Project Name: **Cybersecurity Club's Raspberry Pi Networking Project**

Date: **July 11, 2023**

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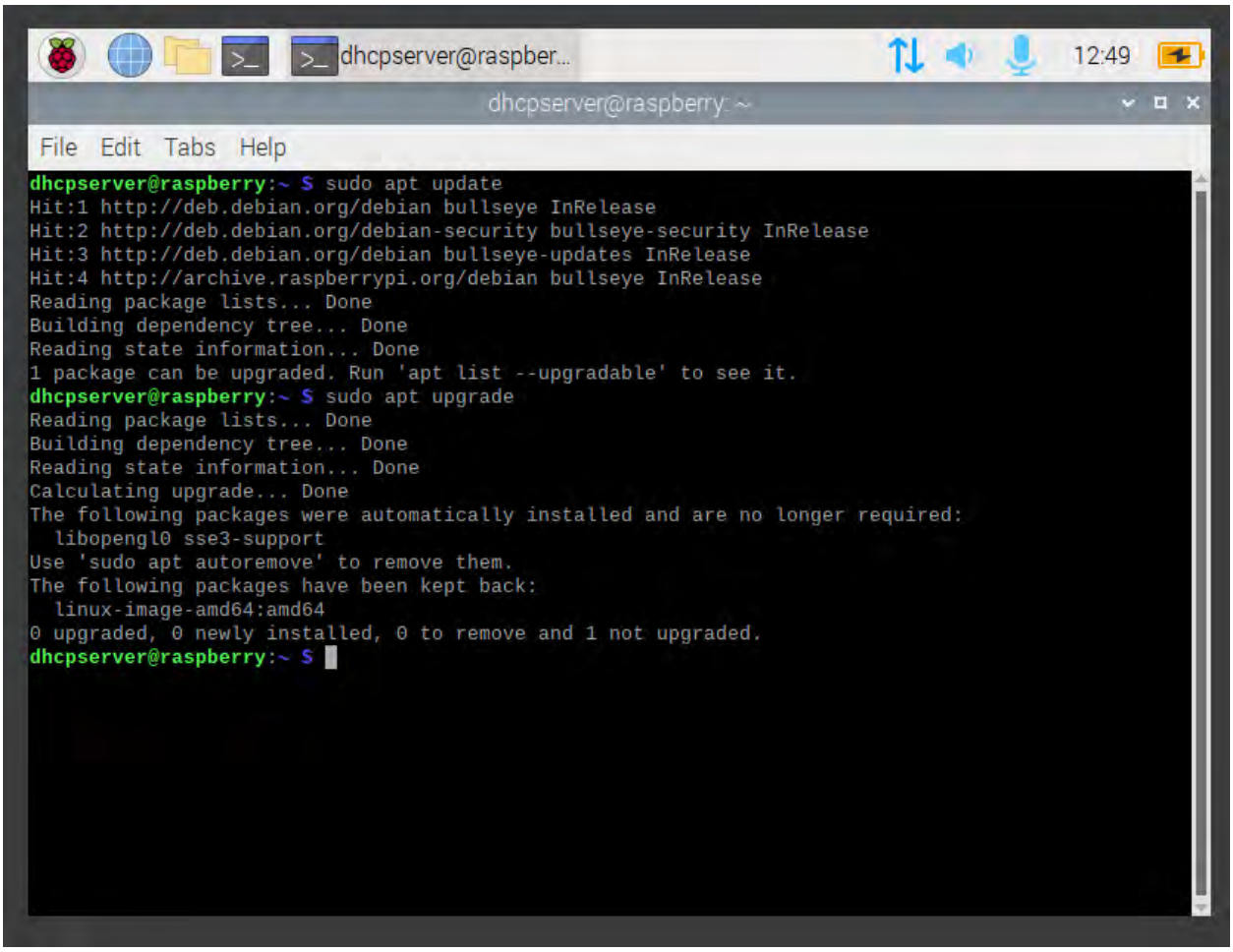
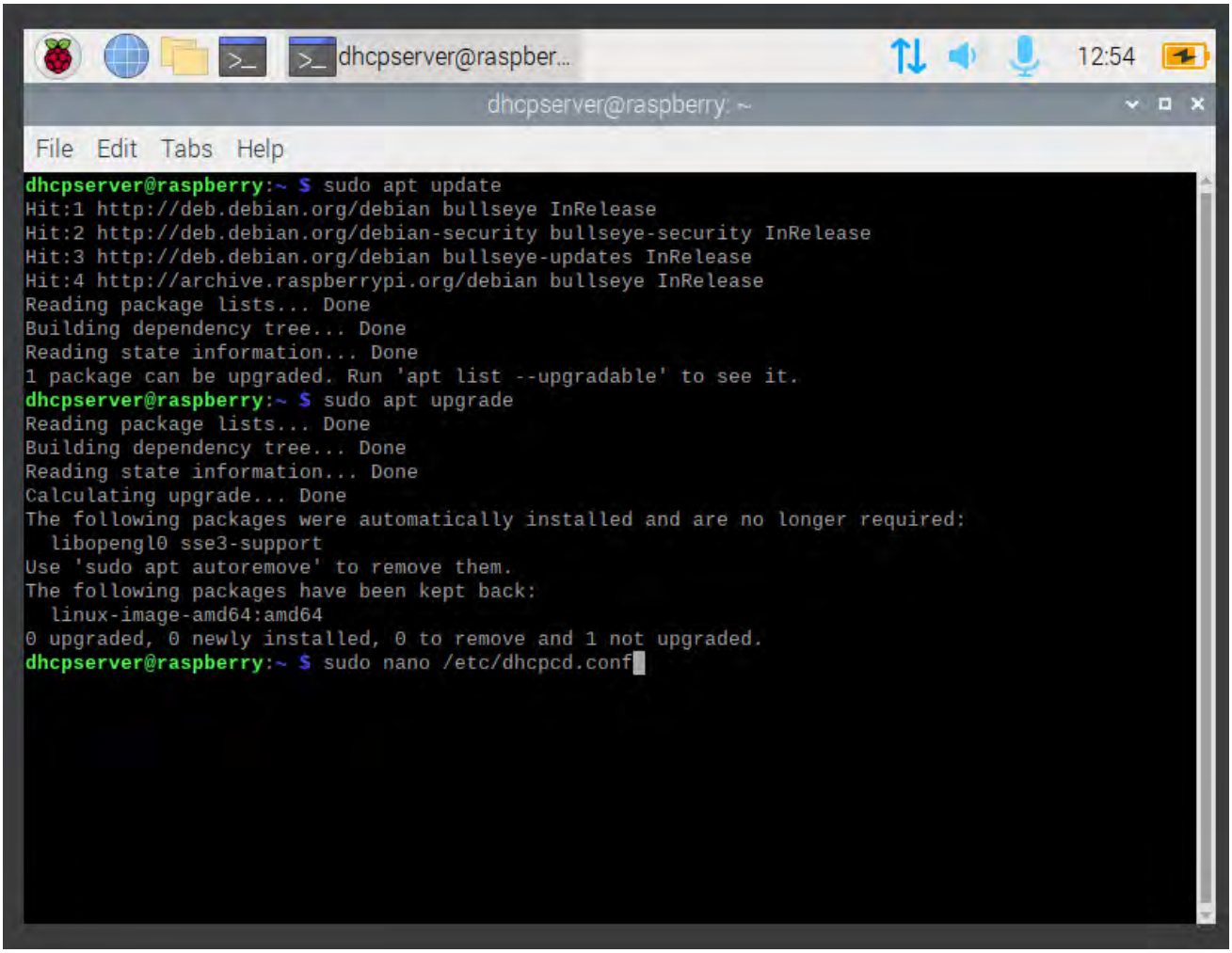
Purpose: **Documentation for the DCHP Server**

Set up a Raspberry Pi as a DCHP Server

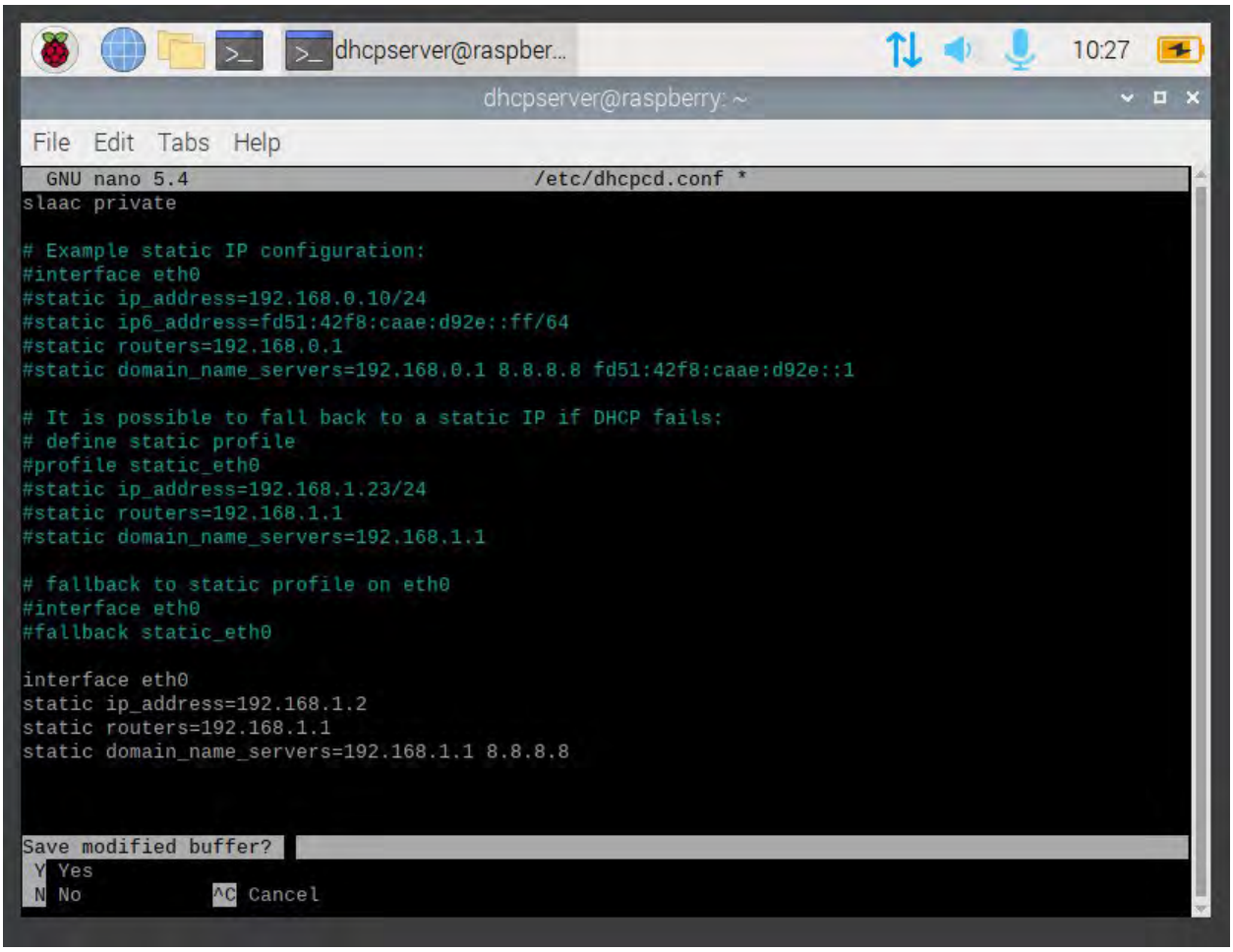
1. The first command I run is **sudo apt update**, this command updates a database of readily available software packages and their versions known as the local package index. The second command I run is **sudo apt upgrade**, this command upgrades the software packages on a Linux system. **Note**: I've forgot to add **sudo apt install dnsmasq**, but I have already installed **dnsmasq** software packages on this **RPI OS.**



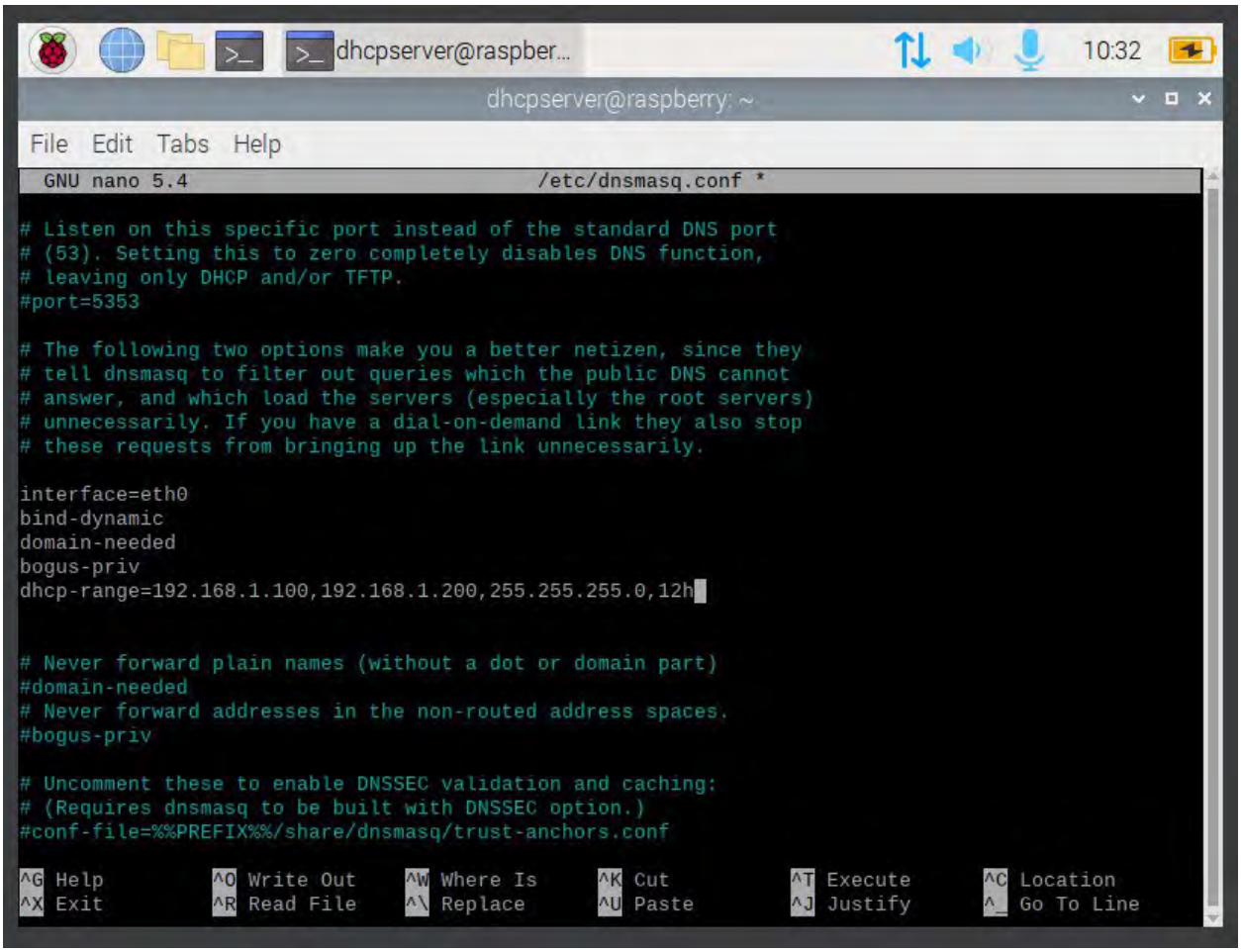
2. The next step is to open the dhcpcd.conf file, using the command: **sudo nano /etc/dhcpcd.conf** and add a few lines to it.



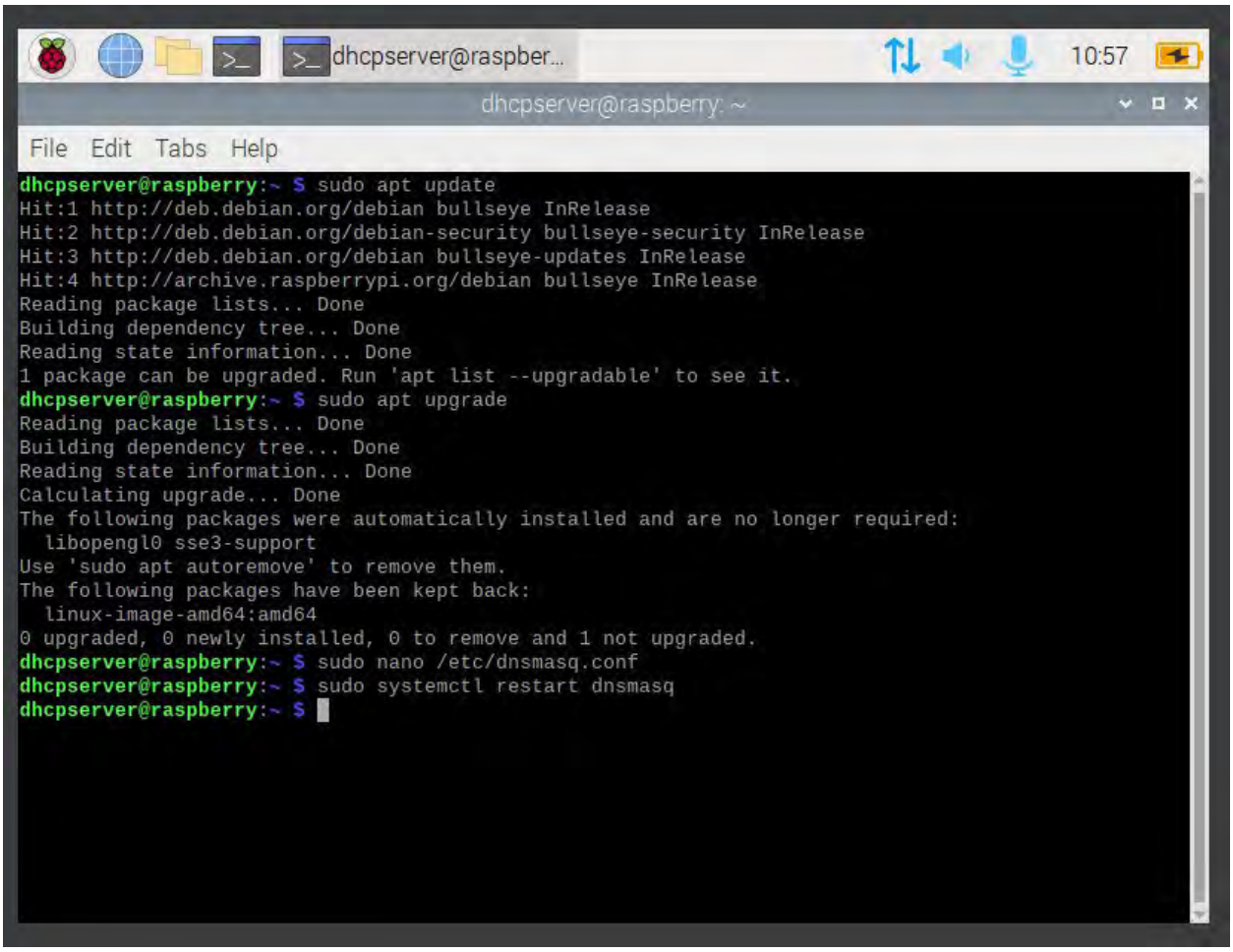
3. In the configuration file, I Added: **interface eth0**,**static ip_address=192.168.1.2**, **static routers=192.168.1.1**, **static domain_name_servers=192.168.1.1 8.8.8.8**. After uncommenting those lines, to save the changes I pressed the keys **CTRL + X** and entered to exit the configuration file.



4. Next I open the configuration file using the command: **sudo nano /etc/dnsmasq.conf** and I added a few lines to our configuration file which are: **interface=eth0**, **bind-dynamic**, **domain-needed**, **bogus-priv**, **dhcp-range=192.168.1.100**, **192.168.1.200**, **255.255.255.0**, **12h**. Here is a short explanation of each line **interface=eth0**: Indicates that the Ethernet interface with the identifier eth0 will use the following configurations. **bind-dynamic**: Tells the DHCP server's IP address-assigning daemon to dynamically bind to it. **domain-needed**: Ensures that only fully qualified domain names are used while performing DNS domain resolution. To avoid the usage of possibly false or malicious IP addresses, **bogus-priv** enables verification for reserved private IP address ranges in DNS answers.

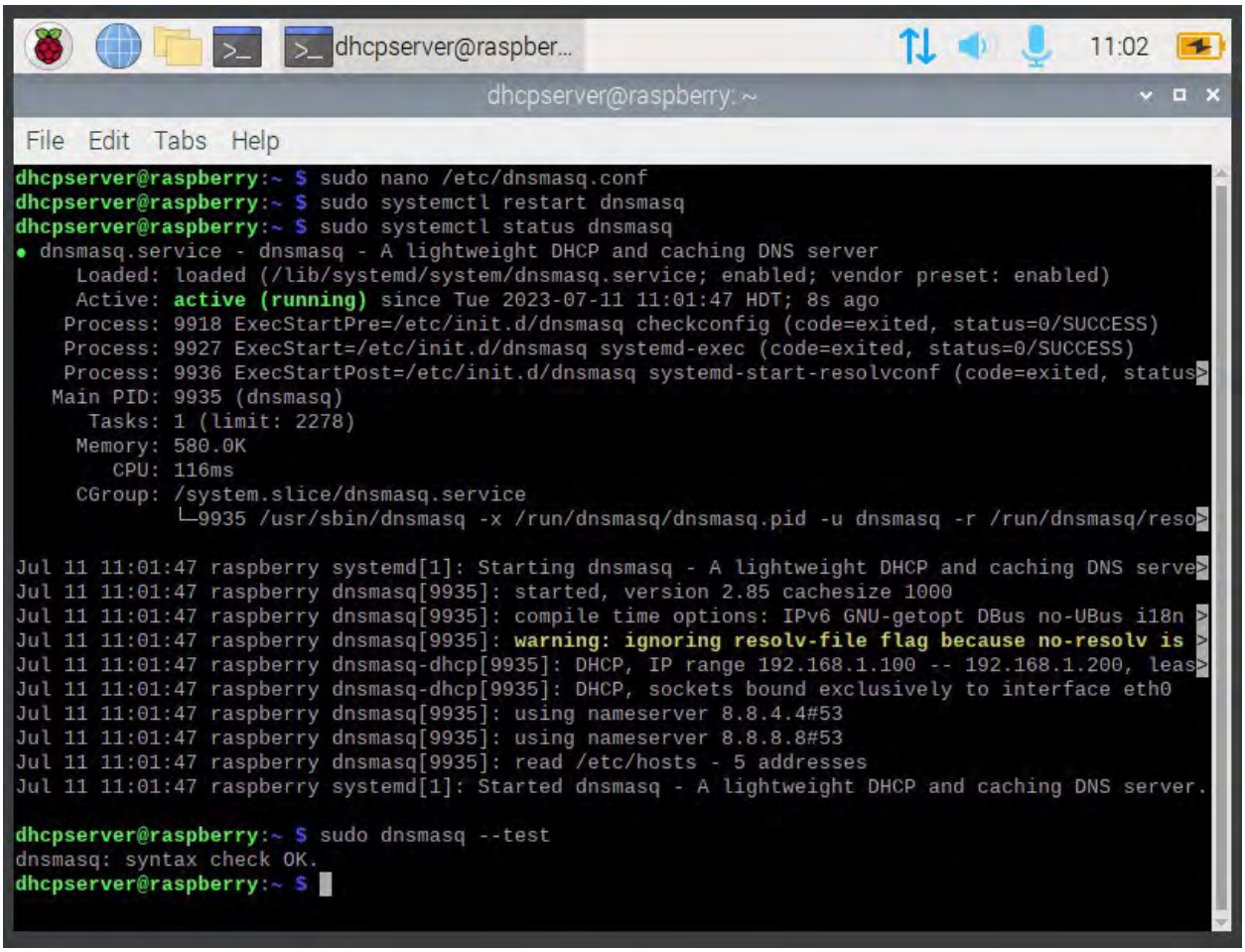


5. After **saving the changes** in the configuration file, the next thing to do is **apply these changes**, and to do that we need to restart the dnsmasq service, using the command **sudo systemctl restart dnsmasq**



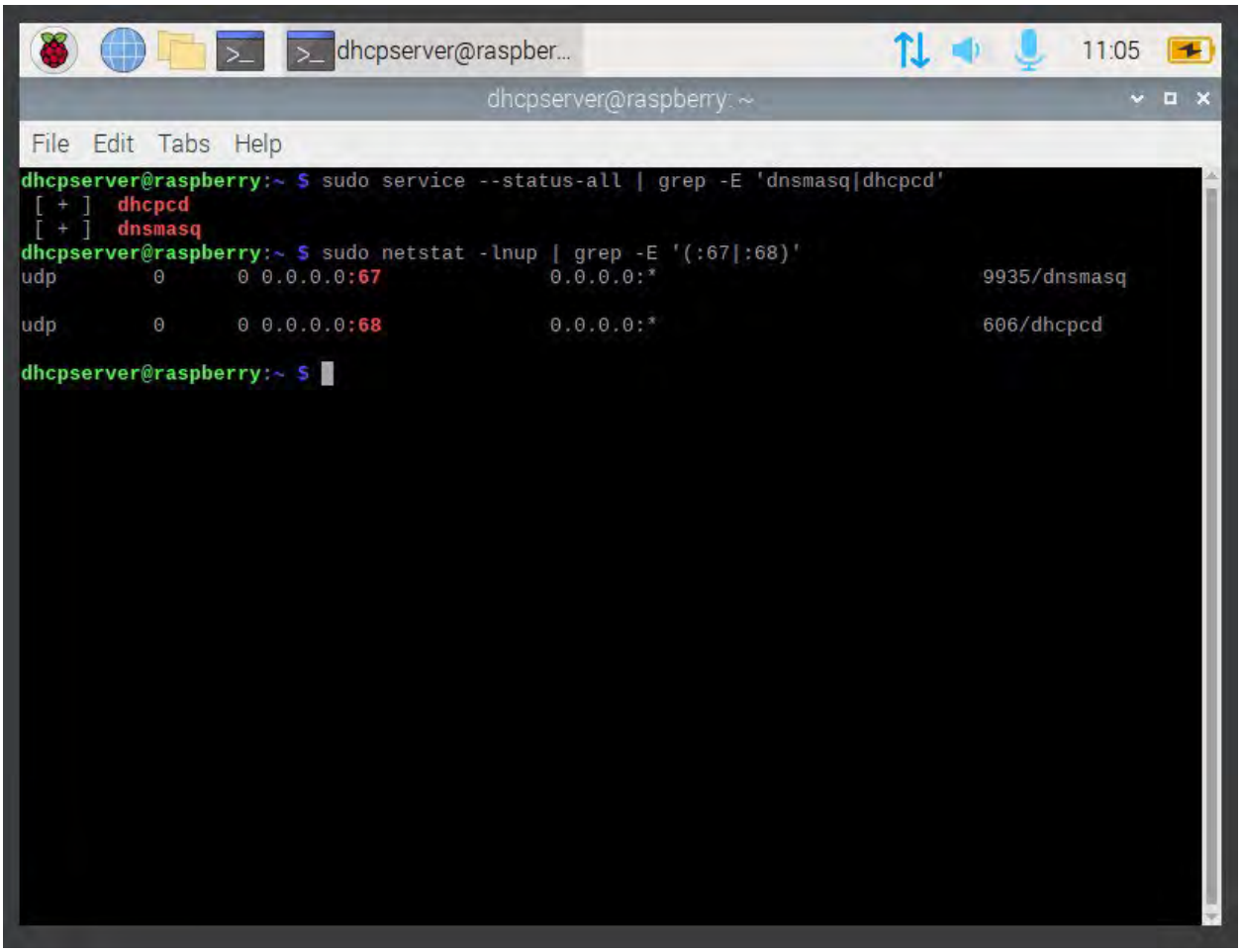
6. The next step to do is to restart the dnsmasq and to do that we need to run the command: **sudo systemctl restart dnsmasq**, after restarting the dnsmasq.service the next step is to verify its status if it is active and running, by executing the command: **sudo systemctl status dnsmasq**. To verify it again I also executed the command: **sudo dnsmasq --test**, as we can see it displays **dnsmasq: syntax check OK.**

   Note: I've attempted to verify that our Raspberry Pi OS is running as a DHCP server. I will verify it **4 times**. In this step, I've already verified it **twice(2)**.



7. In this step, I will verify the Raspberry Pi OS is running as a DHCP server, **2 more times**. By executing the command: **sudo service –status-all | grep -E 'dnsmasq|dhcpcd'** this command will display all the processes/services that are currently running/On however I used a pipe grep to find the dnsmasq & dhcpcd services and display only those services. The next command I executed is: **sudo netstat -lnup | grep -E '(:67|:68)'** this command will list the listening UDP ports on our raspberry pi OS, which are ports 67 and 68. It filters and displays only the lines that contain either ":67" or ":68" in the output of the netstat command. Now we can say that our Raspberry Pi OS is now running as a DHCP server.

   Note: On page 8 I have a command summary of all of this, in case you want to try and test this out for yourself.



8. Here is a summary or list of the commands to execute if you want to try this out:

   - sudo apt update

   - sudo apt upgrade

   - sudo apt install dnsmasq

   - sudo nano /etc/dhcpcd.conf # 1st conf file

   # when you have openned the DHCPCD.conf configuration file, Add the following:

   - interface eth0

   - static ip_address=192.168.1.2

   - static routers=192.168.1.1

   - static domain_name_servers=192.168.1.1 8.8.8.8

   - sudo reboot

   - sudo apt install dnsmasq

   - sudo nano /etc/dnsmasq.conf # 2nd conf file
   # When you have openned the DNSmasq.conf configuration file, Add the following:

   - interface=eth0 # OR: 'wlan0' for Wi-Fi

   - bind-dynamic

   - domain-needed

   - bogus-priv

   - dhcp-range=192.168.1.100,192.168.1.200,255.255.255.0,12h
   # Note CTRL + X, enter y to save the changes

   - sudo systemctl restart dnsmasq # OR: sudo service dnsmasq restart

   - sudo systemctl status dnsmasq

   - sudo dnsmasq --test

- sudo service - -status-all | grep -E ‘dnsmasq|dhcpcd’

- sudo netstat -lnup | grep -E ‘(:67|:68)’

By: **JPS**
Reference: https://raspberrytips.com/dhcp-server-on-raspberry-pi/