2020F_ESE 3014_1

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LAB: 9

DUE DATE: 3 Dec 2020 - 23:55

SUBMITTED DATE: 3 Dec 2020

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Lab-9

INTRODUCTION

In this Lab we are going to learn how to setup an ipv4 address for your beaglebone and ping the host machine with the beaglebone and vice versa.

1. Identify the name and IP address of your host machine's main ethernet connection
    The details are listed below:
 ➢ **NAME:** aman@ubuntu
 ➢ **Ip Address:** 192.168.2.151

```
wlo1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.2.151  netmask 255.255.255.0  broadcast 192.168.2.255
        inet6 fe80::834e:1224:218e:a50d  prefixlen 64  scopeid 0x20<link>
        ether 9c:ad:97:cb:09:59  txqueuelen 1000  (Ethernet)
        RX packets 475  bytes 72769 (72.7 KB)
        RX errors 0  dropped 0  overruns 0  frame 546
        TX packets 369  bytes 177321 (177.3 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
        device interrupt 18
```

2. Identify the name and IP address of your embedded system's main ethernet port (Q: is the IP address local or global? Explain.)
    The details are listed below:
 ➢ **NAME:** BeagleBone-DBD8
 ➢ **Ip Address:** 192.168.2.199

```
wlan0: flags=-28605<UP,BROADCAST,RUNNING,MULTICAST,DYNAMIC>  mtu 1500
        inet 192.168.2.199  netmask 255.255.255.0  broadcast 192.168.2.255
        inet6 fe80::2eab:33ff:fed2:331c  prefixlen 64  scopeid 0x20<link>
        inet6 fdd0:292d:93a1:1:2eab:33ff:fed2:331c  prefixlen 64  scopeid 0x0<global>
        ether 2c:ab:33:d2:33:1c  txqueuelen 1000  (Ethernet)
        RX packets 859  bytes 109239 (106.6 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 529  bytes 80425 (78.5 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

3. Attempt to ping the connection of each machine from the other; use $ man ping for more
information on the exact use of ping

On the host machine: ping 192.168.2.199

```
aman@ubuntu:~$ ping 192.168.2.199
PING 192.168.2.199 (192.168.2.199) 56(84) bytes of data.
64 bytes from 192.168.2.199: icmp_seq=1 ttl=64 time=45.5 ms
64 bytes from 192.168.2.199: icmp_seq=2 ttl=64 time=3.39 ms
64 bytes from 192.168.2.199: icmp_seq=3 ttl=64 time=103 ms
64 bytes from 192.168.2.199: icmp_seq=4 ttl=64 time=231 ms
64 bytes from 192.168.2.199: icmp_seq=5 ttl=64 time=3.81 ms
```

On the beaglebone: ping 192.168.2.151

```
debian@beaglebone:~$ ping 192.168.2.151
PING 192.168.2.151 (192.168.2.151) 56(84) bytes of data.
64 bytes from 192.168.2.151: icmp_seq=1 ttl=64 time=3.38 ms
64 bytes from 192.168.2.151: icmp_seq=2 ttl=64 time=314 ms
64 bytes from 192.168.2.151: icmp_seq=3 ttl=64 time=31.5 ms
64 bytes from 192.168.2.151: icmp_seq=4 ttl=64 time=4.17 ms
^Z
[1]+  Stopped                 ping 192.168.2.151
debian@beaglebone:~$ 
```

4. Verify that you are able to connect to Internet from your embedded system. Using a GUI Linux interface, can you open a web page?
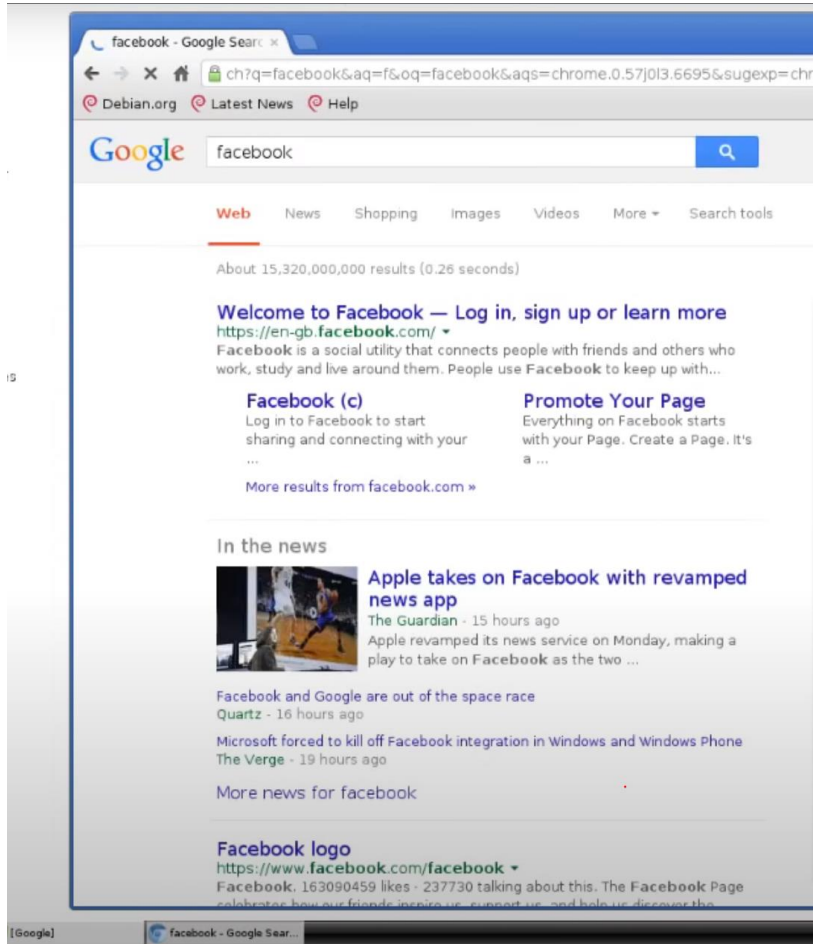
5. Using SSH, login to your embedded system from your host machine using the embedded platform's IP address

```
aman@ubuntu:~$ ssh debian@192.168.2.199
Debian GNU/Linux 10

BeagleBoard.org Debian Buster IoT Image 2020-04-06

Support: http://elinux.org/Beagleboard:BeagleBoneBlack_Debian

default username:password is [debian:temppwd]


The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Fri Dec  4 03:41:33 2020 from 192.168.2.151
debian@beaglebone:~$
```

BONUS PART:

- Since I have a beaglebone black wireless, I couldn't have used a LAN cable to connect my beaglebone black to the host machine and use Internet on it, However for out capstone project next sem we might need to connect the beaglebone to the Internet to demonstrate 'AWS'.
- But since LAN port aren't readily available everywhere, I though of using a wifi network to go online on the beaglebone or use the hotspot from my mobile to go online on the beaglebone.
- But this comes with an extra feature, I could connect my beaglebone to a particular wifi and then connect devices like my laptop or mobile to it. This doesn't really have any pratical implementations however at places where the wifi is almost out of range, I can set my beaglebone there and use it as a wifi extender.

Speed test on the BbbW
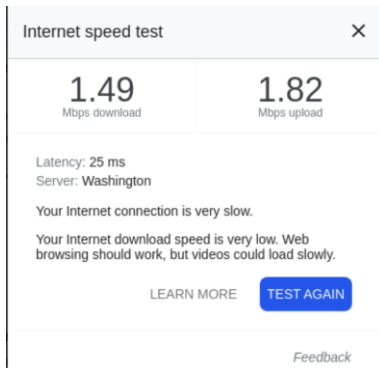
Speed test on the router
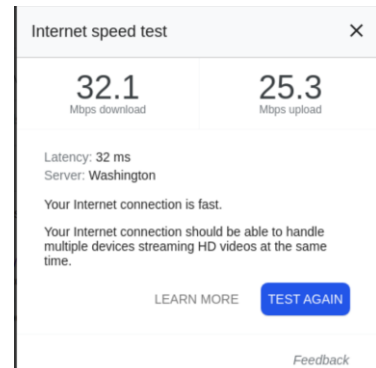
CONCLUSION

- Lab-9 was really important to understand how a wifi module on the beaglebone black would have worked and how to assign a ipv4/6 ip address to it.
- Furthermore you can setup a manual ip address and tweak it as you want.
- I learned that beaglebone black could also be used as a wifi extender for emergencies (as the wifi modem inside is not that powerful or in short you won't get 5Ghz speeds with it)

APPENDIX

- Youtube link**:** https://www.youtube.com/watch?v=T198MK9iqHE