

Quick and Easy NAS Using FreeNAS

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FreeNAS is a very compact and free (as in BSD) CIFS, NFS, and FTP server with RAID 0, 1, 5 support, and a web administration GUI. Believe it or not the whole install is 16 megs. To install, grab the ISO image, burn it to a CD, and boot from it:

```
CD Loader 1.2

Building the boot loader arguments
Looking up /BOOT/LOADER... Found
Relocating the loader and the BTX
Starting the BTX loader

BTX loader 1.00  BTX version is 1.01
Consoles: internal video/keyboard
BIOS CD is cd0
BIOS drive A: is disk0
BIOS drive C: is disk1
BIOS 638kB/260032kB available memory

FreeBSD/i386 bootstrap loader, Revision 1.1
(root@dev.freenas.org, Fri Dec 30 00:08:22 CET 2005)
Loading /boot/defaults/loader.conf
/
usb0: <Intel 82371AB/EB (PIIX4) USB controller> on uhci0
usb0: USB revision 1.0
uhub0: Intel UHCI root hub, class 9/0, rev 1.00/1.00, addr 1
uhub0: 2 ports with 2 removable, self powered
pci0: <bridge> at device 7.3 (no driver attached)
pci0: <display, VGA> at device 15.0 (no driver attached)
lnc0: <PCNet/PCI Ethernet adapter> port 0x1080-0x10ff irq 17 at device
ci0
lnc0: Attaching PCNet/PCI Ethernet adapter
lnc0: [GIANT-LOCKED]
lnc0: Ethernet address: 00:0c:29:92:af:86
lnc0: if_start running deferred for Giant
lnc0: PCnet-PCI
pci0: <multimedia, audio> at device 17.0 (no driver attached)
atkbd0: <Keyboard controller (i8042)> port 0x60,0x64 irq 1 on acpi0
atkbd0: <AT Keyboard> flags 0x1 irq 1 on atkbd0
kbd0 at atkbd0
atkbd0: [GIANT-LOCKED]
sio0: <16550A-compatible COM port> port 0x3f8-0x3ff irq 4 flags 0x10 on
sio0: type 16550A, console
sio1: <16550A-compatible COM port> port 0x2f8-0x2ff irq 3 on acpi0
sio1: type 16550A
fdc0: <floppy drive controller> port 0x3f0-0x3f5,0x3f7 irq 6 drq 2 on a
fdc0: [FAST]
```

Install to your HDD using option 7. We also used the option 2 for the install so that we create 2 UFS partitions. Make sure you can delete all of the information on your hard disk or any other data device hooked up to your system, since this procedure will mess with your boot partitions and records, as well as install an operating system. Enter the detected CDROM device:

Quick and Easy NAS Using FreeNAS

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```
7) Install on HD/CF/USB Key
8) Shell

Enter a number: 7

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

Enter a number: 2
Install FreeNAS on small partition 1 and create partition 2 for DATA

WARNING: It will erase ALL your partitions and data on the destination
e!

WARNING: You can't install FreeNAS if it's already installed (Use upgr
Web GUI)

Here is the list of detected CDROM:
acd0 (desc: VMware Virtual IDE CDROM Drive/00000001)

Enter the name of the CD-ROM drive: █
```

Enter the device name of the hard drive:

```
*****
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

Enter a number: 2
Install FreeNAS on small partition 1 and create partition 2 for DATA

WARNING: It will erase ALL your partitions and data on the destination
e!

WARNING: You can't install FreeNAS if it's already installed (Use upgr
Web GUI)

Here is the list of detected CDROM:
acd0 (desc: VMware Virtual IDE CDROM Drive/00000001)

Enter the name of the CD-ROM drive: acd0
Here is the list of detected disk:
ad0 (desc: VMware Virtual IDE Hard Drive/00000001)

Enter the name of the Hard Drive: ad0
Answer by "y" to the 2 next questions:
(press a key to continue)
```

Quick and Easy NAS Using FreeNAS

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Now, there is a somewhat unhelpful line that says to answer "y" to the next two questions after pressing a key to continue. Well, for us, the only key that moved forward was return. Here is the first question to answer "y" to, but be very careful about continuing, as this is messing around with your partitions and boot records:

```
***** Working on device /dev/ad0 *****
parameters extracted from in-core disklabel are:
cylinders=416 heads=16 sectors/track=63 (1008 blks/cyl)

parameters to be used for BIOS calculations are:
cylinders=416 heads=16 sectors/track=63 (1008 blks/cyl)

Media sector size is 512
Warning: BIOS sector numbering starts with sector 1
Information from DOS bootblock is:
The data for partition 1 is:
sysid 165 (0xa5), (FreeBSD/NetBSD/386BSD)
  start 63, size 65457 (31 Meg), flag 80 (active)
  beg: cyl 0/ head 1/ sector 1;
  end: cyl 64/ head 15/ sector 63
The data for partition 2 is:
sysid 165 (0xa5), (FreeBSD/NetBSD/386BSD)
  start 65583, size 353745 (172 Meg), flag 0
  beg: cyl 65/ head 1/ sector 1;
  end: cyl 415/ head 15/ sector 63
The data for partition 3 is:
<UNUSED>
The data for partition 4 is:
<UNUSED>
Do you want to change the boot code? [n] y
```

Here is the second question that you answer "y" to if you are very confident you don't have any devices you want the data on hooked up to this system:

```
The data for partition 3 is:
<UNUSED>
The data for partition 4 is:
<UNUSED>
Do you want to change the boot code? [n] y

We haven't changed the partition table yet. This is your last chance.
parameters extracted from in-core disklabel are:
cylinders=416 heads=16 sectors/track=63 (1008 blks/cyl)

parameters to be used for BIOS calculations are:
cylinders=416 heads=16 sectors/track=63 (1008 blks/cyl)

Information from DOS bootblock is:
1: sysid 165 (0xa5), (FreeBSD/NetBSD/386BSD)
  start 63, size 65457 (31 Meg), flag 80 (active)
  beg: cyl 0/ head 1/ sector 1;
  end: cyl 64/ head 15/ sector 63
2: sysid 165 (0xa5), (FreeBSD/NetBSD/386BSD)
  start 65583, size 353745 (172 Meg), flag 0
  beg: cyl 65/ head 1/ sector 1;
  end: cyl 415/ head 15/ sector 63
3: <UNUSED>
4: <UNUSED>
Should we write new partition table? [n] y
```

Quick and Easy NAS Using FreeNAS

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Now, perhaps you are familiar with the data device names here, and perhaps you trust this installer as well. We aren't, and don't. Not that this isn't a really cool project, it is simply that we wouldn't install this on a system hoping we could be selective about the device. If you are tempted, be careful, OK? The OS is installed now:

```
Creating BSD Label:
Modify BSD Label information:
Creating filesystem:
/dev/ad0s1: 32.0MB (65456 sectors) block size 16384, fragment size 2048
      using 4 cylinder groups of 8.00MB, 512 blks, 1024 inodes.
super-block backups (for fsck -b #) at:
 160, 16544, 32928, 49312
/dev/ad0s2: 172.7MB (353744 sectors) block size 16384, fragment size 20
      using 4 cylinder groups of 43.19MB, 2764 blks, 5568 inodes.
super-block backups (for fsck -b #) at:
 160, 88608, 177056, 265504
Creation temp mouting point:
Mount disk:
Installation:

FreeNAS has been installed on ad0.
You can now remove the CD-ROM and reboot the PC.

For using the DATA partition:
1. Add the disk ad0 on the Disks:Management page
2. Add the mount point on the disks:Mount point page
(disk: ad0, partition 2, Filesystem: UFS)

Press ENTER to continue.
```

Return to the main menu and reboot:

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Press ENTER to continue.

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

Enter a number: 3

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

Enter a number: 5

```
usb0: <Intel 82371AB/EB (PIIX4) USB controller> on uhci0
usb0: USB revision 1.0
uhub0: Intel UHCI root hub, class 9/0, rev 1.00/1.00, addr 1
uhub0: 2 ports with 2 removable, self powered
pci0: <bridge> at device 7.3 (no driver attached)
pci0: <display, VGA> at device 15.0 (no driver attached)
lnc0: <PCNet/PCI Ethernet adapter> port 0x1080-0x10ff irq 17 at device
ci0
lnc0: Attaching PCNet/PCI Ethernet adapter
lnc0: [GIANT-LOCKED]
lnc0: Ethernet address: 00:0c:29:92:af:86
lnc0: if_start running deferred for Giant
lnc0: PCnet-PCI
pci0: <multimedia, audio> at device 17.0 (no driver attached)
atkbd0: <Keyboard controller (i8042)> port 0x60,0x64 irq 1 on acpi0
atkbd0: <AT Keyboard> flags 0x1 irq 1 on atkbd0
kbd0 at atkbd0
atkbd0: [GIANT-LOCKED]
sio0: <16550A-compatible COM port> port 0x3f8-0x3ff irq 4 flags 0x10 on
sio0: type 16550A, console
sio1: <16550A-compatible COM port> port 0x2f8-0x2ff irq 3 on acpi0
sio1: type 16550A
fdc0: <floppy drive controller> port 0x3f0-0x3f5,0x3f7 irq 6 drq 2 on a
fdc0: [FAST]
```

When the system comes up, choose option 1 to select the network interface:

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When the system comes back up, it should list the correct interface, as well as the default LAN IP address:

```
*** This is FreeNAS, version 0.522
    built on Mon Jan 23 08:31:56 CET 2006 for generic-pc
    Copyright (C) 2005-2006 by Olivier Cochard. All rights reserved.
    Visit http://www.freenas.org for updates.

    LAN IP address: 192.168.1.1

    Port configuration:

    LAN    -> lnc0

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

Enter a number: █
```

Choose option 2 to set the LAN IP address and subnet mask:

```
4) Reset to factory defaults
5) Reboot system
6) Ping host
7) Install on HD/CF/USB Key
8) Shell

Enter a number: 2

Enter the new LAN IP address: 10.50.100.109

Subnet masks are entered as bit counts (as in CIDR notation) in FreeNAS
e.g. 255.255.255.0 = 24
     255.255.0.0   = 16
     255.0.0.0    = 8

Enter the new LAN subnet bit count: 24

The LAN IP address has been set to 10.50.100.109/24.
You can now access the webGUI by opening the following URL
in your browser:

http://10.50.100.109/

Press ENTER to continue.
█
```

Quick and Easy NAS Using FreeNAS

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Reboot again to make sure that the correct address and interface shows up on reboot:

```
*** This is FreeNAS, version 0.522
    built on Mon Jan 23 08:31:56 CET 2006 for generic-pc
    Copyright (C) 2005-2006 by Olivier Cochard. All rights reserved.
    Visit http://www.freenas.org for updates.

    LAN IP address: 10.50.100.109

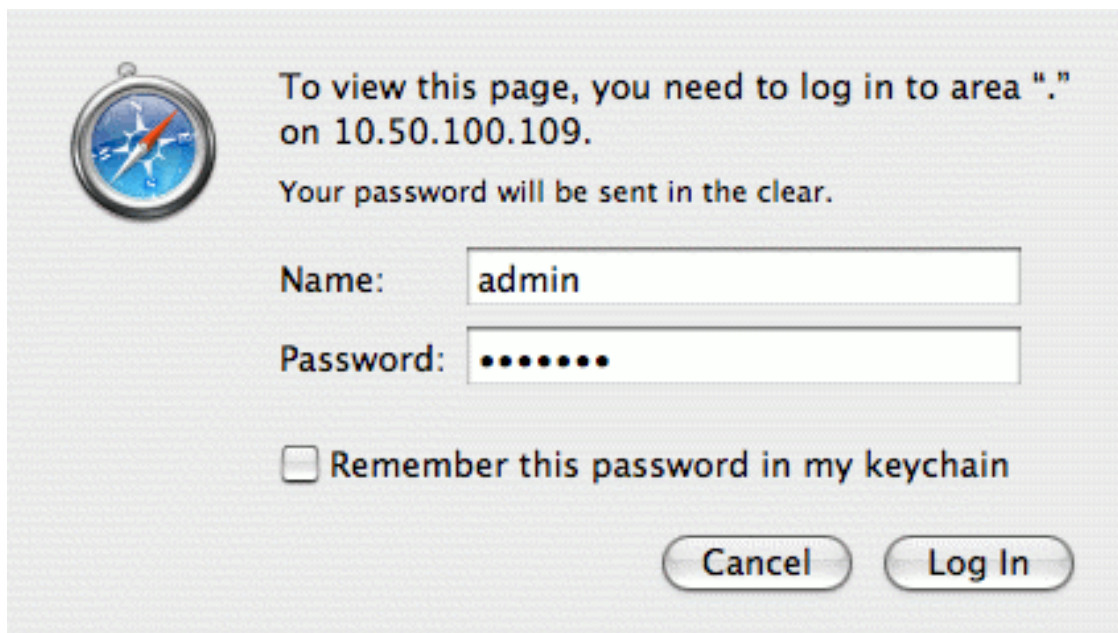
    Port configuration:

    LAN    -> lnc0

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

Enter a number: █
```

Log on as admin with a default password of freenas:



The image shows a web browser login window for FreeNAS. On the left is a compass icon. The main text reads: "To view this page, you need to log in to area "." on 10.50.100.109." Below this, it says "Your password will be sent in the clear." There are two input fields: "Name:" with the text "admin" and "Password:" with seven dots. Below the password field is a checkbox labeled "Remember this password in my keychain". At the bottom right are two buttons: "Cancel" and "Log In".

Change the password, of course. Here is what the web GUI looks like:

Quick and Easy NAS Using FreeNAS

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freenas.local - FreeNAS webGUI

http://10.50.100.109/

FreeNAS webGUI Configuration

FreeNAS

System information	
Name	freenas.local
Version	0.522 built on Mon Jan 23 08:31:56 CET 2006
Platform	generic-pc on Intel(R) Pentium(R) 4 CPU 1.70GHz
Uptime	00:32
Last config change	Wed Jan 25 9:44:29 UTC 2006
Memory usage	<div style="width: 5%;"></div> 5%

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To test this, we are going to set up CIFS and create a share off of a disk device. First off, we will configure CIFS, and change the workgroup to something different (remote1 in this example). Make sure the checkbox is enabled, and click save. If you have a WINS server (or equivalent), fill out the IP address for the WINS server you want the NAS server to announce itself to:

Services: CIFS

Enable

Security	Share
NetBiosName	freenas
Workgroup	remote1 Workgroup to be member of.
Description	FreeNAS Server Server description. This can usually be left blank.
Local Master Browser	Yes
Time server	Yes
WINS server	<input type="text"/> WINS Server IP address.

Save

Quick and Easy NAS Using FreeNAS

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Add a disk drive:

Disks: Disk: Add

Disk	ad0: 204MB (VMware Virtual IDE Hard Drive/00000001)
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 set how loud the drive is while it's operating. <i>Do not set this for CF cards.</i>
acoustic level	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>

Add

Create a share:

Disks: Mount Point

The changes have been applied successfully.

Disk	Partition	File system	Share Name	Status
ad0	1	ufs	share	OK

Note:
Second configuration step: Declaring the filesystem used by your previously configured disk.

To test the CIFS share, we will upload a file with smbclient from a GNU/Linux box:

```
[usr-1@srv-1 ~]$ smbclient \\\10.50.100.109\share
Password:
Domain=[REMOTE1] OS=[Unix] Server=[Samba 3.0.20b]
smb: \> dir
.                D      0 Wed Jan 25 05:50:12 2006
..               D      0 Wed Jan 25 05:50:12 2006
38062 blocks of size 512. 1546 blocks available
smb: \> put test.txt
```

Quick and Easy NAS Using FreeNAS

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```
putting file test.txt as \test.txt (1.7 kb/s) (average 1.7 kb/s)
smb: \> dir
.                D      0 Wed Jan 25 05:56:38 2006
..               D      0 Wed Jan 25 05:50:12 2006
test.txt         A      25 Wed Jan 25 05:56:35 2006
38062 blocks of size 512. 1530 blocks available
smb: \>
```

Easy enough. Let's map a drive from a Windows box and see if we can read the file:

```
C:\Documents and Settings\Administrator>net use w: \\10.50.100.109\share
The command completed successfully.
C:\Documents and Settings\Administrator>dir w:
Volume in drive W is share
Volume Serial Number is ABC4-04E7
Directory of W:\
01/25/2006 02:56a    <DIR>      .
01/25/2006 02:50a    <DIR>      ..
01/25/2006 02:56a                25 test.txt
1 File(s)          25 bytes
2 Dir(s)           781,312 bytes free
C:\Documents and Settings\Administrator>type w:\test.txt
this is a test for samba
C:\Documents and Settings\Administrator>
```

OK. All seems happy. For more details on configuration, see this instruction guide. We are quite excited about this being so quick and easy to install. It provides a way for users access to their files in a recovery situation. The security is pretty bad on this system right now; however, user security is planned for future releases of FreeNAS. Also, since FreeNAS supports USB memory devices, and is so small, it could be used as a quick source for portable document storage that needs to be shared.