Lab 10: SOHO/Home Router Setup w/Wifi

What you will do:

* Complete the basic requirements for connecting to a SOHO/Home router, or similar device
* Configure and confirm the proper operation of basic services.
* Configure Wifi
* Configure Port Forwarding

Things that you will need to know or learn:

* What are the minimum configuration items for providing basic security for a router
* The common wireless signalling modes (B, G, N, and **off**!) and their maximum rates
* Wireless security modes (WEP, WPA, WPA2-Enterprise, WPA2-PSK, AES, TKIP)
* For testing purposes, how to clear your browser of any cached Active Logins

What you need to submit and when:

* Complete the pre-lab prior to starting the lab.
* Complete all parts of Lab 10 (3 demos), **before** the end of your lab period.

Required Equipment:

* SOHO/home router, Linksys E2500 running Linksys firmware
* Network cables to connect both WAN (Internet) and LAN ports (Ethernet)
* Laptop or other computer with Ethernet adapter

Marks:

Each of the lab part identified above is weighted equally, even though they may have a different number of points assigned to them.

20% of your final mark is for labs done during the course of the semester.

References and Resources:

* Google, Wikipedia, and other resources to help with terms & definitions  
  eg: <https://en.wikipedia.org/wiki/Wi-Fi_Protected_Access>   
   <http://www.dd-wrt.com/wiki/index.php/Setuserpasswd_command>   
   <http://www.dd-wrt.com/wiki/index.php/Wireless-N_Configuration>

Overview

* In this lab you will configure a Linksys SOHO router to connect to a simulated Internet using a static IP. You will have two internal clients. One of these clients will get its IP via DHCP via the SOHO router’s DHCP server and the other will be assigned a static IP.
* This lab will follow as closely as possible the pre-lab activity that you’ve already completed.
* After connecting to the simulated Internet you will configure the SOHO router to support Port Forwarding. The client with the static IP will run a light weight webserver while the other client will move to the Internet side of the router where it will connect to the internal client running the webserver.
* Before you begin you need to know if the PCs in your group have 5Ghz capable Wifi Adapters (802.11a) or not. For this lab to work we need as many groups as possible to use 802.1a.
* **This lab is to be completed in groups of two (groups of three not permitted)**

Task 0: Initial Setup

* Determine which computer in your group will be PC1 and which will be PC2.
* When you have decided who’s PC1 and PC2, ask the instructor for your Subnet ID and channel assignment. The instructor will need to know if you will be using the 8021.11a (5Ghz band) or 802.11b (2.4Ghz band) channels.
* Perform a 30/30/30 reset on the router.
* Using the appropriate cable, connect PC1 to any Ethernet port of the router. Remember in a few weeks you will have a lab skills test and you may need to perform these tasks without assistance.
* Download the Web Server from Blackboard to PC2.

Task 1: Initial network connection to the router via HTTP (PC1 does this)

* Tasks 1, 2 and 3 are performed AS A TEAM from PC1 and consist in configuring your SOHO router.
* Disable your Wifi adapter.
* Connect a network cable from a router LAN (Ethernet) port to your laptop. Wait a few moments and verify that your laptop has obtained an IP address via DHCP. The address MUST be assigned from the 192.168.1.0/24 subnet.
* Open a web browser and enter [http://192.168.1.1](http://192.168.1.1/) in the address bar to connect to the router’s configuration page .
* You should see a page like the one shown below. Click “Continue with an open and unsecured network”.



* You will now get another warning screen. Just check the box that says you understand and click continue.
* Login into the router using the username/password of *admin/admin.*
* You will now get another warning, check the “Do not show me this again” box and click OK.
* If the OK button doesn’t work just close the dialog box.

Task 2: Initial network configuration (from PC1)

* From PC1, access the router’s configuration page to set Internet connection type to “Static IP”. Enter the Internet IP information you were given.
* Set the router’s name to the one you were given.
* Set the router’s LAN IP address (this is the LAN’s gatway address!) to the first address in your subnet, assign the correct subnet mask.
* Set the Starting IP to the second usable address in your subnet.
* Set the Maximum number of users to 10.
* Set the timezone to (GMT -5) Eastern Time (USA & Canada)
* Save Settings.
* You may need to issue the appropriate ipconfig commands to release and renew PC1’s IP address.
* Using ipconfig, ensure that PC1 has been assigned an IP address from your assigned subnet. Confirm the subnet mask and the gateway addresses are correct.
* Before proceeding, confirm that you can ping the router’s LAN gateway address as configured in step 3 above.
* Do not continue until you are certain that Task 2 configuration changes have been successfully implemented.

Task 3: Router Wireless Configuration (From PC1)

* From PC1, access the router’s configuration page to configure your SOHO’s router Wireless settings. Select the “manual” radio button
* For the radio (frequency) you are not using set the Network to “Disabled”. For example, disable the 2.4Ghz band if you are not using it.
* Using the information you were given at the start of the lab configure:
* Network Mode
* SSID
* Channel
* Set the Security Mode to WPA2-personal and passphrase to *password*
* Plug the Internet port of the router into a red jack.
* Save Settings.

Task 4: Client Configuration (on both PCs)

* Disconnect the network cable from PC1
* On both PC’s disable the Ethernet Adapter
* On PC2 configure the IPV4 address on the Wireless adapter to the last usable IP address of your subnet. Make sure you set the proper subnet mask, default gateway and DNS server address.
* Configure both clients (PC1 and PC2) to access your SOHO router wirelessly. If you need help see your instructor. Using the ipconfig command, verify the wireless adapter has the correct IPv4 addresses for your subnet: check the IPv4, subnet masks, default gateway and DNS addresses.
* From each PC make sure you can successfully ping both interfaces of your SOHO router. Write down the IPv4 address assigned to PC2’s wireless adapter.
* Test that both PCs can access the site [http://eagle-server.example.com](http://eagle-server.example.com/)
* Leave the page open for your instructor to see
* If you can’t connect go back over your settings to make sure you didn’t miss anything.

**CHECK POINT #1**: From **PC2** open the setup page on the router. You instructor will ask you to show him/her a few things

Task 5: Configuring Port Forwarding

* Disable firewall on PC2
* On PC2 run the Webserver.exe (the file you downloaded in task 0). You will be prompted for the extraction location. Be sure to enter a folder name as the archive will be extracted to the root of the location you specify.



* Navigate to the location you extracted the file to, run *wwebserver.exe* (double click). The webserver window will appear as shown below. Uncheck the box “Start automatically when System starts up (no NT-Service!)”. Now click “Start” to start the server

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* From PC2, verify that you are able to successfully connect to your web server by entering the following in any browser’s address bar: http://127.0.0.1:1080
* **Client Address: 127.0.0.1**
* **Server Address: 127.0.0.1**
* Note PC2’s IPv4 address assigned to the Wireless adapter.
* PC1 must now disable its wireless adapter and then re-enable its Ethernet adapter. Using the appropriate cable connect PC1 to to one of the red jacks.
* Ensure that PC1 has obtained an IPv4 address from the Eagle-Network.
* From PC2 login to the router’s configuration page to configure port forwarding by setting the external Port to port 80, the internal port to the one you set in Step 3, the protocol to TCP and the IP address to PC2’s
* From PC1 connect to PC2’s web server by opening a web browser and typing in [http://internetIP](http://internetip/) where the internetIP is your SOHO router’s (WAN) internet address.

**CHECK POINT #2**: Opening the page from PC

Task 6: Configuring common services and Enhancing Security

A few common services are very handy for administering and maintaining your router: HTTPS, WAN pings, and NTP.

* While logged into the router, click on the Security menu item.
* Have PC1 ping the routers “Internet IP”
* Now uncheck the “Filter Anonymous Internet Requests” and repeat the ping
* What does “Filter Anonymous Internet Requests” do?(block the ping request)
* Click on the “Administration” menu item.
* You will notice that the “Local Management Access” is set to only HTTP. Select both HTTP and HTTPS.
* Have PC1 disconnect from the red network and reconnect to the router. PC1 should try to access the router using [HTTPS://*HYPERLINK "https://internetip/"internetIP*](https://internetip/)
* Note what happens
* Observe the other available settings
* Backup the router’s configuration. Rename the download file to *Group##\_lab10.cfg*
* Example: GroupA1\_Lab10.cfg. You will upload this to Blackboard at the end of the lab
* Save a copy of the configuration file for use in future labs

**Check Point #3**: Uploaded file is marked in bulk after all groups have finished the lab

Task 7: Clean Up

* Return you cables and routers to their proper locations
* Restore you PC settings to their pre-lab values
* Complete the post lab before the start of your next lab period