

Name: GAWSTN\_server\_setup  
Desc: HOWTO set up a mirror of NOAA's GAW aerosol server for local processing  
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20070414/JAO revised for CentOS 5.0  
20070420/JAO added fix for libGL warning (Appendix B)  
20071114/JAO revised 'Configuration of aerosol directories'  
20080724/JAO add instructions to install Text::CSV\_XS

## Introduction

NOAA is collaborating with the WMO Global Atmosphere Watch (GAW) program to enhance aerosol measurements at GAW stations. One aspect of the collaboration is deploying common data acquisition software, which allows sharing of the software that is used to view, edit, and archive the data. A Linux-based server at NOAA's Earth System Research Laboratory (ESRL) in Boulder has been set up with user accounts for the collaborating GAW stations. The data and software on this server are synchronized with the main computer that scientists at ESRL's Global Monitoring Division (GMD) use to view, edit, and archive data from NOAA's aerosol monitoring stations, thereby allowing collaborating GAW stations to take advantage of the years of effort that ESRL/GMD has invested in software development.

Access to the ESRL GAW aerosol server requires a high-speed internet connection, which is not available at all collaborating stations. This document describes an alternative approach for sharing ESRL/GMD aerosol software with GAW collaborators, which does not require as much bandwidth. The approach is to set up a dedicated server at the collaborator's facility, and routinely synchronize this server with the ESRL GAW aerosol server.

## Installation requirements

People: It is strongly advised to have someone familiar with Linux system installation and administration be responsible for the server.

Hardware: Must be compatible with the Linux distribution chosen for the installation. In general, a recent (2005 or later) Pentium-class computer is recommended, with at least 512MB of system memory and 20 GB of hard disk space.

Software: Any modern Linux distribution should work, as long as it is supported by the IDL software. IDL (<http://www.ittvis.com/idl/>) is used for data visualization and must be installed. More information on the Linux platforms supported by IDL is at <http://www.ittvis.com/idl/platform.asp>

## Installation of operating system

As mentioned above, the installation and configuration of the Linux distribution should be performed by a person who is familiar with Linux system administration. Consequently, this document does not go into details of the installation. The procedures given below have been tested on CentOS version 5.0, which is available for download at <http://www.centos.org/>, but other modern Linux distributions should also work. The computer must have an internet connection, and a firewall should be installed. All unnecessary services should be turned off, and the latest system updates should be installed following the initial installation. The system should be configured to check for security updates automatically and regularly.

There is one external Perl package that needs to be installed. Go to <http://search.cpan.org>

and search for Text::CSV\_XS. Download and install the latest version of this package, following the instructions in the Text-CSV\_XS-\*.tgz file that you downloaded.

### **Installation of IDL**

After the operating system is installed, IDL needs to be installed. The NOAA scripts call IDL with the command '/usr/local/bin/idl'. If IDL is installed in some other directory, then a link to IDL should be created in /usr/local/bin. For example, if IDL is installed in /opt/idl and called with the command '/opt/idl/idl', then the following command should be executed (as root) to create the link: 'ln -s /opt/idl/idl /usr/local/bin'. There is a limited version of IDL called "IDL Virtual Machine" that allows users to run compiled IDL programs without requiring the purchase of an IDL license. More information is available at <http://www.itvis.com/idlvm/>. NOAA's IDL-based data visualization software is 100% compatible with the requirements of IDL VM, allowing GAW collaborators to use IDL-based data visualization software without having to purchase IDL. Note, however, that the IDL VM cannot be run in unattended mode, as the user must click on a prompt when IDL VM is started.

### **Configuration of aerosol directories**

Most of the work of installing and configuring the NOAA aerosol data processing software will be done by a script that will be downloaded later. This script requires the presence of a few directories, which must be created by the 'root' user. Execute the command given below to create the required directories and links:

```
for J in aer ftp www; do mkdir /home/${J}; chmod 777 /home/${J}; ln -s /home/${J} /${J}; done
```

### **Configuration of user account**

A user account must be configured with the same user name as the collaborator's user account on the NOAA GAW aerosol server. At present, accounts have been established for the following users: alt, cpt, csj, lul, pnnl, wlg. Create a public/private key pair for the collaborator's user account by executing the following command while logged in as that user:

```
ssh-keygen -t rsa
```

Accept the default directory and filename for the keys, and do not specify a passcode.

Send an email to John.A.Ogren@noaa.gov with the external IP address of the Linux server, and attach the public key file ~/.ssh/id\_rsa.pub. This information will be used to configure the NOAA GAW aerosol server to allow access from the collaborator's Linux computer. You will receive a reply when the NOAA GAW aerosol server has been configured for access from your computer.

### **Installation and configuration of NOAA software**

After you received confirmation that the NOAA GAW aerosol server has been configured to allow access from your Linux computer, execute the following commands to download and run the script that will install the NOAA aerosol software and configure the computer to use the software. These commands should be run as the regular user, not as 'root'.

```
scp -p aerolab6.cmdl.noaa.gov:/aer/prg/bash/aer.sh /tmp
source /tmp/aer.sh
scp -p aerolab6.cmdl.noaa.gov:/aer/prg/bash/bashrc ~/.bashrc
scp -p aerolab6.cmdl.noaa.gov:/aer/prg/bash/profile ~/.bash_profile
```

```
source ~/.bashrc
scp -p aerolab6.cmdl.noaa.gov:/aer/prg/bash/rsync.gawstn /tmp
bash /tmp/rsync.gawstn -s $USER
crontab /aer/prg/crontab/crontab.gawstn
```

## Final thoughts

After installation and synchronization, you should be able to run the NOAA 'xshow' software by typing 'xshow --vm \$USER'. Unless you have installed a licensed copy of IDL, you will always need the '--vm' switch. You can save always having to type the '--vm' switch and user name by adding an alias to your ~/.bashrc file, using the following command:

```
echo "alias xshow='xshow --vm $USER'" >> ~/.bashrc
```

Now, all you have to do is type 'xshow'.

Good luck!

## APPENDIX A: Installing and configuring CentOS 5.0

1. Boot with install DVD (or CD)
2. Press <Enter> at first prompt for graphical installation
3. Be sure to test the installation media before proceeding further
4. Click "Next" at CentOS splash screen
5. Select "English" as installation language, click "Next"
6. Select appropriate keyboard for your system, click "Next"
7. Choose partitioning scheme, click "Next"  
(This example uses "Remove all partitions on selected drives and create default layout")
8. Click "Yes" to confirm that you want to remove partitions.
9. Enter network configuration for this system (ask your network administrator for help), click "Next"
10. Select your time zone. Leave the box "System clock uses UTC" checked.
11. Enter your desired root password, click "Next"  
(This is the password that is used only for system administration. You will create a user account later.)
12. Accept defaults for software installation (Gnome desktop), click "Next"
13. Click "Next" to begin installation
14. Remove CD/DVD, then click "Reboot" when installation is finished.
15. Click "Forward" after system has rebooted
16. Accept defaults for firewall (Firewall Enabled, SSH box checked), click "Forward"
17. Accept default for SELinux (Enforced), click "Forward"
18. Click "Network Time Protocol" tab, check "Enable Network Time Protocol", add names of your local NTP server (ask your network administrator), click "Forward" when done
19. Create a local user, click "Forward"
20. (Optional: Test your sound card), click "Forward"
21. Click "Finish"
22. Login as root user
23. Wait until updates are detected, then click "Apply updates". Accept any key certificates if needed.
24. Reboot after updates are finished installing, if necessary.
25. Additional steps for widescreen (1280x800) LCD display of Dell Latitude D620 laptop
  - a. Download utility to configure video BIOS (all on one line),

<http://dag.wieers.com/rpm/packages/915resolution/915resolution-0.5.2-2.el5.rf.i386.rpm>

- b. Install utility (as root), if firefox doesn't automatically install it  
rpm -ivh 915resolution-0.5.2-2.el5.rf.i386.rpm
- c. Run utility, configure mode 58 as 1280x800, 24-bit color  
/usr/sbin/915resolution 58 1280 800 32
- d. Edit /etc/rc.d/rc.local so that the utility is run on bootup, by adding the following line to the end of the file:  
/usr/sbin/915resolution 58 1280 800 32
- d. Run System->Administration->Display, click on "Hardware" tab, click on "Configure" for monitor type, select "Generic LCD Display 1280x800", click on "OK"
- f. Reboot, confirm that system display is now 1280x800

## **APPENDIX B: How to fix 'libGL' error in X-windows**

1. Depending on your graphics hardware, you might get the error message "libGL warning: 3D driver claims to not support visual 0x5b" when you try to run the IDL Virtual Machine.
2. The fix is to edit (as root) /etc/X11/xorg.conf and add the lines:  
Section "Module"  
    Load "glx"  
EndSection

The lines can be added anywhere in the file outside of another section block, and the beginning or end of the file is fine. If the file already has a Module section, just add the Load line into the existing section.