NAS4Free Setup and User Guide

Still a work in progress 🟡

The goal of this manual is to provide a starting point for you to install and use NAS4Free. Sections 1 and 2 of this manual cover basic installation of NAS4Free and include processes and procedures that may help you configure and use some of the services included in NAS4Free. If you need to know <u>how to do something</u>, you may find it in these first 2 sections of the manual.

Sections 3 and beyond cover details and more advanced features of NAS4Free. In these sections you can find brief explanations about the options and settings you see in the WebGUI. If you need to know <u>what something is or does</u>, you will probably find it in Section 3 or beyond.

NAS4Free is easy to install, configure and manage. It is arguably the simplest and most full featured NAS OS available in 2012. However, NAS4Free is not a turnkey system, you are the W OEM, it is up to you to already know or learn about the services and features provided by NAS4Free so you can make effective use of your server.

Warning - While trying to be as helpful as possible, this manual <u>WILL NOT TRY TO</u>:
* Teach you what RAID is, how to set-up a network or manage a firewall.
* Teach you system administration and how to manage Users and Groups.
* Help you select the best MotherBoard or hard drive controller, etc..
* Show you how to do many other things like how to configure iSCSI to work with your ESXi server in an AD Domain.
You will need to know things like this already or learn about them from other resources.

---

1 Introduction

1.1 Hardware Requirements

NAS4Free can be installed onto a wide range of hardware. Anything from a actual server to an old PC you may have laying around!

- A PC with **a minimum of 512MB of RAM**, a bootable CD-Rom Drive plus either:
    - A Floppy Disk/USB Stick (for configuration storage) and one or more Hard Drives (as storage)
    - A Bootable USB or CF drive (2GB minimum for Embedded platform, 4GB for Full platform), *but use CF or USB drive for Full platform* **not recommended**, and 1 or more Hard Drives for it's data storage.
    - A Bootable Hard Drive and one or more Hard Drives (as storage)
    - A Bootable Hard Drive (which will be partitioned for NAS4Free and Data)
- Or a virtual PC emulator such as VMware/QEMU, configured as above.

Note - Where NAS4Free is installed on a bootable USB Drive, CF Drive or Hard Drive, the bootable Live-CD/USB should be removed once NAS4Free is installed.

Warning !

- 512MB of RAM is the minimum required for upgrading the Embedded platforms.
- 1GB of RAM is the minimum required for starting the Full platform.
- Using advanced features like software RAID-5, ZFS and enabling lots of functions may need more RAM (1GB or greater).
- For using ZFS, we recommend a absolute minimum of 2GB RAM using a 64-bits install by using the latest NAS4Free-x64 releases.

1.2 Limitations

Here are some limitations and interactions of NAS4Free:

Local User/Password feature is covered in this document. Additional notes are available in the changelog on the NAS4Free website.

- UFS-formatted Storage drives are supported and will work with MS Windows accross the LAN.
- UFS is the native NAS4Free 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.
- Only EXT2/3 revision 0 with Inode size of 128 bytes supported. Revision 1 uses a inode size of 256 bytes which is not supported by FreeBSD. When create ext2/3 partitions, using 128 bytes via '-I 128' could solve this problem but the file system is permanently in 'not clean' state.
- SCSI, PATA (IDE), SATA, CF and USB drives are supported.
- NAS4Free's boot drive partition cannot be used as part of any 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 later in this guide.
- Any drive (USB, ZIP, CD-Rom) MUST be first unmounted before removing it. A reboot could occur otherwise.

Major FreeBSD (underlying OS of NAS4Free) old bug:

Using CIFS/SMB to read/write any file(s) on a FAT32 drive partition is known to corrupt files!

1.3 Getting Help

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

1. Read and search through the Wiki.
2. Read the FAQs.
3. Search the forum NAS4Free Forum.
4. Ask in the NAS4Free IRC-Channel FreeNode IRC Channel #nas4free

2 Installation

2.1 Installation and Configuration Overview

NAS4Free installation and configuration involves three steps, which are:

1. Download the NAS4Free ISO, burn it to a CD-ROM, then boot from the CD-ROM. The Initial Configuration is done via the NAS4Free Console Setup Menu on the NAS4Free PC.
   After this stage NAS4Free will be installed on and run from your drive. However, you still need to complete the second step to make NAS4Free operational. This step is optional: You can run NAS4Free from a CDROM and a MS DOS floppy disk or USB device to store configuration.
2. Basic Configuration via the WebGUI.
   After this stage your NAS4Free server will be operational having a basic configuration.
3. Advanced configuration via WebGUI and Command Shell.
   Sections 1 and 2 of this manual cover processes and procedures that may help you configure and use NAS4Free. It is up to you to read and understand the various options and features offered by NAS4Free and to decide How-to and What-to-do based on your own requirements.

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

2.2 Using NAS4Free with the CDROM and a removable disk (LiveCD mode)

You can use NAS4Free with the CDROM and an **MSDOS formatted** floppy disk or USB key.

- The floppy disk or USB key must be already MSDOS formatted (NAS4Free will not format it).
- NAS4Free will try to find its configuration file (config.xml) in the directory "conf" at the root of your removable disk. If there is no existing configuration file, NAS4Free will create the directory "conf" and save its configuration file in it.

This description assumes the NAS4Free PC hardware is capable of booting from a CD Rom and has a floppy/flash/usb/hdd for storage.

Ensure your computer's BIOS is configured to boot from "CDROM" first, to prevent other media from being booted instead.

Insert the CDROM in the CD/DVD drive, and boot your PC. After NAS4Free has booted with no error message concerning "no floppy disk found" you can skip the section 2.3 and go to section 2.4 directly

2.3 Installing NAS4Free on disk

WARNING: NAS4Free is a standalone Operation System (OS) and NAS appliance.

Installing NAS4Free wipes any existing content on the destination disk. Existing files will be deleted as part of the installation process.

The install process of NAS4Free doesn't support Dual-boot.

Don't install NAS4Free on disk bigger than 2TB (NAS4Free support theses disks as "data" disk only, not as system boot disk).

This description assumes the NAS4Free PC hardware is capable of booting from a CD-Rom and has a boot Hard Drive (than can also be an USB key or CF card) and may have one or more Hard Drives for storage. * Download the NAS4Free ISO and burn the image onto a CD-Rom.

- Place the NAS4Free CD in the CD-Rom and boot from CD (Don't connect your flash device at this moment, connect it until you see the console menu below, otherwise LiveCD will write its default configuration file to the root of your flash device lead to the following installation fail).
- Wait until the NAS4Free Console Setup Menu comes up
- If you want to install NAS4Free to flash devices, connect it now, NAS4Free will display new device information on the screen, press Enter to back to console menu
- select option 9 to install NAS4Free on your hard disk/flash devices

```
"Welcome to NAS4Free"
"********************"
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) Shutdown system
9) Install/Upgrade to hard drive/flash device, etc.
```

- You can choose to have a single HDD installation (option 2 or 3 below), that is - have a NAS4Free boot partition and a second one on the same HDD as Storage(DATA).

```
"Install"
"********************"
1) Install 'embedded' OS on HDD/Flash/USB
2) Install 'embedded' OS on HDD/Flash/USB + DATA + SWAP partition
3) Install 'full' OS on HDD + DATA + SWAP partition
4) upgrade 'embedded' OS from CDROM
5) Upgarde 'full' OS from CDROM
6) Upgrade and convert 'full' OS to 'embedded'
```

If you select 1:

```
NAS4Free 'embedded' installer for Flash device or HDD.
- Create 1 partition for OS image
- Uses a RAM disk to limit read/write access to the device
Warning: There will be some limitations:
1. This will erase ALL partition and data on the destination disk
2. You can't use your destination disk for sharing data
Installing on USB key is the preferred way:
```

```
It saves you an IDE or SCSI channel for more hard drives.
```

This option would install NAS4Free 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 or USB Key

- Select the Source CD drive (acd0 for example if you have only one ATA CDROM drive).
- Select the Destination HDD that you want to install and boot NAS4Free from (da0 for example if you want to install it on a USB key).

If you select 2 or 3: This would install NAS4Free on a drive and the remainder of the drive will be UFS-formatted for being used for storage(DATA) 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 NAS4Free from (ad0 for example if you want to install it on the master hard drive on the ATA channel 1).

In both cases, once NAS4Free is installed, follow the instructions, remove the CD and when the menu comes up again

- Pree ESC or select 'Exit' and enter to exit to the main menu
- Select 7 to reboot the computer.

Use the option "4 or 5 or 6) Upgrade an existing release from CDROM"

If you have installed it on a USB key: Ensure your computer's BIOS is configured to boot from "USB hard drive" – some BIOS do not support this ("USB FDD" or "USB ZIP" should be tested).

After the first boot:

- Check that the menu option 9) is no longer present: If it is, then you are still booting from the CDROM.
- Go to the LAN Interface and IP configuration section of this document.

NAS4Free uses FreeBSD as underlying OS, and FreeBSD is not Linux!!!! The disk convention naming 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.
- /dev/da0p1: The '**p**' represents an EFI/GPT partition type, and '**1**' represents the first partition on the device. This is the new standard starting from version 9.0.0.1
- /dev/da0s1: The '**s**' represents the old standard partition type. For any filesystem other that UFS you should look for an 's' type partition.
- /dev/raid5/RAIDname: 'RAID' is only the array device.
- /dev/raid5/RAIDp1: This is the filesystem on the RAID device.

3 Initial configuration

3.1 LAN interface and IP configuration

Once you have installed NAS4Free 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) Shutdown system
8) PowerOff system
```

The default configuration of NAS4Free 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 to use the 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 it is not possible to ping a computer protected by a personal firewall). Disable the firewall first.

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
- fxp1 : 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…

Warning: fwip0 & fwe0 are firewire ports. If you see fwip0 or fwe0 on you port list, DO NOT use it. Better yet, turn off firewire in the BIOS if you are not using those ports for anything.

- NAS4Free transfer rates are very dependent on network transfer speeds more so than cpu and memory performance.

- If you experience slow transfer rates to and from the NAS4Free, connect the desktop directly to the NAS with a crossover cable
- Speed and Duplex settings can then be adjusted to test with the computers directly connected

The switch I connected to my NAS with required all interfaces to be set at auto negotation. The crossover cable will allow you to test/troubleshoot and bypass possible switch bottlenecks. The switch I am using is due for replacement and the crossover cable isolated the bottleneck

3.2 Basic Configuration

Default login name and password

If you can ping another device from the NAS4Free PC, then from another computer on the same subnet, point your Web Browser at the NAS4Free 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.
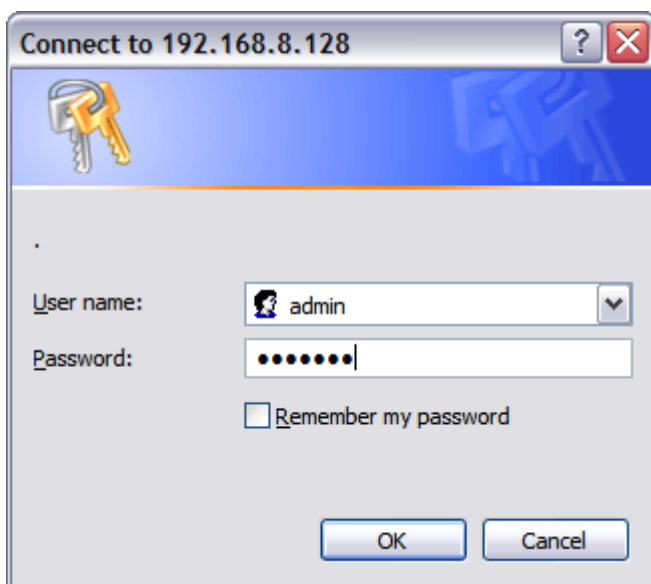
At the login/password dialogue Enter:

1. Default Username as admin,
2. Default password as nas4free
3. Select OK

The NAS4Free team strongly recommend that the default User name and Password be changed before putting NAS4Free into production.

You should be presented with the NAS4Free Web GUI System Status page as shown on the next page. The currently loaded version of NAS4Free is displayed on this page as well as other useful information.

WebGUI Layout

NAS4Free 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 NAS4Free Host name is displayed on this and all other NAS4Free WebGUI pages. This is useful when more than one NAS4Free will be administered.

The NAS4Free host name can be administered on the General setup page.

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

1. ✚ - controls Adding another element
2. ✖ - controls deleting or Removing an element
3. 🔧 - permits the user to Edit the attributes of an element.

3.3 Network Configuration

A lot of this should be determined by your network administrator (which may be you).

Network|Interface Management: Your network adapters should have already been configured from the console after initial installation. Most often, the network is set for "auto", and it detects the correct network card/driver. If not, you should be able to configure them on this screen.

Network|LAN Management: On this screen you can configure:

- Use of DHCP or Static IP configuration
- Whether or not to use IPv6
- MTU
- Media Type (10baseT, 100baseTX, 1000baseTX, 1000baseSX, or autoselect)

System|General Setup: Here you'll want to fill in:

- Hostname
- Domain
- IPv4 and/or IPv6 DNS Servers (If using static IP, otherwise, these should be locked)

You'll also be able to modify (if you want):

- The WebGUI default username
- HTTP or HTTPS
- WebGUI port
- HTTPS certificate (if using HTTPS, otherwise not displayed) NAS4Free will self-create one for you if you don't supply one.
- Private Key (for SSH machine identity verification)
- Language (defaults to English)
- Time Zone and system time (or use of a time server)

System|General|Password: Here, you can replace the default password.

3.4 Software RAID Configuration/Management

NAS4Free 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 the others 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 be based on the smallest disk).

Important - RAID does not equal backup. Even if you create a RAID array you must still keep another copy of your data in a different location.

The NAS4Free team recommends configuring each of the RAID Disks as standalone Storage Disks first to ensure they are fully functional and supported under NAS4Free. 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.)
7. For CIFS you have to create *share*.

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

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 4 identically sized hard drives.

Disks | Management

Disk	Size	Description	Device model	Serial number	Standby time	File system	Status		
ada1	953870MB	Schijf 1	WDC WD10EADS-00L5B1	WD-WCAU4C611299	Always on	SoftRaid	ONLINE		
ada2	953870MB	Schijf 2	WDC WD10EADS-00L5B1	WD-WCAU4C444927	Always on	SoftRaid	ONLINE		
ada3	953870MB	Schijf 3	WDC WD10EADS-00L5B1	WD-WCAU4C444919	Always on	SoftRaid	ONLINE		
ada4	953870MB	Schijf 4	WDC WD10EADS-00L5B1	WD-WCAU4C311324	Always on	SoftRaid	ONLINE		

Rescan disks

Ensure the drives are in an ONLINE status.

You cannot use the 2nd partition of a NAS4Free boot drive as a part of a RAID array. Only whole disks can be used to form a RAID array.

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 | Format

Disk	Raid5: 2861609MB (Software graid5 RAID 5)
File system	Software RAID
Don't Erase MBR	☐ Don't erase the MBR (useful for some RAID controller cards)

Format disk

Warning:
UFS is the NATIVE file format for FreeBSD (the underlying OS of NAS4Free). Attempting to use other file formats such as FAT, FAT32, EXT2, EXT3, or NTFS can result in unpredictable results, file corruption, and loss of data!

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 *******
```
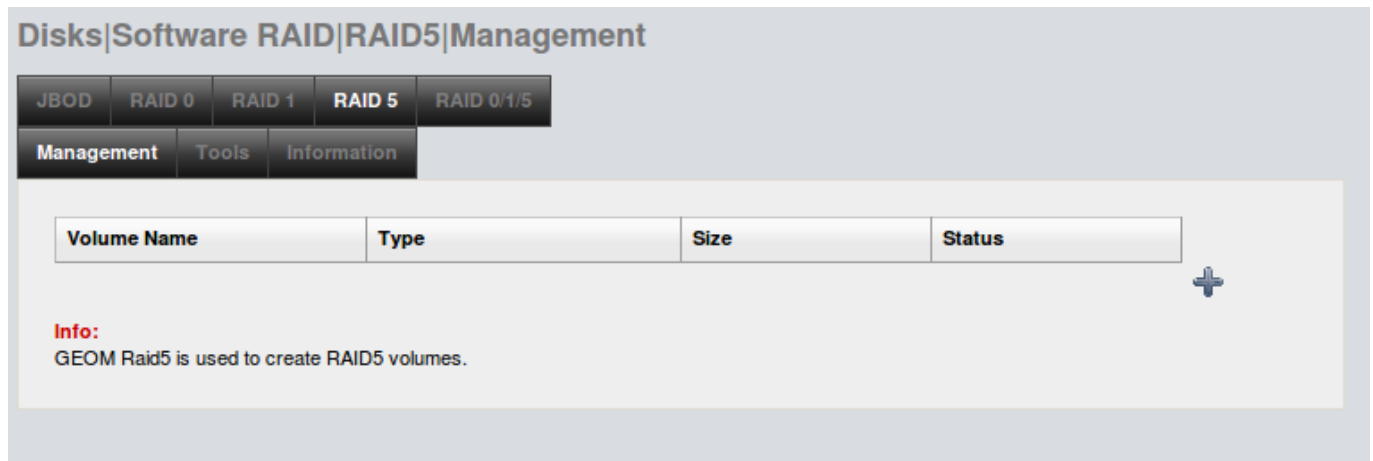
```
Initializing partition:
Destroying old GMIRROR information:
Done!
```

Create the Software RAID array

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

For our example, we select 'Geom RAID5':

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.

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 previsously configured disk.
Wait for the 'up' status before format and mount it!

Creating a RAID 5 array can take a long time:

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

The status field will not immediately update.

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: Format

Disk	BigDisk: (Software graid5 RAID 5)
File system	UFS (GPT and Soft Updates)
Minimum free space	5 Specify the percentage of space held back from normal users. Note that lowering the threshold can adversely affect performance and auto-defragmentation.
Don't Erase MBR	☐ Don't erase the MBR (useful for some RAID controller cards)

[Format disk]

Leave the Type as UFS (GPT and Soft Update), click the Format Disk button and confirm.

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

Disk initialization details:

```
Erasing MBR and all partitions.
Destroying old GPT information:
Creating GPT partition:
/dev/raid5/BigDiskp1 added
Creating filesystem with 'Soft Updates':
/dev/raid5/BigDiskp1: 199.7MB (409020 sectors) block size 16384, fragment size 2048
        using 4 cylinder groups of 49.94MB, 3196 blks, 6400 inodes.
        with soft updates
super-block backups (for fsck -b #) at:
 160, 102432, 204704, 306976
Done!
```

(You should have lot's of more line as this example! On this example the drive was a small 200MB)

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

Disk	BigDisk: (Software graid5 RAID 5)
Partition	EFI GPT Select EFI GPT if you want to mount a GPT formatted drive (default method since 0.684b). Select 1 for UFS formatted drive or software RAID volume creating since the 0.683b. Select 2 for mounting the DATA partition if you select option 2 during installation on hard drive. Select old software gmirror/graid5/gvinum for volume created with old FreeNAS release
File system	UFS
Share Name	big_share
Description	RAID 5 Share

[Add]

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

Change the *Partition* to *EFI – GPT*

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	p1	ufs	big_share	RAID 5 Share	OK	ⓔ ⊗
						⊕

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.

Software RAID array status

You can verify the status of your RAID array from:

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

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

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.

Replacing a failed hard drive on a gmirror array

Note - Supplemental step by step instructions for removing / replacing failed drives in SoftRAID1 and SoftRAID 5 arrays are available in FAQs:

- How do I remove / replace a disk in a SoftRAID1 array ?
- How do I remove / replace a disk in a SoftRAID5 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.

First Step

For replacing this disk: Stop NAS4Free and replace this disk with a new one (in the same place on the ATA or SCSI channel). And restart NAS4Free.

After restarting NAS4Free, 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:

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).

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"*:

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, as sometimes needs a remount.

Replacing a failed hard drive on a graid5 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

First Step

For replacing this disk: Stop NAS4Free and replace this disk with a new one (in the same place on the ATA or SCSI channel). And restart NAS4Free.

After restarting NAS4Free, 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:

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 ▾

Send Command!

You can now check your RAID status (Disk/Software RAID/Geom raid5): It should be 'REBUILDING" or "COMPLETE" (the time needed for rebuilding depends on 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	ⓔ ⊗	

You should check the Disk/Mount Status too, as sometimes needs a remount.

Software RAID configuration with geom vinum

Geom Vinum is all in one module permits you to create a software RAID 0,1 and 5 array. But, for the moment the NAS4Free team doesn't recommend you to use it because too many users have met with problems using the RAID 5 option of this tool.

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

NAS4Free permits you to create advanced Software RAID combinations, for example:

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

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

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

3.5 Users and Groups

Users and groups in NAS4Free follow the unix/posix model of permissions, instead of the windows model of "rights". Sometimes this is confusing for users that come from a windows background.

This guide is a good start for getting familiar with unix/posix users/groups and the related permission schemes.

Access|Groups|Add This screen allows you to create groups for purposes of your own choosing. Each group consists of a group name, numeric group ID (GID), and an optional description.

Access|Users|Add This screen allows you to create users. Each user account consists of:

- Username
- Full name (optional)
- Password
- Numeric user ID (or UID)
- Login shell (many users choose bash, accounts that shouldn't have shell access use "nologin")
- Primary group
- Secondary group(s) (optional)
- Home directory

Additionally, the user can be permitted/denied access to the "user portal" (somewhat restricted form of the WebGUI)

3.6 Status Monitoring

Status|System This screen provides a general system overview, including:

- Hostname
- Version and build information
- Detected system and CPU
- System uptime
- Last configuration commit
- CPU temperature(s), speed, and usage
- Memory Usage
- Load averages
- Disk usage

Status|Processes This screen essentially contains the output of "top", a system and process viewer with per-process memory and CPU usage information.

Status|Services This screen displays running and configured services. A green check in "enabled" means the service should be running. Otherwise should not be running. A green check in "status" means the service is configured. Otherwise isn't configured. ("Status" results aren't particularly useful.)

Status|Interfaces This screen displays information about your network adapters, including: (for each adapter)

- Name (driver)
- MAC Address
- Gateway
- Media (10baseT, 100baseTX, etc)
- MTU
- I/O Packets (count and size)
- I/O Errors and collisions (should be rare on modern networks)
- Status

Status|Disks This screen displays information about your (configured) disks, including: (for each configured drive)

- Disk (device name)
- Size
- Description (either detected from drive or user-supplied)
- Drive model and serial number (if detected)
- Filesystem (as declared in Disks|Management)
- I/O Statistics
- Temperature (if the drive supplies this information)
- Status (online, faulted, etc.)

Status|Graph|Traffic graph This screen shows a running graph of traffic on the chosen network adapter for as far back as the last 120 seconds. The graph starts empty, but progressively fills with data. Once the graph is full (at 120 seconds), the graph will start to scroll and discard older data.

Status|Graph|CPU load This screen shows a CPU usage graph, very much similar to the traffic graph.

Status|Email Report If Emailing has been configured, this page will let you configure the option of sending an email report to an email address of your choosing, either instantly or on a timed interval.

3.7 Diagnostics and Logs

Diagnostics|Log This screen lets you display or download relevant logs about the system. These logs include:

- System
- SSH
- Daemon
- FTP (and FTP transfers)
- S.M.A.R.T.
- Rsync (client, server, and local)
- UPnP
- DAAP

Diagnostics|Log|Settings This page allows you to control where logs are stored, and how they are displayed.

Diagnostics|Information This group of tabs displays information about the following:

- Disks

- Disks (ATA) (drive capabilities)
- Partitions (fdisk output)
- S.M.A.R.T.
- Space used
- Mount points
- Software RAID
- iSCSI Initiator
- MS Domain
- CIFS/SMB
- FTP
- RSYNC Client
- Swap
- Sockets
- UPS

Diagnostics|Ping and Diagnostics|Traceroute These options are used for testing network/internet connectivity.

Diagnostics|ARP tables and Diagnostics|Routing tables These pages display connection/networking information.

3.8 Advanced Tools

Be aware that using an embedded install, many files are stored in ram, and changes to them will not be persistent on reboot.
Be aware that editing the wrong files can damage your installation and render it unstable or unable to operate correctly, and in some cases can make the system non-bootable.

Advanced|File Editor This tool lets you manually edit files.

Advanced|File Manager This page allows you to log into QuiXplorer to browse and manage files.

Advanced|Execute command This page lets you do several things, including:

- Execute a command (as if you were logged into the command line)
- Download or Upload files
- Execute PHP commands

3.9 Getting Help

Help|Report Generator Use this for generating reports to be posted in the Forum when asking for help or helping to supply information for bug reports. It won't generate any text without "Subject", "Description", and "Error" having something filled in. You'll still have to figure out where to post or send that information.

Help|Forum This menu item links you directly to the NAS4Free Forums.

Help|Information & Manual This menu item links you directly to this wiki.

Help|IRC Live Support This menu item links you directly to the FreeNode WEB client for IRC and the

#NAS4Free channel

Help|Release Notes This page displays the release notes file included with the running version.

Help|License & Credits This page shows the License, Contributors, and Software used.

Help|Donate This menu item links to the NAS4Free donation system with Paypal.

3.10 Upgrading NAS4Free

Before performing an upgrade, visit System|Backup/Restore to make a backup of your configuration file.

DO NOT use a embedded firmware upgrade if your NAS4free server has less than 384MB RAM.
If a firmware upgrade fails (Broken Pipe or Mount/Umount related errors, etc), the only solution is to re-install from scratch. This will delete all data on the OS disk. This has no effect on data-only drives, just data stored on the OS drive.

- 512MB of RAM is the minimum system requirement for upgrading any Embedded version of NAS4Free.
- 2GB RAM or higher is recommanded for a better system performance!

Backup Configuration

1. Navigate to the System|Backup/Restore page
2. In the "`Backup configuration`" area, click the "Download configuration" button
3. When prompted by your computer, select Save, and a location on your computer to save the config file

Do not store the config file on your NAS4Free storage

The WebGUI Interface and Setup needs to be inserted here, then we have single page SUG.

4 System|General

4.1 System|General Setup

4.2 System|General|Password

5 System|Advanced

5.1 Advanced

5.2 Email

5.3 Proxy

5.4 Swap

5.5 Command scripts

5.6 Cron

5.7 rc.conf

5.8 sysctl.conf

and so on until the end!

From:
https://www.nas4free.org/wiki/ - **Wiki NAS4Free**

Permanent link:
https://www.nas4free.org/wiki/playground/sug

Last update: **2016/02/19 10:33**