Setup Static IP Address on Raspberry Pi

1. Introduction

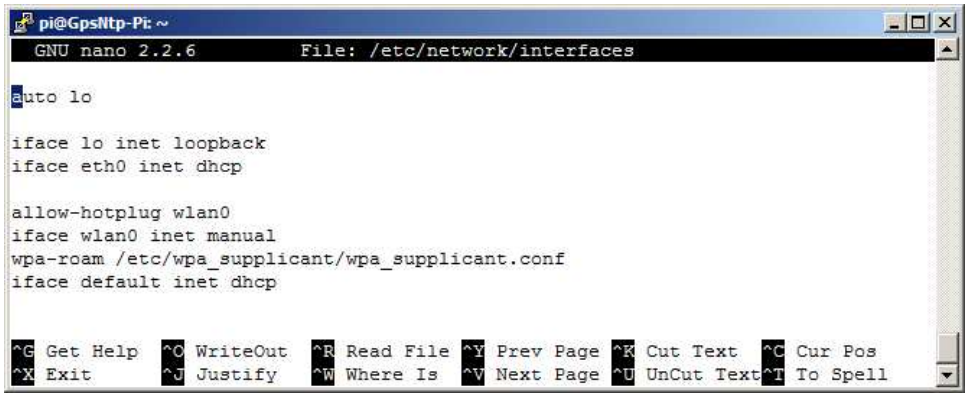
By default, the Raspberry PI (RPi) obtains its IP address automatically from a LAN router using DHCP. However, depending on the router setup, the address could change whenever the RPi is removed from the network or its power is cycled. It may be preferable to operate the RPi with a static IP address, an address that never changes. For one thing, it simplifies connection to the RPi console from an SSH terminal because the address is always known.

This document describes how to setup the RPi wired Ethernet network interface with a static IP address. The following steps assume the RPi is connected to the LAN through the wired Ethernet interface and you know its IP address. As you go through the following steps, take screenshots before and after making changes – this will help in case you make a mistake and need to reverse your changes. A similar process can be used to setup a wireless network interface with a static IP address.

2. Check the Existing RPi Setup

Log into the RPi using PuTTY and enter the following at the prompt:

```
cat /etc/network/interfaces
```



Note the line that indicates the **eth0** interface uses **dhcp**, but do not change it at this time:

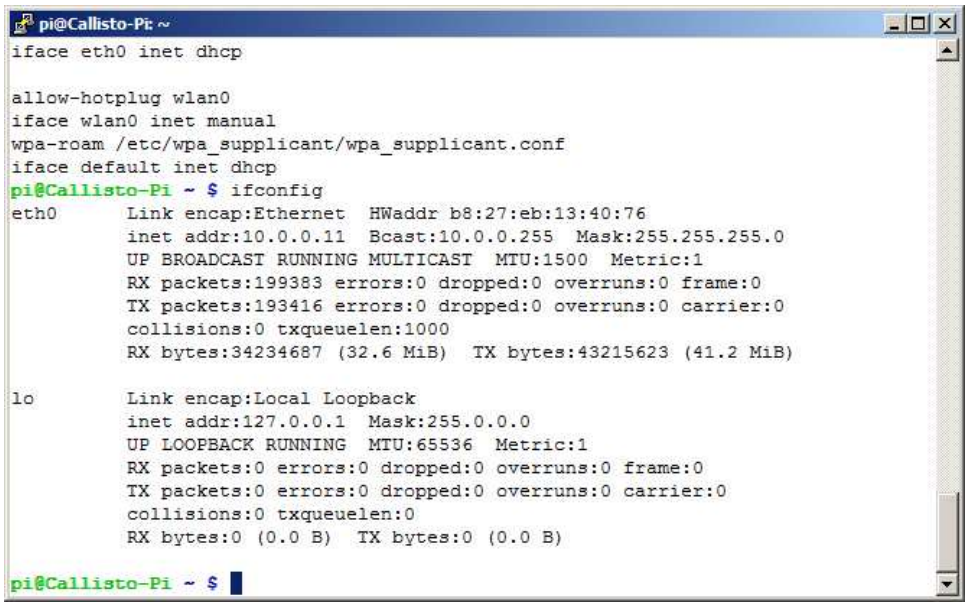
```
iface eth0 inet dhcp
```

There are additional lines having to do with a wireless network interface (**wlan0** and **wpa-roam** or **wpa-conf**) but these will be left alone. If you plan to use a wireless interface, these will need to be changed, but that is beyond the scope of this document revision.

Type CTRL+X (Exit) to close the nano editor.

Now, enter the following at the prompt:

ifconfig



Note the information to the right of **eth0**:

```
eth0      Link encap:Ethernet  HWaddr b8:27:eb:13:40:76
          inet addr:10.0.0.11  Bcast:10.0.0.255  Mask:255.255.255.0
```

In the above example:

inet addr:	10.0.0.11	Current IP address
Bcast:	10.0.0.255	Broadcast IP range
Mask:	255.255.255.0	Subnet mask

Your console screen most likely will show different values. Copy the following from your console:

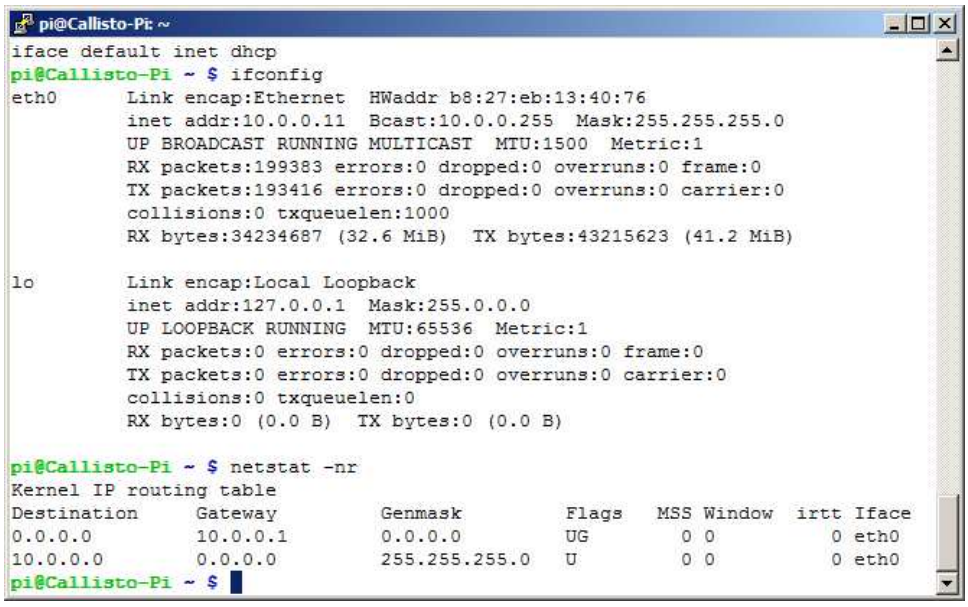
inet addr: _____ (your current IP address)

Bcast: _____ (your broadcast IP range)

Mask: _____ (your subnet mask)

Now, enter the following at the prompt:

netstat -nr



Note the information shown in the Destination and Gateway columns. Ignore the 0.0.0.0 values:

`Destination`: 10.0.0.0 Network destination
`Gateway`: 10.0.0.1 Gateway address

Your console screen most likely will show different values. Copy the following details from your console:

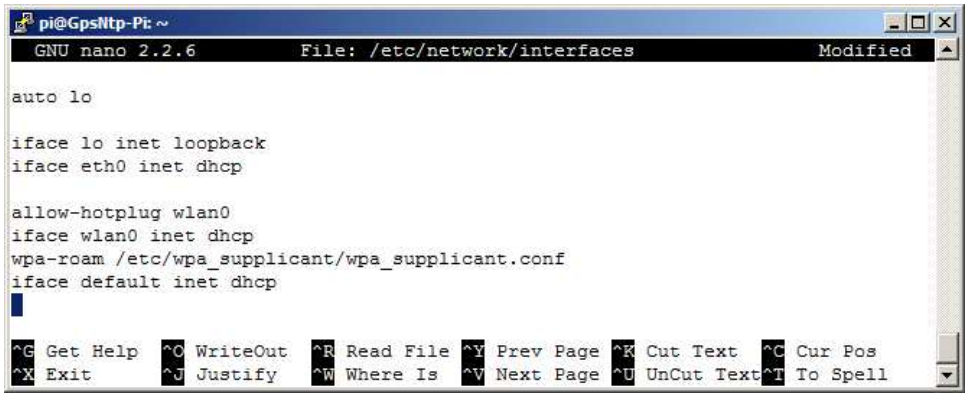
`Destination`: _____ (your network destination)

`Gateway`: _____ (your gateway address)

3. Setup the RPi Network Configuration for Static IP

Use the built-in editor nano again to edit the network interface configuration file:

`sudo nano /etc/network/interfaces`



Using the keyboard arrow keys, move to the end of the line that reads:

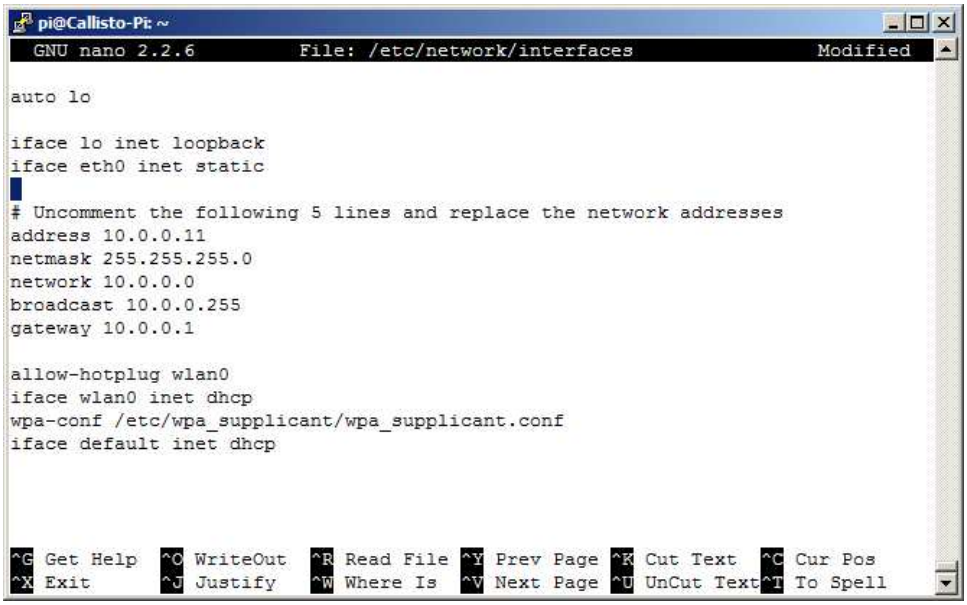
`iface eth0 inet dhcp`

Replace **`dhcp`** with **`static`**, as in:

```
iface eth0 inet static
```

Additional parameters preceded by the comment character # may be directly below the **iface** line that you just changed. If your configuration file has these parameters, uncomment them (delete the # character) and replace the address parameters with those you obtained previously. If your file does not already have these parameters, add them with the address parameters you obtained previously. Do not use the values shown in the example screenshot below:

address	Use your **inet** address
netmask	Use your **subnet mask**
network	Use your **network destination**
broadcast	Use your **broadcast IP range**
gateway	Use your **gateway** address



The **address** field in the above example is the static IP address that was originally dynamically assigned to the RPi. It could be any address within the router's network range but it must not conflict with existing addresses on your LAN. Your console should look similar to the above screenshot but it will have your parameter values.

Type CTRL+X (Exit), Y (Yes) and then ENTER to save the changes and close the nano editor.

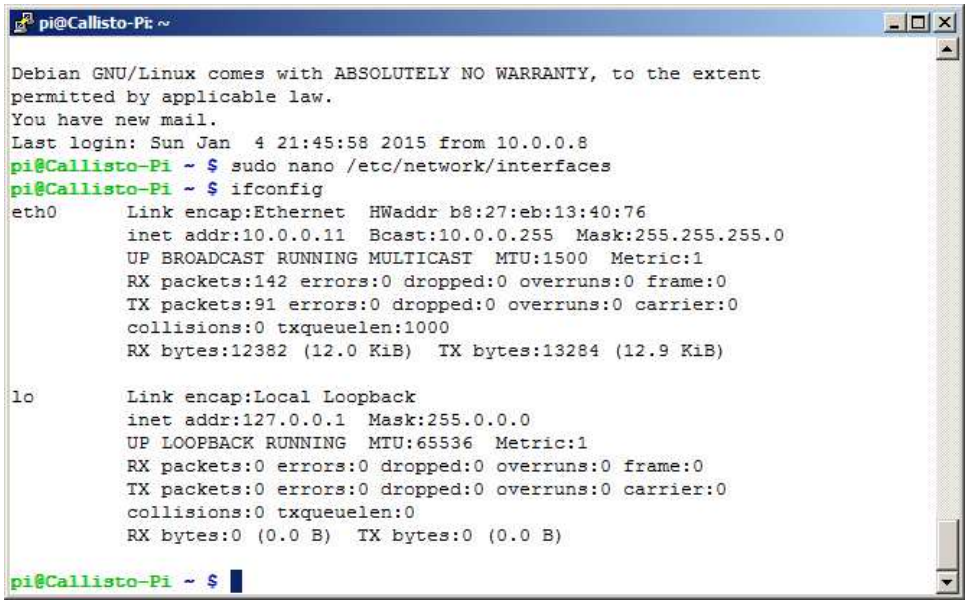
After any network changes you must reboot the RPi:

```
sudo reboot
```

4. Check RPi Static IP Configuration

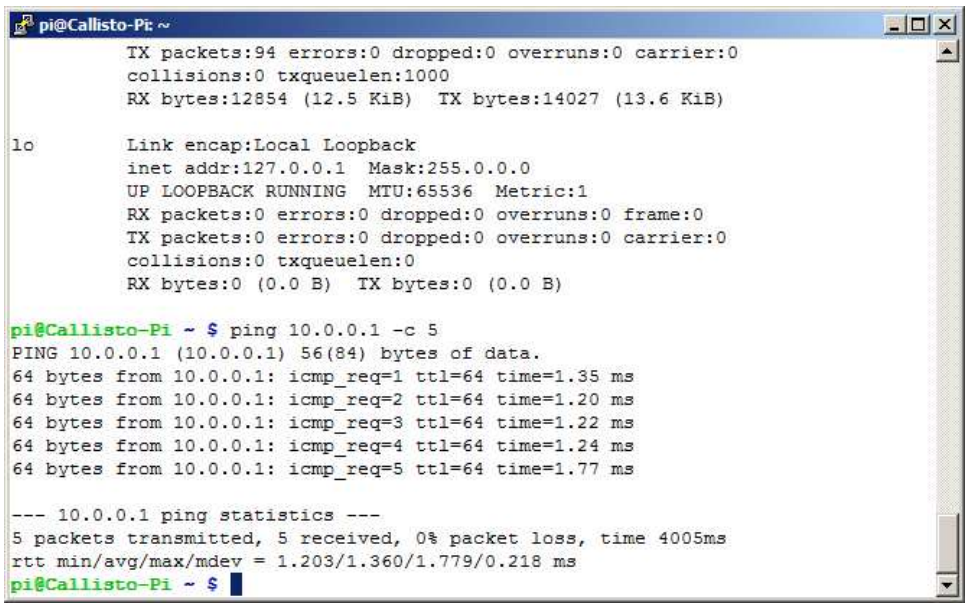
After the RPi reboots, restart the PuTTY session if you used the original IP address or start a new session. To restart the previous session right-click the title bar at top of PuTTY window and select Restart Session, and to start a new session right-click the title bar and select New Session.... Log into the RPi and enter:

```
ifconfig
```



Double-check your work by pinging the gateway (or other nodes on the LAN). The -c 5 option in the command below indicates to ping 5 times. Note: Without the –c 5 option the address will be pinged continuously. If you accidentally start a continuous ping, you can stop by typing CTRL+C. Be sure to use the actual IP address of your gateway (router) and not the one shown in the example here:

```
ping 10.0.0.1 -c 5
```



The pings should be successful with no packet loss. If not successful, then your setup is incorrect. Recheck each step above. If necessary, you can revert to DHCP by reversing the steps or by copying the information shown in your screenshots before the changes.

This completes the static IP network configuration.

Document information

Author: Whitham D. Reeve

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0.1 (Cleaned up and removed references to Callisto-Pi, 18 Feb 2015)
0.2 (Minor revisions, 12 Mar 2015)
1.0 (Initial distribution, 29 Apr 2015)