Using the Amiga A3000UX as a NFS File Server

By David Miller - Unix Technical Support Specialist, CATS

You've just added an A3000UX to your ethernet and you can *rcp* and *ftp* files between UNIX and AmigaDOS using the AS225 TCP/IP software. Great! But what about the AS225's Network File System (NFS) client software? Under AmigaDOS, the NFS software lets your Amiga mount the drives of a NFS server as normal DOS volumes, but how do you set up a server?

NFS allows one machine to share files with other machines connected to a network. NFS lets multiple machines access the same files, so only one copy of the data is necessary. A client machine (a client is any machine that can mount a shared directory) can free some of its disk space by moving common programs to the server's disk (a server is any machine that shares a part of its disk with other machines).

There are however limitations when sharing files between machines with different operating systems. For example;

- **Filenames -** UNIX S5 filesystem does not support filenames longer than 14 characters. If you copy files from AmigaDOS to UNIX, make sure that they are unique in the first 14 characters. And don't forget about the ".info" files! If you copy a file that has a ".info" file associated with it, be sure that the name preceding the ".info" does not exceed 9 characters.

- **Permissions** - UNIX files have permissions for read, write, and execute. There is no delete permission; if you have write access to the directory, you can delete any file it contains. Script and archive bits are not supported either, so setting the script or archive bits, or clearing the delete bit will not work.

- **Filenotes -** UNIX does not support filenotes. If you copy a file from an AmigaDOS filesystem to a UNIX filesystem, any file notes will be lost. Likewise, you cannot add a comment to a file on a UNIX filesystem. You will not receive any error indication, but the operation will have no effect.

The following notes will walk you step-by-step through the process of configuring and administering NFS on the A3000UX. If you have used NFS before with BSD, Sun/OS, Ultrix, or any other operating system, you should at least skim over these notes, because the implementation is different under UNIX SVR4.

To keep this article brief, I'm making the following assumptions:

- ❏ You know how to use one of the editors shipped with Amiga UNIX.
- ❏ You know how to log in as root or how to *su* to root.

If you don't, read the *Learning Amiga UNIX* and *Using Amiga UNIX* manuals which come with the A3000UX.

The five examples illustrate how to do some simple file sharing with NFS. Using the concepts discussed in these examples you will be able to select the options necessary to share files while maintaining system security and integrity. But, first, you need to start the networking software on the A3000UX, if it's not already running. To do this, type the following:

```
# init 3
```

This changes the operating to ‘‘run-level’’ 3, the networking run-level. Other run-levels include:

S - single user maintenance mode
0 - system power off
1 - single user mode
2 - multiuser mode w/o networking
3 - multiuser mode w/ networking
4 - user defined
5 - system reboot
6 - system reboot

To find out what your machine's current run-level is, type:

```
# who -r
```

The output will look something like this:

```
run-level 3  Jun 18 18:40    3    0    S
```

Here's what all of that means:

```
run-level 3  Jun 18 18:40    3    0    S
```

This is the current state of your machine

This is when the current run-level was entered

This is the current run-level

This is the number of times your machine has been in this run-level before.

This is the previous run-level

This is the host table (*/etc/inet/hosts* on Amiga UNIX and *INET:db/hosts* on AmigaDOS) that I'll be using for the examples:

```
#
#   TCP/IP HOST TABLE
#
#
127.0.0.1    localhost loghost loopback me
#
#
#   Widget works engineering network
#
#
# IP Number  NameNicknameComment
#
192.9.120.1   Hydrogen       H    # A3000UX - in comp center
192.9.120.2   Helium         He   # A2000   - in room 316
192.9.120.3   Lithium        Li   # A2500   - in room 321
192.9.120.4   Beryllium      Be   # A3000   - in room 320
192.9.120.5   Boron          B    # A2500   - in room 119
192.9.120.6   Carbon         C    # A2000   - in room 119
192.9.120.7   Nitrogen       N    # A2000   - in room 204
192.9.120.8   Oxygen         O    # A3000   - in room 220
192.9.120.9   Fluorine       F    # A2500   - in room 132
192.9.120.10  Neon           Ne   # A3000   - in room 307
```

The host table contains a list of IP addresses with node names for each of those addresses. The machine uses this list to find other nodes by their name, rather than their numeric IP address.

Example 1

Hydrogen has a directory called */home/scratch* which is for temporary storage. Everyone should be able to read and write in this directory. To share this with the rest of the net, the administrator of Hydrogen would type:

```
share -F nfs -o rw /home/scratch
```

where:

`share` is the command to share files between hosts.
`-F nfs` tells the program *share* to use the NFS filesystem.
`-o rw` tells the program *share* to allow all systems both read and write access to the shared files. This is the default if you don't supply any options. I've just included it here for completeness.
`/home/scratch` is the directory to be shared.

Example 2

Hydrogen also has a large disk attached as */storage.* To allow other hosts to use this as extra disk space type the following:

```
share -F nfs -o rw=Helium /storage/Helium
share -F nfs -o rw=Lithium /storage/Lithium
     ...
share -F nfs -o rw=Ne /storage/Neon
```

where:

`-o rw=`*name* tells share to allow <*name*> to mount this resource and to deny access to everyone else.

This establishes private storage areas for each host. This way all of the hosts can share the disk without having their files readable by everyone on the network.

Note the use of the nickname *Ne* for the host *Neon*. Nicknames must be explicitly entered in the host table and may be used interchangeably with the full name of the host.

Example 3

A group of hosts on the first floor of your building are all being used on one big project, so they need a common work area to store files. The administrator could create a work area in */storage* called, for example, *ff-project*, for first-floor-project, then give the hosts on the first floor access to this work area by typing:

```
share -F nfs -o rw=Boron:Carbon:Fluorine /storage/ff-project
```

where:

`-o rw=`*name*`[:`*name*`]...`

allows read and write access to the hosts that are listed and denies access to everyone else and

```
/storage/ff-project
```

is the name of the directory to share.

Example 4

Hydrogen has a directory called */home/public* which is full of useful Amiga tools. To share these with the rest of the net, the administrator of Hydrogen would type:

```
share -F nfs -o ro /home/public
```

where:

```
-o ro
```

tells share to make the shared filesystem readable to all hosts and writable by no one. The ‘‘ro’’ stands for ‘‘read-only’’ and

```
/home/public
```

is the name of the directory to share.

The files are shared read-only for two reasons. The first is that it prevents temporary files from being created in the shared partition. Also it prevents accidental or malicious removal of shared files.

Example 5

Now, coincidentally, Hydrogen also has a directory called */home/private* which is full of special tools used only by the development staff on the 3rd floor. To share these exclusively with the hosts on the third floor, the administrator of Hydrogen would type:

```
share -F nfs -o ro=He:Li:Be:Ne /home/private
```

where:

```
-o ro=name[:name]...
```

tells the *share* program to give the listed hosts read access to the shared files. All other hosts will be denied access to the shared files (Note the use of nicknames) and

```
/home/private
```

is the name of the shared filesystem.

These options may be combined to allow different types of access. For example:

```
-o rw=Helium:Neon,ro
```

Everyone can read shared files, but only Helium and Neon have write access.

```
-o rw,ro=Fluorine
```

Everyone except Fluorine may read and write files. Fluorine may only read files.

```
-o rw=C:O,ro=N
```

Carbon and Oxygen have read and write access, Nitrogen has read access, and the others have no access.

To summarize:

`-o ro`	Gives everyone read-only access to the shared files
`-o rw`	Gives everyone read/write access
`-o ro=...`	Gives read-only access to the listed hosts
`-o rw=...`	Gives read/write access to the listed hosts

If a host appears in both a rw= and a ro= list, the host will be given read and write access. The ordering of the options does not matter.

Since you probably want these directories to be shared automatically every time you start Amiga UNIX, you need to perform the following steps:

1. Edit the file */etc/inittab* and change the line:

```
is:2:initdefault
```

to

```
is:3:initdefault
```

This will make your machine go directly to run-level 3 when you boot the UNIX Operating System.

2. Edit the file */etc/dfs/dfstab*, and enter one line for each directory to be shared. For Example 1 above, this would be the line:

```
share -F nfs -o ro /home/public
```

So, the complete *dfstab* for the 5 examples given above would look something like this:

```
#
# For Example 1
#
share -F nfs -o rw /home/scratch

#
# For Example 2
#
share -F nfs -o rw=Hydrogen /storage/Hydrogen
share -F nfs -o rw=Helium /storage/Helium
share -F nfs -o rw=Lithium /storage/Lithium
share -F nfs -o rw=Beryllium /storage/Beryllium
share -F nfs -o rw=Boron /storage/Boron
share -F nfs -o rw=Carbon /storage/Carbon
share -F nfs -o rw=Nitrogen /storage/Nitrogen
share -F nfs -o rw=Oxygen /storage/Oxygen
share -F nfs -o rw=Fluorine /storage/Fluorine
share -F nfs -o rw=Neon /storage/Neon

#
# For Example 3
#
share -F nfs -o rw=Boron:Carbon:Fluorine /storage/ff-project

#
# For Example 4
#
share -F nfs -o ro /home/public

#
# For Example 5
#
share -F nfs -o ro=He:Li:Be:Ne /home/private
```

3. Run the command:

```
shareall -F nfs
```

which will share all of the NFS filesystems, and the command:

```
unshareall -F nfs
```

which will make the NFS filesystems unavailable.

For those interested in more information on UNIX SVR4 networking, either as a user or an administrator, *UNIX System V Release 4 - Network User's and Administrator's Guide*, published by Prentice Hall is an excellent starting place.

If you have any suggestions for the new Amiga UNIX section of Amiga Mail, please send it to me either via email:

davidm@cbmvax.commodore.com
or
...!{rutgers,uunet}!cbmvax!davidm

or US Mail:

ATTN: David Miller
Commodore Applications and Technical Support
Commodore Business Machines, Inc.
1200 Wilson Drive
West Chester, PA 19380

or FAX:

David Miller
Commodore Business Machines
+1 215 431 9156

or BIX:

david.miller

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