FreeNAS

FreeNAS Setup and User guide (for FreeNAS 0.522 - draft)

DRAFT

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Document Change Control

When	What	Who
01 Jan, 2006	Document created for FreeNAS 0.5	Bob Jaggard
04 Jan, 2006	Title Page - Updated for 0504 4.3 – added High-Level process for creating a share 4.5 – removed references to the top level 'share' folder. 4.6 - Added High-level process for RAID New 5.1.3 – Added place marker for Wireless LAN Interfaces section. Footer – reformatted to inc pagination and ver.	Bob Jaggard
08 Jan, 2006	Title Page – Updated to 0505 New 4.6.6 – Included a section on RAID status 5.1.1 – Updated Section. Footer updated to Ver 0505	Bob Jaggard
26 Jan, 2006 (Australia Day !!!!)	Title Page – Updated to 0522 1.2 - Removed references to boot drive sharing storage – this is supported in 0522. Added mention of issue with SCSI RAID. 3 – added some menu text for clarity 4.2 – updated graphic to 0.522 4.3.1&2, altered references to two partition boot disk, adding, mounting, formatting, etc 5.1.2, 5.1.5 - updated 5.2.3 – added section 5.3 – added Upgrading and Backup 5.4 – added Serial port various – updated GUI graphics to reflect 0.522 interface relocated this CC table Footer updated to Ver 0522	Bob Jaggard
27 Jan, 2006	4.6.6 – Additional statement regarding time RAID sync may take.	Bob Jaggard
6th, Feb 2006	1.1 Note relating to Serial port requirement and boot process. 1.2 and 4.6.1 – Note added regarding RAID and FreeNAS boot drive, 2nd partition.	Bob Jaggard

1 Introduction

1.1 Hardware Requirements

- A PC with a minimum 64Mb of RAM and a bootable CD Rom 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)
  - Serial port (required under 0.52~0.522 releases) to permit monitoring of the boot process. FreeNAS will not boot fully if a serail port is either not present or disabled (in BIOS).
- Or a virtual PC emulator such as Vmware, configured as above.

Note – Where FreeNAS is installed on a bootable USB Drive, CF Drive or Hard Drive, the bootable CD Rom can be removed once FreeNAS is installed.

1.2 Important: Limitations and Interactions

Here are some limitations and interactions of Release 0.522 of FreeNAS:

Notes regarding FreeNAS 0.522

- FreeNAS 0.522 now supports 'single drive' installations, where FreeNAS occupies a small portion of a single hard drive and the remainder is available for storage.
- FreeNAS 0.522 now also supports firmware upgrades meaning future FreeNAS versions can be installed without a complete install being performed.

Both are covered in this document. Additional notes are available in the changelog on the FreeNAS website.

- UFS format drives are supported and will work with Windows across the LAN.
- NTFS formatted Storage drives will incorrectly identify sub-directories (sub-folders) as files when viewed across the share. When viewed via FTP, sub-directories are correctly displayed. (FreeBSD limitation)
- NTFS drives are read-only at this time.
- SCSI, IDE, CF and USB drives are supported.
- SCSI drives currently have may a RAID issue. (Reported, being verified)
- You cannot use the FreeNAS boot drive, 2nd partition 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.

- Do not remove USB drives without un-Mounting them first. A reboot can occur otherwise.
- User Level Access and Groups, to permit different levels of share access and control, are planned for a future release of the project/product and are currently not supported. FreeNas is currently a network share and FTP server.

2 Installation and Configuration Overview

FreeNAS installation and configuration requires a minimum two steps, these are -

- Initial Configuration, via the FreeNAS Console Setup Menu on the FreeNAS PC followed by
- Basic Configuration via the Web GUI.

Further customisation, such as RAID configuation and localising to your environment can then be performed.

The Initial Configuration sets up the boot installation and preliminary network configuration and settings. Once the Initial Configuration is complete, then the remaining Basic Configuration and and additional customising is performed using the FreeNAS Web GUI.

3 Initial configuration

3.1 Install on disk (optional)

3.1.1 Hard drive

This description assumes the FreeNAS PC hardware is capable of booting from a CD Rom and has a boot Hard Drive and may have one or more Storage Hard Drives.

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

```
"FreeNAS console setup"
"**********************"
1) Interfaces: assign network ports
2) Set up LAN IP address
3) Reset webGUI password
4) Reset to factory defaults
5) Reboot system
6) Ping host
7) Install on HD/CF/USB Key
8) Shell
```

FreeNAS console setup Menu

- As of 0.522 you can now elect to have a single HDD installation, that is have a FreeNAS boot partition and on the same HDD have the remainder as storage.

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

FreeNAS Install options

If you select **1** *(this installs FreeNAS on a drive, and that drive cannot be used for storage)*

- Select the Source CD drive (acd0 in my case, yours may be different).
- Select the Destination HDD that you want to install and boot FreeNAS from (ad0 in my case, yours may be different).

If you select **2** *(this installs FreeNAS on a drive and the remainder of the drive can be used for storage by creating two partitions on the drive)*

- When you choose to create two partitions:
- Select the Source CD drive (acd0 in my case, yours may be different).
- Select the Destination HDD that you want to install and boot FreeNAS from (ad0 in my case, yours may be different).
- Do you want to change the boot code? Answer - Y
- Should we write new partition table ? Answer - Y

- In either case, once FreeNAS is installed, follow the instructions and remove the CD and when the menu comes up again
- Select 5 to reboot the computer.
- Go to the LAN Interface and IP configuration section of this document.

3.1.2 USB Key

This assumes the FreeNAS PC hardware is capable of booting from a USB key and can boot from a CD Rom for the initial boot and installation and has one or more Hard Drives for storage.

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

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

FreeNAS Install options

- Select 1 from this menu – this assume most USB key implementations will not use the USB key for storage.
- Select the Source CD drive (acd0 in my case).
- Select the Destination USB Key that you want to install and boot FreeNAS from (da0 in my case, yours may be different).
- Once installed, follow the instructions and remove the CD and when the menu comes up again,
- Select 5 to reboot the computer.
- Go to the LAN Interface and IP configuration section of this document.

3.2 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,

```
"FreeNAS console setup"
"**********************"
1) Interfaces: assign network ports
2) Set up LAN IP address
3) Reset webGUI password
4) Reset to factory defaults
5) Reboot system
6) Ping host
7) Install on HD/CF/USB Key
8) Shell
```

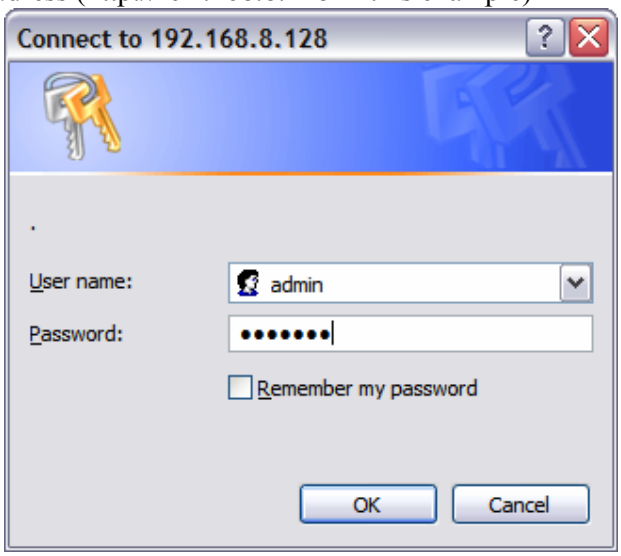
- Select 1 and enter the name of your Ethernet Interface (fxp0 in my case, yours may be different)
- Press <Return> at the Optional 1 Interface prompt, Select Y and reboot the PC.
- Once the computer has rebooted and the menu is up again, select 2 and enter your IP Address settings (192.168.8.128 and /24 in my example).
- Once the menu is up, select 6 and ping another device on the subnet and ensure network connectivity is OK.

If you cannot Ping another device on the network, then reboot the FreeNAS PC and try again.

4 Basic Configuration

4.1 Default Login

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.



Hint - If you are not presented with a login/password dialogue box, try Pinging the FreeNAS PC, alternately reboot the FreeNAS PC to ensure any network configuration changes are accepted.

At the login/password dialogue
Enter the

- 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.

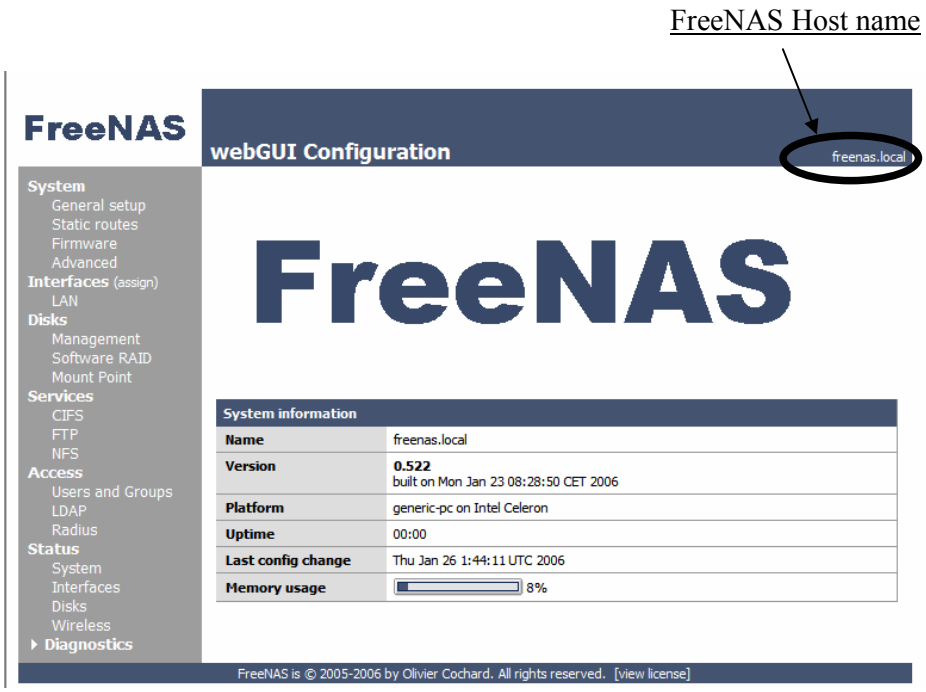
You should be presented with the FreeNAS Web GUI System Status page as shown on the next page

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 where more than one FreeNAS is administered.



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

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

4.3 Disks

Disks must be added before they can be formatted or 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. Do not remove USB drives once Mounted in FreeNAS otherwise a reboot may occur.

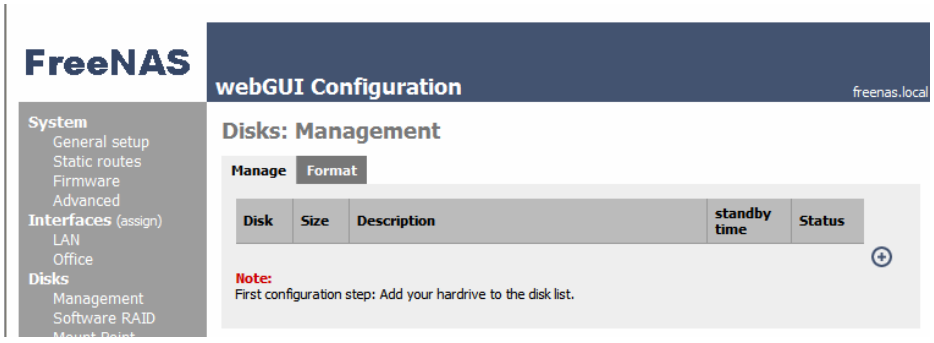
The High-Level process flow for configuring a visible share in FreeNAS is -

- Add Disks
- Format Disks (if required)
- Add Mount Point
- Enable Services (CIFS, FTP, etc)

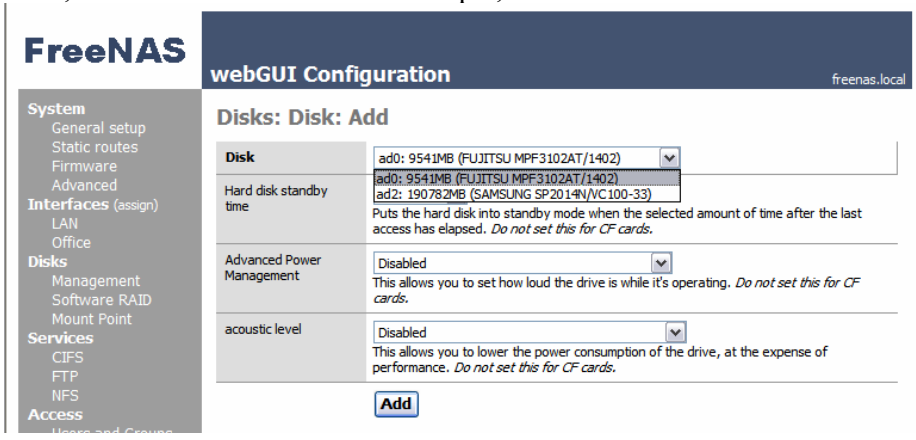
In that order. To remove a share, simply reverse the process.

4.3.1 Adding a disk

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



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

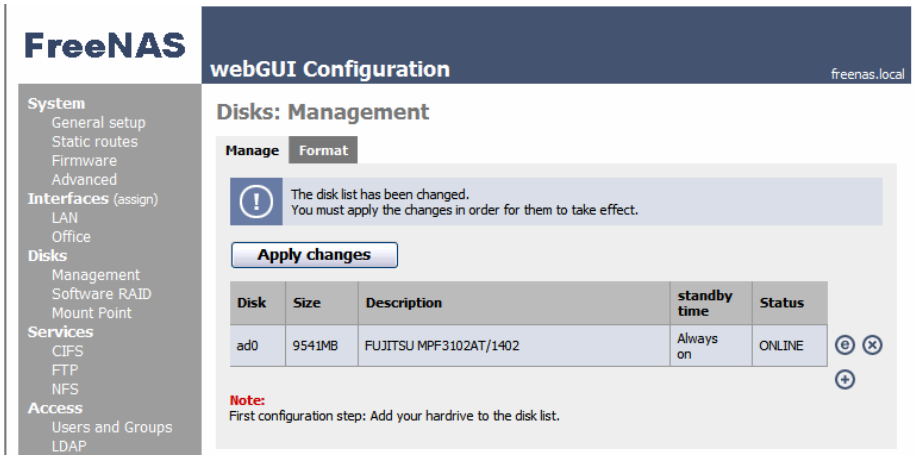


Note – For single partition hard drive installations (ref section 3.1.1) Do not add the FreeNAS boot drive *(in this example ad0.*
Adding the FreeNAS Boot drive can affect the operation of FreeNAS, and also incorrectly permits the boot drive to be formatted and mounted, which is then not accessible as a share. (in this example ad0 is the FreeNAS boot drive)

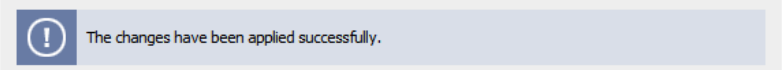
For two partition hard drive installations, *where you want to share the capacity of a single hard drive between FreeNAS and storage, you can* ***Add*** *the FreeNAS boot drive (ad0 in this example)*

For information about the Hard Disk Standby Time, Advnaced Power Management and Acoustic Level setting, please refer to section 5.3. For the moment, leave these as default.

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.



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

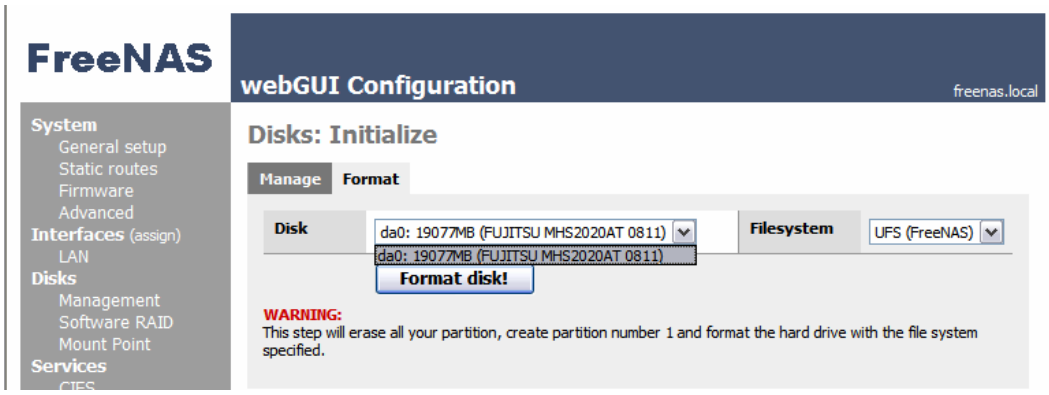


4.3.2 Formatting a Disk

IMPORTANT NOTE
If you have an existing NTFS 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 ***Format*** tab in the ***Disks/Management*** page and in the drop down, select the drive you want to format.



Note – Only Disks that you have ***Added*** appear in the drop down

In this example we will configure the disk for normal read/write access using UFS.

Leave the Filesystem setting as ***UFS(FreeNAS)*** and click the ***Format disk!*** Button

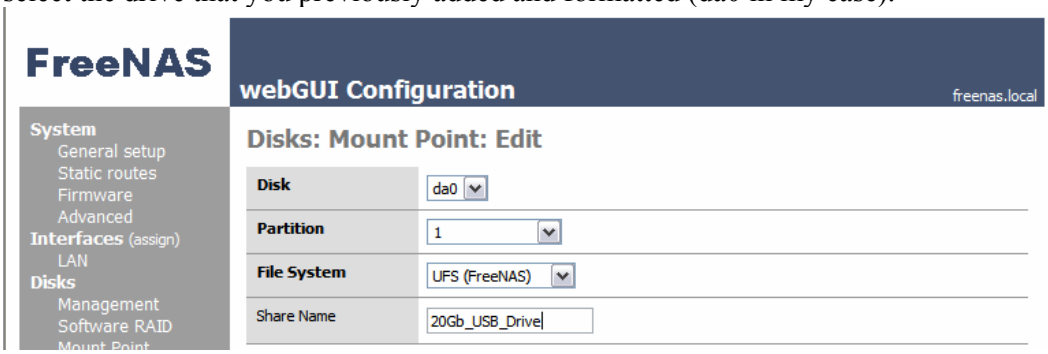
In the Display area, information similar to the following should be displayed. The amount of data and the content will different in your case.

```
Disk create UFS output:
20+0 records in
20+0 records out
20480 bytes transferred in 0.393816 secs (52004 bytes/sec)
fdisk: invalid fdisk partition table found
fdisk: Geom not found
******* Working on device /dev/da0 *******
16+0 records in
16+0 records out
524288 bytes transferred in 0.060896 secs (8609575 bytes/sec)
/dev/da0s1: 19077.2MB (39070016 sectors) block size 16384, fragment size 2048
        using 104 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,
 36129952, 36506304, 36882656, 37259008, 37635360, 38011712, 38388064, 38764416
```

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

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 (da0 in my case).



Leave the ***Partition*** dropdown as ***1*** and enter the ***Share Name*** that you want to appear on the network, **20Gb_USB_Drive**, in my example.

Note - If you have an existing NTFS disk with data on it select ***NTFS*** from the ***File System*** drop down. ***Share Name*** supports Linux standards, a-z, A-Z, 0-9, - (dash), _(underscore) characters.

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***

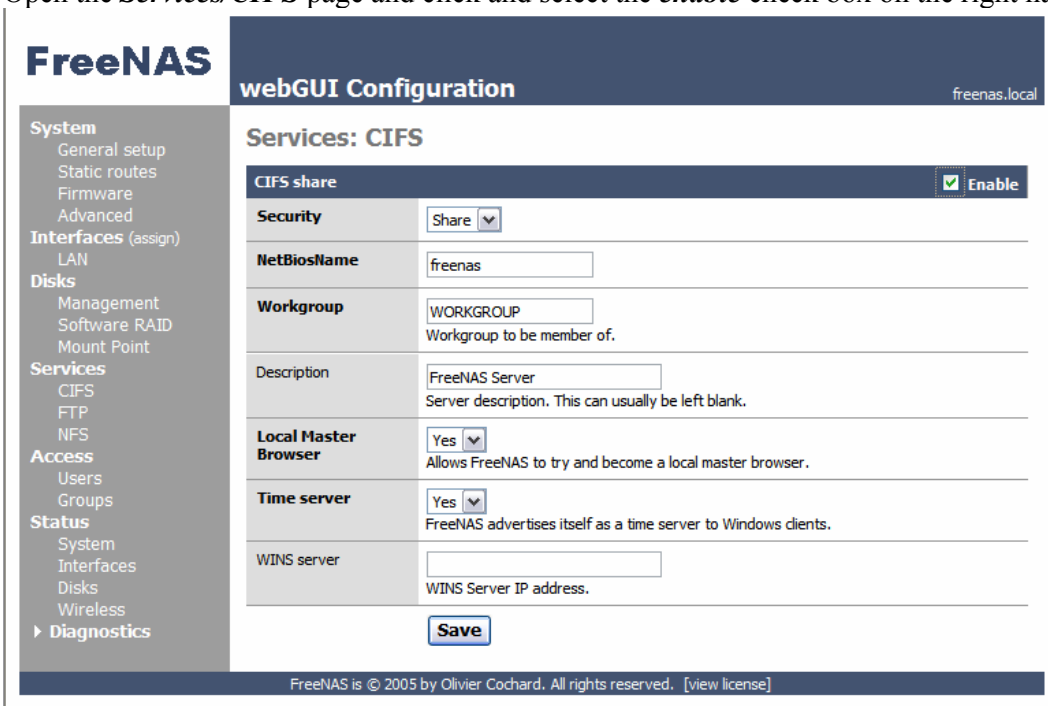
Note - Depending on the size of the Disk/s, mounting may take some time to complete. During 'mounting', all shares are temporarily offline.

4.4 Services

The last step to permit the mounted drive/s to be visible across the network is to enable some services, any or all of CIFS, FTP or NFS.

4.4.1 CIFS (Samba)

Open the ***Services/CIFS*** page and click and select the ***enable*** check box on the right hand side.



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*** (This will not work in this release of FreeNAS)

4.4.2 FTP

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.

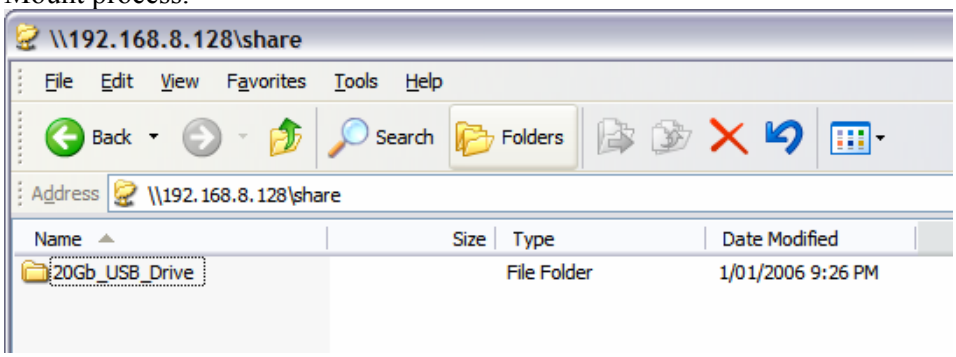
4.4.3 NFS

If you wish to permit NFS access to the FreeNAS Storage Drive/s you can enable the NFS Service. Open the ***Services/NFS*** page, add the ***Authorized network*** and ***subnet*** and click and ***enable*** the check box on the right hand side and click the ***Save*** button.

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 (\\192.168.8.128 in my case).

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 nomally logs into a Domain that is different to the 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

FreeNAS 0.5 supports Software RAID 0, 1 and 5 configurations as well as Hardware RAID. This section describes configuring Software RAID 0. The process is virtually identical for RAID 0, 1 or 5, with the exception of the option selected in the Add RAID section.

The FreeNAS team recommend 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 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.

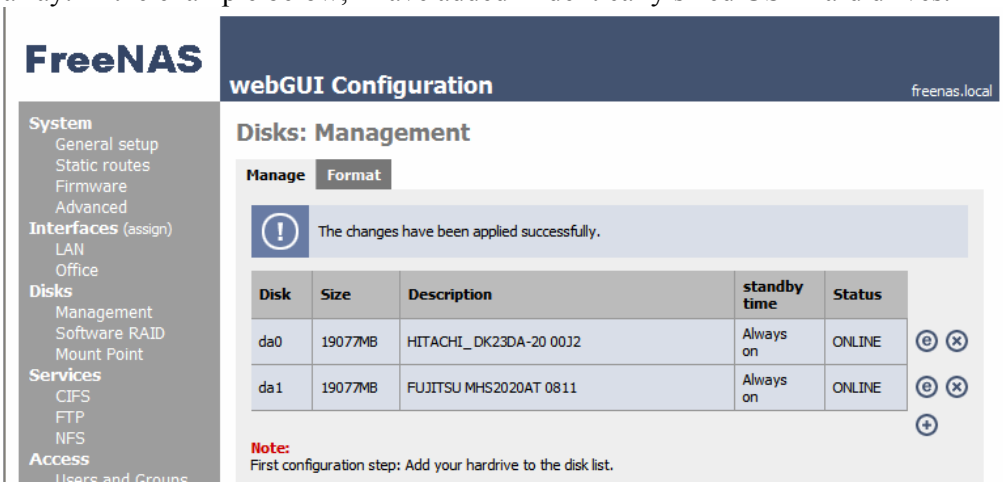
The High-Level process flow for configuring a RAID array is -

- Add Disks
- Format Disks
- Add RAID
- Format RAID
- Add Mount Point

In that order. To remove a RAID array, simply reverse the process ***plus*** reboot the FreeNAS PC once the disks are removed.

4.6.1 ADD 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 2 identically sized USB hard drives.

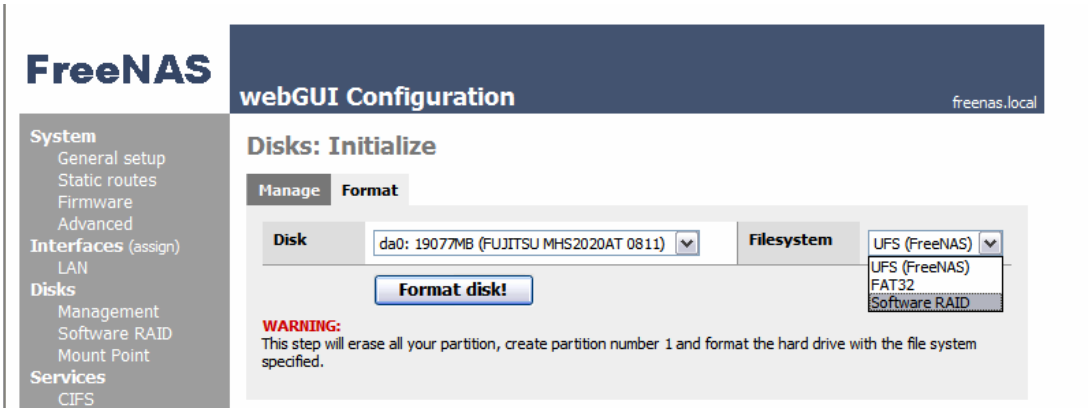


Ensure the drives are in an *ONLINE* status.

Note – You cannot use the FreeNAS boot drive, 2nd partition as a part of a RAID array. Only whole disks can be used to form a RAID array.

4.6.2 Format Disks

Open the ***Format*** TAB, select each of the Disks in turn and ensure the ***Filesystem*** is changed to ***Software RAID*** and click the ***Format Disk!*** Button.



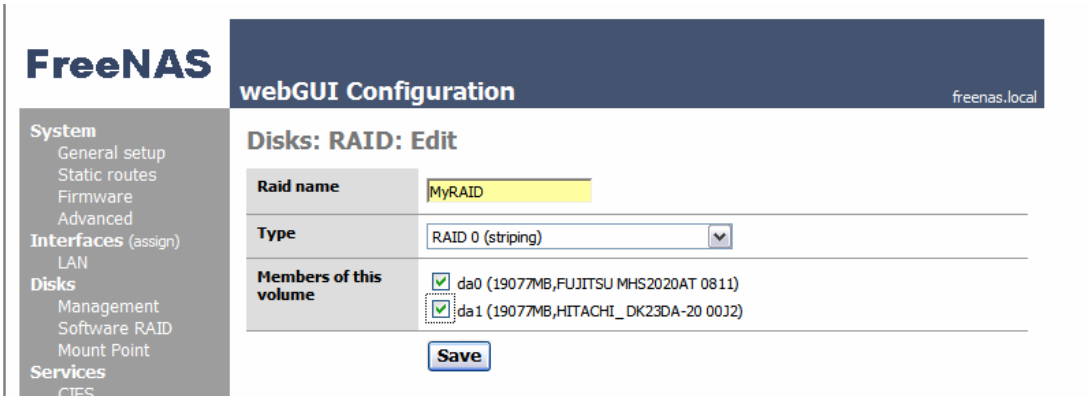
Repeat for all Disks to be used in the RAID array.

4.6.3 ADD RAID array

Open the ***Disks/Software RAID*** page and click the + sign on the right hand side to *Add* a new RAID.

Enter a ***RAID name*** for the RAID, and select the ***Type***, RAID 0 (Striping) for this example.
Note - RAID 1 (Mirroring) and RAID 5 are also available types.

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

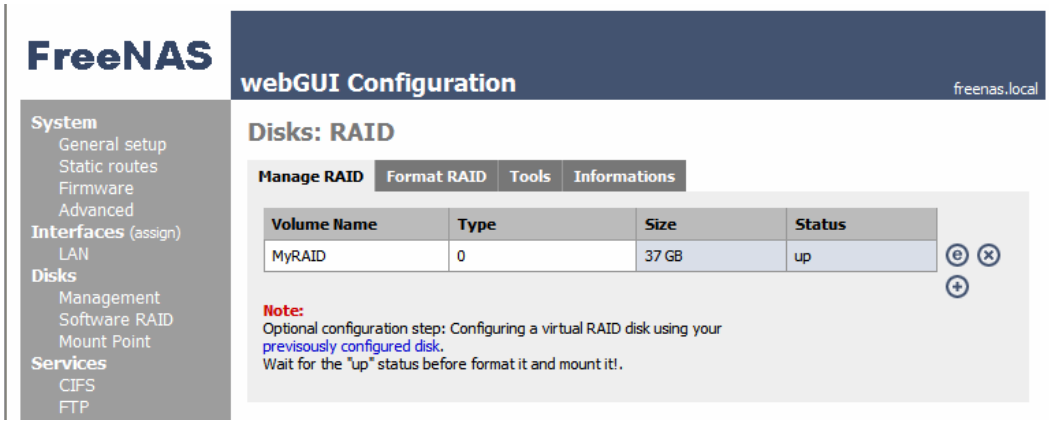


Note – drives will not appear here unless they have previously been formatted as ***Software RAID***

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

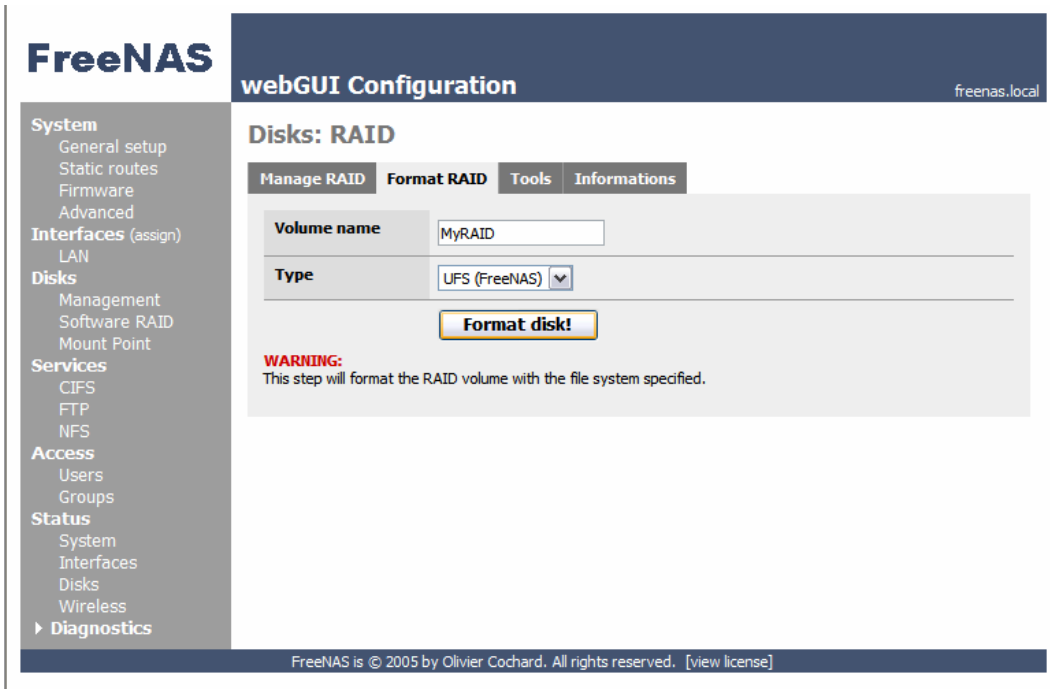
The status field will not immediately update.

In the *Navigation Tree*, click on the ***Disks Software RAID*** Navigation Tree item and the status field should update to reflect the status of the RAID array.



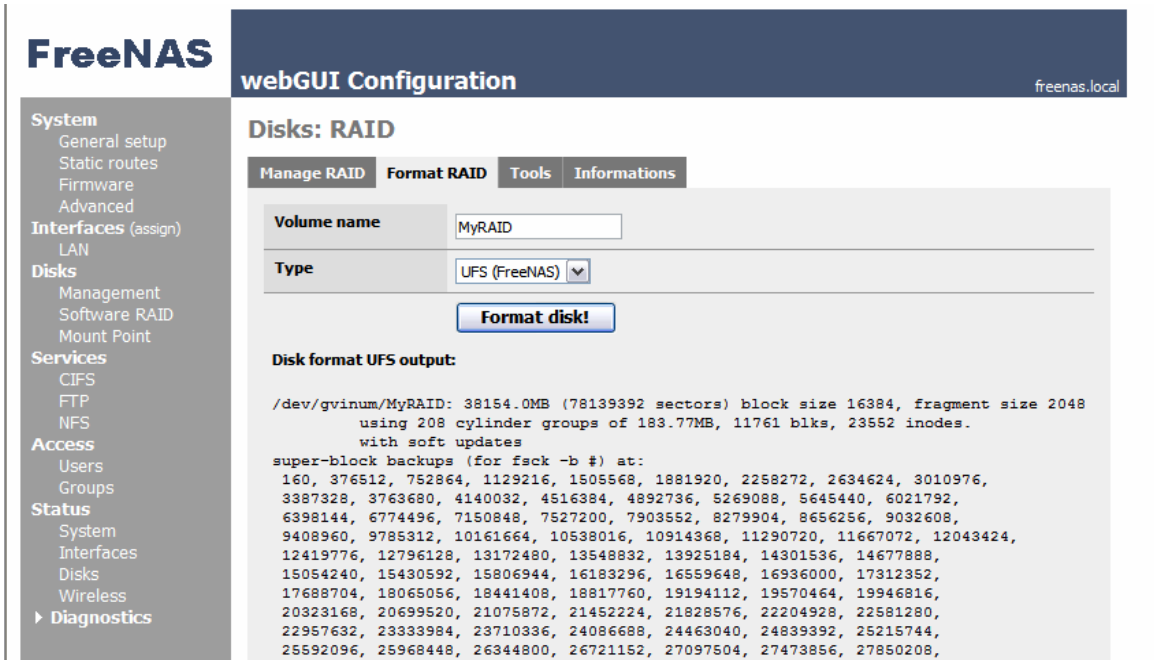
4.6.4 Format RAID array

When the Status is up, then the RAID array must be formatted.
Open the ***Format RAID*** tab and enter the RAID V***olume name*** (MyRAID in this example)



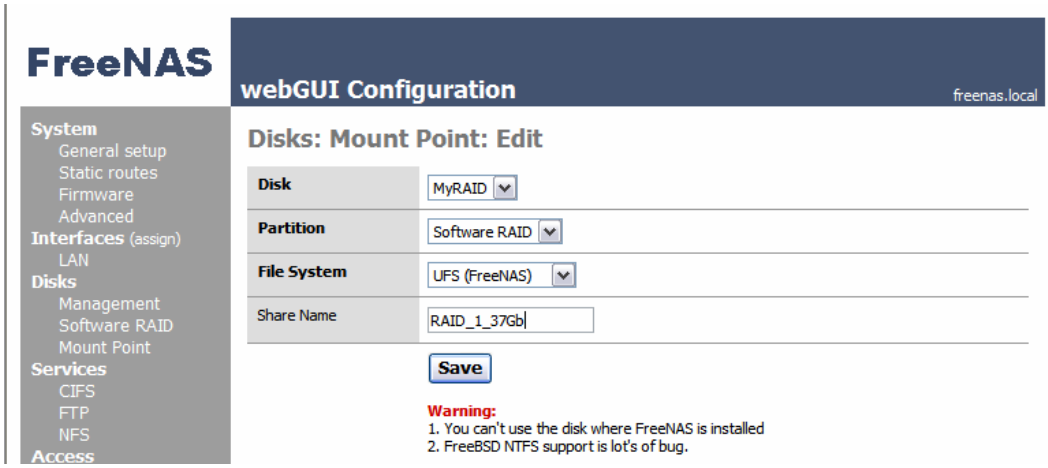
Leave the ***Type*** as ***UFS(FreeNAS)*** and click the ***Format Disk!*** Button.

A display similar to this should be output.



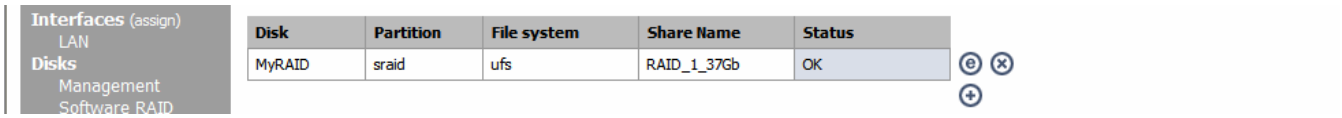
4.6.5 Mount RAID array

Once the RAID array is formatted, all that is left is to Mount the array.



Open the ***Disk/Mount Point*** page and click the + on the right hand side.
From the ***Disk*** drop down, select the RAID disk. The ***RAID name*** you previously configured is visible.
Change the ***Partition*** to ***Software RAID***
Enter a useful ***Share name*** and click the Save button.

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

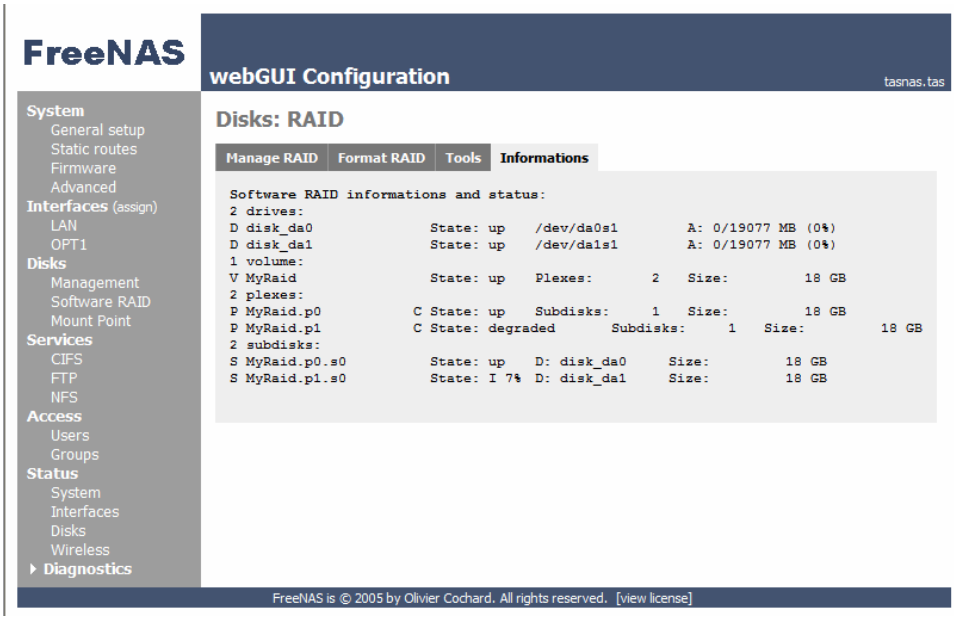


Your RAID 0 array is now ready for use. If you have already enabled CIFS, FTP or NFS, then the array, with the defined Share name, will be visible across you network.

4.6.6 RAID Status

If you want to verify the status of you RAID array, go either of the ***Status/Disks*** page and select the ***Information*** Tab or the ***Disks/Software RAID*** page and select the ***Information*** Tab. Both locations provide the same view.

A healthy RAID array will show all the State: values as ***up***. The example below shows a Mirrored RAID array (RAID 1) called ***MyRaid***, consisting of two disks (da0 and da1) with da1 in a degraded state as it is in the process of synching with the partner drive. If you get a display similar to this with a State: value of I and a percentage, refreshing the page should give an indication of increasing progress.



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 this page.

5 Customising the Configuration

5.1 Network Settings

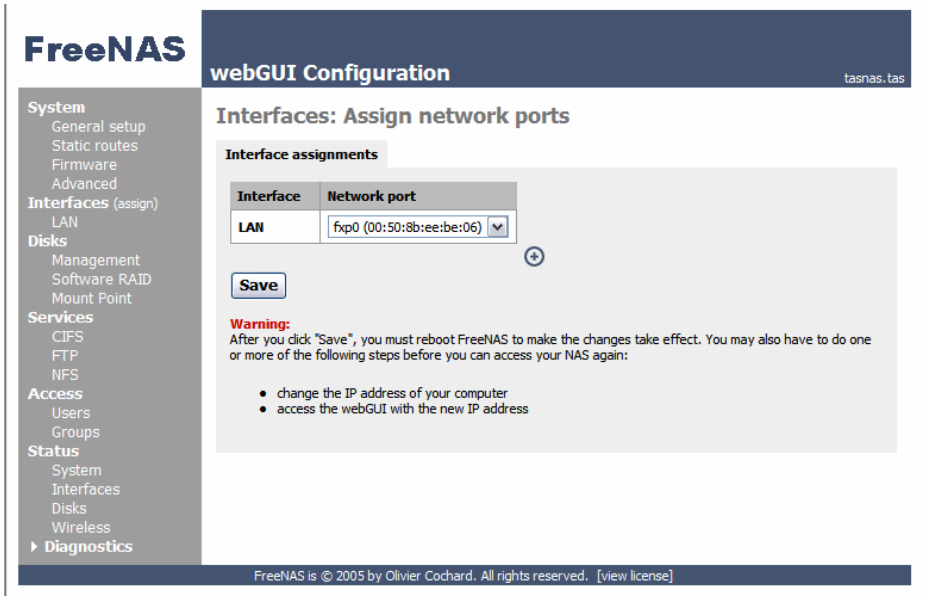
The following additional Network configurations are not mandatoryfor the operation of FreeNAS, but may be required in some network configurations.

5.1.1 Additional LAN interfaces

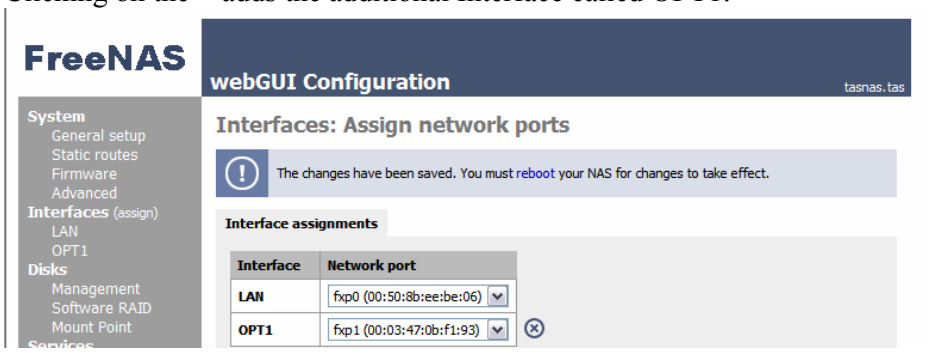
In addition to the LAN interface, additional Ethernet Interfaces can be defined, if required. This can be either wired Ethernet interface or Wireless interfaces. See section 5.1.3 for more information relating to wireless LAN interfaces.
The additional interfaces may be used to administer FreeNAS or to access the shares, so it can be a useful redundant interface to FreeNAS for either function.

The addiditonal 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 facilitiate 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 addiditonal 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.



Clicking on the + adds the additional Interface called OPT1.



OPT1 is the default name of the interface, and this can be customised. Once OPT1 is configured you will notice an additional level under ***Interfaces (assign)*** called ***OPT1***.
Click Save
Then reboot FreeNAS to ensure the additional interface is recognised. Ou 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,

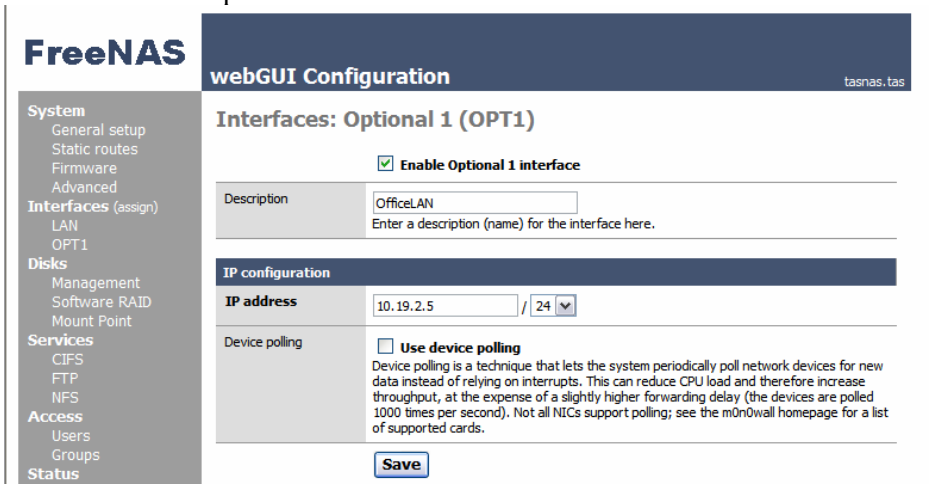
Click the Enable Optional 1 interface check box.

Enter a description for the interface.

Enter the IP Address and Subnet for the Interface and click Save.

This new Interface name in the Navigation Tree and other displays like ping/traceroute, etc will be updated.

A reboot is not required.

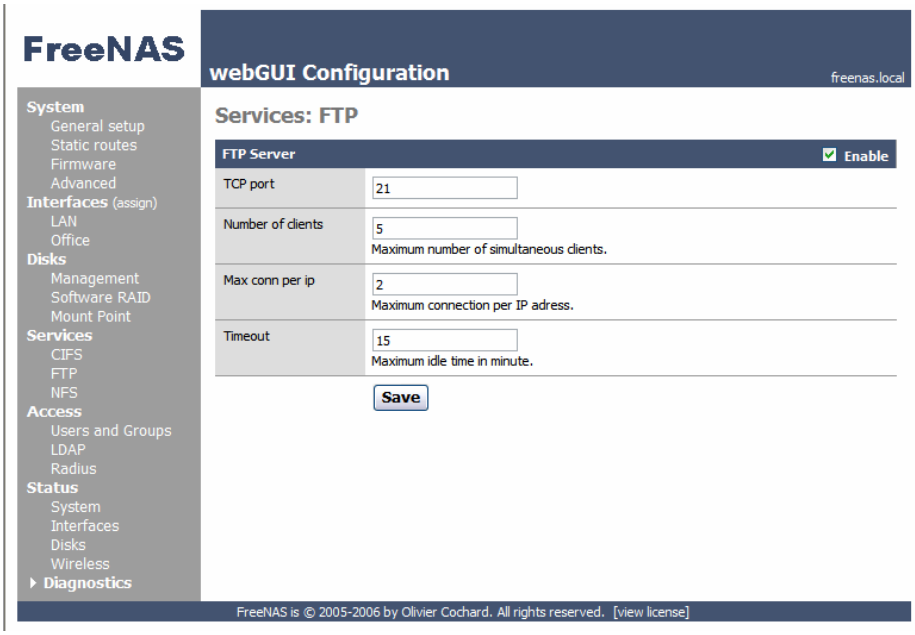


Security Note on additional interfaces
FreeNAS does not provide any routing between Ethernet interfaces, so any potential security risks of 'joining' two networks via FreeNAS is not possible. But, there is always the potential for virus infected files stored on FreeNAS to be accessible from either network, 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.
In a future release of FreeNAS, user permissions may also consider the network interface as one of the configurable attributes.

5.1.2 Assigning/Changing FTP Port

The FTP server within FreeNAS, if enabled permits users to FTP files into/out of FreeNAS rather than using a network share. This can be used to permit access to FreeNAS shares from other networks. To improve the security of FTP or to overcome limitations in some networks where the standard FTP TCP port (21) is not permitted, the FreeNAS FTP port can be changed on the ***Services:FTP*** page. Don't forget to click ***Save*** once the change is made.

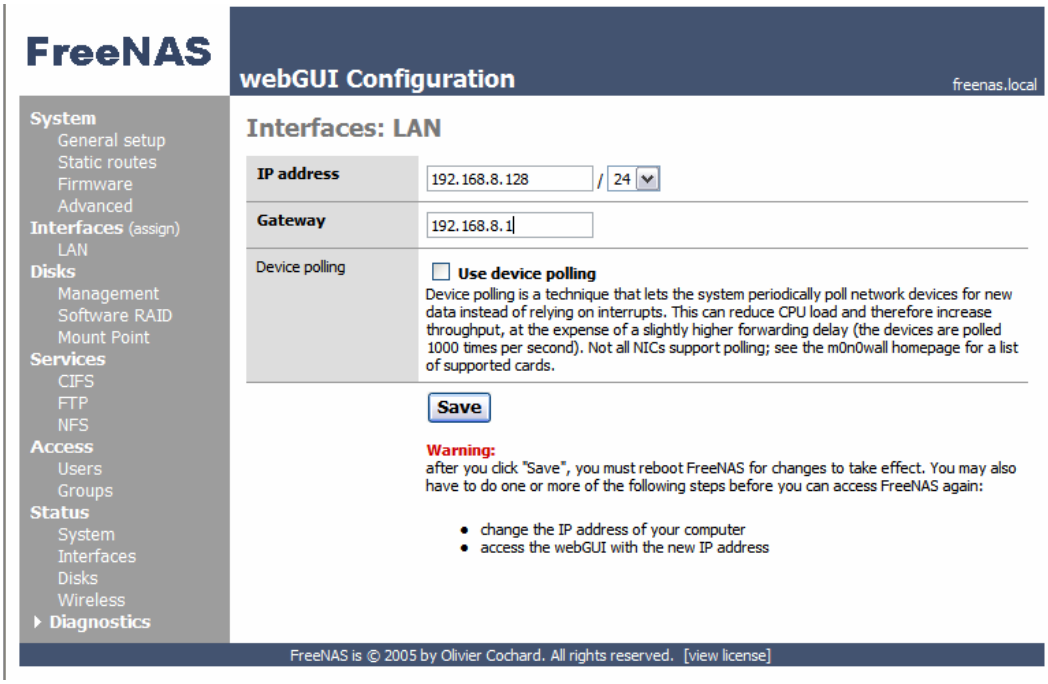


5.1.3 Wireless LAN interfaces (incomplete)

To be added

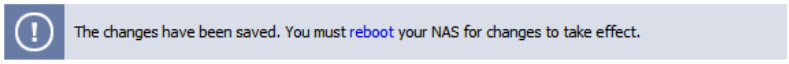
5.1.4 Default Gateway

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***



Configure the address your ***Default Gateway***. (192.168.8.1, in this example)

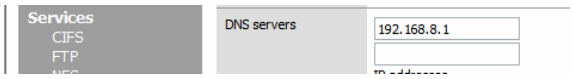
If you change your ***Default Gateway***, or select Save at this point, you will be prompted to reboot the FreeNAS PC with the following message;



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.

5.1.5 DNS

DNS server settings are required where FreeNAS is required to permit FreeNAS to connect to NTP time servers or to ping other network devices by name.
Up to two DNS servers may be configured on the System: General setup page and a reboot is not required when changing the DNS settings.



5.1.6 WebGUI Protocol and Port (incomplete)

To be added

5.1.7 Static Routes (incomplete)

To be added

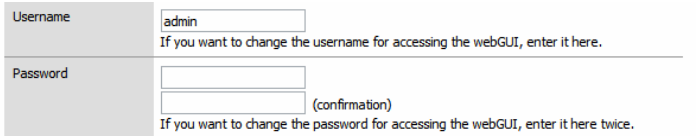
5.2 Other Settings

5.2.1 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.

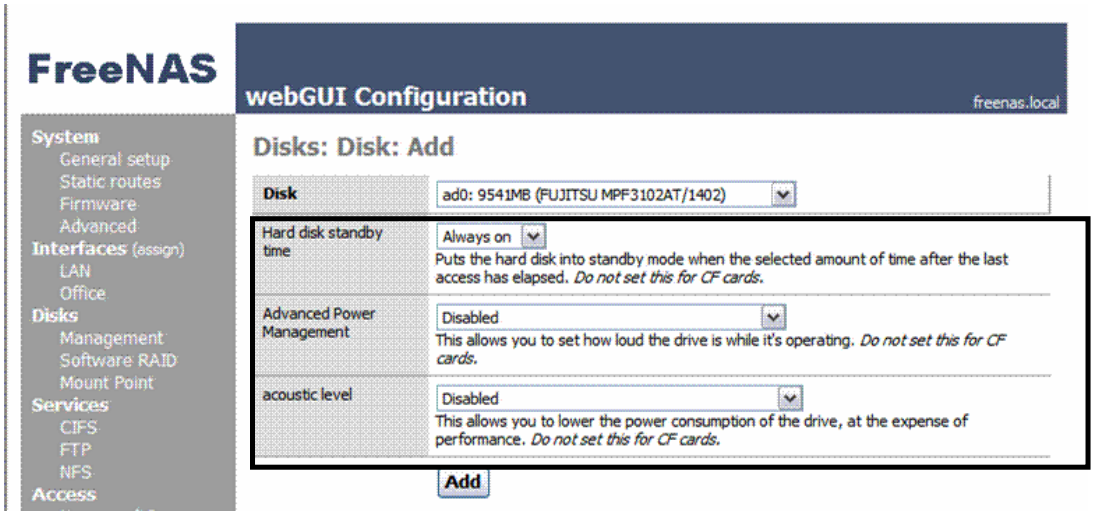
5.2.2 Changing Default Admin Username and Password

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



5.3 Advanced Hard Drive Parameters

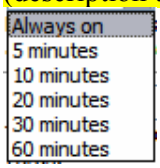
When Adding a Disk, there are some new options included as part of FreeNAS 0.522 and above that have the portential to increase the lifespan of Hard Disk Drives within FreeNAS. Not all HDD support any, or all of these advanced hard drive options, and so you should confirm your HDD capabilities via the Diagnostic: Information Page and the ataidle tab. (see below) Similarly, CF cards should not have ANY of these settings enabled.



Advanced Hard Drive Parameters

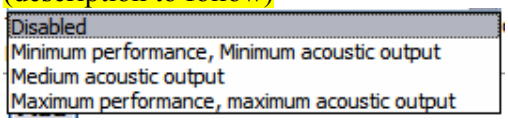
5.3.1 Hard Disk Standby time

(description to follow)

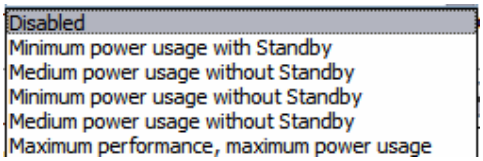


5.3.2 Advanced Power Management (also known as APM)

(description to follow)



5.3.3 Acoustic Level (also known as AAC)



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

Verify you HDD capabilites for S.M.A.R.T, APM and AAC via the the Diagnostic: Information page, ataidle Tab.
Examples of Advanced Hard Drive capabilities from the Diagnostic: Information page, ataidle Tab.

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:

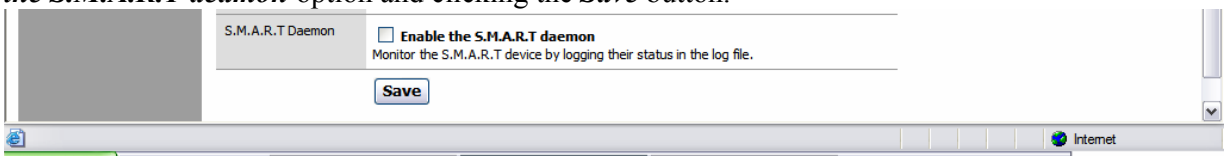
Model:	SAMSUNG SP2014N
Serial:	S088J1RY906273
Firmware Rev:	VC100-33
ATA revision:	ATA-7
Geometry:	16383 cyls, 16 heads, 63 spt
Capacity:	127GB
SMART Supported:	yes
SMART Enabled:	yes
APM Supported:	no
AAC Supported:	yes
AAC Enabled:	no

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.

5.3.5 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 deamon*** option and clicking the ***Save*** button.



5.4 Upgrading FreeNAS

Only supported on FreeNAS 0.52 and above.

Upgrading FreeNAS, via the Firmware Upgrade page is only supported on FreeNAS 0.52 and above. Do not attempt to upgrade eariler versions of FreeNAS.
Upgrading permits a user to upgrade the FreeNAS code without performing a complete installation.

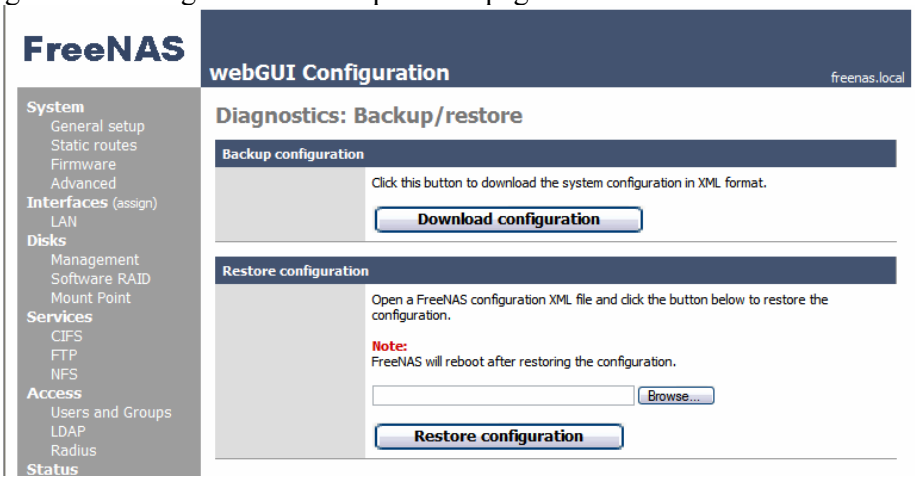
Normally an installation would require an .iso file to be burnt to CD. For upgrades, a .img file is used and may be stored on anylocation that your PC (the client) can see.

Firsly, download the latest FreeNAS .img file from the FreeNAS website or Sourceforge. Then, assuming you are logged into FreeNAS, perform the following steps.

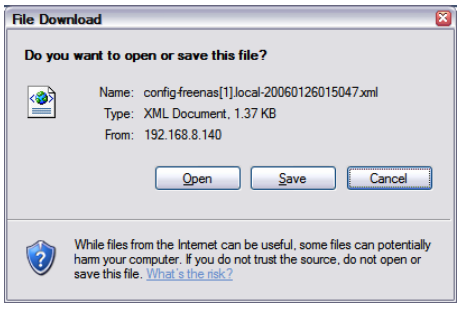
- Backup your existing configuration
- Upgrade FreeNAS
- Verify your FreeNAS configuration

5.4.1 Backup FreeNAS

- Navigate to the Diagnostics: Backup/restore page



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

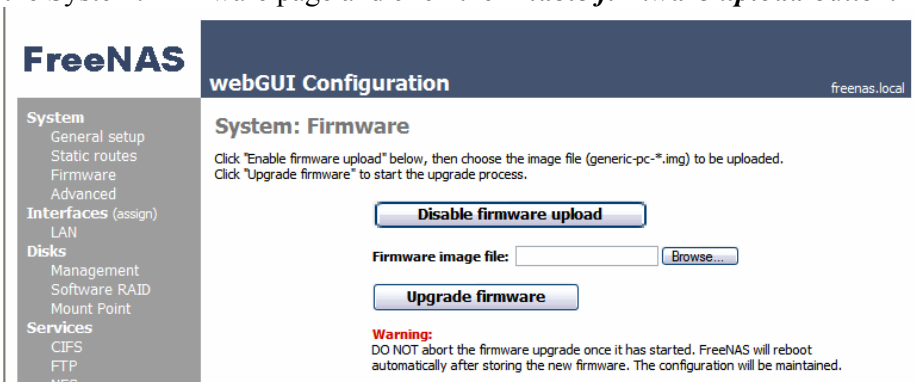


Saving the config file (XP example)

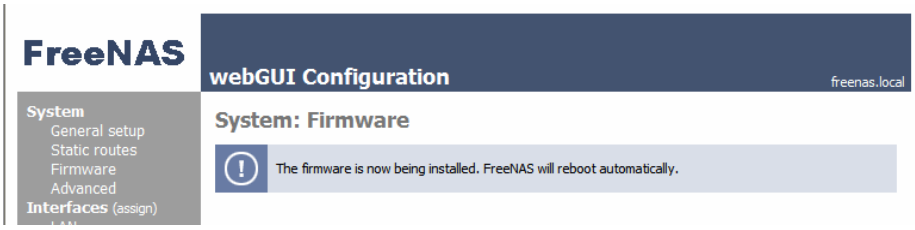
Do not store the config file on your FreeNAS storage.

5.4.2 Performing the Upgrade

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



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 FreeNAS or Sourceforge website.
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.



Once the reboot is complete, log back into FreeNAS. 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.

5.4.3 Verify FreeNAS configuration

The upgrade will normally not modify any of the FreeNAS configuration, 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.

5.5 Serial port

FreeNAS 0.522 introduces the ability to monitor the boot process and system messages via the FreeNAS PC serial port, if equipped. Any system generated messages are output to this port as well as catured in the log, accible via the WebGUI.

Console Setup menu access via the serial port is currently not supported, but may be supported in a future release of FreeNAS.

The settings for this are 9600,N,8,1 and if you are monitoring the serial port with another PC, then a null modem cable or adaptor is required as this will be a DTE to DTE connection.

A typical boot log is displayed below

```
/boot/kernel/kernel text=0x46ada4 -_data=0x7ef74+0x51658 |_syms=[0x4+0x576e0\_+0x4+0x6db39/_
Booting [/boot/kernel/kernel]...
Copyright (c) 1992-2005 The FreeBSD Project.
Copyright (c) 1979, 1980, 1983, 1986, 1988, 1989, 1991, 1992, 1993, 1994
        The Regents of the University of California. All rights reserved.
FreeBSD 6.0-STABLE #10: Thu Jan  5 12:03:39 CET 2006
    root@dev.freenas.org:/usr/src/sys/i386/compile/FREENAS_GENERIC
Timecounter "i8254" frequency 1193182 Hz quality 0
CPU: Intel Celeron (598.06-MHz 686-class CPU)
  Origin = "GenuineIntel"  Id = 0x686  Stepping = 6

Features=0x383fbff<FPU,VME,DE,PSE,TSC,MSR,PAE,MCE,CX8,APIC,SEP,MTRR,PGE,MCA,CMOV,PAT,PSE36,MMX,FXSR,S
SE>
real memory  = 267386880 (255 MB)
avail memory = 231104512 (220 MB)
MPTable: <COMPAQ   Deskpro     >
ioapic0: Changing APIC ID to 8
ioapic0: Assuming intbase of 0
ioapic0 <Version 2.0> irqs 0-23 on motherboard
npx0: [FAST]
npx0: <math processor> on motherboard
npx0: INT 16 interface
cpu0 on motherboard
pcib0: <MPTable Host-PCI bridge> pcibus 0 on motherboard
pci0: <PCI bus> on pcib0
agp0: <Intel 82815 (i815 GMCH) SVGA controller> mem 0x44000000-0x47ffffff,0x40900000-0x4097ffff irq
16 at device 2.0 on pci0
pcib1: <MPTable PCI-PCI bridge> at device 30.0 on pci0
pci2: <PCI bus> on pcib1
ohci0: <NEC uPD 9210 USB controller> mem 0x40200000-0x40200fff irq 16 at device 4.0 on pci2
ohci0: [GIANT-LOCKED]
usb0: OHCI version 1.0
usb0: <NEC uPD 9210 USB controller> on ohci0
usb0: USB revision 1.0
uhub0: NEC OHCI root hub, class 9/0, rev 1.00/1.00, addr 1
uhub0: 3 ports with 3 removable, self powered
ohci1: <NEC uPD 9210 USB controller> mem 0x40300000-0x40300fff irq 18 at device 4.1 on pci2
ohci1: [GIANT-LOCKED]
usb1: OHCI version 1.0
usb1: <NEC uPD 9210 USB controller> on ohci1
usb1: USB revision 1.0
uhub1: NEC OHCI root hub, class 9/0, rev 1.00/1.00, addr 1
uhub1: 2 ports with 2 removable, self powered
ehci0: <NEC uPD 720100 USB 2.0 controller> mem 0x40600000-0x406000ff irq 21 at device 4.2 on pci2
ehci0: [GIANT-LOCKED]
usb2: EHCI version 0.95
usb2: companion controllers, 3 ports each: usb0 usb1
usb2: <NEC uPD 720100 USB 2.0 controller> on ehci0
usb2: USB revision 2.0
uhub2: NEC EHCI root hub, class 9/0, rev 2.00/1.00, addr 1
uhub2: 5 ports with 5 removable, self powered
umass0: NewMotionTECH USB Storage Adapter, rev 2.00/11.06, addr 2
umass1: vendor 0x05e3 USB TO IDE, rev 2.00/0.02, addr 3
fxp0: <Intel 82801BA/CAM (ICH2/3) Pro/100 Ethernet> port 0x1000-0x103f mem 0x40400000-0x40400fff irq
20 at device 8.0 on pci2
miibus0: <MII bus> on fxp0
inphy0: <i82562EM 10/100 media interface> on miibus0
inphy0:  10baseT, 10baseT-FDX, 100baseTX, 100baseTX-FDX, auto
fxp0: Ethernet address: 00:02:a5:1a:80:18
fxp1: <Intel 82559 Pro/100 Ethernet> port 0x1040-0x107f mem 0x40500000-0x40500fff,0x40100000-
0x401fffff irq 18 at device 9.0 on pci2
miibus1: <MII bus> on fxp1
```



```
inphy1: <i82555 10/100 media interface> on miibus1
inphy1:  10baseT, 10baseT-FDX, 100baseTX, 100baseTX-FDX, auto
fxp1: Ethernet address: 00:03:47:0b:f1:93
bge0: <Broadcom BCM5703 Gigabit Ethernet, ASIC rev. 0x1002> mem 0x40000000-0x4000ffff irq 21 at
device 10.0 on pci2
miibus2: <MII bus> on bge0
brgphy0: <BCM5703 10/100/1000baseTX PHY> on miibus2
brgphy0:  10baseT, 10baseT-FDX, 100baseTX, 100baseTX-FDX, 1000baseTX, 1000baseTX-FDX, auto
bge0: Ethernet address: 00:10:18:03:92:63
isab0: <PCI-ISA bridge> at device 31.0 on pci0
isa0: <ISA bus> on isab0
atapci0: <Intel ICH2 UDMA100 controller> port 0x1f0-0x1f7,0x3f6,0x170-0x177,0x376,0x2460-0x246f at
device 31.1 on pci0
ata0: <ATA channel 0> on atapci0
ata1: <ATA channel 1> on atapci0
uhci0: <Intel 82801BA/BAM (ICH2) USB controller USB-B> port 0x2440-0x245f irq 23 at device 31.4 on
pci0
uhci0: [GIANT-LOCKED]
usb3: <Intel 82801BA/BAM (ICH2) USB controller USB-B> on uhci0
usb3: USB revision 1.0
uhub3: Intel UHCI root hub, class 9/0, rev 1.00/1.00, addr 1
uhub3: 2 ports with 2 removable, self powered
pci0: <multimedia, audio> at device 31.5 (no driver attached)
pmtimer0 on isa0
orm0: <ISA Option ROMs> at iomem 0xc0000-0xc9fff,0xca000-0xcb7ff,0xcb800-0xd8fff,0xe0000-0xeffff on
isa0
atkbdc0: <Keyboard controller (i8042)> at port 0x60,0x64 on isa0
atkbd0: <AT Keyboard> flags 0x1 irq 1 on atkbdc0
kbd0 at atkbd0
atkbd0: [GIANT-LOCKED]
fdc0: <Enhanced floppy controller> at port 0x3f0-0x3f5,0x3f7 irq 6 drq 2 on isa0
fdc0: [FAST]
fd0: <1440-KB 3.5" drive> on fdc0 drive 0
sc0: <System console> at flags 0x100 on isa0
sc0: VGA <16 virtual consoles, flags=0x300>
sio0 at port 0x3f8-0x3ff irq 4 flags 0x10 on isa0
sio0: type 16550A, console
sio1 at port 0x2f8-0x2ff irq 3 on isa0
sio1: type 16550A
vga0: <Generic ISA VGA> at port 0x3c0-0x3df iomem 0xa0000-0xbffff on isa0
unknown: <PNP0501> can't assign resources (port)
unknown: <PNP0501> can't assign resources (port)
unknown: <PNP0700> can't assign resources (port)
unknown: <PNP0c01> can't assign resources (memory)
unknown: <PNP0100> can't assign resources (irq)
unknown: <PNP0303> can't assign resources (port)
Timecounter "TSC" frequency 598062477 Hz quality 800
Timecounters tick every 1.000 msec
md0: Preloaded image </mfsroot> 20971520 bytes at 0xc0a015b0
ad0: 9541MB <FUJITSU MPF3102AT 1402> at ata0-master UDMA66
ad2: 190782MB <SAMSUNG SP2014N VC100-33> at ata1-master UDMA100
da0 at umass-sim0 bus 0 target 0 lun 0
da0: <HITACHI_ DK23DA-20 00J2> Fixed Direct Access SCSI-0 device
da0: 40.000MB/s transfers
da0: 19077MB (39070080 512 byte sectors: 255H 63S/T 2432C)
da1 at umass-sim1 bus 1 target 0 lun 0
da1: <FUJITSU MHS2020AT 0811> Fixed Direct Access SCSI-0 device
da1: 40.000MB/s transfers
da1: 19077MB (39070080 512 byte sectors: 255H 63S/T 2432C)
Trying to mount root from ufs:/dev/md0
fxp0: link state changed to UP
fxp1: Microcode loaded, int_delay: 1000 usec  bundle_max: 6
fxp1: link state changed to UP
fxp1: Microcode loaded, int_delay: 1000 usec  bundle_max: 6
speaker0: <PC speaker> at port 0x61 on isa0
```


The Last Page (so far)

