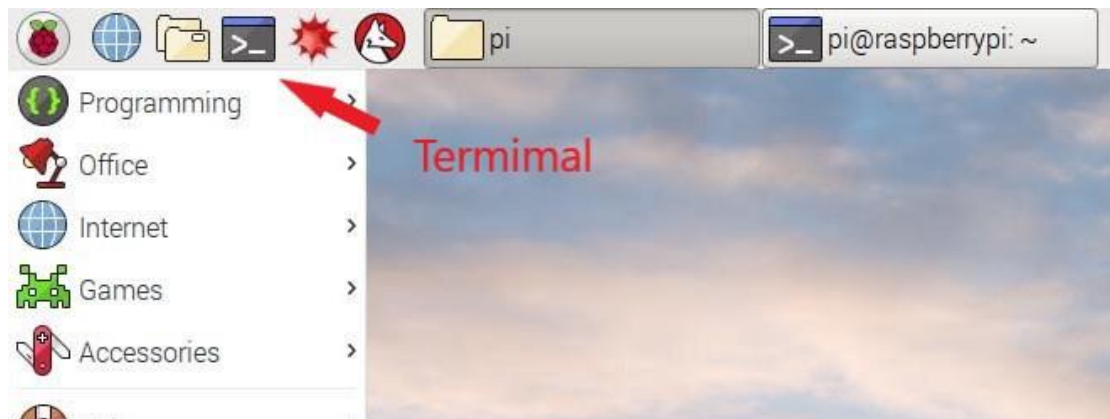


Setup SSH/VNC

Setting up remote access allows Pi computer to run headless (i.e. without a monitor/keyboard/mouse) which saves us from having to connect a monitor and keyboard/mouse to it all the time. Here are the steps, anyways.

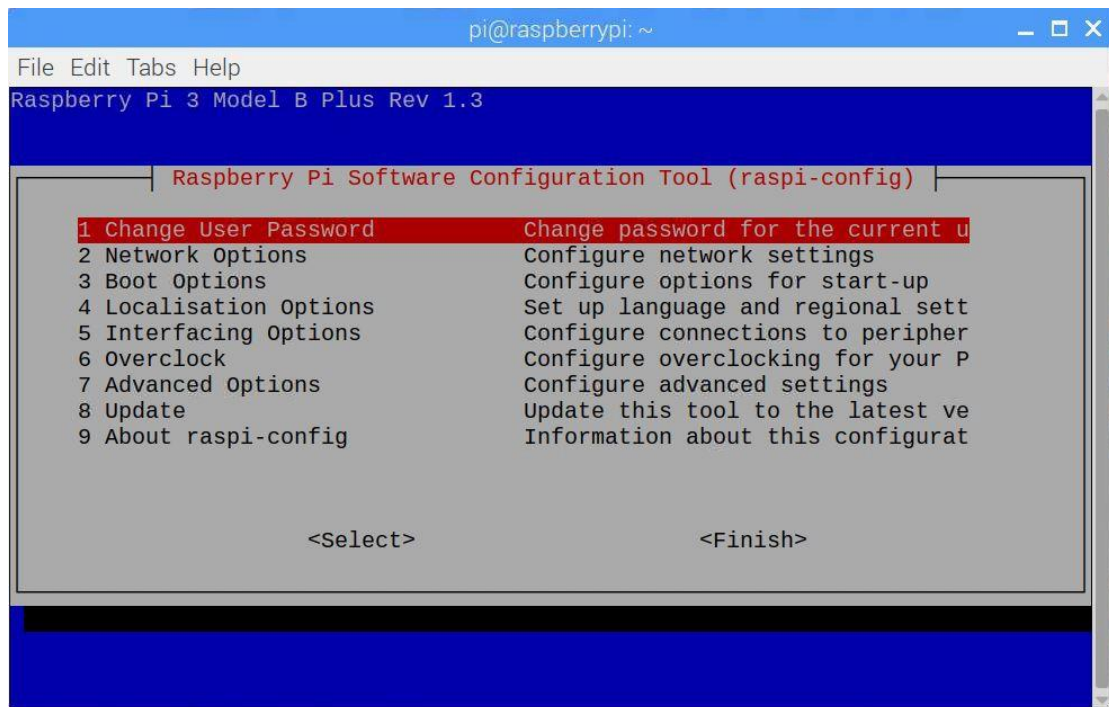
1. Open the Terminal application, as shown below. The Terminal app is a very important program, as most of our command in later articles will be entered from Terminal.



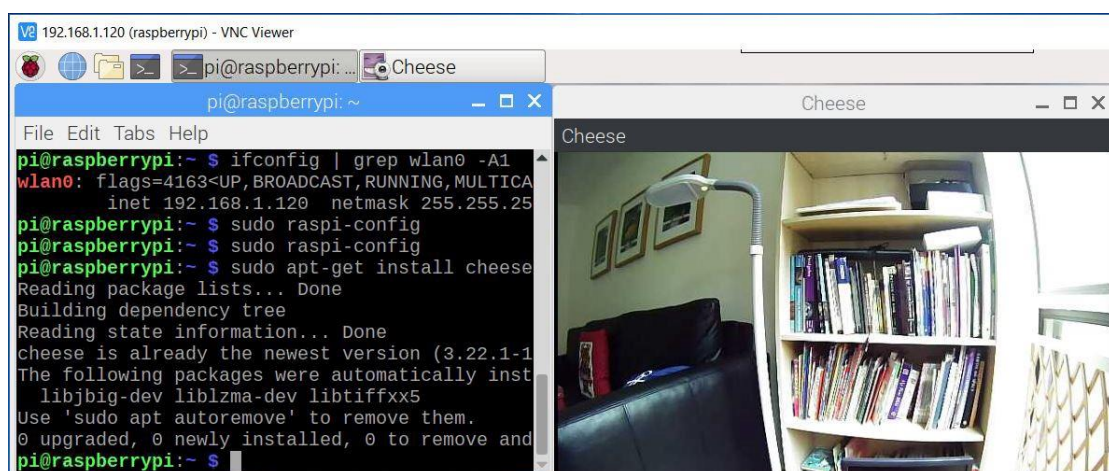
2. Find the IP address of the Pi by running `ifconfig`. In this case, my Pi's IP address is `192.168.1.120`.

```
pi@raspberrypi:~ $ **ifconfig | grep wlan0 -A1**  
wlan0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500  
    inet **192.168.1.120** netmask 255.255.255.0 broadcast 192.168.1.255
```

3. Run `sudo raspi-config` in Terminal to start the "Raspberry Pi Software Configuration Tool". You may be prompted to type in the password for user `pi`



4. Enable SSH Server: Choose 5. Interface Options -> SSH -> Enable
5. Enable VNC Server: Choose 5. Interface Options -> VNC -> Enable
6. Download and [install RealVNC Viewer](#) onto your PC.
7. Connect to Pi's IP address using Real VNC Viewer. You will see the same desktop as the one Pi is running.
8. At this point, you can safely disconnect the monitor/keyboard/mouse from the Pi computer, leaving just the power adapter plugged in.



Setup Remote File System Access

Since our Pi will be running headless, we want to be able to access Pi's file system from a remote computer so that we can transfer files to/from Pi

computer easily. This will be very useful since we can edit files that reside on Pi directly from our PC. We will install Samba File Server on Pi.

```
pi@raspberrypi:~ $ sudo apt-get update && sudo apt-get upgrade -y
Get:1 http://archive.raspberrypi.org/debian stretch InRelease [25.4 kB]
Packages [45.0 kB]
[omitted...]
Unpacking lxplug-ptbatt (0.5) over (0.4) ...
Setting up lxplug-ptbatt (0.5) ...
pi@raspberrypi:~ $ sudo apt-get install samba samba-common-bin -y
Reading package lists... Done
Building dependency tree
[omitted...]
Processing triggers for libc-bin (2.24-11+deb9u4) ...
Processing triggers for systemd (232-25+deb9u11) ...
pi@raspberrypi:~ $ sudo rm /etc/samba/smb.conf
pi@raspberrypi:~ $ sudo nano /etc/samba/smb.conf
```

Then paste in the following lines into the nano editor

```
[global]
netbios name = Pi
server string = The PiCar File System
workgroup = WORKGROUP

[HOMEPI]
path = /home/pi
comment = No comment
browsable = yes
writable = Yes
create mask = 0777
directory mask = 0777
public = no
```

Save and exit nano by Ctrl-X, and Yes to save changes.

Then set up a Samba Server password. For simplicity, we will use the same `rasp` as the Samba server password. After the password is set, restart the Samba server.

```
# create samba password
pi@raspberrypi:~ $ sudo smbpasswd -a pi
New SMB password:
Retype new SMB password:
```

```
Added user pi.  
# restart samba server  
pi@raspberrypi:~ $ sudo service smbd restart
```

At this point, you should be able to connect to the Pi computer from your PC via Pi's IP address (My Pi's IP is 192.168.1.120). Go to your PC (Windows), open a Command Prompt (cmd.exe) and type:

```
# mount the Pi home directory to R: drive on PC  
C:\>net use r: \\192.168.1.120\homepi  
The command completed successfully.  
C:\Users\dctia>r:  
C:\>dir r:  
Volume in drive R is HOMEPI  
Volume Serial Number is 61E3-70FF  
Directory of R:\  
05/02/2019 03:57 PM    <DIR>        .  
04/08/2019 04:48 AM    <DIR>        ..  
04/08/2019 05:43 AM    <DIR>        Desktop  
04/08/2019 05:43 AM    <DIR>        Documents  
04/08/2019 05:43 AM    <DIR>        Downloads  
04/08/2019 05:15 AM    <DIR>        MagPi  
04/08/2019 05:43 AM    <DIR>        Music  
05/02/2019 03:43 PM    <DIR>        Pictures  
04/08/2019 05:43 AM    <DIR>        Public  
04/08/2019 05:43 AM    <DIR>        Templates  
04/08/2019 05:43 AM    <DIR>        Videos  
                0 File(s)            0 bytes  
                11 Dir(s) 22,864,379,904 bytes free
```