# Raspberry Pi Router

PROJECT DATE: 4/12/24

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A close-up of a computer

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### Purpose:

I needed a way to practice hacking wireless networks without fear of bringing down an actual network. I decided to create a Raspberry Pi router using a Raspberry Pi 4B. I used Open WRT for the operating system on the Pi. Creating this would allow me to input any wireless network available and output it to an SSID of my creation.

### Open WRT Configuration

To complete this project, I had to modify the network file, the firewall file, and the wireless file. As a good network administrator would do, I first backed up the original configurations. I accessed Open WRT through the Windows command line with SSH. I changed the default password and rebooted the system.

#### Network Configuration

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The Configuration change here was the LAN interface. The default IP was the standard 192.168.1.1. I next created the ‘wwan’ interface. This is the interface that users would connect to once I made the new wireless network.

#### Firewall Configuration

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The only change here was to the LAN zone. I needed to ensure that the input was changed from REJECT to ACCEPT. This would allow the traffic to pass freely.

#### Wireless Configuration

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I ran into some difficulties here. Using ChatGPT and Open WRT documentation I found I needed to add a few options to the ‘radio0’ configuration. I first changed the channel from 30 to 7. Next, I changed the htmode to HT20. This changes it to a 20MHz channel width, the standard channel for 802.11n networks. I then created the option short\_gi\_40 and enabled it. It was initially strange to me, considering this option was for a 40MHz channel width. After doing a bit of digging, I found this combination was to help minimize interference. The wifi-iface ‘wifinet2’ is my home wireless network and the one I used for testing. It was configured through the Open WRT GUI. More on that later. Finally, I configured the radio1 interface. I changed the SSID to ‘HackThisNetwork’ to entice my classmates to try. I changed the encryption to psk2, which is WPA2-PSK. I then added my own key. I can also change the key here for future labs.

#### Open WET GUI

If one chooses, one can configure almost everything in the GUI. However, I find the CLI plenty user-friendly. Lastly, here is a picture to show the wireless networks in operation.

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##### Documentation

Open WRT: <https://openwrt.org/docs/start>

OPEN WRT Images: <https://openwrt.org/downloads>

Hardware Used: Raspberry Pi 4B, EASTECH Wireless WiFi USB Dongle Stick Adapter RT5370