

Instructions for WLG Router Configuration
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The contents of the box shipped to Zhang Xiao-Ye at CAMS are:

- printed document "Suggestions for Network Configuration at Mt. Waliguan Observatory (WLG)"
- Linksys WRT54GS wireless router, serial no. CGN10D379032. This router has been upgraded at CMDL with the Sveasoft firmware and configured using Firewall Builder, as described in the "Suggestions for Network Configuration..." document.
- network cable
- AC power adapter
WARNING: this adapter is for use with 120 VAC/60Hz power only! A replacement power adapter suitable for use in China must be provided to use the router in China. The replacement power adapter must supply 1000mA at 12 VDC, with the plug wired for center-pin positive polarity.)
- Linksys installation instructions and installation CD. The installation CD is not needed, as the router has been pre-configured at CMDL.
- LiveCPD boot CD-ROM containing NOAA/CMDL aerosol data acquisition system
- SanDisk Cruzer Micro 256MB USB flash drive
- this document

These instructions describe how to set up and configure a test network so that CAMS network administrators can become familiar with the network hardware and remote access software to be installed at Mt. Waliguan GAW station. Here's what is needed to conduct the tests:

1. AC power adapter for the router, operating on Chinese mains power and supplying 1000 mA at 12 VDC.
2. PC with bootable CD drive, one free USB port, ethernet adapter, SVGA display, keyboard, and mouse. The NOAA LiveCPD boot CD-ROM is designed to work with common, modern hardware, and we recommend a minimum hardware configuration of a 400 MHz Celeron processor with 128 MB RAM. Some hardware may not be auto-detected and configured by the LiveCPD software, particularly the display and ethernet adapter. If auto-detection does not work, the easiest solution is to try a different computer. The LiveCPD software does not use the hard disk and will not alter the contents of the hard disk in normal use. We will call this PC "WLG100" during later tests.
3. Connection to local area network. The router is pre-configured to obtain its IP address and other network configuration information over the network from a DHCP server. If a static IP address is to be used, the following information will be needed to configure the

router:

- IP addresses
 - subnet mask
 - gateway address
 - DNS address
 - host name (optional)
 - domain name (optional)
4. A second PC connected to the local network and running Windows. This PC will be used to test remote access to computers running in the private network behind the router and firewall. We will call this PC "CAMS_client" in later tests.

The USB flash drive contains Windows software for remote access, as described in the "Suggestions for Network Configuration..." document. Plug the USB drive into the CAMS_client and copy the files in the \home\local\sw directory on the USB drive to the local hard drive. The following Windows programs are provided:

- fwbuilder: installation program for Firewall Builder. This is shareware, and a fee is required to use the software. The CMDL LiveCPD boot disk contains the free Linux version of the Firewall Builder software, so the Windows version is not required.
- opensshwindows: installation software for the SSH server and client needed for secure remote access.
- vnc: installation software for the VNC server and client needed for secure remote access.
- sleep.exe: CMDL-written program required by the CMDL-written svnc software. Sleep.exe must be installed in a directory that is listed in the Windows "PATH" environment variable.
- svnc.exe: CMDL-written program that facilitates connection to a remote PC running SSH and VNC server software.
- NetTime: software for synchronizing the PC clock to a NTP server. The NOAA aerosol computer for Mt. Waliguan will run an NTP server synchronized to a GPS receiver, and the NetTime software will allow other computers at Mt. Waliguan to synchronize their clocks to the GPS time standard.

Instructions for configuration and use of these programs can be found in the "Suggestions for Network Configuration..." document. At this time, you only need to install vnc, opensshwindows, and svnc.exe on CAMS_client. Make sure that the directories where you install vncviewer.exe, ssh.exe, and svnc.exe are listed in the Windows PATH environment variable.

Connect the hardware as follows:

1. Connect the WAN port on the router to the local network.
2. Connect the PC ethernet port to port #1 on the router.

3. Plug the power cord from the AC power adapter into the router.
4. Plug the AC power adapter into a power outlet. The front-panel LED's should blink, and then illuminate steadily.
5. Connect the monitor, keyboard, mouse, and AC power cord to the WLG100 PC.
6. Plug the USB flash drive into the PC
7. Insert the LiveCPD boot CD-ROM into the CD drive.
8. Turn ON the PC. It may be necessary to change the BIOS settings to instruct the PC to boot from the CD drive.
9. Progress messages during the boot process will be displayed on the monitor. Eventually, a graphical display should appear with the data acquisition window in the center of the screen. If the computer hangs during the boot process, or if the graphical display doesn't appear, turn off the PC and replace it with a different one.

Configure the router settings for your local network. Note that these steps are not needed if the network configuration is provided automatically by a DHCP server.

10. Click on the "Stop CPD" icon to halt the data acquisition software, click "Yes" in the confirmation window.
 11. Click on the "Mozilla" icon to start a web browser.
 12. Enter "<http://192.168.1.1>" in the browser location bar.
 13. Login as user "wlg" and password "cNc#3010"
 14. Select "Static IP" internet connection type
 15. Enter the local network information provided by your network administrator:
 - Internet IP address
 - Subnet mask
 - Gateway address
 - Static DNS #1 address (optionally, DNS#2 and DNS#3)
 - Host name (optional)
 - Domain name (optional)
 - Time zone
- Click on "Save Settings"
16. Close Mozilla by clicking on the "X" in the upper right corner of the window.

Configure the firewall settings for your local network. Note that these steps are not needed if the network configuration is provided automatically by a DHCP server.

17. Click on the "Firewall Builder" icon on the desktop.
18. Click on the arrow next to the "firewall" icon in the left pane.
19. Double-click on the "outside" icon.
20. Select "Regular" interface.
21. Click on "Apply Changes".

22. Close the configuration settings dialog by clicking on the "X" in the upper right corner of the dialog window.
23. Right-click on the "outside" icon, click on "Add IP address", enter the values for IP address and subnet mask assigned in step #15, click on "Apply Changes", close the dialog window.
24. Save the firewall configuration by clicking the menu entries "File... Save".
25. Compile the firewall rules by clicking the menu entries "Rules... Compile".
26. Upload the firewall rules to the router by clicking the menu entries "Rules... Install", then click "Next", then "Finish" when the upload is complete.
27. Close Firewall Builder by clicking "File... Exit".

The router and firewall are now configured for testing with the local network. Verify that the network connection is working properly:

28. Click on "Terminal" on the toolbar, and type "ping vortex". Press the <Enter> key, and you should see responses from the computer called 'vortex' at CMDL. If you don't see responses, something is wrong with the network connection. Contact John Ogren at CMDL (John.A.Ogren@noaa.gov) for help with troubleshooting. If you see responses from 'vortex', press <Ctrl-C> to quit the ping program. Close the terminal window by typing "exit" and then pressing <Enter>.
29. Click on "Mozilla" and type in the address of a web server (www.google.com works fine) to check that the domain name server is working.

Now it's time for the main event: log in to WLG100 from CAMS_client over a secure, encrypted and compressed network connection.

30. On CAMS_client, click on "Start->Run". Type "svnc.exe -C -l cpd -p 10100 IPADDR" into the dialog box, where IPADDR is the address that you assigned to the router in step #15 above. Press <Enter>, and a window should appear with a "Password:" prompt. Type in the password "cNc#3010" and press <Enter>. A window should appear that shows the current display on WLG100. You can now use the mouse and keyboard on CAMS_client to control WLG100. To close the session, click on the "X" in the upper-right corner of the window.

If step 30 succeeded, congratulations! You now have a working test network that you can use to evaluate the remote access procedures for computers on Mt. Waliguan. There are many configuration details to study and explore, both in the router configuration screens (<http://192.168.1.1>) and the firewall configuration program (Firewall Builder). The first thing that you might want to try is to configure a Windows computer as a VNC/SSH server, connect it to port #2 on the

router, and connect to it from CAMS_client. You should configure this computer's network connection as follows:

- Internet IP address: 192.168.1.101
- Subnet mask: 255.255.255.0
- Gateway address: 192.168.1.1
- Static DNS #1: 192.168.1.1

Follow the directions in the "Suggestions for Network Configuration..." document for configuring the VNC and SSH servers. The procedure to connect to this "remote" server (let's call it WLG101) from CAMS_client is similar to the procedure for connecting to WLG100:

31. On CAMS_client, click on "Start->Run". Type "svnc.exe -C -l administrator -p 10101 IPADDR" into the dialog box, where IPADDR is the address that you assigned to the router in step #15 above. Press <Enter>, and a window should appear with a "Password:" prompt. Type in the administrator password for WLG101 and press <Enter>. A window should appear that shows the current display on WLG101. You can now use the mouse and keyboard on CAMS_client to control WLG101. To close the session, click on the "X" in the upper-right corner of the window.

Note that you should normally use a regular user account when connecting to WLG101, not the administrator account.

You can create icons on the desktop of CAMS_client to allow connections to WLG100 and WLG101 with a double-click. The procedure is as follows:

- right-click on the CAMS_client desktop, click on "New->Shortcut"
- type in the full path to svnc.exe into the dialog box, along with the arguments needed to specify a connection to WLG100. For example, if you installed svnc.exe in [C:\wlg](#) and the IP address of the router is 198.28.2.222, you should enter "C:\wlg\svnc.exe -C -l cpd -p 10100 198.28.2.222" into the dialog box. Click on "Next", enter the name of the shortcut "WLG100" into the next dialog box, and click on "Finish".
- Follow the same procedure for WLG101, the only difference being that you should use "-p 10101" instead of "-p 10100".

Good luck! Please contact John.A.Ogren@noaa.gov if you need help.