

# Computer Maintenance 1

## Module 16 Homework/Study Guide

### Assignment #1 – Wireless Setup

#### Objectives:

- Setup a wireless network
- Implement an IPv4 addressing scheme
- Connect a laptop/portable device to the wireless network

#### Resources:

- Wireless Router
- Laptop
- Appropriate Straight-Thru cable

#### Step 1 – Initial setup

- Plug in the wireless router
- Locate the reset button on the back of the router. Press and hold for 30 seconds. This will reset the router back to factory defaults.
- Plug your Ethernet cable into any switch port on the router and the other end to your computer. Do not plug anything into the Internet (WAN) port right now.
- Restart the router.
- On your PC, open the Command Prompt (click the **Start** button and select **Run**. Type **cmd** and click **OK** or press **Enter**)
- Type **ipconfig** and **press Enter**. This will display the IP, Subnet Mask, and Default Gateway addresses.
- Write down the settings:  
IP address:  
  
Subnet Mask:  
  
Default Gateway:
- Troubleshoot as needed:
  - Make sure the cable is a known-good straight-through cable. Test to verify.
  - Verify that the link light for the port where the computer is attached is lit.
  - Check whether the multi-function device has power.
  - At the Command Prompt, type **ipconfig /renew** to get a new IP address.
- Open a web browser and type to Default Gateway address and press Enter. This should access the router web interface.
- Enter the routers username and password.

#### Step 2: Change the default router IP address

- In the main menu, change the default router IP address to 192.168.5.1.
- Set the Subnet Mask to 255.255.255.0.
- Change the Start IP Address to 192.168.5.100
- Change the Maximum Number of Users to 10.
- Save the settings. (Nothing will change until you click save)
- At the Command Prompt, type **ipconfig /renew** to get a new IP address.
- Enter the new Default Gateway address into the web browser.

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### Step 3: Change the default passwords

- a. In the main menu, click on the **Administration** tab.
- b. Change the default password to **mypass** (this is case sensitive).
- c. You will have to relogin with the new password.

### Step 4: Configure the basic wireless network

- a. In the main menu, click on the **Wireless** option.
- b. In the Wireless Settings window, the Network Mode shows mixed by default, because the AP supports 802.11b, g, and n wireless devices. You can use any of these standards to connect to the AP. If the wireless portion of the multi-function device is not being used, the network mode would be set to Disabled. Leave the default of **Mixed** selected.
- c. In the Network Name (SSID) textbox, Enter the new SSID of **MYWLAN**. SSIDs are case-sensitive.
- d. Click on the **Radio Band** drop-down menu.
- e. For a wireless network that can use 802.11b, g, or n client devices, the default is Auto. Auto allows the Wide Channel option to be chosen and gives the best performance. The Standard Channel option is used if the wireless client devices are 802.11b or g, or both b and g. The Wide Channel option is used if only 802.11n client devices are being used. Leave the default of **Auto** selected.
- f. SSID Broadcast is set to Enabled by default, which enables the AP to periodically send out the SSID using the wireless antenna. Any wireless devices in the area can detect this broadcast. This is how clients detect nearby wireless networks. **Disable** the SSID Broadcast.
- g. Click on the **Save Settings** button before exiting the screen. The AP is now configured for a wireless network with the name (SSID) that you gave it.

### Step 5: Configure encryption and authentication

- a. Choose the Wireless Security tab on the Wireless screen. Most routers support five types of security mode settings:
  - WEP (Wired Equivalent Privacy)
  - WPA (Wi-Fi Protected Access) Personal, which uses a pre-shared key (PSK)
  - WPA Enterprise, which uses Remote Access Dial In User Service (RADIUS)
  - WPA2
  - WPA2 Enterprise
- b. Select **WPA2 Personal** Security Mode.

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- c. Choose an Encryption algorithm.

To secure a network, use the highest level of encryption possible within the Selected Security mode. The following Security Modes and Encryption levels are listed from least secure (WEP) to most secure (WPA2 with AES)

- TKIP (Temporal Key Integrity Protocol)
- AES (Advanced Encryption System)

AES is only supported by newer devices that contain a co-processor. Select **AES**.

- d. For authentication, enter a pre-shared key (password) **MyPass123**. This key is shared by device and all connected devices. It is case sensitive.
- e. Choose a key renewal period between 600 and 7200 seconds. The renewal period is how often the device changes the encryption key. Leave at the default.
- f. Click on the **Save Settings** button before exiting the screen.

### Step 6: Attach a device to the wireless network

- a. Most wireless NIC adapters have client software, built-in or third party, to control the NIC. The software shows any wireless networks that are discovered (broadcasting). Is your wireless showing?
- b. Since you disabled the SSID it should NOT be in the list. You will have to setup the connection manually. Open the Network and Sharing Center (Windows 7) on your device. Select Manage Wireless Networks.
- c. Click Add and select Manually Create a Network Profile. Enter the same information as when you setup the wireless. Be sure to select the two options at the bottom of the page.

Enter information for the wireless network you want to add

|                  |   |
|------------------|---|
| Network name:    | <input type="text" value="MYWLAN"/>   |
| Security type:   | <input type="text" value="WPA2-Personal"/>                                      |
| Encryption type: | <input type="text" value="AES"/>  |
| Security Key:    | <input type="text" value="MyPass123"/> <input type="checkbox"/> Hide characters |

- Start this connection automatically
- Connect even if the network is not broadcasting

Warning: If you select this option, your computer's privacy might be at risk.

- d. If the wireless NIC does not connect to the wireless network, perform the appropriate troubleshooting.

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### Step 7: Configure MAC address filtering

- a. Open a web browser and go to the wireless router's GUI.
- b. Choose the Wireless MAC Filter tab on the Wireless screen.
- c. MAC address filtering allows only selected wireless client MAC addresses to have access to your network. Select the radio button to **Permit PCs listed below to access the wireless network**. Click the **Wireless Client List** button to display a list of all wireless client computers on your network.
- d. The next screen allows you to identify which MAC addresses can have access to the wireless network. Click the **Save to MAC Address Filter List** check box for any client device you want to add, and then click the **Add** button. Any wireless clients, other than those in the list will be prevented from accessing your wireless network.
- e. Click on the **Save Settings** button before exiting the screen.

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### Assignment #2 - Planning a IP Addressing Scheme

IP Address: **195.36.44.0/24**

#### Step 1: Creating a subnet chart

- a. Follow the 9 step process:
  1. Determine the Class of each given network.
  2. Determine the Default Mask.
  3. Determine how many bits you must borrow to create the desired number of subnets.
  4. Determine the possible and usable subnets
  5. Determine how many possible and usable hosts you have in each subnet.
  6. Determine the Subnet Mask.
  7. Determine the IP address range (increment) of each subnetwork.
  8. Determine the network and broadcast address for each useable subnetwork.
  9. Determine the usable range for each subnetwork.

| Subnet # | Network Address | Usable Range | Broadcast Address |
|----------|-----------------|--------------|-------------------|
| SN0      |                 |              |                   |
| SN1      |                 |              |                   |
| SN2      |                 |              |                   |
| SN3      |                 |              |                   |
| SN4      |                 |              |                   |
| SN5      |                 |              |                   |
| SN6      |                 |              |                   |
| SN7      |                 |              |                   |
| SN8      |                 |              |                   |
| SN9      |                 |              |                   |
| SN10     |                 |              |                   |
| SN11     |                 |              |                   |
| SN12     |                 |              |                   |
| SN13     |                 |              |                   |
| SN14     |                 |              |                   |
| SN15     |                 |              |                   |

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b. Label all the ports with the appropriate IP address.

