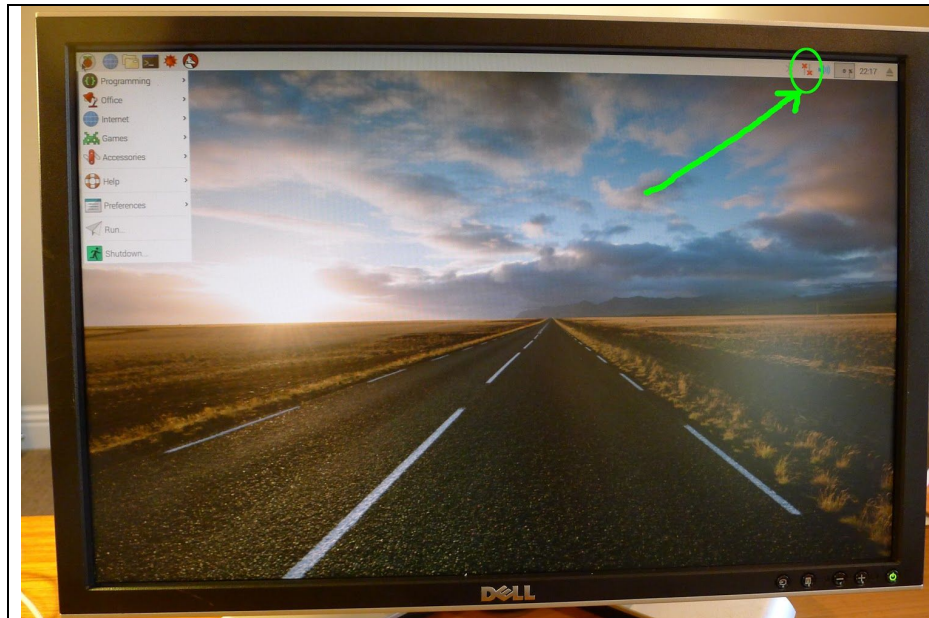


GSOC Raspberry Pi WiFi Connectivity Instructions

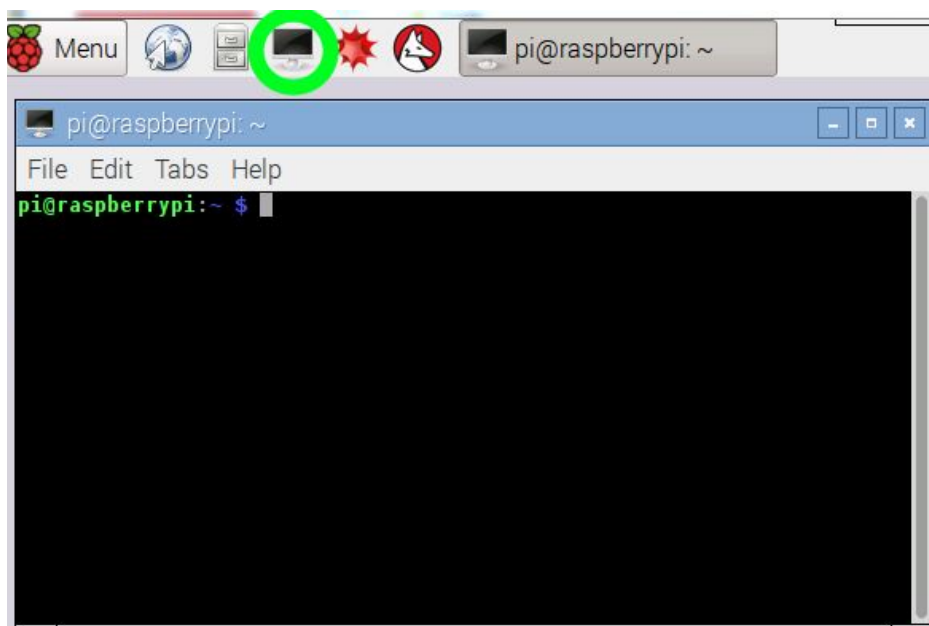
Last updated March 22, 2018

The following instructions illustrate how to connect a GSOC Raspberry Pi to the local WiFi network. You will need to know the local WiFi network's SSID (i.e. name of network) and password to complete this process.

With the Raspberry Pi on and the user interface appearing as shown above, if you see the red X's as called out in the picture below, then you are NOT connected to the local WiFi network



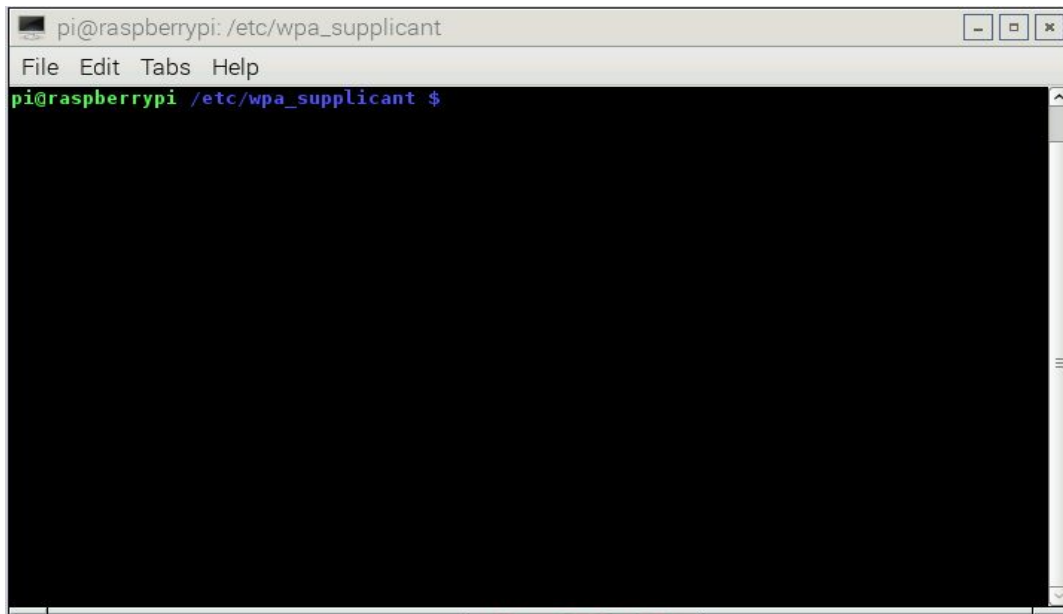
At the very top left of the screen as shown above, on the same line as the Raspberry Icon in the upper left corner, you'll notice a black "terminal" icon. Click on this icon (note the green call out below) to open a new terminal window as shown below.



The terminal window displays a `pi@raspberrypi: ~$`: prompt as shown in the picture on the previous page. At the terminal application prompt (meaning immediately after `pi@raspberrypi: ~$` as per the previous picture), type in:

```
cd /etc/wpa_supplicant
```

... and press the keyboard's ENTER key. The terminal window screen's prompt will change as shown below:



We have successfully changed directories (`cd`) into the `/etc/wpa_supplicant` folder. Now we need to edit a file found within this folder named `wpa_supplicant.conf`.

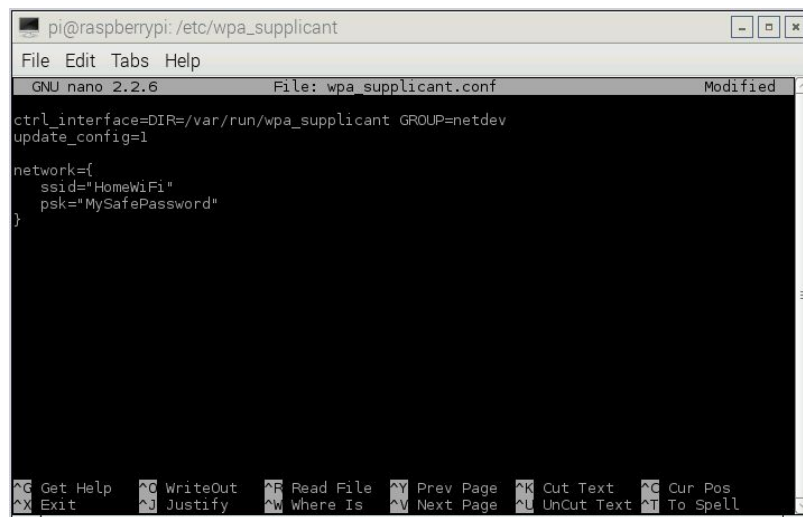
This file is a "system" file and requires "super user" privileges to edit. We therefore need to use the command `sudo` (super user do) in addition to the name of our editor application (`nano`) in order to edit the `wpa_supplicant.conf` file.

At the terminal application prompt, type in:

```
sudo nano wpa_supplicant.conf
```

... which will open the nano text editor application and edit the `wpa_supplicant.conf` file with super user privileges.

The screenshot below shows the wpa_supplicant.conf file opened within the nano editor. We can see that there is an existing reference to a WiFi network's SSID and password already within this file. In this case, the reference is to a WiFi network with SSID "HomeWiFi" and password "MySafePassword".



```
pi@raspberrypi: /etc/wpa_supplicant
File Edit Tabs Help
GNU nano 2.2.6 File: wpa_supplicant.conf Modified
ctrl_interface=DIR=/var/run/wpa_supplicant GROUP=netdev
update_config=1

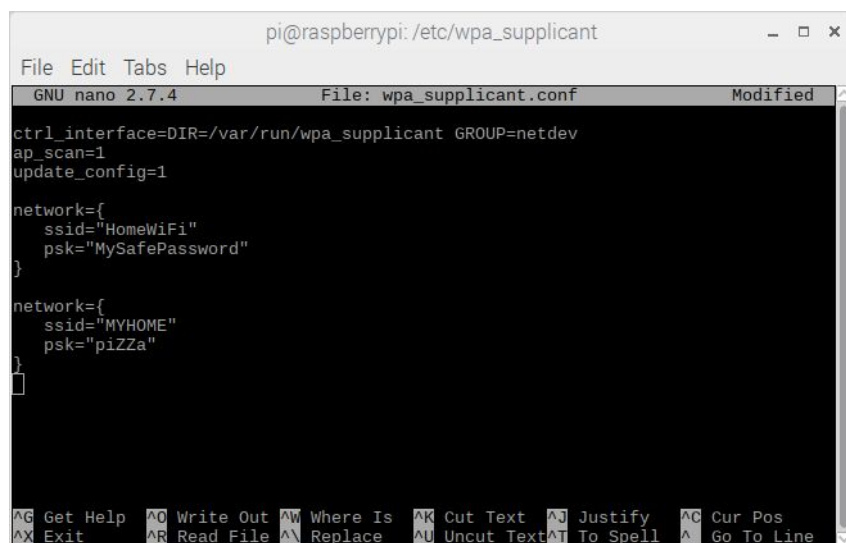
network={
    ssid="HomeWiFi"
    psk="MySafePassword"
}
```

It's OK to leave this network's reference within the wpa_supplicant.conf file, perhaps this Raspberry Pi will be used at that network location in the future.

To connect to your WiFi network, you need to ADD similar network={ } lines that reference your network's SSID and password.

For example, let's say your local network's SSID is MYHOME and password is piZZa. (remember passwords are case sensitive).

Use the keyboard's up and down arrow keys (not the mouse!) to move the cursor down to a line below the existing network={ } lines, then start typing in new additional network={ } lines as shown below. You may need to press the keyboard's ENTER key to add a new blank line beneath the existing network={ } lines.



```
pi@raspberrypi: /etc/wpa_supplicant
File Edit Tabs Help
GNU nano 2.7.4 File: wpa_supplicant.conf Modified
ctrl_interface=DIR=/var/run/wpa_supplicant GROUP=netdev
ap_scan=1
update_config=1

network={
    ssid="HomeWiFi"
    psk="MySafePassword"
}

network={
    ssid="MYHOME"
    psk="piZZa"
}

```

Leave any lines found at the top of the file, i.e. above the `network={ }` lines, alone.

Now we need to save this file with our changes. Locate the Ctrl (control) keyboard key and hold down the Ctrl key while you additionally press the X key on the keyboard (Ctrl+X). A prompt will appear at the bottom of the nano editor screen:

```
Save modified buffer? (Answering "No" will DISCARD changes.)
```

Press the Y key to save our changes. Now the nano editor will prompt you once again to confirm the file name that you wish to save to. The prompt will indicate:

```
File Name to Write: wpa_supplicant.conf
```

Press the ENTER key to confirm and save our changes to this file and to exit the nano editor.

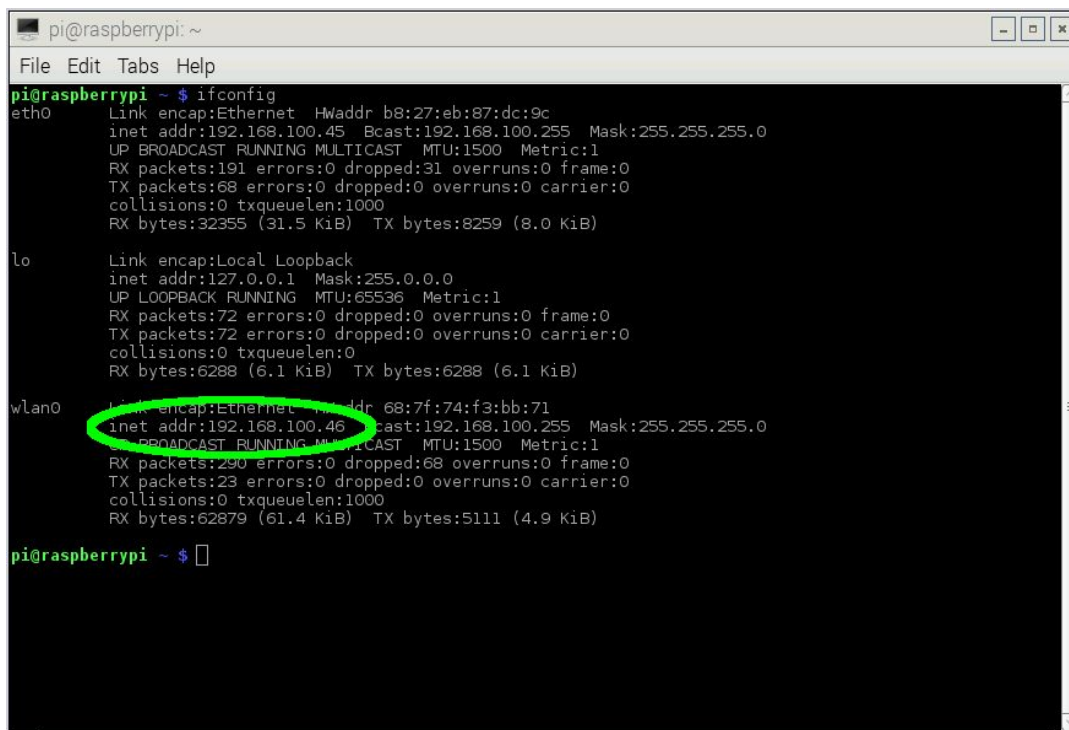
Next, back at the terminal application prompt, type in:

```
sudo reboot
```

... to reboot the Raspberry Pi. Rebooting will take a minute or two, after which you will need to open the terminal application as we had previously. At the terminal application prompt, type in:

```
ifconfig
```

... which will display information regarding the connectivity of the Raspberry Pi, and example of which is shown in the picture below.



```
pi@raspberrypi ~$ ifconfig
eth0      Link encap:Ethernet  HWaddr b8:27:eb:87:dc:9c
          inet addr:192.168.100.45  Bcast:192.168.100.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:191 errors:0 dropped:31 overruns:0 frame:0
          TX packets:68 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:32355 (31.5 KiB)  TX bytes:8259 (8.0 KiB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:72 errors:0 dropped:0 overruns:0 frame:0
          TX packets:72 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:6288 (6.1 KiB)  TX bytes:6288 (6.1 KiB)

wlan0     Link encap:Ethernet  HWaddr 68:7f:74:f3:bb:71
          inet addr:192.168.100.46  Bcast:192.168.100.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:290 errors:0 dropped:68 overruns:0 frame:0
          TX packets:23 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:62879 (61.4 KiB)  TX bytes:5111 (4.9 KiB)

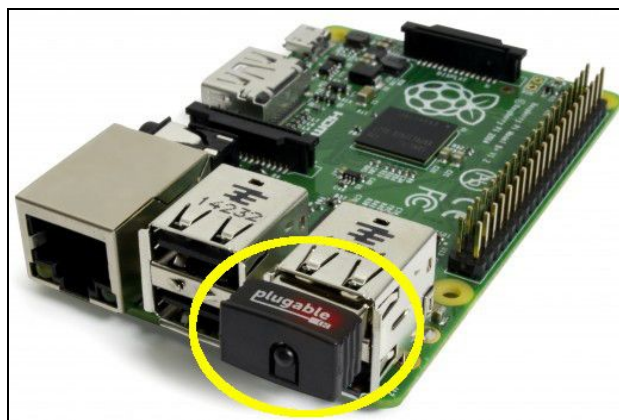
pi@raspberrypi ~$
```

Referring to the previous picture, on the left side of the display we see `wlan0` which is our WiFi or wireless connection port of the Raspberry Pi.

To the right and beneath `wlan0` we can determine the IP address (please Google “IP address” if you are unfamiliar with this term) of the Raspberry Pi on the local network. Within this example screen the IP address of our Raspberry Pi is 192.168.100.46 (`inet addr:192.16.100.46`), but you will almost certainly have a different address. **Write down YOUR IP address as you may need to refer to it within your next project!**


If you don't see `wlan0` anywhere on this screen, then you are not connected to the WiFi network. Look at the top of the user interface screen to see if the “red X's” appear, just like the very first picture within this document. Also verify that the “WiFi dongle” is plugged into the Raspberry Pi as shown below.

The dongle is required to use WiFi. If the dongle is not plugged in, please power down the Raspberry Pi by removing the white micro USB power cord from the Raspberry Pi before plugging in the dongle. Plug in the dongle, power the Raspberry Pi back up by plugging in the white micro USB power cord, and then try these steps again.



If the dongle is plugged in, but the red X's appear and you do not see `wlan0` within the screen above, then you need to revisit the `wpa_supplicant.conf` editing instructions above to be sure you have entered the WiFi network information correctly.

If you do see `wlan0` on the screen as shown in the previous picture, then you should also see

the icon  in place of the “red X's” on the top of the user interface screen. This icon indicates you have successfully connected to and are communicating with the WiFi network.

You can now use the Raspberry Pi's web browser (icon that looks like a globe next to the Raspberry icon located at the top left of the user interface) to browse the internet, or connect the Raspberry Pi to other devices on this same WiFi network.