RouterPi – AP - WirelessBridge

Done on a kali pi

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**Goal:**

The mission here is to create a raspberry pi Access Point. From there we will proceed to create a travel router, an access point that is able to piggyback public wifi and host a more secure network in public spaces.

Raspberry Pi has a Dual Band Wireless Network Interface Controller. Understanding what this means may prove crucial to our understanding of the Router set up. A question that comes to mind is if a Dual Band nic can both virtualize itself and split itself into two interfaces per Band. It seems possible however the only issue is that we find is that the NIC can’t do both at the same time. It either connects to the WiFi or is broadcasting the signal. This is seen where the network manager will pick up the connected internet connection however will drop it after a few seconds and then attempt to try again.

<https://www.lifewire.com/dual-band-wireless-networking-explained-818279>

Modern Wifi Adapters have dual-band capability, meaning that they are able to broadcast both 2.5ghz and 5ghz. However most if not all wireless adapters are only able capable of receiving/broadcasting one signal at a time. So in order to set up our Wireless Access Point/ Router we need another wireless dongle.

Raspberry Pi Access Point

Sources, Articles, References

<https://pimylifeup.com/raspberry-pi-wifi-extender/>

<https://www.shellvoide.com/wifi/setup-wireless-access-point-hostapd-dnsmasq-linux/>

<https://www.raspberrypi.org/documentation/configuration/wireless/access-point.md>

<http://www.intellamech.com/RaspberryPi-projects/rpi3_simple_wifi_ap.html>

<https://seravo.fi/2014/create-wireless-access-point-hostapd>

First Step

We need to install Hostapd and dnsmasq to create the architecture needed for creating an AP as well as a Domain Name Server (DNS) masq, which will set up domain name forwarding. Both can be installed through the aptitude repository.

sudo apt-get install dnsmasq hostapd -y

sudo systemctl stop dnsmasq

sudo systemctl stop hostapd

We switch the interface into monitor mode to allow it to broadcast.

(I found this step not crucial )

ifconfig

ifconfig wlan0 down

iwconfig wlan0 mode monitor

ifconfig wlan0 up

**Now we create the hostapd.conf file**

nano hostapd.conf

In the file write the following

interface=wlan0

driver=nl80211

ssid=[AP NAME]

hw\_mode=g

chanel=[AP Channe:6]

macaddr\_acl=0

ignore\_broadcast\_ssid=0

#uncomment these lines if you’d like authentication

#auth\_algs=1

#wpa=2

#wpa\_key\_mgmt=WPA-PSK

#rsn\_pairwise=CCMP

############TKIP

#wpa\_passphrase=pass

Now save the file

And edit the dnsmasq.conf

nano /etc/dnsmasq.conf

The in the dnsmasq.conf add the following

Interface=wlan0

dhcp-range=192.168.8.2,192.168.8.30,255.255.255.0,12h

dhcp-option=3,192.168.8.1

dhcp-option=6,192.168.8.1

server=8.8.8.8

log-queries

log-dhcp

listen-address=192.168.8.0

Now we have our AP configured

Now we create the hostapd script to activate the AP

#!/bin/bash

service hostapd start

service dnsmasq start

echo run the dnsmasq start file in another terminal

hostapd /etc/hostapd/hostapd.conf

#EoF

#!/bin/bash

#you can customize this script so it the user can set their custom interface ip address

#To configure the interface type the following in the terminal

#ifconfig wlan0 up 192.168.8.1 netmask 255.255.255.0

#route add -net 192.168.8.0 netmask 255.255.255.0 gw 192.168.8.1

#uncomment the lines above if the ip isn’t already configured

#not crucial

dnsmasq -C dnsmasq.conf -d

#Eof

**Trouble Shooting**

When I run the my “startHostapd” ( shown above), the following error is returned:

Line 2: invalid/unknown driver 'nl80211'

This error is returned due to two main factors, generally that the NIC doesn’t support that specific driver, or a spelling error or syntax error. In my case, it was both, when I attempted to set up the above configuration I was missing the appropriate driver, so I set up the AP on my native NIC. If you choose to set up the Hostapd configuration with a different driver you may need to figure out which driver is compatible with the NIC and download it separately. Upon remediating this error the response is given and all is right again in the world

Wlan0: AP-ENABLED

My Next issue I encountered was the passphrase and authentication of the AP. This wasn’t such a prevalent issue at the moment, since for the current usage the AP is simple acting as a gateway to hide a local network. For the moment, I removed WPA and PSK encryption along with the passcode, however this issue will need to get solved upon moving forward in the project.

Another not prevalent but still import issue arises, which is the IP table forwarding. It seems that my issue lies in the syntax of the of the iptables command. Upon resolution of this issue, The AP will have bridge like capabilities and be able to relay the internet signal that it connects to it’s clients.

**WORK IN PROGRESS**

Set up traffic forwarding, edit the sysctl.conf file

```

sudo nano /etc/sysctl.conf

```

Add the following/uncomment the line

```

net.ipv4.ip\_forward=1

```