Raspberry Pi 2 Project with PortAudio Tutorial

ENABLE WIFI

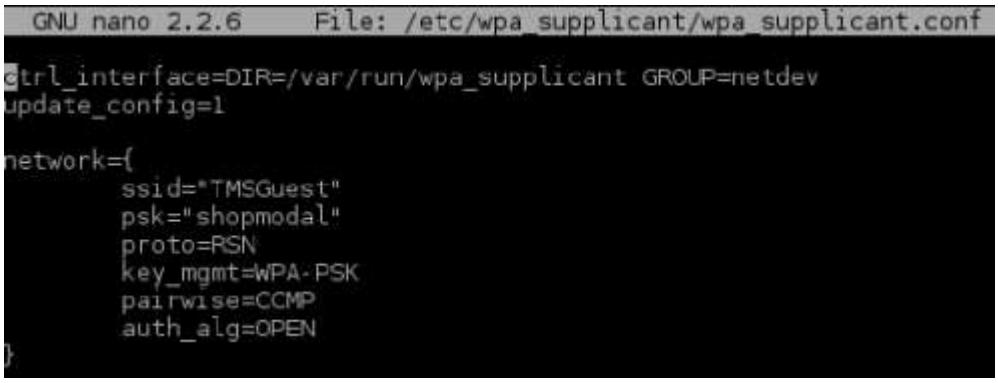
1. Follow the link to set up wi-fi capabilities:

   http://thepihut.com/blogs/raspberry-pi-tutorials/16018016-how-to-setup-wifi-on-the-raspberry-pi-raspbian

2. OR you could follow this manual by typing the following.

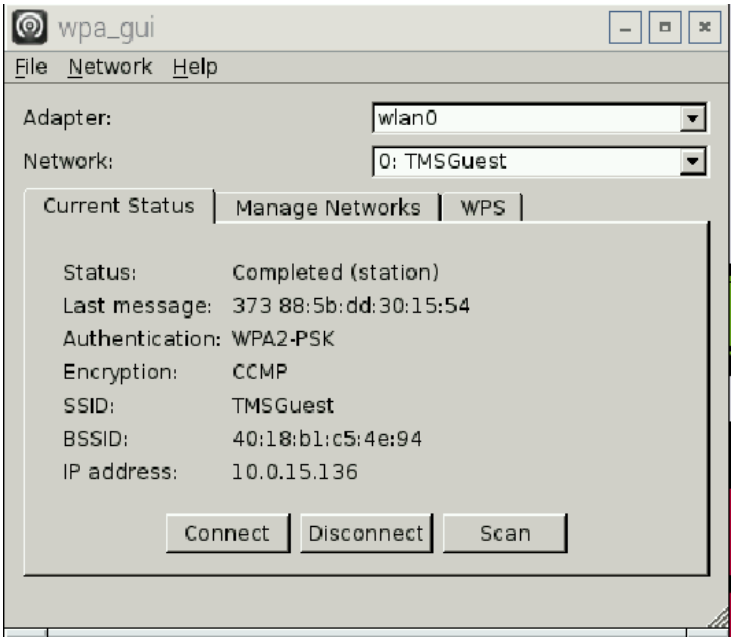
   apt-get install wpasupplicant wireless-tools

3. Then, configure your wpa-supplicant file like so:

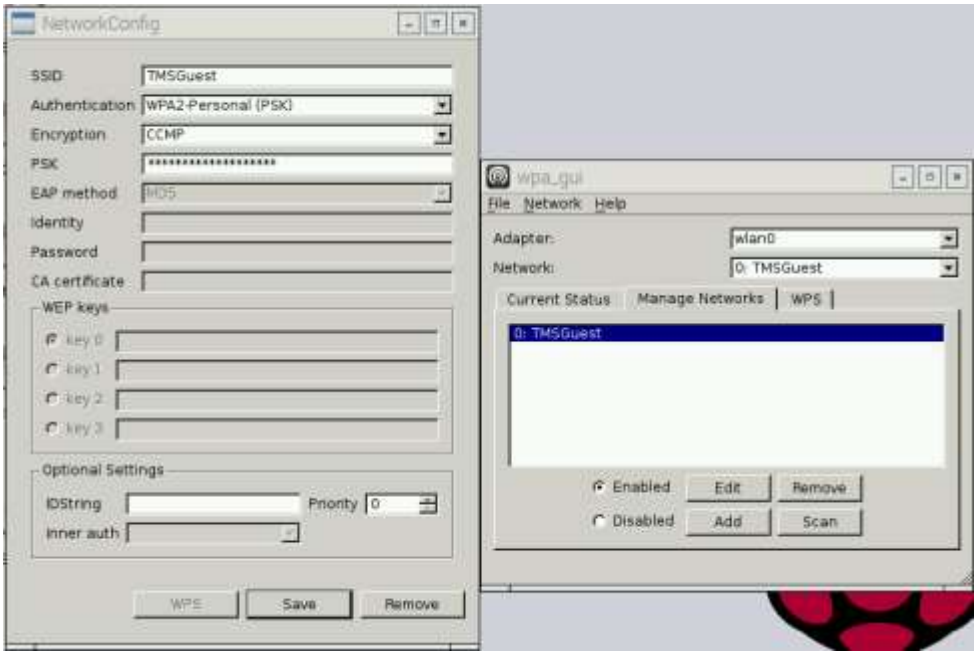


4. You can manually restart the interface with ***sudo ifdown wlan0*** and ***sudo ifup wlan0*** or you can reboot your Raspberry Pi with ***sudo reboot***

5. Now, find the WiFi Config executable on the GUI and open.



6. You can configure all of your network information here.



DOWNLOAD & CONFIGURE PORTAUDIO

1. You want to download the latest PortAudio version available. Follow the link to install PortAudio on your Raspberry Pi.

   http://www.portaudio.com/download.html

2. After downloading and unzipping PortAudio, run this in the terminal to build and install (make sure you're in the correct directory)

   ./configure && make

   Notice: the examples are already compiled in the bin folder of PortAudio. However in order to compile your own executables, keep reading.

3. Make sure to run the following for PortAudio development headers:

   apt-get install portaudio19-dev

4. Make sure that whichever code you're compiling has the included header like so:

   #include <stdio.h>
   #include <stdlib.h>
   #include <portaudio.h>

5. For safety, you can include the portaudio.h file in the project directory. To accomplish this, run:

   cp /usr/include/portaudio.h /your/project/directory

6. For quick use when compiling the code that you've written, open and write a bash script to make the command easy to run. Type:

   gcc –I/usr/include –L/usr/lib –o NAME main.c –ljack –lportaudio libportaudio.a –lm –lrt –I/usr/include/alsa/pcm –g

   Be sure to save

7. To make the executable bash script, run:

   chmod a+x NAME.sh

   Now you can run ***'./test.sh'*** to compile!

8. To run your compiled code and ignore ALSA errors, just type **'./NAME 2> file.log'**

MAP RASPBERRY PI 2 AS A DRIVE ON WINDOWS COMPUTER

1. First, download Samba, a Linux implementation of the Server Message Block protocol.

   apt-get install samba samba-common-bin

2. Before you change the configuration file, download **leafpad**. **Leafpad** is a simple editing tool with ctrl-f capabilities that will come in handy.

   apt-get install leafpad

3. Now, open the samba configuration file and change the entries for workgroup and wins support to look like the following:

   leafpad /etc/samba/smb.conf &

4. You also need to add the following to the Share Definitions section

```
#======================= Share Definitions =======================
[pihome]
   comment = Pi Home
   path = /home/pi
   browseable = Yes
   writeable = Yes
   only guest = no
   create mask = 0777
   directory mask = 0777
   public = no

[homes]
   comment = Home Directories
   browseable = no

# By default, the home directories are exported read-only. Change the
# next parameter to 'no' if you want to be able to write to them.
   read only = no
```

5. Under the **"Authentication"** section, remove the **"#"** sign in front of **"security = user".**

6. Set **"workgroup = WORKGROUP"** and **"wins support = yes"** like below:

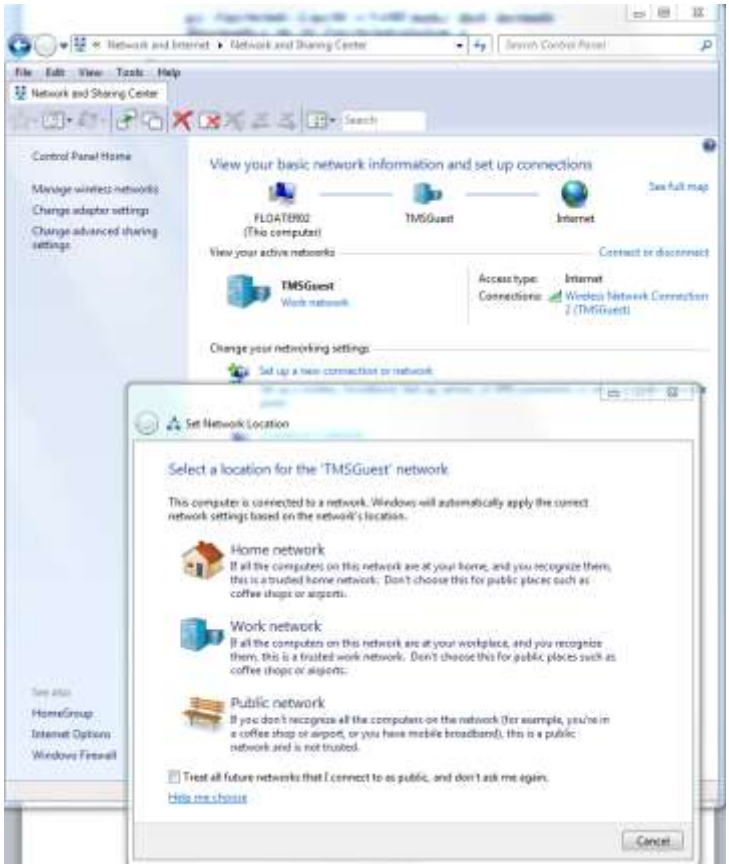
```
## Browsing/Identification ###

# Change this to the workgroup/NT-domain name your Samba server will part of
   workgroup = WORKGROUP

# server string is the equivalent of the NT Description field
   server string = %h server

# Windows Internet Name Serving Support Section:
# WINS Support - Tells the NMBD component of Samba to enable its WINS Server
#   wins support = no
```

7. Under the [Homes] section, **'read only = yes'** changes to **'read only = no'**. Afterward, save and exit.

8. Now type the following commands and make the password **'pi'**

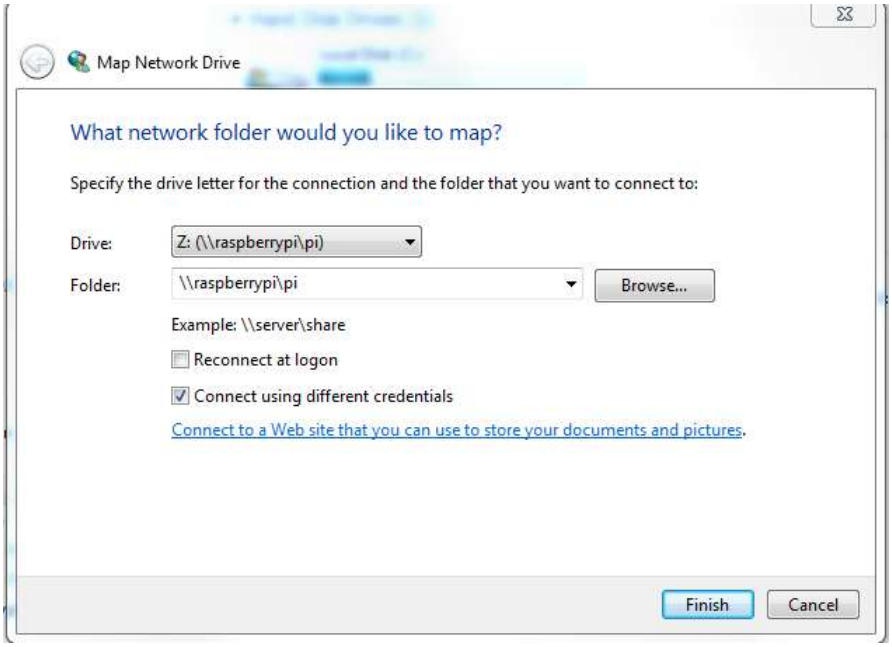
   service samba restart
   smbpasswd –a pi

9. Make sure your network is set to **"Work Network".** To do this, go to your **Control Panel->Network and Internet->Network and Sharing Center** and there you can set the network location



10. Now on the host computer, open the **"Computer"** window (on Windows 7) or **"This PC"** (on Windows 8) and click the **"Map Network Drive"** button on the toolbar (Windows 7) or click the **"Map Network Drive"** button under **"Computer"** (on Windows 8).

11. Select an unused drive letter from the **"Drive:"** drop-down and enter **\\raspberrypi\pi** in the **"Folder:"** field. Check **"Connect using different credentials"** and click **"Finish."**



12. Enter **"pi"** in the Username field and your password (should have been set as **"pi"** as well).

Now you're connected!

USING "./Digiducer_Script" TO GRAB VIBRATION DATA ON RASPBERRY PI

1. After downloading and configuring PortAudio, using the Digiducer_Script bash file should be very straightforward. First, make sure that all of your files are in the correct directories as stated above.

2. Make sure that the main.c file created by Digiducer, INC is in the same directory. You will be using this program to grab vibration data.

3. Now, open a bash script by typing:

   gedit Digiducer_Script

4. Within the bash script, you need 2 things.

   a. You need to have your gcc command given above

   b. You need your specifications for the program. The following are the specifications/modifiers:

      i. **'-f"** is FILENAME

1. You do not need to put the '.wav' extension. The program does that for you.

ii. **'-b'** is BLOCK SIZE

1. The program will make block size to whichever closest conventional block size is available. (i.e. 8000 -> 8192)

iii. **'-s'** is SAMPLE RATE

1. The program will make sample rate to whichever closest conventional sample rate is available. (i.e. 49000 -> 49000)

iv. **'-p'** is PERIOD/DELAY TIME

1. This value describes how long to wait in between grabbing a block of data

v. **'-n'** is NUMBER OF FILES

1. This value determines how many files to write before overwriting previous files

vi. **'-r'** is NUMBER OF ACQUISITIONS

1. This value determines how many times to grab blocks of data. If **'0'** is inputted, the Number of Acquisitions will be infinite.

5. Your bash script should look like the following:.

```
1 gcc -I/usr/include -L/usr/lib -o test main.c -ljack -lpthread -lportaudio libportaudio.a -lm -lrt -
  I/usr/include/alsa/pcm -g
2 ./test 2> file.log -f TEC -b 8192 -s 48000 -p 0 -n 3 -r 10
```

Note: be sure to put a **'-'** in between all modifiers or else the program will not work. You can also edit your bash file at any time to change values.

6. After saving your bash script, run the following to give the shell permission to execute the script:

chmod 755 Digiducer_Script

7. Now run **"./Digiducer_Script"** to grab data!