

Network Attached Storage Server Operating System

Bitten by The NAS Bug

**A Step-By-Step Guide to Converting and Using an Old Computer as a
Workgroup File Server Using the NASLite Network Attached Storage
Server Operating System**

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Revision History

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Introduction

Like every computer person out there, I have an ever-growing collection of older and unused machines and computer parts. Until now they were all relegated to being parts donors, but NASLite changed all that. This software allows an older computer to serve as Network Attached Storage (NAS) for a Small Office / Home Office (SOHO) network. While this allows for a no frills server (no user permissions and no way to make more shares,) it works very well on older hardware, which would have a hard time running any other operating system.

Gathering All The Requirements

The first step is to gather all the hardware for the project, which will consist of the following:

- 1 PC with the following minimum configuration
 - 486 processor or higher
 - 16 MB of Ram or more
 - 1 or more hard drives
 - 1 floppy drive
 - 1 ISA or PCI network card
- 1 copy of NASLite-FDU
- 1 machine with a CDROM drive and a floppy drive (to create the Floppy Disk)
- 1 Floppy disk (for the server software and the configuration information)



Figure 1. The test machine consists of a celeron 300 with 32mb of ram

With such modest hardware requirements it's easy to see that this software can be used on computers that are beyond a useful life for any other purpose currently.

We will be using a Slot one Celeron at 300 Mhz, along with 32 MB of Ram. The network card in the machine is a 3COM 3c905tx 10/100Mbps PCI card.



Figure 2. This is the running server.

This is the server machine while it is up and running. Since we can access it remotely, there is no need for a monitor and a keyboard and mouse. While there is no use for a monitor, the motherboard used would not boot without a video card, so one had to be put into the computer. This is a limitation of the BIOS on the test machine, and not NASLite. The only connections (as indicated by the cables coming out of the back) are the power and the Network card. Once the machine is confirmed to be functional, it can be closed up and put in its final place. Remember to shut it down using the menu and not just power it off.

Making The System Disk

First, download the .ISO file and create a CD to be able to generate a boot floppy. This can be done on the machine that will become a server if it has a

working CD drive, or on any other PC (if the machine in question does not have a CD-ROM drive).

Once the CD is created, boot the machine with it. Once the machine initialized, press “Enter” and you will be presented with a few choices.

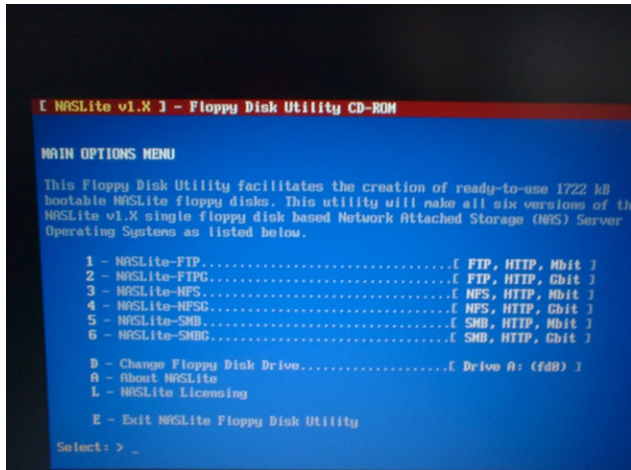


Figure 3. Choosing which NASLite boot disk you want to create.

Since we will be using this server on a windows network, we need to create an SMB floppy that supports 10/100 Mbit cards (option 5 NASLite – SMB). SMB (Server Message Block) is the default protocol used by Windows Networking.

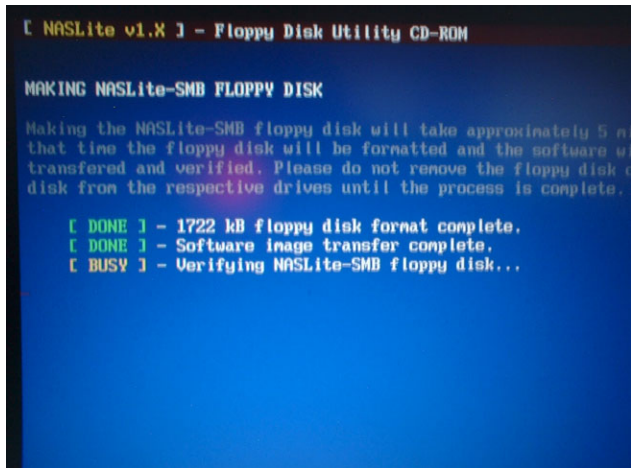


Figure 4. The Disk Creation Process

Once the floppy disk creation is complete, you can take the CD and Floppy disk out of the drives and boot the NASLite machine with the floppy disk. The CD should be labeled and stored in case you need to recreate a replacement disk or another type of disk in the future.

NOTE: Making the floppy takes a bit of time, and since the system uses sections of a floppy disk not normally used by windows formats, it is possible that a floppy or two will fail before you can get a functional boot disk out of the program. This is normal, and unfortunately the declining quality of floppy disks does nothing to reduce this. The software will tell you when the boot disk creation has completed successfully.

Other NASLite Floppy Disk Options

In the previous section, we chose to create an SMB floppy that supports 10/100 Mbit cards (option 5 NASLite – SMB). Based on our target requirements, that was the version best suited for our needs. The NASLite-FDU CD-ROM offers additional versions with different capabilities. The table below is provided as a reference that lists the different versions with associated capabilities:

| Server OS | FTP | NFS | SMB | HTTP | MBit | Gbit | Client OS |
|--------------|-----|-----|-----|------|------|------|-----------|
| NASLite-FTP | ✓ | | | ✓ | ✓ | | ① ② ③ |
| NASLite-FTPG | ✓ | | | ✓ | | ✓ | ① ② ③ |
| NASLite-NFS | | ✓ | | ✓ | ✓ | | ② ③ |
| NASLite-NFSG | | ✓ | | ✓ | | ✓ | ② ③ |
| NASLite-SMB | | | ✓ | ✓ | ✓ | | ① ② ③ |
| NASLite-SMBG | | | ✓ | ✓ | | ✓ | ① ② ③ |

① – Windows ② – UNIX/Linux ③ – MAC OS-X

Table 1. NASLite Floppy Disk Options

Set-up And Configuration

Once the floppy disk has been created, boot the machine with the floppy disk. And login at the prompt when NASLite initializes. NASLite login is: “admin” and the password is “nas”. You will be presented with the following menu.

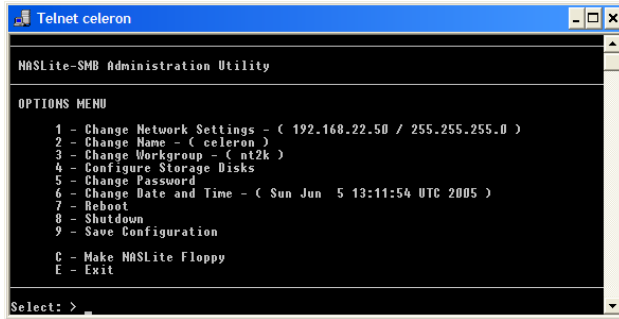


Figure 5. The Main Administration Menu.

Once you log in, you can configure the storage disks to be used in the server. This can be done using Option 4 on the menu. Keep in mind this destroys data on the disks so make sure you can afford to do so **BEFORE** deciding to use the hard drives in the NASLite server. The reason I chose to do this step first is because it is the one that is most time consuming if one chooses to perform a check for bad blocks on the hard drives. As a ball park estimate, on my machine, a Celeron 300Mhz with 32 Mb of ram, it took over 20 minutes to scan a 4 gig hard drive, so it really does take a while.

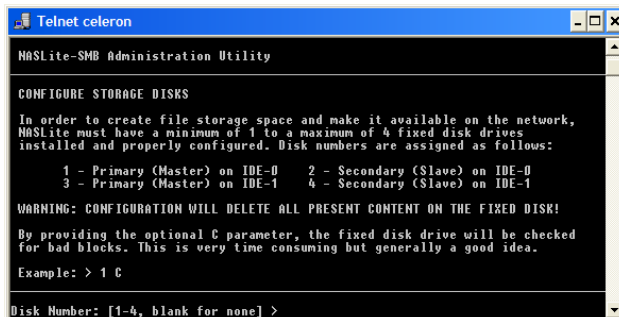


Figure 6. The Configure Storage Disks Menu.

Keep in mind that NASLite will show configuration for all four hard drive locations, even if you don't have 4 hard drives installed in the machine. Initialize the drive(s) with the C option the first time you do so (this is a precaution that will better guarantee the integrity of the data on the drives once they are up and running. For example, on my machine, we have a disk 2 and a disk 4 that are hard drives (a slave on the primary and a slave on the secondary IDE channel).

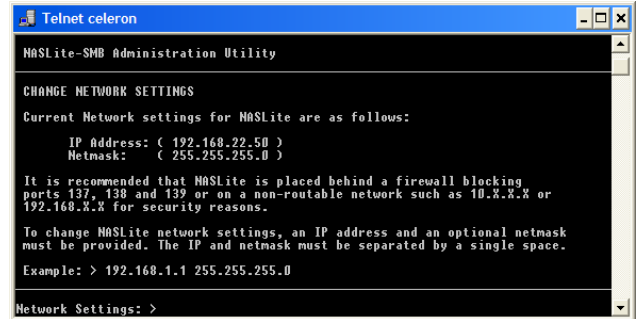


Figure 7. The Network Configuration Options.

Once each hard drive has been initialized (if you have more than one in the machine) you should change the IP Address.

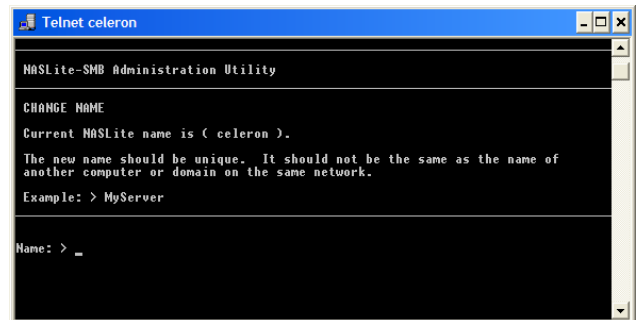


Figure 8. The NetBIOS Name Configuration Option.

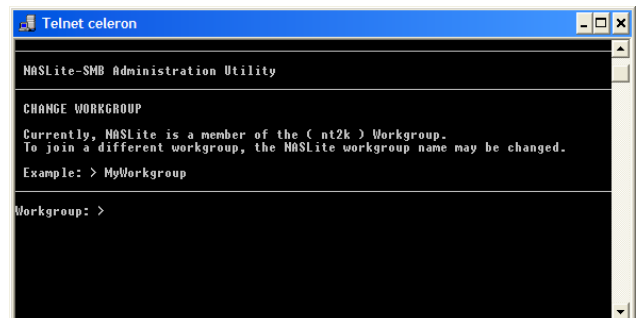


Figure 9. The Workgroup Name Configuration Option.

Assign a unique NetBIOS name and change the workgroup name to match that of your own network. Make sure you SAVE the settings (Option 9 on the

main menu, this saves them to the floppy and on the next reboot makes them the defaults).

Use And Maintenance of The Server

Once you reboot (option 7 on the menu) the server will be up and running. This means that you can place the server in its final destination, because from now on you can telnet into it to make any changes you need to.

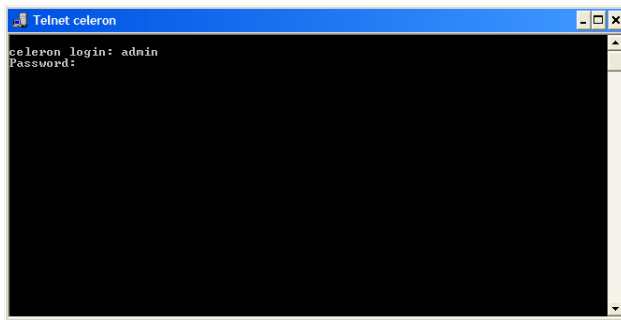


Figure 10. Typing "telnet celeron" at a Command Prompt Opens The Following Window.

Once this is done, the server will prompt you for a user name and password, and the rest is just like you are sitting in front of the machine itself. Once the server is up and running you can monitor its status from a web browser. On the local network this can be done by typing the IP address of the server into any web browser. In my case it is <http://192.168.22.50> which yields the following screen.

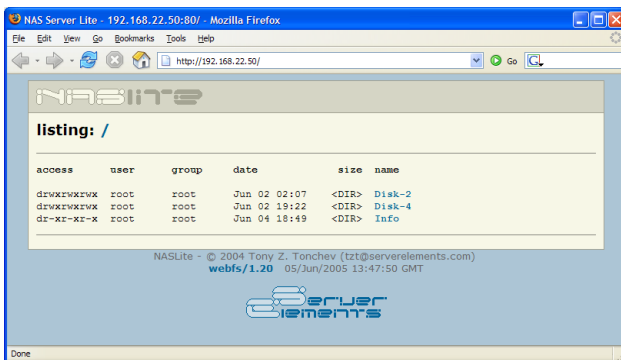


Figure 11. The Main NASLite Server Web Page.

Clicking on the info directory gives the following screen, from which you can monitor the server, and get info on the health of the drives as well as the free space available.

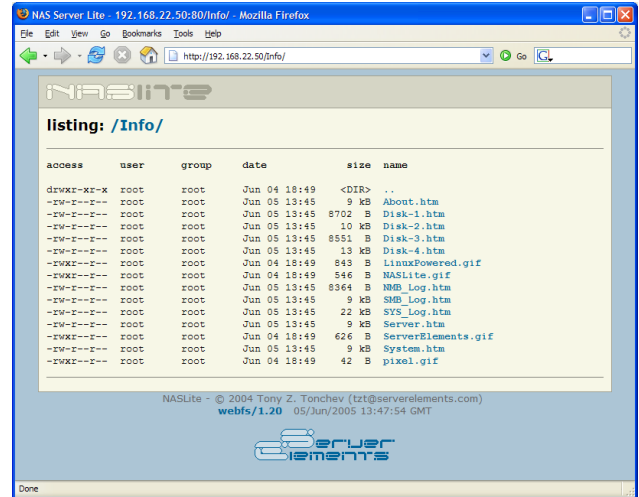


Figure 12. The Info Web Page.

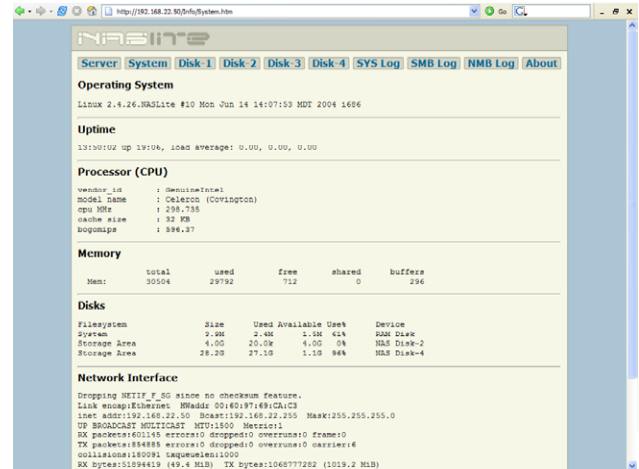


Figure 13. The System Web Page.

From this screen we can get an idea of the uptime of the server (mine has been up 19 hours and 6 minutes at the time of this screenshot), the number of disks (2 as indicated by the two lines of "Storage area") and the associated free space of each disk. My server has a 4 gig drive that is empty and a 30 gig drive that has about 1.1 gig free.

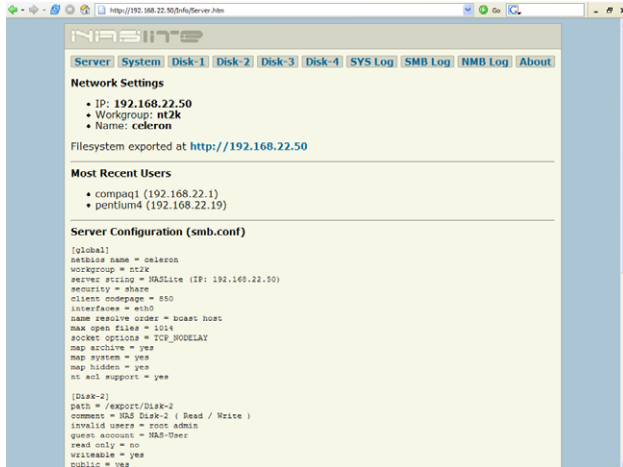


Figure 14.

Clicking in the system drive yields the following information, which allows you to see the server configuration with the associated settings of IP address, net bios name and workgroup.

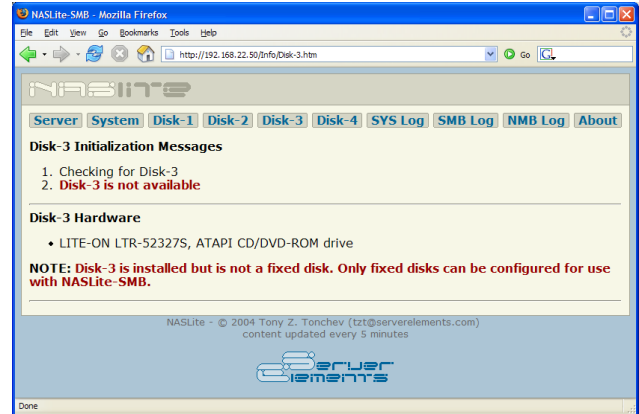


Figure 16. Clicking On a CD-ROM Disk's Info Page.

As you can see, NASLite will tell you if a disk is unavailable (in this case, disk 1 is not initialized as a storage device, and disk 3 is a CD-ROM drive.)

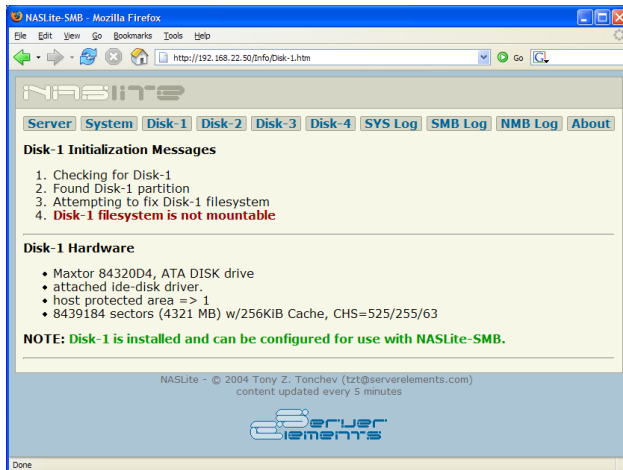


Figure 15. Clicking On An Unmounted Disk.

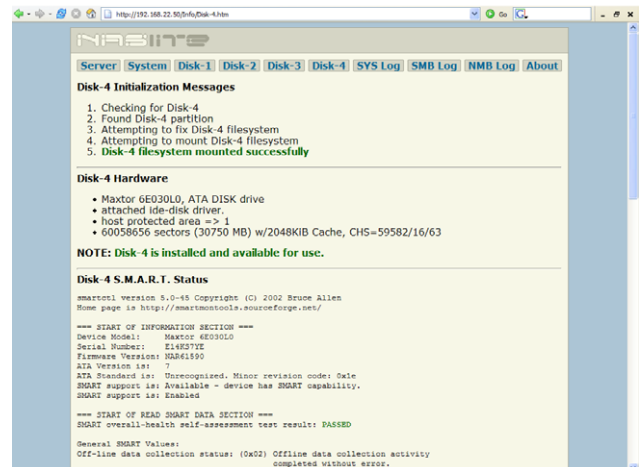


Figure 17. Clicking On a Functional And Mounted Disk.

Clicking in a disk that is available and configured for sharing gives the following information. What kind of disk it is (in this case it is a Maxtor 6E30L0 drive, which has 30750 MB of storage space and a 2MB cache. Below that is a thorough list of the S.M.A.R.T. status of the drive (useful for preventative maintenance and proactive monitoring of the status of the drive.)

Using The Server On Your Network.

There are three practical ways to get to the drives on the server from a windows network client. The first is to browse for the drives and the server. This is done by typing in the server name in the address bar of any windows explorer window as in the figure below.

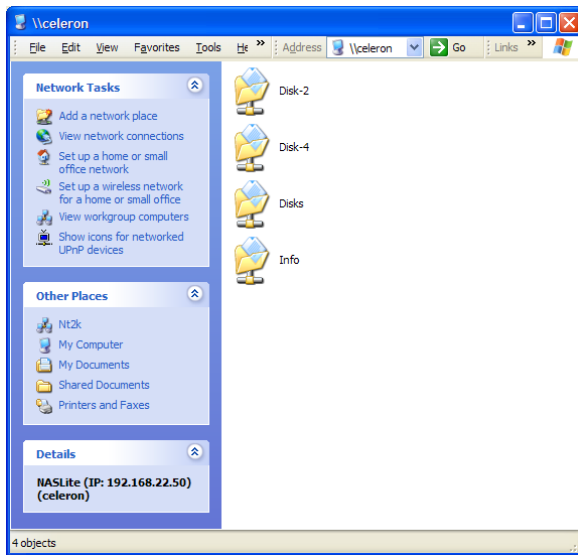


Figure 18. Results of typing \\celeron in the address bar.

From here a user can navigate to either disk-2 or disk-4, and use them to read or write files to them.

The disks directory contains links to the shared disks on the server, but these shares are READ ONLY, so using it in this scenario is unnecessary. If there is a disk that you want accessible to users as a read only device, then map it to the user computer from the \\computername\disks\disk-? Share.

For example: If I want disk-4 to be accessible for reading and writing, I will map to it via \\celeron\disk-4. If however, I want to protect it and have it as a read only share, I will map to it using \\celeron\disks\disk-4. This is a good way to have an information drive in the company that is accessed but not modified by people. Keep in mind however that this is only a measure to keep honest users honest, there is no technical aspect that keeps someone from navigating or mapping to the drive in

other ways and being able to have read/write access to it.

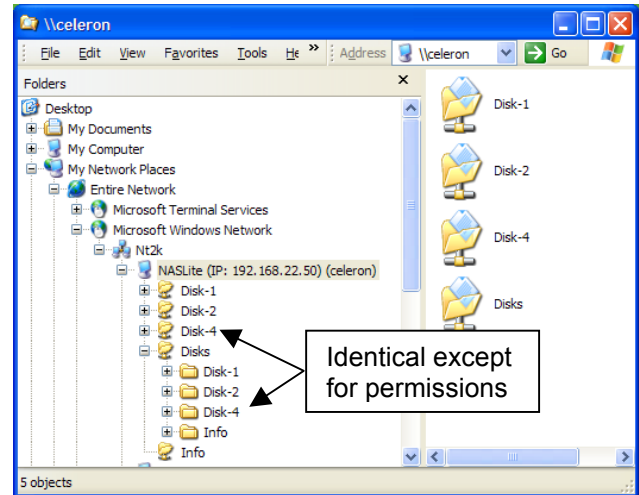


Figure 19. Getting to the data and data access issues.

In summation, both \\celeron\disk-4 and \\celeron\disks\disk-4 point to the same data location on the server (the 4th disk), but the difference is the latter will only allow you read access.

The second way to get to the server is to browse the network by opening "My Network Places" and viewing workgroup computers

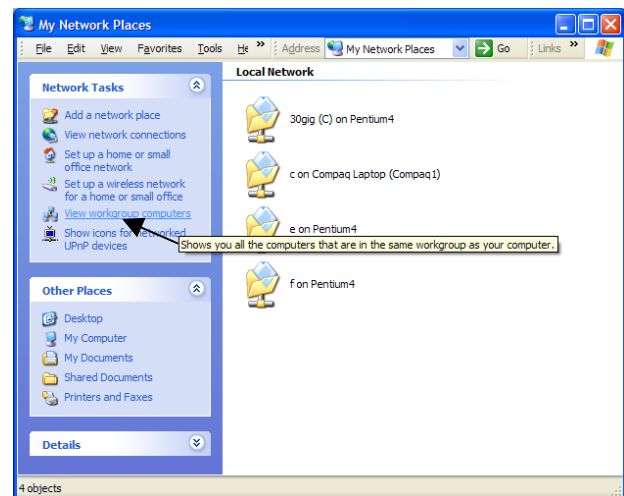


Figure 20. The location of "View Workgroup Computers" menu item

Clicking this link will give you a list of all the computes on the LAN, and will also list the NASLite Server. In this case, you can see the IP address and the net bios name.

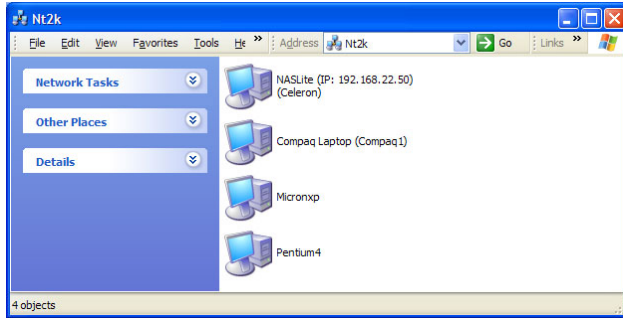


Figure 21. Results of Browsing The Network.

The last way to make the server available is to map drives on client machines directly to it.

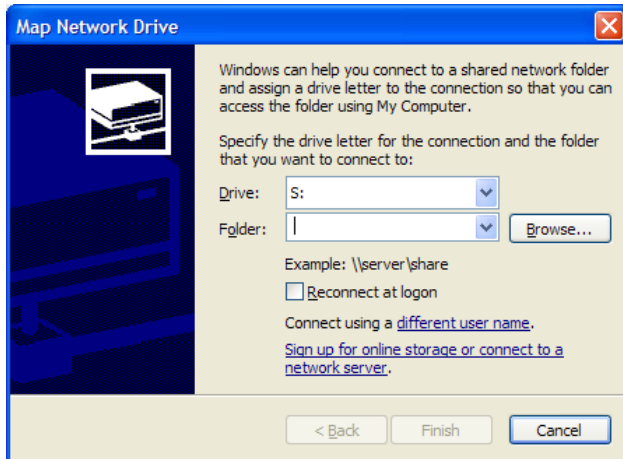


Figure 22. The Map Network Drive Dialog Box

An easy way to make sure there are no typos is to browse to the drive instead of typing the name.

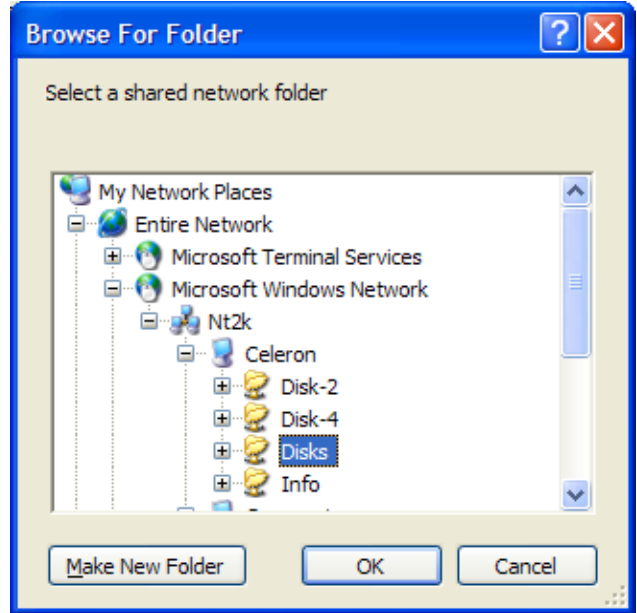


Figure 23. Browsing and Drilling Down to The Disks Directory to Map a Drive.

This will map a drive letter to the share on the server that will contain an icon for each shared drive on the server as well as the info share. Keep in mind which shares you connect to will determine whether you have write access to the drives or not.

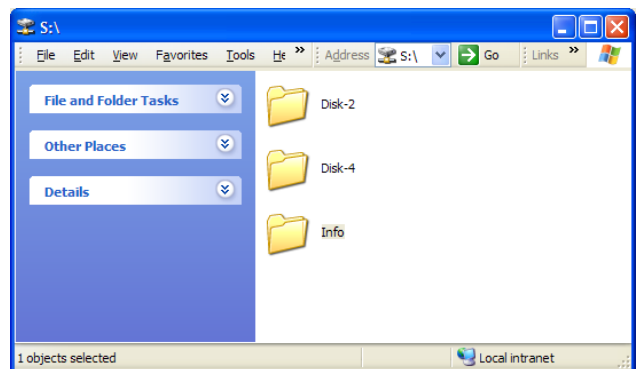


Figure 24. Viewing the shared drive (Drive S: in my case).

Conclusion

Hopefully, by now you can see the value of such an Operating System. Being able to take an old

computer from your junk pile, and convert it into a capable filesaver is not only good for your wallet, but it's also good for the environment. Keeping the old iron employed will surely keep it out of the landfill.

Online Resources

The following is a list of online resources that may be of interest. Links and descriptions are as follows:

- <http://www.serverelements.com/> - Server Elements: Distributors of NASLite Network Attached Storage Server Operating System

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