WIreless Router Setup

**Lesson Description:** In this learning module, students will configure a wireless router that would be used in a residential environment. The focus will be to understand the security setting in the router in order to protect personal data on a network. Public and private IP addresses will be discussed, as well as the bandwidth on the channel of a router. The students will also setup a white list of MAC addresses of devices that can connect to the wireless router.

**Prerequisite Knowledge:** Previous knowledge on IP addressing and MAC addressing.

**Length of Completion**: 40 minutes

**Level of Instruction:** High School or Middle school introductory level.

**Applicable First Principles &/or Concepts:**

**GenCyber First Principles**

Domain Separation Abstraction

Process Isolation Data Hiding

Resource Encapsulation Layering

Modularity Simplicity

Least Privilege Minimization

**GenCyber Cybersecurity Concepts**

**Defense in Depth** **Availability**

Confidentiality **Think Like an Adversary**

Integrity Keep it Simple

**Resources that are Needed:** To complete this lesson, the student will need a wireless router, an Ethernet cable, a computer with an Ethernet port, and a portable device (smart phone or pad).

**Accommodations Needed:** May need someone to read items that are on the screens if there is a visually impaired participant.

# learning outcomes

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* Explain the purpose and function of a wireless router
* Determine the best place to locate a wireless router
* Explain what a wireless router gateway is, and how to configure it
* Explain how to change the administrative password on a wireless router
* Explain how to update the firmware of a wireless router
* Setting up the security on a wireless network

# Lesson Details

**Interconnection:** Lays out foundations of networking which will be referenced in remaining lessons of the day, as well as lessons on Tuesday and Thursday of this week. 1.5 Wireless Networking Basics; 4.1 Connecting Raspberry Pi to the Network.

**Assessment:** Post exercise discussions, Observations, Walk around.

**Extension Activities:** None

**Differentiated Learning Opportunities:**

# lesson 1.4

**Lesson 1.4 Details:**

**Warm Up:** Create a Home Wireless Router Safety List

Each table group will use the internet to come up with 5 best practices people should do to enhance the security of a home wireless network.

**Lesson:**

Activities:

1. Students will set up communications with the wireless router

2. Setup a primary channel on the router

3. Setup a guest network on the router

4. Create a white list of MAC addresses that can connect

5. Setup the level of security required on the router

6. Set up a group on the router for stations to connect to

- Describe the Teacher Instruction:

30 minutes of lecture with a Power Point, supporting PDF materials, and thorough demonstration to explain all of the hardware on a setting up a wireless router. The participants will perform activities 1 through 6 in small groups, with multiple instructors in the room to assist. The following topics will be discussed.

A. Purpose of a wireless router

1. Serves as a hardware firewall

2. Public versus private IP addresses

3. Configuring the bandwidth of a channel

4. Limit user access to certain channels of the router

5. Multiple computers/devices connect simultaneously

B. Initial configuration of a router

1. Change the admin password before using

2. Creating a user account, and limiting the bandwidth

3. Security levels (WPA, WPA2, etc.)

4. Creating a MAC address access list

5. How to update the firmware of a wireless router

Acknowledgement: Lesson developed by Roger Spears, Tami Norris, Gary Border.