

K4LED

Georgia Amateur Radio Astronomy Observatory

Observatory “RSS Streaming Lessons Learned” 3-4-2017

INTRODUCTION: This stations experience will be outlined for sharing with others, if desired, that may want to stream their Radio Sky Spectrograph (RSS) data. It is specific to this stations equipment and software. The router is a Netgear 6300, Modem Netgear DM111PSP, and Windows 10 operating system on an Asus laptop. This paper may supplement the fine paper written by Richard Flagg, Dave Typinski, et. al. previously. Please be aware that opening ports on your computer to the outside world is done at your own risk. You must decide if the risk is acceptable to you. If you are not comfortable changing settings in your computer operating system and router, get help from others.

GETTING STARTED: Establish your fixed IP address for the computer that will be running RSS in the server mode. Right click on the network icon in the Windows 10 task bar. Select “Open Network and Sharing Center”. **Be sure you have a hard-wired LAN cable connected to that computer.** In the left-hand column select “Change Adaptor Settings”. Click on the Ethernet icon. Click to highlight the line in the middle window that says “Internet Protocol Version 4(TCP/IPv4). Click the properties tab. Click the button that says “Use the following IP Address”. Type in your selected IP address. Most use 192.168.1.101. Click in the subnet mask box and Windows will populate it for you. Usually 255.255.255.0. The default gateway is your routers IP address usually 192.168.1.1. Enter this same IP address in the following Internet DNS server box. (Note: I said usually as there could be variations for others). There are several ways to do the same things in Windows 10 so use the method that is familiar to you. Close all the windows. **In RSS select “Options”, “Network”, then “Make Public”.**

OPEN RSS SERVER PORTS: RSS uses ports (pathways) to communicate data in and out of your computer. The ports are normally protected by your operating system firewall. We are going to open selected firewall ports to the world in the following procedure. Right click on the START button and select “Control Panel”. Click on “Systems Security”. Click “Windows Firewall”. Click “Advanced Settings” in the left column. Note you must have admin rights to enter this area. In the left column click on “Inbound Rules”. In the right column click on “New Rule” then click on “Port” and “NEXT”. The next window is where you specify the span of ports you want to open. You can find the port range in the above referenced Flagg document. Now go back and make the same rule for outbound ports.

If this procedure fails for you it is possible to turn off the firewall totally. This is not recommended by this station but is an easy alternative. This is a risk you must give due consideration.

ROUTER PORT FORWARDING: The data streams just opened on your server computer need to flow through your router. Connect a USB cable from a computer to your router USB connector. Open a web browser and type in your router IP address. It will be something like 192.168.1.1 that you can find in your router documentation along with the router security user name and password. **Update your router firmware if needed.** Click on the “Advanced Tab”. Open the Advanced settings in the left column. Click on Port Forwarding. Then enter your fixed IP address of your server. Press ADD and enter your starting and ending port numbers. Give the service a name and click APPLY. Close the windows. Now that the router knows your fixed IP address and port numbers you should protect that IP address from the DHCP. Click Setup Tab and then LAN setup. Click ADD and enter your server fixed IP address to reserve it from DHCP activity. Note: The IP address must end with .2 to .254 to be valid. Click APPLY and logout.

NOTE: Like disabling the firewall in your computer you can do a similar thing in your router and modem by invoking a DMZ. This opens the modem, router and your whole network to the world. This is not recommended and the procedure will not be provided here.)

MONITOR YOUR STREAM: Now that everything is set up you need to know if it is working. You will discover that, from another computer on your LAN, clicking on your server listing in RSS in the client mode will not work. You will get a socket error and no data will appear. To fix this right click somewhere in the server window and enter your RSS server IP address. Then enter your server port number. (Thanks Jim Sky!) Oh, you don’t know what the port number is? The following is a procedure that will let you discover your RSS server port number as it may possibly vary from computer to computer.

1. Press Ctrl Shift and Esc simultaneously on your keyboard to bring up the Task Manager.
2. Click on “Details” tab. Look for Spectrograph.exe in the left column. Note the PID number following Spectrograph.exe. Usually a four-digit number. Close the Task Manager.
3. Open a windows command prompt window by right mouse clicking on the START button and select “Command Prompt (admin)”.

4. Type in netstat -ano and look in the PID column on the right for the PID number you just noted in step 2. In the left column, you will see (0.0.0.0:xxxx) The xxxx is the port number of your RSS server.

Now that you know your RSS server IP address and port number you can go to any computer on your LAN and monitor your RSS server stream to ensure that the data stream is making it through your router. Check the RSS server listing to see if your station is listed. If it is you should be streaming properly. Please be aware that after rebooting or stopping your stream for some reason it may take a long time (often 30 minutes or more) for your station to reappear in the server listing.

REFERENCES: Thanks to Richard Flagg, Dave Typinski, Jim Sky and et. al. for valuable information. Consult your specific router, modem, and computer manuals for additional information. Google is a wonderful resource for Windows 10 information.

CAVEAT/WARNING: Remember setting up a server presents a security vulnerability that is at your own risk. You alone must decide if the risk, however small, is acceptable to you.

LEGAL/HOLD HARMLESS STATEMENT: This station and the entire Radio Jove Project takes no responsibility for any damage to your computer system, LAN or software or information lost or disclosed after implementing RSS streaming. This station will not be held responsible for any errors or omissions in this document. However, you should be able to establish RSS streaming with little trouble.

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