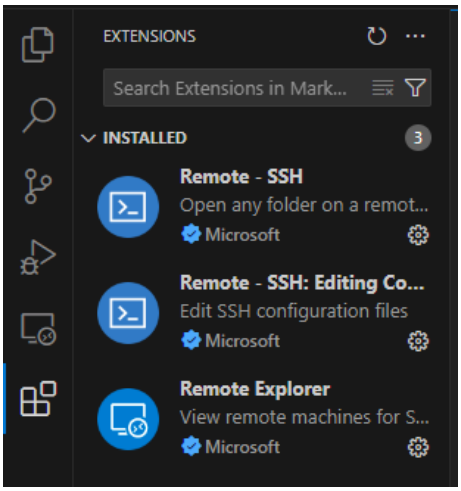
Contents

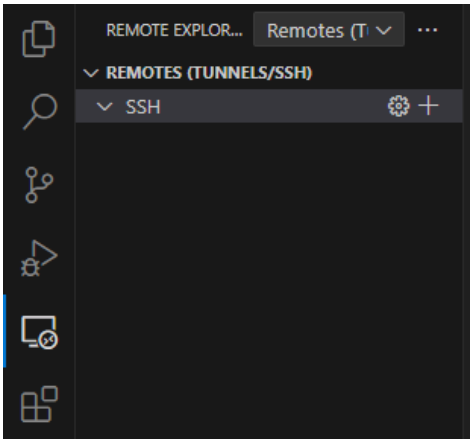
Raspberry Pi Startup Instructions

Connecting to the RPi

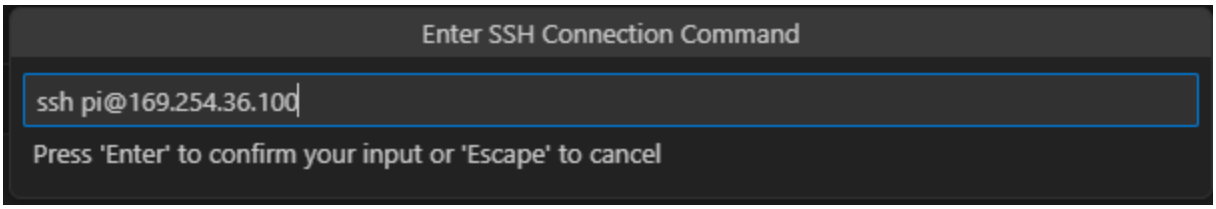
1. On the Windows computer, open Visual Studio Code (VSCode).
2. Plug in Raspberry Pi
    a. Ethernet cable to Raspberry Pi and USB->Ethernet adapter to computer
    b. Power supply to the USB-C port on the pi
3. Install the following extension in VSCode. If you just install the Remote – SSH extension, the others will be installed automatically.



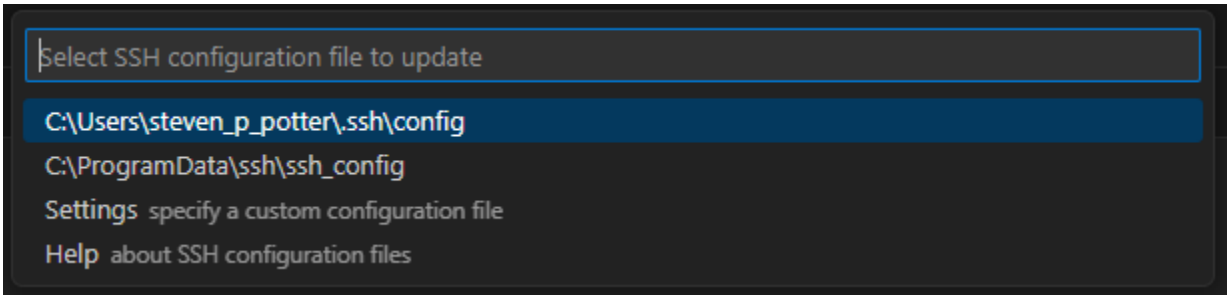
4. Go to the Remote Explorer and click the + next to SSH



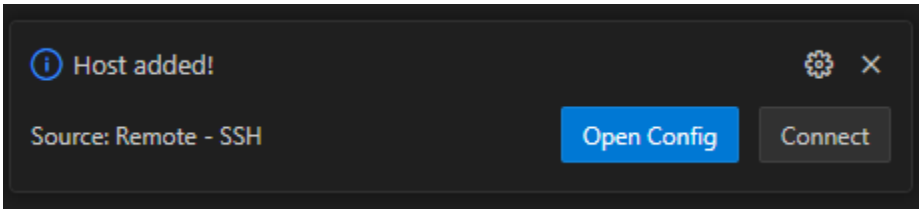
5. In the window that pops up:



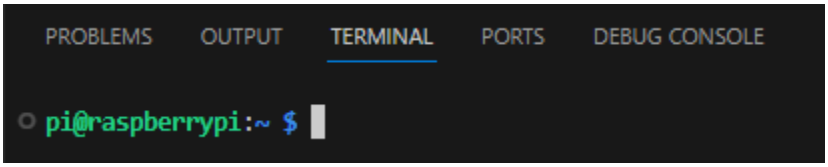
6. At the next window:



7. At the bottom right, click ‘Connect’



8. When it asks you to select an operating system, select ‘Linux’.
9. When it asks to Continue, say ‘Continue’.
10. When it asks for a password, the default password is:
    a. Thx2EcsSupp0rt
        i. The 3rd to last character is zero
11. Once it connects, select the ‘Terminal’ in the bottom pane and you should see the following. If there is not a terminal in the bottom pane (or there is no bottom pane), use the menu at the top to select Terminal->New Terminal.



RPi Configuration

1. Check to see if you are connected to the ECS-IoT network. To do so, run the following command:
    a. ifconfig
        i. This will list all of the interfaces on the RPi. The wlan0 interface should have an IP address starting with 192.168.6. If not, please let me know immediately.

2. The MicroSD cards were made based off of an 8GB image, but they are 32GB. I did this to make the process of creating MicroSD cards 4x faster. But we would like to be able to use the entire 32GB card if necessary. To do this, run the following command to expand from 8GB to 32GB.
    a. sudo raspi-config --expand-rootfs
3. I made a mistake on the image file that you will need to fix. From the terminal, run the following command:
    a. sudo nano /boot/config.txt
    b. Edit the last line in the file to change gpio-pin=16 to gpio_pin=16.
    c. Ctrl-o, enter
    d. Ctrl-x
    e. sudo reboot
4. Wait for the system to reboot (about 30 seconds), then reload the window in VSCode. It will likely ask for your password.

Network Time Protocol (NTP) Setup

For a variety of reasons, it is important for the RPi to have an accurate clock time. However, since the RPi does not have a battery to keep time while it is powered off, you get a different (and inaccurate) time each time you start it up. To resolve this, we will connect to a time server at Baylor (time.baylor.edu) and the RPi will get its clock time from that server.

1. We need to edit the timesync config file to look for time.baylor.edu. Use the command below to edit the file and update the [Time] section to look like the screenshot below.
    a. sudo nano /etc/systemd/timesyncd.conf

```
[Time]
NTP=time.baylor.edu
#FallbackNTP=0.debian.pool.ntp.org 1.debian.pool.ntp.org 2.debian.pool.ntp.org 3.debian.pool.ntp.org
RootDistanceMaxSec=5
PollIntervalMinSec=32
PollIntervalMaxSec=2048
ConnectionRetrySec=30
SaveIntervalSec=60
```

2. Before we can install the time sync package that we need, we have to manually set the time (ironic). If your time is extremely inaccurate, the package servers will not respond to you. To manually set the time, use the following command but substitute in the current time and date.
    a. sudo date --set="2 OCT 2006 18:00:00"
3. We need to install the systemd-timesyncd package to the RPi. Before we can do this, we must update the package list on the RPi, then we can install the package.
    a. sudo apt-get update
    b. sudo apt install systemd-timesyncd
4. Run the following command to ensure that NTP is enabled in the timesyncd service.
    a. sudo timedatectl set-ntp true
5. Run the following command and make sure that the system clock is synchronized, the NTP service is active, and the time and date are accurate.
    a. timedatectl

6. This is the end of configuration, so we will shut down the Raspberry Pi using the following command:
    a. sudo shutdown -h now
    b. Wait approximately 30 seconds before you unplug the Raspberry Pi power supply.

Important Reference Information

Shut down methods for the Raspberry Pi

In order of desirability:

1. From the command line:
    a. sudo shutdown -h now
    b. If you instead want to restart the Pi:
        i. sudo reboot
2. Connect a push button between pins 34 and 36. Press the button to shut down the device.
3. With either method, you will know the device is shut down when you no longer hear the fan.

How to stop a program

1. In the terminal window with the program running, press Ctrl-C