-Labbé  
Bob Jaggard

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# 1 Introduction

## 1.1 Hardware Requirements

- A PC with a minimum of 96Mb of RAM, a bootable CD Rom Drive plus either:
  - A Floppy Disk (for configuration storage) and one or more Hard Drives (for storage)
  - A Bootable USB or CF drive and one or more Hard Drives (for storage)
  - A Bootable Hard Drive and one or more Hard Drives (for storage)
  - A Bootable Hard Drive (The drive will be partitioned for FreeNAS and Data)
- Or a virtual PC emulator such as VMware/QEMU, configured as above.

**Note** – *Where FreeNAS is installed on a bootable USB Drive, CF Drive or Hard Drive, the bootable CD Rom should be removed once FreeNAS is installed. At this time installing FreeNAS from CD-rom is the only supported method.*

## 1.2 Important: Limitations and Interactions

Here are some limitations and interactions of Release 0.684b of FreeNAS:

Local User/Password feature is covered in this document. Additional notes are available in the change-log on the FreeNAS website.

- UFS formatted Storage drives are supported and will work with MS Windows across the LAN.
- UFS is the native FreeNAS filesystem: Using other filesystem for data storage is not recommended.
- FAT, NTFS and EXT2,3 can be used to transfer bulk data to an UFS formatted drive ONLY.
- SCSI, PATA (IDE), SATA, CF and USB drives are supported.
- You cannot use any portion of the FreeNAS boot drive as a part of a RAID array. Only whole disks can be used to form a RAID array.
- USB Drives can be HOT-PLUGGED, but new External USB drives will need to be ADDED and MOUNTED, before using as described elsewhere in this guide.
- Any drives (USB, ZIP, CD-ROM) MUST be un-Mounted first and removed after. A reboot can occur otherwise.

Major FreeBSD (underlying OS of FreeNAS) old bug:

Do not write or access to a FAT32 drive across CIFS (Samba) Protocol: It will corrupt some of your file!

*(Message for FreeBSD committer/guru... Can you fix this problem please?)*

## 1.3 Getting Help

For your technical questions please consult the following links in order:

1. Try to find an answer by reading this manual (good point: you are reading it!).  
<http://www.freenas.org/downloads/docs/user-docs/FreeNAS-SUG.pdf>
2. Try to find an answer by reading a FAQ.  
[http://www.freenas.org/index.php?option=com\\_openwiki&Itemid=30&id=faqs:en](http://www.freenas.org/index.php?option=com_openwiki&Itemid=30&id=faqs:en)
3. Try to find an answer by reading the Knowledge base (The FreeNAS advanced user Bible!)  
<http://freenas.bcapro.com/kb/>
4. Try to find an answer by searching the archives of the forum (FreeNAS):  
[http://sourceforge.net/search/?group\\_id=151951&type\\_of\\_search=forums](http://sourceforge.net/search/?group_id=151951&type_of_search=forums)

## 2 Installation and Configuration Overview

FreeNAS installation and configuration involves three steps, these are:

1. **Initial Configuration, via the FreeNAS Console Setup Menu on the FreeNAS PC.**

*After this stage FreeNAS will be installed in and run from your drive.*

*However you still need to complete the second step to make FreeNAS operational.*

*This step is optional: You can run FreeNAS from a CDROM and a MS DOS floppy disk.*

2. **Basic Configuration via the Web GUI.**

*After this stage your FreeNAS server will be operational having a basic configuration.*

3. **Advance configuration via Web GUI and Command Shell.**

*This stage is not covered by this manual. It is up to you to read and understand the various options and features offered by FreeNAS and to decide How-to and What-to-do base on your own requirements.*

Further customization, such as RAID configuration and localising to your environment can then be performed.



## 3 Initial configuration

### 3.1 Using FreeNAS with the CDROM and a floppy disk

You can use FreeNAS with the CDROM and an **MSDOS formatted** floppy disk.

- The floppy disk must be already MSDOS formatted (FreeNAS will not format it) and empty.
- FreeNAS will use this floppy disk for save its configuration file.

*This description assumes the FreeNAS PC hardware is capable of booting from a CD Rom and has a floppy drive and one or more Hard Drives for storage.*

***Ensure your computer's BIOS is configured to boot from "CDROM".***

Insert the CDROM on the CD/DVD drive, and boot your PC.

After FreeNAS have booting with no error message concerning 'no floppy disk found' you can skip the section 3.2 for the section 3.3 directly.

### 3.2 Install FreeNAS on disk (optional)

*This description assumes the FreeNAS PC hardware is capable of booting from a CD Rom and has a boot Hard Drive (than can be an USB key or CF card) and may have one or more Hard Drives for storage.*

- Download the FreeNAS ISO and burn the image onto a CD Rom.
- Place the FreeNAS CD in the CD Rom and reboot from CD.
- Wait until the FreeNAS Console Setup Menu comes up and select option 7 to install FreeNAS on your HDD

```
"Console setup"
"*****"
1) Assign Interface
2) Set LAN IP address
3) Reset WebGUI password
4) Reset to factory defaults
5) Ping host
6) Shell
7) Reboot system
8) PowerOff system
9) Install to a hard drive/memory drive/USB Pen, etc.
```

FreeNAS console setup Menu

- You can select to have a single HDD installation, that is - have a FreeNAS boot partition and on the same HDD, have the remainder as Storage(DATA).

```
"Install"  
"*****"  
1) Install on HD, CF or USB key: Create 1 UFS partition  
2) Install on HD: Create 2 UFS partitions (OS and DATA)  
3) Return to main menu
```

#### FreeNAS Install options

##### If you select 1:

*This installs FreeNAS on a drive entirely dedicated for OS (this drive cannot be used for storage).*

*It's the recommended option if you are using CF card of USB Key*

- Select the Source CD drive (acd0 for example if you have one ATA CDROM drive).
- Select the Destination HDD that you want to install and boot FreeNAS from (da0 for example if you want to install it on a USB key).

##### If you select 2:

*This installs FreeNAS on a drive and the remainder of the drive will be UFS formatted for being used for storage by creating two partitions on the drive*

- Select the Source CD drive (acd0 for example if you have one ATA CDROM drive).
- Select the Destination HDD that you want to install and boot FreeNAS from (ad0 for example if you want to install it on the master hard drive on the ATA channel 1).

In either case, once FreeNAS is installed, follow the instructions and remove the CD and when the menu comes up again

- Select 3 to exit to the main menu
- Select 7 to reboot the computer.

If you have installed it on an USB key:

***Ensure your computer's BIOS is configured to boot from "USB hard drive" – not all BIOS support this ("USB FDD" or "USB ZIP" should be tested).***

After the first boot:

- Check that the menu option 9) is not present: If it's the case, this is meaning that you are still booting from the CDROM.
- Go to the LAN Interface and IP configuration section of this document.

Advanced notes:

FreeNAS use FreeBSD as underlining OS, and FreeBSD in not Linux!!!!

The disk convention name under FreeBSD is:

/dev/ad0 : Is the First ATA hard drive on the ATA channel 1

/dev/ad1 : Is the Second ATA hard drive on the ATA channel 1

/dev/ad2 : Is the First ATA hard drive on the ATA channel 2

/dev/acd0: Is the first ATA CD/DVD drive detected

/dev/da0: Is the first SCSI hard drive. USB key device under FreeBSD are using an SCSI driver, then this name can link to your USB key/drive too.

**WARNING:** *FreeNAS is a standalone Operation System (OS) and NAS appliance.*

*Installing FreeNAS wipes the existing configuration of the boot disk. ALL Existing files will be deleted as part of the installation process.*

*The install process of FreeNAS doesn't support Dual OS booting.*

## 3.3 LAN interface and IP configuration

Once you have installed FreeNAS on a CF, HDD or USB drive and the computer has rebooted from that device, and when the menu is up again,

```
"Console setup"
"*****"
1) Assign Interface
2) Set LAN IP address
3) Reset WebGUI password
4) Reset to factory defaults
5) Ping host
6) Shell
7) Reboot system
8) PowerOff system
```

The default configuration of FreeNAS is to use the first detected NIC (Network Interface Card) with the IP address set to 192.168.1.250.

- Select 1 and enter the name of your Ethernet Interface (fxp0 in my case, yours may be different)
- Press <Return> at the Optional 1 Interface prompt, select 'y' and reboot the PC.

*(This reboot step is an m0n0wall heritage; it should be possible to skip it).*

- Once the computer has rebooted and the menu is up again, select 2 and choose to use or not DHCP client. If not, enter your IP Address settings (192.168.8.128 and /24 in my example).
- Once the menu is up, select 5 and ping another device on the subnet and ensure network connectivity is OK (remember that is not possible to ping a computer protected by a personal firewall). Disable the firewall first.

### Advanced notes:

FreeBSD doesn't use generic network interface name as Linux (eth0 for example).

The network interface name is dependant of the drivers used:

fxp0 : For the first Intel EtherExpress chipset NIC found

fxp0 : For the second Intel EtherExpress chipset NIC found

bge0: For the first Broadcom BCM570XX Gigabit NIC found

nve0: For the first nVidia nForce MCP chipset found

etc...

fwip0 Is a firewire port. If you see fwip0 on your port list don't use it.

## 4 Basic Configuration

### 4.1 Default login name and password

If you can ping another device from the FreeNAS PC, then from another PC on the same subnet, point your *Web Browser* at the FreeNAS PCs IP Address (<http://192.168.8.128> in this example) You should be presented with a login/password dialogue box like that shown here.

At the login/password dialogue

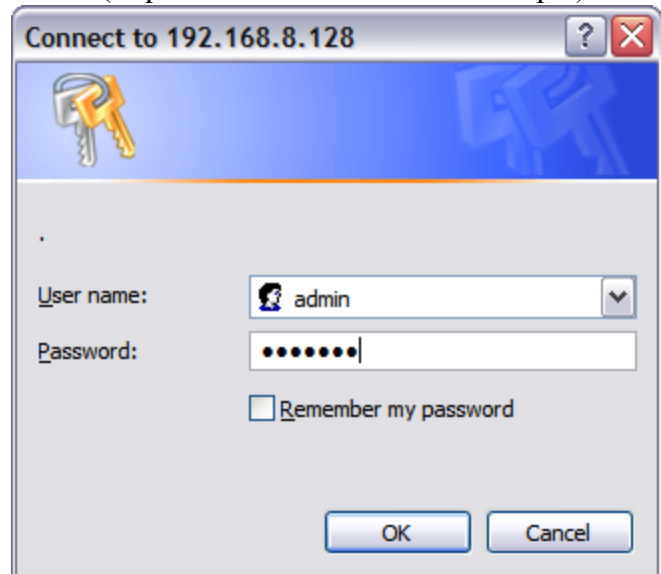
Enter:

- Default Username as ***admin***,
- Default password as ***freenas***
- Select OK

*Hint - The FreeNAS team strongly recommend that the default User name and Password be changed before putting FreeNAS into production.*

You should be presented with the FreeNAS Web GUI System Status page as shown on the next page.

The currently loaded version of FreeNAS is displayed on this page as well as other useful information.



## 4.2 WebGUI Layout

FreeNAS web pages are configured with the *Navigation Tree* in the Left Hand side of the page and the Display and Data entry area to the right of the Navigation Tree.




The FreeNAS Host name is displayed on this and all other FreeNAS WebGUI pages. This is useful when more than one FreeNAS will be administered.

**Note:** The FreeNAS host name can be administered on the General setup page.

FreeNAS Host name

System information	
<b>Name</b>	freenas.local
<b>Version</b>	0.684b built on Thu Feb 15 01:53:50 CET 2007
<b>OS Version</b>	FreeBSD 6.2-STABLE (revision 199506)
<b>Platform</b>	generic-pc on Intel(R) Core(TM)2 CPU T5600 @ 1.83GHz running at 1829 MHz
<b>Date</b>	Thu Feb 15 18:47:10 UTC 2007
<b>Uptime</b>	00:06
<b>Last config change</b>	Thu Feb 15 18:42:52 UTC 2007
<b>Memory usage</b>	<div style="width: 47%;"></div> 47% of 39MB
<b>Load averages</b>	0.05, 0.12, 0.08 [show process information]
<b>Disk space usage</b>	No disk configured

Within the Display and Data Entry areas of WebGUI pages, some displays have additional controls such as those shown here.

-  controls Adding another element
-  controls deleting or removing an element
-  permits the user to edit the attributes of an element.

## 4.3 Disks

Disks must be added before they can be formatted and mounted or configured in a RAID array.

All disks that you wish to configure in FreeNAS should ideally be connected when FreeNAS boots up, although external USB drives may be connected once FreeNAS is running.

**Note:** *Do not remove USB drives once mounted in FreeNAS otherwise a reboot may occur.*


**The High-Level process flow for configuring a visible share in FreeNAS is:**

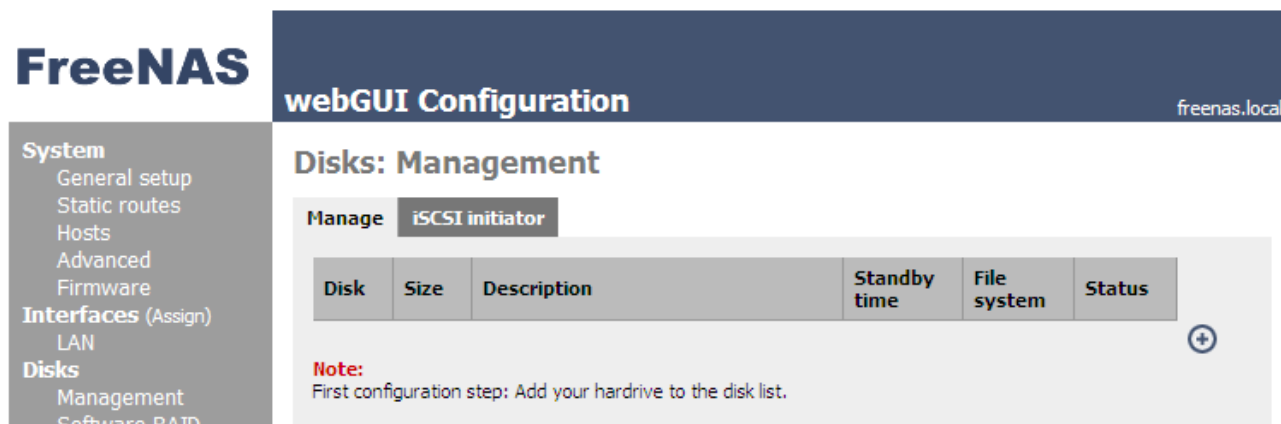
1. Add Disks
2. Format Disks (if required) in UFS filesystem
3. Add Mount Point
4. Enable Services (CIFS, FTP, etc.)

To remove a disk, you must delete the Mount Point first and remove the disk after.

**Note:** *Please ensure you add disks and test each of them before attempting to configure disks in any RAID configuration.*

### 4.3.1 Adding a disk or CD/DVD drive


To add a disk, open the **Disks/Management** page and click the  on the right hand side of the Display area



**FreeNAS** webGUI Configuration freenas.local

**Disks: Management**







Manage **iSCSI initiator**

Disk	Size	Description	Standby time	File system	Status
					

**Note:**  
First configuration step: Add your harddrive to the disk list.

In the drop down, select a disk drive. In this example, we will select ad0.

#### Disks: Disk: Add

<b>Disk</b>	ad0: 102MB (VMware Virtual IDE Hard Drive/000000001) 
UDMA mode	Auto  <small>You can force UDMA mode if you have 'UDMA_ERROR.... LBA' message with your hard drive.</small>
Hard disk standby time	Always on  <small>Puts the hard disk into standby mode when the selected amount of time after the last access has elapsed. Do not set this for CF cards.</small>
Advanced Power Management	Disabled  <small>This allows you to lower the power consumption of the drive, at the expense of performance. Do not set this for CF cards.</small>
Acoustic level	Disabled  <small>This allows you to set how loud the drive is while it's operating. Do not set this for CF cards.</small>
Preformatted FS	Unformatted  <small>This allows you to set FS type for preformatted disk with data. Leave 'unformatted' for unformatted disk and then use format menu.</small>

**Add**

**Note – FOR USB OR COMPACT FLASH INSTALLATIONS (ref section 3.2) Do not add the FreeNAS boot drive (in this example ad0)**

Adding the FreeNAS Boot drive **WILL** affect the operation of FreeNAS, and also incorrectly permits the boot drive to be formatted and mounted, which is then not accessible as a share. (In this example ad0 is the FreeNAS boot drive)

**Note:** You can add the boot hard-drive **ONLY** if you need to take advantage of FreeNAS power saving configuration.



**FOR TWO PARTITION HARD DRIVE INSTALLATIONS**, where you want to share the capacity of a single hard drive between FreeNAS and storage, you can add the FreeNAS boot drive (*ad0* in this example)

For information about the Hard Disk Standby Time, Advanced Power Management and Acoustic Level setting, please refer to section 5.4. For the moment, leave these as default.


For the ‘Preformatted FS’: Leave it as default for new disk, or set it to NTFS/EXT2 or FAT for existing disk. Anyway, it’s an information field that don’t impact the comportment of FreeNAS.

Click the **Add** button. Continue to add additional disks as required.

The Disk/s should appear in the table and the Status should show **ONLINE** as illustrated below.




## Disks: Management

**Manage** **iSCSI initiator**

 The disk list has been changed.  
You must apply the changes in order for them to take effect.


**Apply changes**

Disk	Size	Description	Standby time	File system	Status
ad0	102MB	VMware Virtual IDE Hard Drive/00000001	Always on	Unknown or unformatted	ONLINE

**Note:**  
First configuration step: Add your harddrive to the disk list.

Click the **Apply Changes** button and if successful, the following message will be displayed.

 The changes have been applied successfully.

### 4.3.2 Formatting a Disk

#### **IMPORTANT NOTE**

*If you have an existing disk with existing data on it - **DO NOT FORMAT THE DISK**, it **WILL** erase all the data. If you have a disk that you want to clean out and format for Read/Write Access, Initialise the disk, as described next.*

*For two partition hard drive installations, where you want to share the capacity of a single hard drive between FreeNAS and storage, **you do not have to format the disk**, this was already done for you back in the console setup. The storage partition is already formatted as UFS.*

Click on the **Disks/Format** page and in the dropdown; select the drive you want to format.

#### Disks: Initialize

Disk	ad1: 512000MB (VMware Virtual IDE Hard Drive/00000001) ▼
File system	UFS with Soft Updates (use 8% space disk) ▼
Don't Erase MBR	<input type="checkbox"/> Don't erase the MBR (useful for some RAID controller cards)

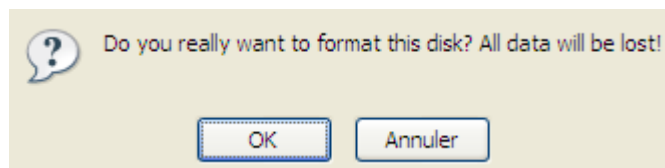
**Format disk**

**Note:** Only Disks that you have added appear in the drop down list

In this example we will configure the disk for normal using the native FreeBSD UFS filesystem.

Leave the File system setting as **UFS with Soft Updates (use 8% space disk)** and click the **Format disk** Button.

Then, answer OK at the confirmation popup:



In the Display area, information similar to the following should be displayed. The amount of data and the content will differ in your case.

```
Erasing MBR and all partitions:
Creating one partition:
***** Working on device /dev/ad1 *****
Initializing partition:
Creating BSD label:
Creating filesystem:
/dev/ad1s1: 511999.9MB (1048575716 sectors) block size 16384, fragment size 2048
        using 2787 cylinder groups of 183.77MB, 11761 blks, 23552 inodes.
        with soft updates
super-block backups (for fsck -b #) at:
 160, 376512, 752864, 1129216, 1505568, 1881920, 2258272, 2634624, 3010976,
 3387328, 3763680, 4140032, 4516384, 4892736, 5269088, 5645440, 6021792,
 6398144, 6774496, 7150848, 7527200, 7903552, 8279904, 8656256, 9032608,
 9408960, 9785312, 10161664, 10538016, 10914368, 11290720, 11667072, 12043424,
 12419776, 12796128, 13172480, 13548832, 13925184, 14301536, 14677888,
 15054240, 15430592, 15806944, 16183296, 16559648, 16936000, 17312352,
 17688704, 18065056, 18441408, 18817760, 19194112, 19570464, 19946816,
 20323168, 20699520, 21075872, 21452224, 21828576, 22204928, 22581280,
        <= TEXT REMOVED =>
 36129952, 36506304, 36882656, 37259008, 37635360, 38011712, 38388064,
 38764416, 39140768, 39517120, 39893472, 40269824, 40646176, 41022528,
 810662368, 811038720, 811415072, 811791424, 812167776, 812544128, 812920480,
 813296832, 813673184, 814049536, 814425888, 814802240, 815178592, 815554944,
 815931296, 816307648, 816684000, 817060352, 817436704, 817813056, 818189408,
 818565760, 818942112, 819318464, 819694816, 820071168, 820447520, 820823872,
 1045506016, 1045882368, 1046258720, 1046635072, 1047011424, 1047387776,
 1047764128, 1048140480, 1048516832
Done!
```


If you have previously added other disks, then select the additional disks and format them as well, if required.

Note:

- *Formatting hardware RAID may require to select: “don’t erase the MBR” (Some hardware RAID controllers store information’s on the disks MBR)*
- *Formatting a volume over 2TB require to select the filesystem as: UFS(EFI/GPT)*

### 4.3.3 Mounting a disk

Once a disk is formatted it needs to be mounted before it can be used.

Go to the **Disks/Mount Point** page and Click the  on the right hand side and in the **Disk** drop down, select the drive that you previously added and formatted (ad1 in this example).

#### Disks: Mount Point: Add

Disk	ad1: 512000MB (VMware Virtual IDE Hard Drive/00000001) ▼
Partition	1 (or new software RAID method) ▼
File system	UFS ▼
Share Name	500GB_drive
Description	Drive used for DivX

**Add**

#### Partition:

- 1: For MBR partition n°1, or for software RAID array (created with FreeNAS release newer than the 0.68);
- 2: For MBR partition n°2 (*If you used the same drive for FreeNAS and for the DATA, don't forget to select the partition 2*);
- 3-4: For MBR partition n3 to 3: To be used only for add existing disk to FreeNAS;
- GPT: New EFI/GPT partition table, to be used if you format your drive with this method;
- Previous software RAID: Used for mount Software RAID array create with FreeNAS release older than the 0.68

#### File system:

- UFS: FreeNAS (FreeBSD) native disk
- FAT: FAT16 or FAT32 drive
- CD/DVD: Used for CD/DVD ROM with the cd9660 filesystem
- NTFS: For Windows XP/2000/2003/Vista native hard drive
- EXT2: For Linux EXT2 or EXT3 drive.

**Share Name:** Name that you want to appear on the network (**500GB\_drive**, in this example). Supports Linux standards, a-z, A-Z, 0-9, - (dash), \_ (underscore) characters.

**Description:** Enter a description for the share (used by some services as CIFS).

Click **Save** and the disk should appear in the table with a **Status** of **Configuring**.

If you have additional disks you have previously Added and Formatted, then you can also mount these now.

Click **Apply Changes** and a '**Changes have been applied successfully**' message should be seen. Drive **Status** should now show **OK**

**Note** - Depending on the size of the Disk/s, mounting may take some time to complete. During 'Applying Changes', **ALL shares** are temporarily offline.

## 4.4 Services

The proper operation of FreeNAS is controlled and provided by small programs running in the background, named services or daemon.

If a service is provided by FreeNAS is because:

- The service was properly configured from WebGUI.
- The service was properly started.
- The service operates properly.

If the service is not provided by FreeNAS is because:

- The service didn't start.
- The service was not properly configured.
- The service was stopped (manually or automatically).

The last step to permit the mounted drives to be visible across the network is to enable some services.

You can enable(start) any or all of the services listed here: CIFS, FTP, NFS, RSYCD, SSHD, Unison, AFP, UPnP or the special iSCSI Target.

### 4.4.1 CIFS (Samba)

CIFS is the protocol used under Microsoft Environment. It's this protocol that is used when you select 'Network neighbourhood' under Windows.

If you have Windows computer that need to access your FreeNAS, it's the protocol to use. Open the **Services/CIFS** page and click and select the **enable** check box on the right hand side.

**Services: CIFS**

**Settings** **Shares**

Common Internet File System		<input checked="" type="checkbox"/> Enable
<b>Authentication</b>	Anonymous <input type="button" value="v"/>	
<b>NetBiosName</b>	freenas	
<b>Workgroup</b>	WORKGROUP Workgroup to be member of.	
<b>Description</b>	FreeNAS Server Server description. This can usually be left blank.	
<b>Dos charset</b>	CP850 <input type="button" value="v"/>	
<b>Unix charset</b>	UTF-8 <input type="button" value="v"/>	
<b>Log Level</b>	Minimum <input type="button" value="v"/>	
<b>Local Master Browser</b>	Yes <input type="button" value="v"/> Allows FreeNAS to try and become a local master browser.	
<b>Time server</b>	Yes <input type="button" value="v"/> FreeNAS advertises itself as a time server to Windows clients.	
<b>WINS server</b>	<input type="text"/> WINS Server IP address.	
<b>Recycle Bin</b>	<input type="checkbox"/> Enable Recycle bin This will create a recycle bin on the CIFS shares	
<b>Send Buffer Size</b>	16384 Size of send buffer (16384 by default).	
<b>Receive Buffer Size</b>	16384 Size of receive buffer (16384 by default).	
<b>Save and Restart CIFS</b>		

Leave all other fields as their Default values for the moment, you can tweak things later.

Click the **Save** button.

**Note:** ***DO NOT** select a **Security** setting of **User** at this stage, Refer to the User Authentication section for more information's on this feature.*

## 4.4.2 FTP

**File Transfer Protocol** is used to connect two computers over an IP network so that the user of one computer can transfer files and perform file commands on the other computer.

**Note:** *FTP is an insecure standard for transferring file over Internet, use it only if you want to share some of your file across Internet without strong security.*

If you wish to permit FTP access to the FreeNAS Storage Drive/s you can enable the FTP Service.

Similar to the CIFS page, Open the **Services/FTP** page and click and **enable** the check box on the right hand side and click the **Save** button.

### Services: FTP

FTP Server		<input type="checkbox"/> Enable
TCP port	<input type="text" value="21"/> Default is 21	
Number of clients	<input type="text" value="5"/> Maximum number of simultaneous clients.	
Max. conn. per IP	<input type="text" value="2"/> Maximum number of connections per IP address (0 = unlimited).	
Timeout	<input type="text" value="5"/> Maximum idle time in minutes.	
Anonymous login	<input checked="" type="checkbox"/> Enable anonymous login.	
Local User	<input checked="" type="checkbox"/> Enable local user login.	
Banner	<div></div> Greeting banner displayed by FTP when a connection first comes in.	
FXP	<input type="checkbox"/> Enable FXP protocol. FXP allows transfers between two remote servers without any file data going to the client asking for the transfer (insecure!).	
NAT mode	<input type="checkbox"/> Force NAT mode. Enable this if your FTP server is behind a NAT box that doesn't support applicative FTP proxying.	
Resume	<input type="checkbox"/> Enable resume mode. Use this option to enable resuming broken transfers at the point of interruption.	

Passive IP address	<input type="text"/>	Use this option to override the IP address that FTP daemon will advertise in response to the PASV command.
pasv_min_port	<input type="text" value="0"/>	The minimum port to allocate for PASV style data connections (0 = use any port).
pasv_max_port	<input type="text" value="0"/>	The maximum port to allocate for PASV style data connections (0 = use any port).

**Save and Restart FTP**

If you want to use FreeNAS behind a NAT box (router or firewall) that don't support FTP you should:

1. Configure your NAT box (router or firewall) to forward port (TCP 21 and a RANGE TCP port) to your FreeNAS
2. Add your public IP address on the 'Passive IP address' field
3. Add your lower TCP port of your configured range on the 'pasv\_min\_port' field
4. Add your high TCP port of your configured range on the 'pasv\_max\_port' field
5. Enable 'NAT Mode'




### 4.4.3 NFS

NFS is the CIFS equivalent for UNIX/Linux World.

If you have some Linux that need access to FreeNAS, it's the protocol to be used.

If you wish to permit NFS access to the FreeNAS Storage Drive/s you can enable the NFS Service.

Open the *Services/NFS* page:

- Click on *enable*
- Click on the  icon for add *Authorized network* (usually your FreeNAS IP Subnet)
- Set *subnet mask* (usually 24)
- Click the *Save* button.

## 4.4.4 RSYNCD

### 4.4.4.1 Server

RSYNC is a multi-platform incremental copy over network utility that can be used for backup. If you want to backup some of your file regularly, it's the protocol to use: The incremental sync process permit to copy only the differences in the files across the link, from the last backup.

There are some tools under windows that support RSYNC:

- DeltaCopy (<http://www.aboutmyip.com/AboutMyXApp/DeltaCopy.jsp>)
- NasBackup (<http://www.nasbackup.com>) is an open source backup solution. It is a high-performance, enterprise-grade system for backing up MS Windows desktop PCs, laptops and servers to network disks.

### 4.4.4.2 Client

This option permit to synchronize file between a FreeNAS 'server' and one or more FreeNAS 'client'.

On the FreeNAS 'server', you must just enable RSYNCD Server (with 'read only' box to "No").

On the FreeNAS 'client':

Click on the  icon for add a new client entry and:

1. Select your local configured share. Warning it will be the 'destination' share
2. Enter the Remote Share name configured on the RSYNCD Server
3. Enter the IP address of the RSYNCD Server
4. Set the synchronisation time

At the given time, the FreeNAS 'client' will do an rsync (incremental copy) from the FreeNAS 'server' share to the FreeNAS 'client' share.

You can check the detected share name of the RSYNCD Server configured by using the Diagnostics:

**Information:** *RSYNC Client* page.

### 4.4.4.3 Local

It's the same as 'client' but with local share only.

Very useful for local backup "drive to drive" can be an alternative solution for drives mirroring.

**Note:** *If you change the rsync user on Web GUI you must restart(disable/enable) this service for changes to take effect.*

## 4.4.5 SSHD

SSH (Secure Shell) permits an alternate and highly secure form of FTP access to the FreeNAS storage. SSH is enabled via the *Services/SSHD* page.\*

It will permit to use:

- SFTP file transfer
- SCP File transfer
- SSH access and remote commands execution.

Click the **Enable** check box, and click **Save** for a simple Read only default SSH implementation. Modify the SSH settings if required.

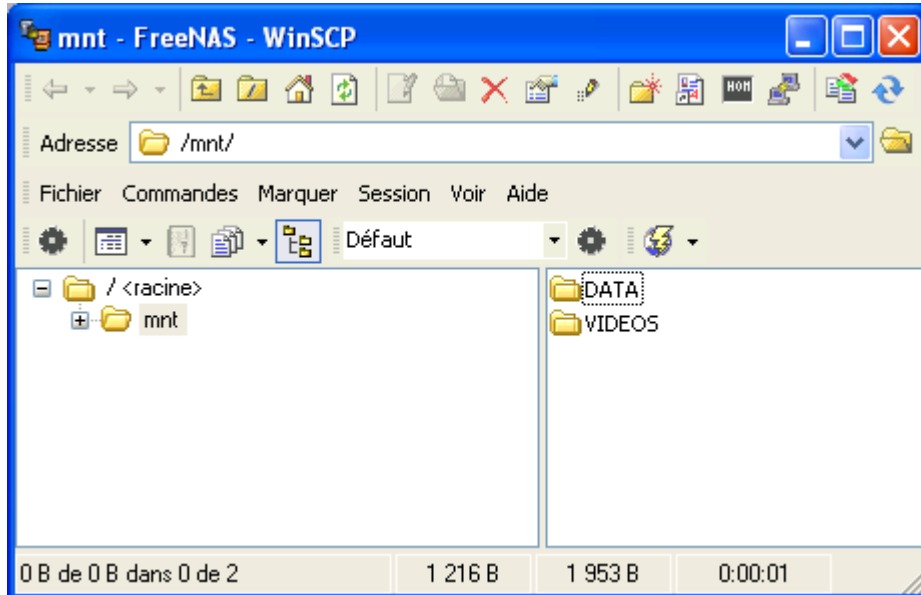
### Services: SSHD

SSH Daemon		<input checked="" type="checkbox"/> Enable
Read only	<input type="text" value="Yes"/>	
TCP port	<input type="text" value="22"/> <small>Alternate TCP port. Default is 22</small>	
Permit root login	<input type="checkbox"/> Specifies whether it is allowed to login as superuser (root) directly.	
Enable TCP Forwarding	<input type="checkbox"/> Permit to do SSH Tunneling.	
SSH key		
Private Key	<div></div> <small>Paste a DSA PRIVATE KEY in PEM format here.</small>	
<input type="button" value="Save and Restart SSHD"/>		

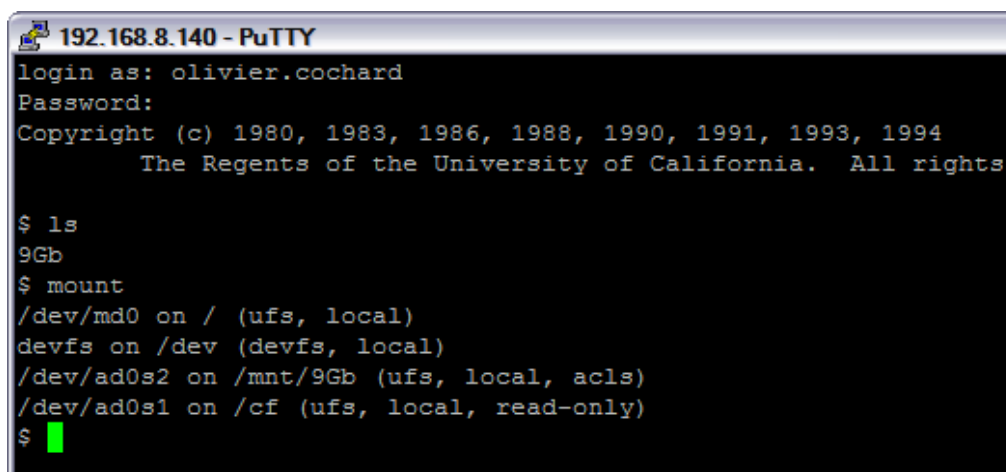
**Note:** If you enable the option “Permit root login”, the root password is the same as the WebGUI password.

**Using WinSCP (<http://www.winscp.com>)**

Once SSH is configured, login via SSH is enabled, and you can use SCP protocol for file transfer. Here is an example with WinSCP:

**Using Putty (<http://www.chiark.greenend.org.uk/~sgtatham/putty/>)**

If your user settings are configured with the 'full shell' option, you can connect with a SSH client to a remote terminal on FreeNAS: here is an example PuTTY interface is shown below.



```
192.168.8.140 - PuTTY
login as: olivier.cochard
Password:
Copyright (c) 1980, 1983, 1986, 1988, 1990, 1991, 1993, 1994
The Regents of the University of California. All rights reserved.

$ ls
9Gb
$ mount
/dev/md0 on / (ufs, local)
devfs on /dev (devfs, local)
/dev/ad0s2 on /mnt/9Gb (ufs, local, acls)
/dev/ad0s1 on /cf (ufs, local, read-only)
$
```

For a console mode to FreeNAS, the SSH access is preferred over direct screen/keyboard method: The system PATH is more complete with an SSH access.

### 4.4.6 Unison

Unison is a multi-platform file-synchronization tool. Unison can synchronize changes to files and directories in both directions simultaneously, there is no 'source' and 'destination' and at the end of the process both sides should be on the same status.

Dan Mershi has done a Graphical Frontend for using an Unison client under Windows XP that you can download here:

<http://freenas.bcapro.com/unison/>

SSHD must be enabled on FreeNAS and the user must have 'full shell' access.

Unison will make the transfer over SSH.

### 4.4.7 AFP

AFP permits Apple MacOSX users to access the storage resources of FreeNAS.

From Appleshare:


Guest mode: `afp://guest;AUTH=No%20User%20Authent:password@FreeNASip/share`

### 4.4.8 UPnP


UPnP permit to enable the UPnP file server (Works great with GeeXboX for example):

<http://www.geexbox.org/>




Click on the 'enable' button choose an UPnP server name, and select the interface where to enable this service.

Then click on the  for add directory to share using UPnP:

#### Services: UPnP

 The content directory list has been changed.  
You must apply the changes in order for them to take effect.

**Apply changes**

UPnP A/V Media Server		 <b>Enable</b>
<b>Name</b>	<input type="text" value="freenas"/> <small>UPnP friendly name.</small>	
<b>Interface</b>	<input type="text" value="lnc0"/>  <small>Interface to listen to.</small>	
<b>Content</b>	<div><div><b>Directory</b></div><div><input type="text" value="/mnt/secure_disk/"/></div><div></div></div> <div><small>Directories to be shared.</small></div>	

**Save and Restart UPnP**

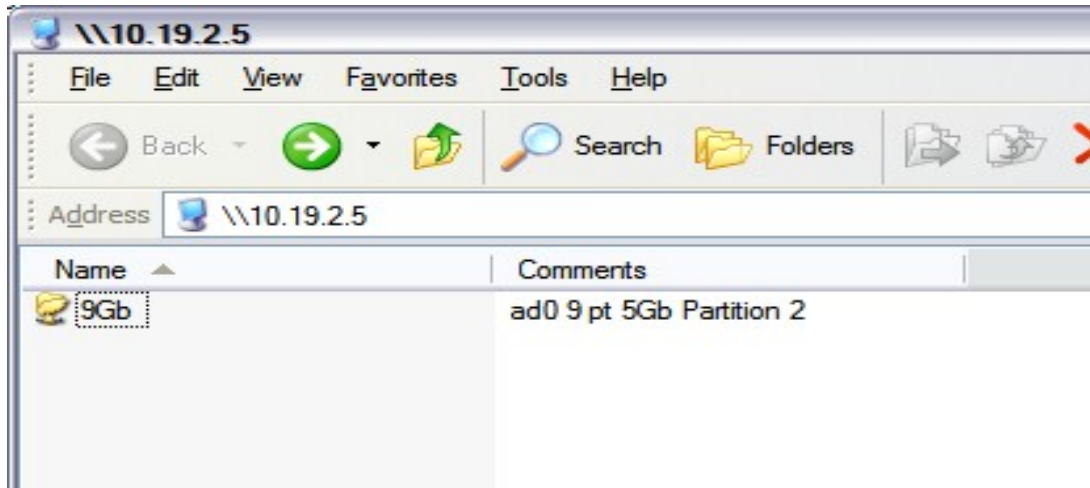
**Notes:** New added files on the share are not updated automatically.

You must restart(disable/enable) this service to rebuild the new file list.

## 4.5 Verify and Use the Share

From another PC on the FreeNAS subnet (in this example I am using XP Pro).  
Select **Start** and **Run** and enter \\ followed by the FreeNAS PC IP Address (\\10.19.2.5 in my example).

Click OK and the mounted Share should appear complete with the **Share name** you entered in the Mount process.



This Share is available to the network for Read/Write access and you can map a local drive to the share.

Test it by copying some data to it.

If you have 'show hidden files and folders' enabled in your Explorer settings, you will see a hidden and read only folder in there called `.snap` - ignore it.

**Note:** *If you are using a PC which normally logs into a Domain that is different from the WORKGROUP name configured in FreeNAS, you may possibly get one or more Login dialogue boxes. If so, leave the password blank and select OK.*

This concludes the Basic Configuration set up for FreeNAS. Additional settings including configuring RAID follow.

## 4.6 Software RAID configuration with geom modules

FreeNAS supports Software JBOD, RAID 0, 1 and 5 configurations as well as Hardware RAID. This section describes configuring Software RAID 5. The process is virtually identical for all other with the exception of using geom. Vinum (unstable).

Here is the FreeBSD module name and equivalent:

- JBOD: Geom concat
- RAID 0: Geom stripe
- RAID 1: Geom mirror
- RAID 5: Geom RAID5 (*Thanks to Arne for developing this non official FreeBSD module!!*)

All disks must be the same size for all RAID types with the exception of JBOD and Geom RAID5 (it will base on the smallest disk).

*The FreeNAS team recommends configuring each of the RAID Disks as standalone Storage Disks first to ensure they are fully functional and supported under FreeNAS. Once confirmed, remove any of the mount points and Disks for the RAID drives to ensure a clean start. The following description assumes that the drives have been confirmed as functional.*

**The High-Level process flow for configuring a simple RAID array is:**

1. Add Disks
2. Format Disks for “Software RAID”
3. Create the RAID array using the previously formatted for “Software RAID”
4. Format the newly created RAID array in UFS filesystem
5. Add Mount Point
6. Enable Services (CIFS, FTP, etc.)

**To remove a RAID array, remove the mount point first and delete the RAID.**

Note:

- Formatting a volume over 2TB may require to select the filesystem as: UFS(EFI/GPT)


In this example, we will show how to create a software RAID 5 array with 3 500GB hard drive.









### 4.6.1 Add the Disks


Follow the Add Disk process as described above to *add* each of the Disks to be used in a RAID array. In the example below, I have added 3 identically sized hard drives.

#### Disks: Management

**Manage** **iSCSI initiator**

 The changes have been applied successfully.

Disk	Size	Description	Standby time	File system	Status	
ad0	102MB	VMware Virtual IDE Hard Drive/00000001	Always on	UFS	ONLINE	 
ad1	512000MB	VMware Virtual IDE Hard Drive/00000001	Always on	Unknown or unformatted	ONLINE	 
ad2	512000MB	VMware Virtual IDE Hard Drive/00000001	Always on	Unknown or unformatted	ONLINE	 
ad3	512000MB	VMware Virtual IDE Hard Drive/00000001	Always on	Unknown or unformatted	ONLINE	 



**Note:**  
First configuration step: Add your hardrive to the disk list.

Ensure the drives are in an *ONLINE* status.

**Note:** You cannot use the 2<sup>nd</sup> partition of a FreeNAS boot drive as a part of a RAID array. Only whole disks can be used to form a RAID array.



## 4.6.2 Prepare (format) the disks

Open the **Disk:Format** TAB, select each of the Disks in turn and ensure the **File system** is changed to **Software RAID**, click the **Format Disk** button and confirm your action.

### Disks: Initialize

<b>Disk</b>	ad1: 512000MB (VMware Virtual IDE Hard Drive/00000001) ▼
<b>File system</b>	Software RAID ▼
<b>Don't Erase MBR</b>	<input type="checkbox"/> Don't erase the MBR (useful for some RAID controller cards)
<b>Format disk</b>	

Repeat for all Disks to be used in the RAID array.

The result should be for example:

```
Erasing MBR and all partitions:
Creating one partition:
***** Working on device /dev/ad1 *****
Initializing partition:
Destroying old GMIRROR information:
Done!
```


## 4.6.3 Create the Software RAID array

Open the **Disks/Software RAID** page and choose your Software RAID type.

For our example, we select 'Geom RAID5':

### Disks: Geom Raid5: RAID

<b>Geom Mirror</b>	<b>Geom Concat</b>	<b>Geom Stripe</b>	<b>Geom Raid5</b>	<b>Geom Vinum(unstable)</b>
<b>Manage RAID</b>	<b>Tools</b>	<b>Information</b>		
Volume Name	Type	Size	Status	
<p><b>Note:</b> Optional configuration step: Configuring a virtual RAID disk using your <a href="#">previously configured disk</a>. Wait for the 'up' status before format and mount it!</p>				

Click the  icon on the right hand side to *Add* a new RAID 5.

Enter a **RAID name** for the RAID.

Click and select each of the drives to be used in this RAID array.

## Disks: RAID: Add

Raid name	<input type="text" value="BigDisk"/>
Type	RAID 5 (rotated block-interleaved parity)
Members of this volume	<div><input checked="" type="checkbox"/> ad1 (512000MB, VMware Virtual IDE Hard Drive/00000001)</div> <div><input checked="" type="checkbox"/> ad2 (512000MB, VMware Virtual IDE Hard Drive/00000001)</div> <div><input checked="" type="checkbox"/> ad3 (512000MB, VMware Virtual IDE Hard Drive/00000001)</div>
<div>Add</div>	

**Note:** Drives will not appear here unless they have previously been formatted as **Software RAID**

Click the **Add** button and when prompted, click the **Apply Changes** button.

## Disks: Geom Raid5: RAID

Geom Mirror

Geom Concat

Geom Stripe

Geom Raid5

Geom Vinum(unstable)

Manage RAID

Tools

Information

!

The changes have been applied successfully.

Volume Name	Type	Size	Status
BigDisk	5	1000	REBUILDING

Note:

Optional configuration step: Configuring a virtual RAID disk using your previously configured disk. Wait for the 'up' status before format and mount it!

Creating RAID 5 array can take a long time:

**But you can already use your raid during the building process! (even if it's in 'REBUILDING state).**

The status field will not immediately update.

## 4.6.4 Format the software RAID array

When the Status is up or rebuilding, then the RAID array must be formatted.

Open the **Disk:Format** menu and choose the newly created RAID array:

### Disks: Initialize

<b>Disk</b>	BigDisk: (Software graid5 RAID 5) ▼
<b>File system</b>	UFS with Soft Updates (use 8% space disk) ▼
<b>Don't Erase MBR</b>	<input type="checkbox"/> Don't erase the MBR (useful for some RAID controller cards)

**Format disk**

Leave the *Type* as **UFS with Soft Update (use 8% space disk)**, click the **Format Disk** button and confirm.

A display similar to this should be output (example when the RAID 5 was in state 'rebuilding'):

### Disks: Initialize


<b>Disk</b>	BigDisk: (Software graid5 RAID 5) ▼
<b>File system</b>	UFS with Soft Updates (use 8% space disk) ▼
<b>Don't Erase MBR</b>	<input type="checkbox"/> Don't erase the MBR (useful for some RAID controller cards)

**Format disk**

#### Disk initialization details:

```
Erasing MBR and all paritions:
Creating one partition:
***** Working on device /dev/raid5/BigDisk *****
Initializing partition:
Creating BSD label:
Creating filesystem:
/dev/raid5/BigDisks1: 1023994.7MB (2097141100 sectors) block size 16384, fragment size 2048
    using 5573 cylinder groups of 183.77MB, 11761 blks, 23552 inodes.
    with soft updates
super-block backups (for fsck -b #) at:
160, 376512, 752864, 1129216, 1505568, 1881920, 2258272, 2634624, 3010976,
3387328, 3763680, 4140032, 4516384, 4892736, 5269088, 5645440, 6021792,
6398144, 6774496, 7150848, 7527200, 7903552, 8279904, 8656256, 9032608,
9408960, 9785312, 10161664, 10538016, 10914368, 11290720, 11667072, 12043424,
12419776, 12796128, 13172480, 13548832, 13925184, 14301536, 14677888,
15054240, 15430592, 15806944, 16183296, 16559648, 16936000, 17312352,
17688704, 18065056, 18441408, 18817760, 19194112, 19570464, 19946816,
20323168, 20699520, 21075872, 21452224, 21828576, 22204928, 22581280,
22957632, 23333984, 23710336, 24086688, 24463040, 24839392, 25215744,
```

### 4.6.5 Create the mount point

Once the RAID array is formatted, all that is left is to mount the array. Open the **Disk/Mount Point** page and click the  icon on the right hand side.

#### Disks: Mount Point: Add

<b>Disk</b>	BigDisk: (Software graid5 RAID 5) ▼
<b>Partition</b>	1 (or new software RAID method) ▼
<b>File system</b>	UFS ▼
<b>Share Name</b>	big_share
<b>Description</b>	RAID5 share

**Add**

From the **Disk** drop down, select the RAID disk. The **RAID name** you previously configured is visible.


Change the **Partition** to *1 (or new software RAID method)*

Enter a useful **Share name** and click the Add button.

The **Status** should display as *configuring*, and then click the **Apply Changes** button and the **Status** should update to *UP*.

#### Disks: Mount Point

**Manage**
**Tools**
**Fsck**

 The changes have been applied successfully.

Disk	Partition	File system	Share Name	Description	Status
/dev/raid5/BigDisk	s1	ufs	big_share	RAID5 share	OK

**Note:**

Your Geom RAID5 array is now ready for use. If you have already enabled CIFS, FTP or NFS, then the array, with the defined Share name, will be visible across you network.

#### 4.6.6 Software RAID array status

If can verify the status of you RAID array from:

- *Status/Disks* page and select the *Information* Tab
- *Disks/Software RAID/geom used* page and select the *Information* Tab.

Both locations provide the same view.

A healthy RAID array will show all the State: values as *UP* or *COMPLETE*.

*Important Note – RAID 1 and RAID 5 arrays may take some time to synchronise completely, be patient and monitor the status of the RAID synchronisation by continuing to refresh the Information page.*

## 4.6.7 Replacing a failed hard drive on a gmirror array

In the case of a failure on one hard drive, your RAID array is in the ‘DEGRADED’ state:

Here is an example with the RAID 1 array named “mirroire” in “DEGRADED” state with a missing hard drive:

### Disks: Geom Mirror: RAID

Geom Mirror	Geom Concat	Geom Stripe	Geom Raid5	Geom Vinum(unstable)
Manage RAID	Tools	Information		
Volume Name	Type	Size	Status	
mirroire	1	102M	DEGRADED	ⓘ × +

And we can check that the disk is missing in the **Disk/Management** page:

### Disks: Management

Manage	iSCSI initiator				
Disk	Size	Description	Standby time	File system	Status
ad0	102MB	VMware Virtual IDE Hard Drive/00000001	Always on	UFS	ONLINE ⓘ ×
da0	102MB	VMware, VMware Virtual S 1.0	Always on	SoftRaid	ONLINE ⓘ ×
da1	204MB	VMware, VMware Virtual S 1.0	Always on	SoftRaid	MISSING ⓘ × +

We can see that in our example, the disk da1 is missing.

#### 4.6.7.1 First Step

For replacing this disk: Stop FreeNAS and replace this disk with a new one (in the same place on the ATA or SCSI channel). And restart FreeNAS.

After restarting FreeNAS, the Disk/Management should display it back (ONLINE if it’s the same, or CHANGED if it’s a different disk).

The Software RAID 1 status is still ‘DEGRADED’, we must add this new disk:

### 4.6.7.2 Second Step

Open the **Disk/Software RAID/Geom mirror/Tools** page and select your DEGRADED RAID array and action **“forget”** (*The Disk field is not used on this first action*).

#### Disks: Geom Mirror: Edit

Geom Mirror	Geom Concat	Geom Stripe	Geom Raid5	Geom Vinum(unstable)
Manage RAID	Tools	Information		
Volume Name	mirroire ▼			
Disk	/dev/da0 ▼			
Command	forget ▼			
<b>Send Command!</b>				

### 4.6.7.3 Third Step

Still on this **Disk/Software RAID/Geom mirror/Tools** page, re-select your DEGRADED RAID array, the select the newly replaced **Disk**, and choose action **“insert”**:

#### Disks: Geom Mirror: Edit

Geom Mirror	Geom Concat	Geom Stripe	Geom Raid5	Geom Vinum(unstable)
Manage RAID	Tools	Information		
Volume Name	mirroire ▼			
Disk	/dev/da1 ▼			
Command	insert ▼			
<b>Send Command!</b>				

You can now check your RAID status (**Disk/Software RAID/Geom mirror**): It should be ‘REBUILDING’ or ‘COMPLETE’ (the time needed for rebuilding depend of your disk size).

#### Disks: Geom Mirror: RAID

Geom Mirror	Geom Concat	Geom Stripe	Geom Raid5	Geom Vinum(unstable)
Manage RAID	Tools	Information		
Volume Name	Type	Size	Status	
mirroire	1	102M	COMPLETE	ⓘ ✕ +




You should check the Disk/Mount Status too, sometimes it need a remount.

## 4.6.8 Replacing a failed hard drive on a RAID5 array

In the case of a failure on one hard drive, your RAID array is in the ‘DEGRADED’ state.










Here is an example with the RAID 5 array “bigdisk” with a missing hard drive:

### Disks: Geom Raid5: RAID

Geom Mirror	Geom Concat	Geom Stripe	Geom Raid5	Geom Vinum(unstable)
Manage RAID	Tools	Information		
Volume Name	Type	Size	Status	
bigdisk	5	204M	DEGRADED	  

And the disk is missing:

### Disks: Management

Manage	iSCSI initiator					
Disk	Size	Description	Standby time	File system	Status	
ad0	102MB	VMware Virtual IDE Hard Drive/00000001	Always on	UFS	ONLINE	 
da0	102MB	VMware, VMware Virtual S 1.0	Always on	SoftRaid	ONLINE	 
da1	204MB	VMware, VMware Virtual S 1.0	Always on	SoftRaid	ONLINE	 
da2	307MB	VMware, VMware Virtual S 1.0	Always on	SoftRaid	MISSING	  

#### 4.6.8.1 First Step

For replacing this disk: Stop FreeNAS and replace this disk with a new one (in the same place on the ATA or SCSI channel). And restart FreeNAS.

After restarting FreeNAS, the Disk/Management should display it back (ONLINE if it’s the same, or CHANGED if it’s a different disk).

The Software RAID 5 status is still ‘DEGRADED’, we must add this new disk:



### 4.6.8.2 Second Step

Open the *Disk/Software RAID/Geom Raid5/Tools* page and select your DEGRADED RAID array, the replaced **Disk** name and action “insert”.

#### Disks: Geom Raid5: Edit

Geom Mirror	Geom Concat	Geom Stripe	Geom Raid5	Geom Vinum(unstable)
Manage RAID	Tools	Information		
Volume Name	bigdisk ▼			
Disk	/dev/da2 ▼			
Command	insert ▼			
<button>Send Command!</button>				

You can now check your RAID status (*Disk/Software RAID/Geom raid5*): It should be ‘REBUILDING’ or ‘COMPLETE’ (the time needed for rebuilding depend of your disk size).

#### Disks: Geom Raid5: RAID

Geom Mirror	Geom Concat	Geom Stripe	Geom Raid5	Geom Vinum(unstable)
Manage RAID	Tools	Information		
Volume Name	Type	Size	Status	
bigdisk	5	204M	COMPLETE	<div>e x +</div>

You should check the Disk/Mount Status too, sometimes it need a remount.

## 4.7 Software RAID configuration with geom vinum

Geom Vinum is all in one module that permit to create software RAID 0,1 and 5 array. But, for the moment the FreeNAS team doesn't recommend to use it because too many users meet problems using the RAID 5 option of this tool.

## 4.8 Complex Software RAID combinations (RAID 1+0, 5+0, etc..)

FreeNAS permit to create advanced Software RAID combinations, for example:

- RAID 1+0: Permit to create a RAID 0 array using RAID 1 arrays
- RAID 5+0: Permit to create a RAID 0 array using RAID 5 arrays
- RAID X + Y: Permit to create a RAID Y array using RAID X arrays

**The High-Level process flow for configuring a complex RAID X + Y array is:**

7. Add the Disks (4 disks minimum for a RAID 1+0, 6 disks for a RAID 5+0)
8. Format Disks for "Software RAID"
9. Create the RAID X arrays using the previously formatted for "Software RAID"
10. Format the newly created RAID X arrays for "Software RAID"
11. Create the RAID Y array using the previously RAID X arrays formatted for "Software RAID"
12. Add Mount Point
13. Enable Services (CIFS, FTP, etc.)

# 5 Advanced Configuration

## 5.1 General system options

Using the *Navigation Tree* on the Left Hand side of the screen, select **System/General setup**

### 5.1.1 Changing Default Admin Username and Password

Changing the default Username and Password is performed via the System/General setup page using the Username and Password fields as shown below.

Username	<input type="text" value="admin"/>
If you want to change the username for accessing the webGUI, enter it here.	
Password	<input type="password"/>
	<input type="password" value=""/> (confirmation)
If you want to change the password for accessing the webGUI, enter it here t	

### 5.1.2 DNS

DNS server settings are required to permit FreeNAS to connect to NTP time servers or to ping other network devices by name.

DNS servers	<input type="text"/>
	<input type="text"/>
	IP addresses

Up to two DNS servers may be configured on the System: General setup page. A reboot is not required when changing the DNS settings.

### 5.1.3 Language

You can select the WebGUI language on this page:

Language	<input type="text" value="English"/>
----------	--------------------------------------

### 5.1.4 WebGUI Protocol and Port

If you require a higher level of security when accessing the WebGUI then you can modify some areas to provide this.

You can change the WebGUI protocol from the default HTTP on port 80 to the alternate and more secure HTTPS on port 443. Either port (80 or 443 are configurable).

WebGUI protocol	<input type="radio"/> HTTP <input checked="" type="radio"/> HTTPS
WebGUI port	<input type="text"/>
Enter a custom port number for the webGUI above if you want to override the default (80 for HTTP, 443 for HTTPS).	

You must reboot FreeNAS and connect to the new HTTPS WebGUI.

## 5.2 Network Settings

The following additional Network configurations are not mandatory for the operation of FreeNAS, but may be required in some network configurations.

### 5.2.1 Ethernet Interface properties

To configure advanced interface properties, go to the *Interfaces LAN* page:

#### Interfaces: LAN

Type	Static ▼
Static IP configuration	
IP address	192.168.80.138 / 24 ▼ 📅
Gateway	192.168.80.254
DHCP client configuration	
Client Identifier	00:0c:29:03:3a:68 <small>The value in this field is sent as the DHCP client identifier when requesting a DHCP lease.</small>
Hostname	freenas.local <small>The value in this field is sent as the DHCP hostname when requesting a DHCP lease.</small>
General configuration	
MTU	<input type="text"/> <small>Standard MTU is 1500, use 9000 for jumbo frame.</small>
Device polling	<input type="checkbox"/> <b>Enable device polling</b> <small>Device polling is a technique that lets the system periodically poll network devices for new data instead of relying on interrupts. This can reduce CPU load and therefore increase throughput, at the expense of a slightly higher forwarding delay (the devices are polled 1000 times per second). Not all NICs support polling; see the m0n0wall homepage for a list of supported cards.</small>
Speed	autoselect ▼
Duplex	half-duplex ▼
<input type="button" value="Save"/>	

On this page you can configure IP addressing type: DHCP or static.

**Note:** In both situations(Static or DHCP) you must set the DNS manually.

**MTU size:** Useful for enabling Jumbo frame support (if your NIC support it).

You can check if your NIC card support jumbo frame from this web site (FreeBSD manpage):

<http://www.freebsd.org/cgi/man.cgi>

Just enter your interface name (go on the Interface: Assign page for display the name of your card: fxp for example).



## 5.2.2 Additional Ethernet interfaces

In addition to the LAN interface, additional Ethernet Interfaces can be defined, if required. This can be either wired Ethernet interface or Wireless interfaces. See section 5.2.3 for more information relating to wireless LAN interfaces.

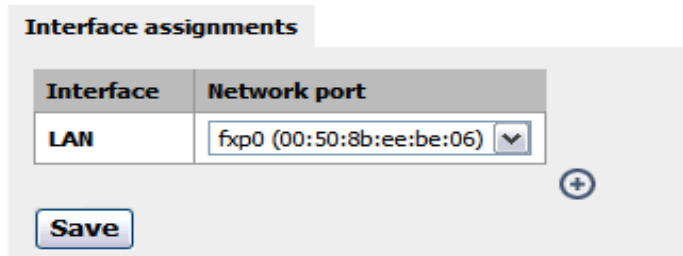
The additional interfaces may be used to administer FreeNAS or to access the shares, so it can be a useful redundant interface to FreeNAS for either function.

The additional Ethernet Interface can be within the existing LAN subnet or on a completely different subnet depending on your networks configuration. Where the additional interface is on a different subnet to that of the LAN interface, additional static routes may be required to facilitate connections to the other subnet, for example, the other subnet's gateway and beyond.


Before adding an additional Ethernet Interface to FreeNAS, ensure that the additional interfaces are installed when FreeNAS is booted.


To add an additional interface, go to the **Interfaces (assign)** page. If your additional Ethernet interface is recognised, you will have a  alongside the standard display, as shown below. If you do not have a  on this display, your interface is either not correctly installed or not recognised by FreeNAS.

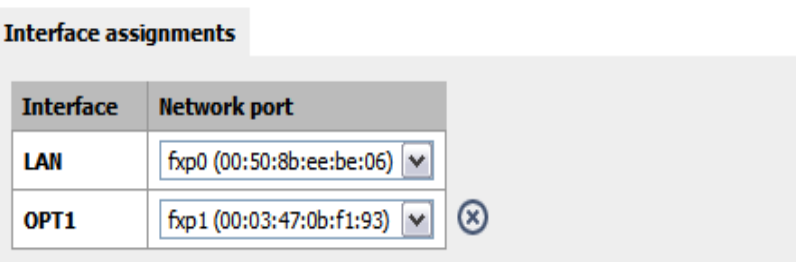
### Interfaces: Assign network ports





Interface	Network port
LAN	fxp0 (00:50:8b:ee:be:06) ▼



Clicking on the  to add the additional Interface called OPT1.



Interface	Network port
LAN	fxp0 (00:50:8b:ee:be:06) ▼
OPT1	fxp1 (00:03:47:0b:f1:93) ▼

OPT1 is the default name of the interface, and this can be customized. Once OPT1 is configured you will notice an additional level under **Interfaces (assign)** called **OPT1**.

Click **Save** and reboot FreeNAS to ensure the additional interface is recognised. You can reboot FreeNAS via the **Diagnostics/Reboot System** page.

Once FreeNAS is again operational, you can configure the OPT1 interface and rename it to something more relevant to your network.

As per the display shown below,

Click the **Enable Optional 1 interface** check box.

- Enter a description for the interface.
- Enter the IP Address and Subnet for the Interface and click Save.
- Change the MTU size if you need/want to. We recommend leaving this blank unless you know what you are doing and have a requirement to change the MTU size.
- This new Interface name in the Navigation Tree and other displays like ping/traceroute, etc will be updated.

A reboot is not required.

## Interfaces: Optional 1 (OPT1)

☒ **Enable Optional 1 interface**

Description	<input type="text" value="Office"/> <small>Enter a description (name) for the interface here.</small>
-------------	--

**IP configuration**

IP address	<input type="text" value="10.19.2.6"/> / <input type="text" value="24"/>
MTU	<input type="text"/> <small>Standard MTU is 1500, use 9000 for jumbo frame.</small>
Device polling	<input type="checkbox"/> <b>Use device polling</b> <small>Device polling is a technique that lets the system periodically poll network devices for new data instead of relying on interrupts. This can reduce CPU load and therefore increase throughput, at the expense of a slightly higher forwarding delay (the devices are polled 1000 times per second). Not all NICs support polling; see the m0n0wall homepage for a list of supported cards.</small>

**Save**

### Security Note on additional interfaces

FreeNAS does not provide any routing between Ethernet interfaces, so any potential security risks of ‘joining’ two networks via FreeNAS should be limited. But, there is always the potential for virus infected files stored on FreeNAS to be accessible from either network, and so, it is important that a current and up to date anti-virus application is able to scan all files stored on FreeNAS, from time to time. Is not a case of viruses ‘jumping’ from one network to another, its more likely that a user on one network will save a file on FreeNAS and then that is access by another user on the other network.

### 5.2.3 Wireless LAN interfaces

If a Wireless NIC is identified by FreeNAS, then you can configure this interface to access FreeNAS.

**Note:** Do not configure a wireless interface as Primary network interface for FreeNAS.

(More detail to follow here)

#### Interfaces: Optional 1 (Wireless)

☒ **Enable Optional 1 interface**

Description	<input type="text" value="Wireless"/> Enter a description (name) for the interface here.
<b>IP configuration</b>	
IP address	<input type="text" value="10.19.2.5"/> / <input type="text" value="8"/>
Device polling	<input type="checkbox"/> <b>Use device polling</b> Device polling is a technique that lets the system periodically poll network devices for new data instead of relying on interrupts. This can reduce CPU load and therefore increase throughput, at the expense of a slightly higher forwarding delay (the devices are polled 1000 times per second). Not all NICs support polling; see the m0n0wall homepage for a list of supported cards.
<b>Wireless configuration</b>	
Mode	<input type="text" value="IBSS"/> Note: IBSS mode is sometimes also called "ad-hoc" mode; BSS mode is also known as "infrastructure" mode
SSID	<input type="text" value="FreeNAS-Dell"/>
Channel	<input type="text" value="Auto"/> Note: Not all channels may be supported by your card
Station name	<input type="text"/> Hint: this field can usually be left blank
WEP	<input type="checkbox"/> <b>Enable WEP</b> <div style="float: right;">TX key</div> <div style="clear: both;"></div> <div>           Key 1: <input type="text"/> <input type="radio"/> </div> <div>           Key 2: <input type="text"/> <input type="radio"/> </div> <div>           Key 3: <input type="text"/> <input type="radio"/> </div> <div>           Key 4: <input type="text"/> <input type="radio"/> </div> <p>40 (64) bit keys may be entered as 5 ASCII characters or 10 hex digits          104 (128) bit keys may be entered as 13 ASCII characters or 26 hex digits          '0x'.</p>
<input type="button" value="Save"/>	

## 5.2.4 Default Gateway

If you have a Default Gateway in your network, you may need to configure the Default Gateway within FreeNAS. You may also need to configure the Default Gateway to permit FreeNAS to connect to NTP time servers.

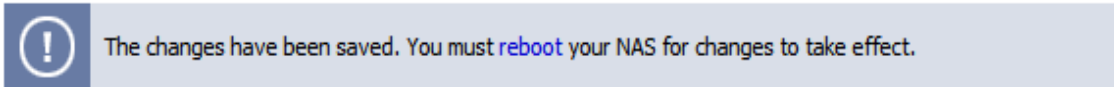
Using the *Navigation Tree* on the Left Hand side of the screen, select **Interfaces/LAN**

### Interfaces: LAN

Type	Static ▼
Static IP configuration	
IP address	192.168.80.138 / 24 ▼
Gateway	192.168.80.254

Configure the address your **Default Gateway**. (192.168.80.254, in this example)

If you change your **Default Gateway**, or select **Save** at this point, you will be prompted to reboot the FreeNAS PC with the following message;



To Reboot the FreeNAS PC, Expand the *Diagnostics item in the Navigation Tree*, select **Reboot System** and select **Yes**. The FreeNAS PC will reboot.

Once the FreeNAS PC is rebooted, again point your web browser at the FreeNAS PC. You should be presented with the System Status page again. Login if prompted.



## 5.2.5 Static Routes

In most LAN environments, a single LAN interface will be used (the LAN interface) and its default gateway will provide the interface to other networks. Where multiple LAN interfaces are configured in FreeNAS, then additional static routes may be needed in FreeNAS to permit network traffic to the other networks.

**Note:** *This configuration is usually not required unless you have to direct traffic from one subnet via another.*

In the example below the interface 'LAN' has the IP Address of 192.168.80.130 and its default gateway is 192.168.80.254, my Internet router.

I have another router with a local address of 192.168.80.2 that is connect to another network (10.1.1.0/24). In order for FreeNAS to direct traffic to the 10.1.1.0/24 network, a static route is configured directing any 10.1.1.0/24 traffic to the 192.168.80.2 (local router to its remote network) via the LAN NIC.

### System: Static routes: Edit

Interface	LAN <input type="button" value="v"/> <small>Choose which interface this route applies to.</small>
Destination network	10.1.1.0 / 24 <input type="button" value="v"/> <small>Destination network for this static route</small>
Gateway	192.168.80.2 <small>Gateway to be used to reach the destination network</small>
Description	To secondary house in La Digue - Seychelles <small>You may enter a description here for your reference (not parsed).</small>

## 5.2.6 Hosts resolution

### *Found under System/Hosts*

You can define fixed hostname / IP address resolution.

This is useful if you don't have DNS resolution for your NFS client for example.

### System: Hosts: Hosts: Add

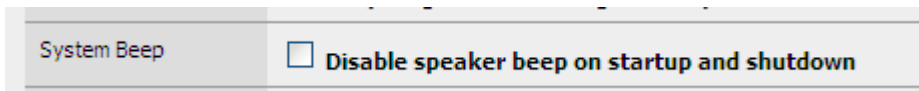
Hostname	Cray_Red_Storm <small>The host name may only consist of the characters a-z, A-Z and 0-9, -, _ and .</small>
IP address	172.16.69.69 <small>The IP address that this hostname represents.</small>
Description	Dedicaced to play Ultima 7 - The Black Gate <small>You may enter a description here for your reference.</small>

## 5.3 Advanced system options

*Found under System/Advanced page*

### 5.3.1 Shutdown and Startup Tones

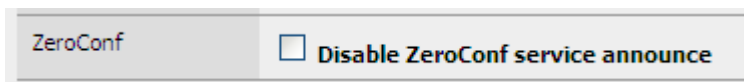
If your FreeNAS PC has a speaker or audio capabilities, FreeNAS provides tones to the user when shutting down and when boot up is complete. These are provided for FreeNAS installations that are ‘headless’, that is, where no screen or keyboard is left connected to the FreeNAS PC. Tones may be disabled via the *System/Advanced* page using *System Beep* option as shown below.



### 5.3.2 mDNS: bonjour/ZeroConf

#### About ZeroConf:

By default, FreeNAS will announce this available service (multicast) with the Zeroconf protocol. This will permit other computers to detect that there is a computer that provide FTP, SSH, SAMBA, AFP, etc.... services. Zeroconf/Bonjour is used by Apple computer and newer Linux distributions.



### 5.3.3 Kernel Tuning

Tuning will permit advanced users to tune some FreeBSD kernel parameters. This option toggles some kernel parameter settings to alternate values. The values for the Tuning option being selected (checked or de-selected (unchecked)) are shown in the table below.

Tuning Unchecked	Tuning Checked
net.inet.tcp.delayed_ack: 1	net.inet.tcp.delayed_ack=0
net.inet.tcp.sendspace: 32768	net.inet.tcp.sendspace=65536
net.inet.tcp.recvspace: 65536	net.inet.tcp.recvspace=65536
net.inet.udp.recvspace: 42080	net.inet.udp.recvspace=65536
net.inet.udp.maxdgram: 9216	net.inet.udp.maxdgram=57344
net.local.stream.recvspace: 8192	net.local.stream.recvspace=65535
net.local.stream.sendspace : 8192	net.local.stream.sendspace=65535
kern.ipc.maxsockbuf: 262144	kern.ipc.maxsockbuf=2097152
kern.ipc.somaxconn: 128	kern.ipc.somaxconn=8192
kern.ipc.maxsockets: 3072	kern.ipc.maxsockets=16424
kern.ipc.nmbclusters: 3072	kern.ipc.nmbclusters=60000
kern.maxfiles: 1064	kern.maxfiles=65536
kern.maxfilesperproc: 957	kern.maxfilesperproc=32768

Before to do some benchmark comparison, Try to enable this option ;-)

### 5.3.4 Memory SWAP file

#### *Found under System/Advanced/Swap page*

This section will show how to create a special file on your share, and use this file for memory swap.

If your PC have less that 256MB of RAM you can create a SWAP file for having a total memory size (RAM + SWAP). 256MB RAM is the minimum for using the iSCSI target.

This example show how to use the 'secure\_disk' mount point for creating a 256MB file used for swap.

#### System: Advanced: Swap file

**Note:**

The options on this page are intended for use by advanced users only, and there's **NO** support for them.

Swap memory		<input checked="" type="checkbox"/> Enable
Mount to use for swap	secure_disk ▼	
Swap file size	256 Size in MB.	
<input type="button" value="Save"/>		

## 5.4 Disk Encryption

FreeNAS can encrypt your hard drive (or RAID array) using the FreeBSD geom eli module. This feature use hardware crypto acceleration card if supported.

**Warning:** *Creating an encrypted disk will erase ALL data on this disk.*

You should configure the WebGUI to use HTTPS protocol before using this feature: The passphrase used for encrypting your disk must be protected when you send it to the WebGUI.

The encryption layer must take place between the hard drive (or RAID array) and the filesystem.

**The High-Level process flow for encrypting simple disk is:**

1. Add Disks
2. Create your encrypted volume using the previously added disk : This step will automatically 'attach' this volume
3. Format this encrypted volume
4. Add a Mount Point using this encrypted volume

**The High-Level process flow for encrypting software RAID array is:**

1. Create your simple or complex RAID array (chapter 4.6) without formatting it at the end of this process.
2. Create your encrypted volume using the previously created software RAID array: This step will automatically 'attach' this volume
3. Format this encrypted volume
4. Add a Mount Point using this encrypted volume

**Note:** *At each reboot of FreeNAS, the mount point using encrypted disk cannot be mount automatically: You must enter your passphrase to 'attach' it.*

### 5.4.1 Configure your WebGUI for using HTTPS




It's not a mandatory step, but a highly recommended step before to create an encrypted volume: This will prevent transferring your passphrase in clear on the network.

**Note:** *Refer to Chapter 5.4.1 for how to change this parameter.*

## 5.4.2 Add your disk or create your software RAID array


On this example, I will use this newly created software RAID 5 array (not formatted):

### Disks: Geom Raid5: RAID




Geom Mirror	Geom Concat	Geom Stripe	Geom Raid5	Geom Vinum(unstable)
Manage RAID	Tools	Information		
Volume Name	Type	Size	Status	
BigDisk	5	1000	REBUILDING	  

If you want to use a simple hard drive, simply add it on the **Disk:Management** menu

## 5.4.3 Create the encrypted volume

Open the **Disk/Encryption** page and click the  icon on the right hand side.

### Disks: Encryption: Create

Disk	BigDisk: (Software graid5 RAID 5) 
Data integrity algorithm	none 
Encryption algorithm	AES 
Passphrase	<input type="password" value="::: :::"/> <input type="password" value="::: :::"/> (Confirmation)

**Init and encrypt disk**

1. Select your newly added disk/created RAID array on the disk menu.
2. Choose the Encryption Algorithm
3. Choose a strong pass phrase
4. Click on “Init and encrypt disk”, and confirm

**Note:** Using Data integrity will reduce the disk size of about 10%.

**Note:** Generating time for the encrypted volume is dependent of your disk size: It will fill your disk with random value.

You should obtain the following output:

## Disks: Encryption: Create

<b>Disk</b>	BigDisk: (Software graid5 RAID 5) ▼
<b>Data integrity algorithm</b>	none ▼
<b>Encryption algorithm</b>	AES ▼
<b>Passphrase</b>	<div> <div>*****</div> <div>*****</div> </div> (Confirmation)

**Init and encrypt disk**

### Disk initialization and encryption:

```


Encrypting... Please wait:
Calculating number of iterations...
Done, using 133500 iterations.
Metadata value stored on /dev/raid5/BigDisk.
Done.
Attaching...
Attached to /dev/raid5/BigDisk.
Done.



```

Then click on ‘save’:

## Disks: Encryption

**Manage** **Tools**

 The changes have been applied successfully.

Disk	Data integrity	Encryption	Status	
BigDisk	none	AES	Attached	 

### 5.4.4 Format Encrypted disk

When the Status is 'attached', then the Encrypted disk must be formatted.

Open the **Disk:Format** menu and choose the newly created Encrypted disk:

#### Disks: Initialize

<b>Disk</b>	BigDisk: (Encrypted disk) ▼
<b>File system</b>	UFS with Soft Updates (use 8% space disk) ▼
<b>Don't Erase MBR</b>	<input type="checkbox"/> Don't erase the MBR (useful for some RAID controller cards)

**Format disk**

Leave the *Type* as **UFS with Soft Update (use 8% space disk)**, click the **Format Disk** button and confirm.

A display similar to this should be output:

#### Disks: Initialize

<b>Disk</b>	ad0: 102MB (VMware Virtual IDE Hard Drive/00000001) ▼
<b>File system</b>	UFS with Soft Updates (use 8% space disk) ▼
<b>Don't Erase MBR</b>	<input type="checkbox"/> Don't erase the MBR (useful for some RAID controller cards)


**Format disk**

#### Disk initialization details:




```
Erasing MBR and all partitions:
Creating one partition:
***** Working on device /dev/raid5/BigDisk.eli *****
Initializing partition:
Creating BSD label:
Creating filesystem:
/dev/raid5/BigDisk.eli1: 1023994.7MB (2097141100 sectors) block size 16384, fragment size 2048
        using 5573 cylinder groups of 183.77MB, 11761 blks, 23552 inodes.
        with soft updates
super-block backups (for fsck -b #) at:
160, 376512, 752864, 1129216, 1505568, 1881920, 2258272, 2634624, 3010976,
3387328, 3763680, 4140032, 4516384, 4892736, 5269088, 5645440, 6021792,
6398144, 6774496, 7150848, 7527200, 7903552, 8279904, 8656256, 9032608,
9408960, 9785312, 10161664, 10538016, 10914368, 11290720, 11667072, 12043424,
12419776, 12796128, 13172480, 13548832, 13925184, 14301536, 14677888,
15054240, 15430592, 15806944, 16183296, 16559648, 16936000, 17312352,
17688704, 18065056, 18441408, 18817760, 19194112, 19570464, 19946816,
20323168, 20699520, 21075872, 21452224, 21828576, 22204928, 22581280,
22957632, 23333984, 23710336, 24086688, 24463040, 24839392, 25215744,
25592096, 25968448, 26344800, 26721152, 27097504, 27473856, 27850208,
28226560, 28602912, 28979264, 29355616, 29731968, 30108320, 30484672,
30861024, 31237376, 31613728, 31990080, 32366432, 32742784, 33119136,
33495488, 33871840, 34248192, 34624544, 35000896, 35377248, 35753600,
```

### 5.4.5 Create the mount point for encrypted disk

Once the Encrypted volume is created and formatted, all that is left is to create the mount point.

Open the **Disk/Mount Point** page and click the  icon on the right hand side.

#### Disks: Mount Point: Add

<b>Disk</b>	BigDisk: (Encrypted disk) 
<b>Partition</b>	1 (or new software RAID method) 
<b>File system</b>	UFS 
<b>Share Name</b>	secure_disk
<b>Description</b>	Files to protects

From the **Disk** drop down, select the Encrypted disk. The **Encrypted disk name** you previously configured is visible.




Change the **Partition** to *1 (or new software RAID method)*

Enter a useful **Share name** and click the Add button.

The **Status** should display as **configuring**, and then click the **Apply Changes** button and the **Status** should update to **UP**:

#### Disks: Mount Point

Manage Tools Fsch					
Disk	Partition	File system	Share Name	Description	Status
/dev/raid5/BigDisk.eli	s1	ufs	secure_disk	Files to protects	OK

Now you can use your encrypted disk.

Try to put some files on it, and we will check the comportment after a reboot:



### 5.4.6 Reboot for checking your passphrase

Reboot FreeNAS, and open the *Disk/Mount Point* page.

You should see an error because FreeNAS can't mount this encrypted disk without the passphrase:

#### Disks: Mount Point

Manage Tools Fscck					
Disk	Partition	File system	Share Name	Description	Status
/dev/raid5/BigDisk.eli	s1	ufs	secure_disk	Files to protects	Error - Retry

Now open the *Disk/Encryption* page

You should see this encrypted disk with the status 'Not attached':

#### Disks: Encryption

Manage Tools			
Disk	Data integrity	Encryption	Status
BigDisk	none	AES	Not attached

You must enter your passphrase by opening the *Disk/Encryption/Tools* page:

#### Disks: Encryption: Tools

Manage Tools	
Encrypted disk name	BigDisk: (Encrypted disk) ▼
Passphrase	*****
Command	attach ▼
Send Command!	

Enter you Pass phrase, select command 'attach' and click on 'Send Command!'"

It should display:

**Command output:**

```
Attaching...
Successful
Mounting this disk...
Successful
```

Now the state of this disk should be ‘attached’:

## Disks: Encryption

**Manage****Tools**

Disk	Data integrity	Encryption	Status
BigDisk	none	AES	Attached



And the mount point status should be ‘OK’ now:

## Disks: Mount Point

**Manage****Tools****Fsck**

Disk	Partition	File system	Share Name	Description	Status
/dev/raid5/BigDisk.eli	s1	ufs	secure_disk	Files to protects	OK



## 5.5 iSCSI


iSCSI permit to simulate the presence of local SCSI hard drive across an IP Network.

- The server side (the real disk) is called iSCSI Target.
- The client side (simulated disk) is called iSCSI disk.

### 5.5.1 iSCSI target

FreeNAS permit to create special file with given size that simulate iSCSI disk.

Warning: You must have a minimum of 256MB RAM: Use the swap file if you have less than 256MB of RAM.

Open the *Service/iSCSI target* page and click the  icon on the right hand side.


#### Services: iSCSI Target: Add

Mount Point	<input type="text" value="mi"/>
File size	<input type="text" value="30"/> Size in MB.
Authorised network	<input type="text" value="192.168.80.0"/> / <input type="text" value="24"/> Network that is authorised to access to this iSCSI target.
<input type="button" value="Add"/>	



Select the **mount point** used for the iSCSI target file, enter the **file size** in MB, enter **authorised network** to connect to this iSCSI target and click on the **Add** button.

You can check the new iSCSI target entry:

#### Services: iSCSI Target

 The changes have been applied successfully.

Target name	Network	Mount used	Size
iqn.1994-04.org.netbsd.iscsi-target:target0	192.168.80.0/24	mi	30


**Warning:**  
You must have a minimum of 256MB of RAM for using iSCSI-target.

## 5.5.2 iSCSI initiator

An iSCSI initiator simulates an SCSI controller across an IP Network to permit FreeNAS to use other drive resources as disks.

To test FreeNAS's iSCSI support, a free iSCSI target under a Windows 2003 server such as StarWind can be used, or using another FreeNAS configured as iSCSI target.

Here is an example for using the previously created iSCSI target from another FreeNAS:

Open the **Disks/Management/iSCSI initiator** page and click the  icon on the right hand side.

### Disks: Management: iSCSI initiator: Edit

<b>Name</b>	<input type="text" value="iSCSI disk 1"/>	This is for information only (not using during iSCSI negotiation).
<b>Initiator name</b>	<input type="text" value="initiator.freenas.org:yo"/>	This name is for example: iqn.2005-01.il.ac.huji.cs:somebody.
<b>Target Name</b>	<input type="text" value="iqn.1994-04.org.netbsd.iscsi-target:target0"/>	This name is for example: iqn.1994-04.org.netbsd.iscsi-target:target0.
<b>Target address</b>	<input type="text" value="192.168.80.131"/>	This the IP address or DNS name of the iSCSI target.




For this example, I'm using the following parameters:

- Name: Entry name (using for information only)
- Initiator name: initiator.freenas.org:yo
- Target Name: iqn.1994-04.org.netbsd.iscsi-target:target0 (The same as displayed in the iSCSI target configuration on the FreeNAS iSCSI target)
- Target IP: The IP address of the iSCSI target


### Disks: Management

<b>Manage</b>	<b>iSCSI initiator</b>
---------------	------------------------

Name	Target address	Target name
iSCSI disk 1	iqn.1994-04.org.netbsd.iscsi-target:target0	192.168.80.131

After creating the iSCSI initiator entry, you can add the iSCSI disk now.

Open the **Disks/Management** page and click the  on the right hand side of the Display area.

You should have a new SCSI disk (daX) as on this example:

### Disks: Disk: Add

Disk	ad0: 102MB (VMware Virtual IDE Hard Drive/00000001)
UDMA mode	ad0: 102MB (VMware Virtual IDE Hard Drive/00000001) da0: 102MB (VMware, VMware Virtual S 1.0) da1: 102MB (VMware, VMware Virtual S 1.0) da2: 102MB (VMware, VMware Virtual S 1.0) da3: 204MB (VMware, VMware Virtual S 1.0) da4: 307MB (VMware, VMware Virtual S 1.0) da5: 307MB (VMware, VMware Virtual S 1.0) da6: 30MB (NetBSD NetBSD iSCSI 0)
Hard disk standby time	
Advanced Power Management	Disabled This allows you to lower the power consumption of the drive, at the expense of performance. <i>Do not set this for CF cards.</i>
Acoustic level	Disabled This allows you to set how loud the drive is while it's operating. <i>Do not set this for CF cards.</i>
Preformatted FS	Unformatted This allows you to set FS type for preformatted disk with data. <i>Leave 'unformatted' for unformatted disk and then use <a href="#">format menu</a>.</i>

**Add**

After configuring your iSCSI initiator, if you meet a problem (don't see new SCSI disk) you can check the presence of the Target name that you are using the Diagnostics/Information/iSCSI initiator page:

### Diagnostics: Information

Disks	Partitions	S.M.A.R.T.	ATAidle	Space Used	Mounts	Software RAID
iSCSI initiator	MS Domain	Swap	Sensors	FTP users	RSYNC Client	
Show the list of available target name on all configured iSCSI targets						
Discovered iSCSI target for 192.168.80.131						
TargetName=iqn.1994-04.org.netbsd.iscsi-target:target0						
TargetAddress=192.168.80.131:3260,1						

## 5.6 Advanced Hard Drive Parameters

When Adding a Disk, there are some options included that have the potential to increase the lifespan of Hard Disk Drives within FreeNAS.

Not all HDD support any, or all of these advanced hard drive options, and so you should confirm your HDD capabilities via the Diagnostic: Information Page and the ataidle tab. (see below).

**Warning: CF cards should not have ANY of these settings enabled.**

### Disks: Disk: Edit

<b>Disk</b>	ad0: 102MB (VMware Virtual IDE Hard Drive/00000001) ▼
UDMA mode	Auto ▼ You can force UDMA mode if you have 'UDMA_ERROR.... LBA' message with your hard drive.
Hard disk standby time	Always on ▼ Puts the hard disk into standby mode when the selected amount of time after the last access has elapsed. <i>Do not set this for CF cards.</i>
Advanced Power Management	Disabled ▼ This allows you to lower the power consumption of the drive, at the expense of performance. <i>Do not set this for CF cards.</i>
Acoustic level	Disabled ▼ This allows you to set how loud the drive is while it's operating. <i>Do not set this for CF cards.</i>
Preformatted FS	UFS with Soft Updates (use 8% space disk) ▼ This allows you to set FS type for preformatted disk with data. <i>Leave 'unformatted' for unformatted disk and then use format menu.</i>

**Save**

Advanced Hard Drive Parameters

### 5.6.1 UDMA mode

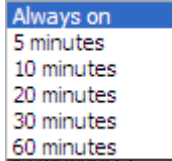
Use this option only if FreeNAS can't automatically detect this mode correctly. Currently supported modes are:

- Auto
- UDMA-33
- UDMA-66
- UDMA-100
- UDMA-133

### 5.6.2 Hard Disk Standby time

Puts the hard disk into standby mode when the selected amount of time after the last access has elapsed.

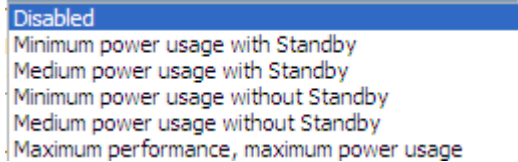
Proposed values are:



### 5.6.3 Advanced Power Management (also known as APM)

This allows you to lower the power consumption of the drive, at the expense of performance.

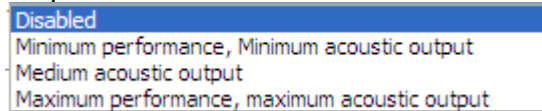
Proposed values are:



### 5.6.4 Acoustic Level (also known as AAC)

This allows you to set how loud the drive is while it's operating.

Proposed values are:



### 5.6.5 Verifying your Disk's S.M.A.R.T, APM, AAC capabilities

Verify your HDD capabilities for S.M.A.R.T, APM and AAC via the Diagnostic: Information page, ataidle Tab.

Examples of Advanced Hard Drive capabilities:

**List of Advanced ATA capabilities on all ATA disk:**

Results for ad0:

Device Info:

```
Model:          FUJITSU MPF3102AT
Serial:         31277991
Firmware Rev:   1402
ATA revision:   ATA-5
Geometry:       16383 cyls, 16 heads, 63 spt
Capacity:       9GB
SMART Supported: yes
SMART Enabled:  yes
APM Supported:  yes
APM Enabled:    no
AAC Supported:  yes
AAC Enabled:    no
Note:           AAC = AutoAcoustic
                APM = Advanced Power Management
                SMART = Self-Monitoring, Analysis and Reporting Technology
```

Results for ad2:

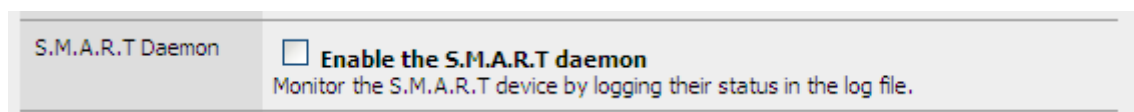
Device Info:

```
Model:          SAMSUNG SP2014N
Serial:         S088J1RY906273
Firmware Rev:   VC100-33
ATA revision:   ATA-7
Geometry:       16383 cyls, 16 heads, 63 spt
Capacity:       127GB
SMART Supported: yes
SMART Enabled:  yes
APM Supported:  no
AAC Supported:  yes
AAC Enabled:    no
Note:           AAC = AutoAcoustic
                APM = Advanced Power Management
                SMART = Self-Monitoring, Analysis and Reporting Technology
```

From this you can see that on ad0, there is no value in setting APM or AAC for this drive as it is not supported. Similarly on ad2, APM is not supported, but AAC is support, but not enabled.

### 5.6.6 S.M.A.R.T

SMART is enabled on a system-wide basis via the *System:Advanced* page by checking the **Enable the S.M.A.R.T daemon** option and clicking the **Save** button.



**Warning:** *This option can prevent the disk Advanced Power Management to works correctly.*



## 5.7 Upgrading FreeNAS

Upgrading FreeNAS, via the Firmware Upgrade page is only supported on FreeNAS 0.52 and above.

**Note:** *You can't upgrade earlier version of FreeNAS.*

Upgrading permits a user to upgrade the FreeNAS code without performing a complete installation.

Normally an installation would require an .ISO file to be burnt to CD.

For upgrades, an .IMG file is used and may be stored on any location that your PC (the client) can see.

First, download the latest FreeNAS .IMG file from the FreeNAS website on Sourceforge.

Then, assuming you are logged into FreeNAS, perform the following steps.

- Backup your existing configuration
- Upgrade FreeNAS
- Verify your FreeNAS configuration

### 5.7.1 Backup Configuration

- Navigate to the Diagnostics: Backup/restore page

---

Click this button to download the system configuration in XML format.

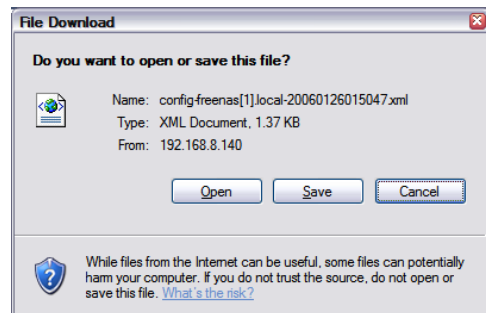
**Download configuration**

---

- In the Backup configuration area, click the 'Download configuration' button
- When prompted by your PC, select Save, and location on your PC to save the config file

Saving the config file (XP example)

Do not store the config file on your FreeNAS storage.



a

## 5.7.2 Performing the Upgrade

**Warning:** For upgrading from the 0.67x or previous release you need following this procedures:  
<http://www.freenas.org/downloads/patch/>

You need a minimum of 128 MB of RAM for performing Upgrade, if not; Use the Memory swap file feature for increase your RAM quantities.

Navigate to the System: Firmware page and click the *Enable firmware upload* button.

### System: Firmware

Click "Enable firmware upload" below, then choose the image file (generic-pc-\*.img) to be uploaded. Click "Upgrade firmware" to start the upgrade process.



**Warning:**  
DO NOT abort the firmware upgrade once it has started. FreeNAS will reflash automatically after storing the new firmware. The configuration will be n

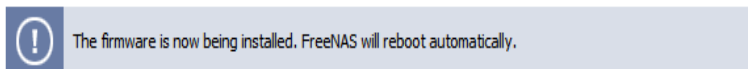
Click the *Browse* button and navigate to where you stored the previously downloaded .IMG file.

**Note:** This is not the backup xml file you just saved; this is the .IMG file from the Sourceforge or FreeNAS website. **DO NOT USE the ISO file here!!!**

Once the file is in *the firmware image file* window, click the *Upgrade* firmware button.

A message will indicate the upgrade installation is being performed and FreeNAS will reboot once this is completed.

### System: Firmware



Once the reboot is complete, log back into FreeNAS.

**Note:** If, for some reason you cannot connect to FreeNAS, connect a screen to your FreeNAS PC (if not already connected) and verify the network settings using the console menu.

It's possible that with new release, the name of your LAN card change (FreeBSD new NIC drivers for example).

## 5.7.3 Verify FreeNAS configuration

The upgrade will normally not modify any of the FreeNAS configurations, but to be sure, navigate to several screens in your FreeNAS and ensure that items such as the network and disk configuration are as you previously configured it.

## 5.8 User Management


Actually FreeNAS implement user and group Authentication.

The user/group permission is functional but not implemented on the WebGUI configuration interface.

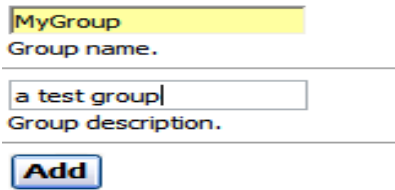
(Works in progress for version 0.7)

## 5.8.1 Local User Management

First you must add a group by selecting the *Access/Users and Groups* page.

- Click the **Groups** TAB and click the  to add a Group.
- Enter a group name **Note:** only a-z, A-Z and 0-9 are supported. \_ (underscores) and spaces are not supported.
- Enter a description then click *Add* and *Apply Changes*

### Group: Add



MyGroup  
Group name.

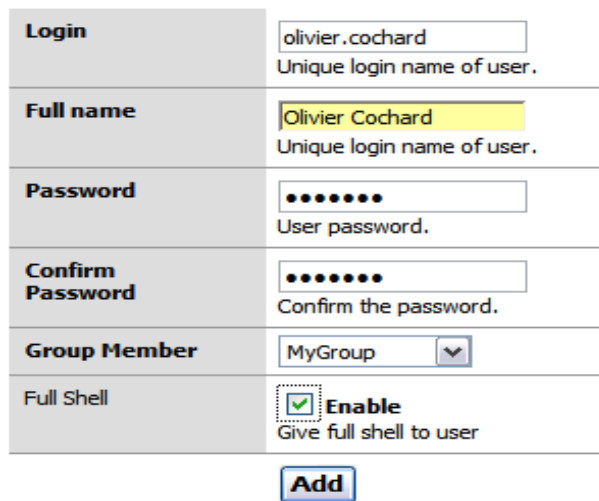
a test group  
Group description.

**Add**

Once a Group is created then users can be created.

As shown below, Enter the users login name, their Full Name, a password, select the group they belong to and Click *Add*.

**Warning:** Do not use the character “:”(colon) on the password!



Login	olivier.cochard Unique login name of user.
Full name	Olivier Cochard Unique login name of user.
Password	•••••• User password.
Confirm Password	•••••• Confirm the password.
Group Member	MyGroup ▼
Full Shell	<input checked="" type="checkbox"/> <b>Enable</b> Give full shell to user

**Add**

**Note:** A Full Shell enabled user can access the shell account on FreeNAS via SSH. A user without Full Shell user cannot access the shell. This is a different account to the WebGUI admin account, which has full access to the WebGUI configuration.

With this box un-checked, the user has SCPONLY access. Scponly is an alternative 'shell' (of sorts) for system administrators who would like to provide access to remote users to copy file (SCP) without providing any remote execution privileges.

## 5.8.2 MS Active Directory

FreeNAS can get the user database (login and password) from a Microsoft Active Directory (Windows 2000/2003).

Note: in FreeNAS, you must use the pre-win2000 domain name. For example if your domain name is 'freenas.org', you must set the domain name 'FREENAS'

### Access: Active Directory

Active Directory		<input checked="" type="checkbox"/> Enable
AD server name	<input type="text" value="mainpdc"/> AD or PDC name.	
AD server IP	<input type="text" value="192.168.80.10"/> IP address of MS Active Directory server.	
Domain name	<input type="text" value="FREENAS"/> Domain name in old format.	
Administrator name	<input type="text" value="Administrator"/> Username of a domain administrator account.	
Administration password	<div><input type="password" value="*****"/> <input type="password" value="*****"/> (Confirmation) Password of domain administrator account, enter it here twice.</div>	

After configuring, CIFS/FTP/SSH/Unison authentication will rely **ONLY** on user's accounts present in the AD.

## 5.8.3 LDAP

Works in progress

## 6 How to contribute to FreeNAS

### 6.1 Translators

#### 6.1.1 Web GUI

If you want to translate the FreeNAS Web GUI, here is to proceed:

1. Check on the FreeNAS documentation mailing list that no other same language translator as you are already working on it:  
[https://sourceforge.net/mailarchive/forum.php?forum\\_id=48149](https://sourceforge.net/mailarchive/forum.php?forum_id=48149)
2. Download the English reference .pot file (en\_EN.ISO8859-1.pot) from the Web SVN FreeNAS site:  
[http://freenas.svn.sourceforge.net/viewvc/\\*checkout\\*/freenas/trunk/locale/en\\_EN.ISO8859-1.pot](http://freenas.svn.sourceforge.net/viewvc/*checkout*/freenas/trunk/locale/en_EN.ISO8859-1.pot)
3. Download a PO file editor. For example you can use this tools:  
<http://sourceforge.net/projects/poedit/>
4. Start you PO file editor, and use the .pot as reference file, and create your own language file
5. Send your own language .po file on the FreeNAS-documentation mailing-list (This will permit to archive your name with your file).

#### 6.1.2 UserManual

You can download the MS word file or OpenOffice version here:

<http://www.freenas.org/downloads/docs/user-docs/FreeNAS-SUG.doc>

<http://www.freenas.org/downloads/docs/user-docs/FreeNAS-SUG.odt>

Add your modifications and send your file to this list of FreeNAS team member:

`olivier@freenas.org`

`bobj@freenas.org`

#### 6.1.3 Website

We are working on adding multiple editor account on the website.

Meanwhile, you can contact the webmaster for proposing your help:

`youri.trioreau@no-log.org`

## 6.2 BSD user and/or PHP coder

We are not BSD guru, but only simple user. Then the configuration file of FreeNAS can be easily improved.

We are looking for PHP expert too for reviewing/improving the FreeNAS code (99% of PHP, 1% of Unix shell).

Here is a simple way for 'playing with FreeNAS':

1. Enable SSHD with 'Permit root access' checked
2. Open an WinSCP (or other SCP tools) session on your FreeNAS.

You can now directly edit the code files of FreeNAS:

- /var/etc directory contain the configuration files generated (simple text config files)
- /usr/local/www contain the WebGUI files (PHP files)
- /etc/inc contain the systems scripts( PHP files too)

Check existing file for learning how FreeNAS works (it's very simple!)

2. Send your modifications on the FreeNAS developer mailing-list:

[https://sourceforge.net/mailarchive/forum.php?forum\\_id=47361](https://sourceforge.net/mailarchive/forum.php?forum_id=47361)

(This will archive your name with your patch)

Don't forget to update the licence page if you are re-using other Open source code!

If you want to build a FreeNAS from scratch, follow the FreeNAS Developers' Handbook:

<http://www.freenas.org/downloads/docs/devel-docs/>

## 6.3 User support

Simply check the FreeNAS support forum:

[https://sourceforge.net/forum/?group\\_id=151951](https://sourceforge.net/forum/?group_id=151951)

And answers at the maximum users questions...

The Last Page (so far)