

Fall 2023

Mobile and Embedded System Design and Application - ELEC 553

Project 1

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In this project, I followed a straightforward series of steps to successfully set up my Raspberry Pi Zero W. Initially, I downloaded the official Raspberry Pi Lite OS image from the official website and proceeded to write it onto the SD card, then modify the wpa_supplicant configuration file in the SD card to let Raspberry Pi get WiFi. Once that was done, I powered up the Raspberry Pi and established a connection to the device using SSH. My next steps involved running "sudo apt update" and "sudo apt upgrade" to familiarize myself with the Linux system and ensure it was up to date. To validate the internet connection, I executed a simple "ping google.com" command as shown in the following figures.

Surprisingly, I didn't encounter many challenges throughout the project, completing it in just under 2 hours. Looking ahead, I am excited about the prospect of working on more advanced projects with the Raspberry Pi. One particular area of interest is emulating a RISC-V processor on the Raspberry Pi. This endeavor would not only deepen my understanding of RISC-V but also highlight its potential as a viable alternative to established architectures like Intel, AMD, Arm, and their respective partners, even though RISC-V still has a long journey ahead to compete at that level.

```
piscis — hl116@raspberrypi: ~ — ssh hl116@raspberrypi.local — 80x24
Last login: Mon Sep 11 23:36:26 on ttys000
(base) piscis@piscis ~ % ssh hl116@raspberrypi.local
hl116@raspberrypi.local's password:
Linux raspberrypi 6.1.21+ #1642 Mon Apr  3 17:19:14 BST 2023 armv6l

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: Mon Sep 11 23:36:50 2023 from 2601:2c6:4e00:4430:8cbd:68f9:8f24:7d08
hl116@raspberrypi:~$
```

Raspberry Pi Login

```
piscis — hl116@raspberrypi: ~ — ssh hl116@raspberrypi.local — 80x24
Last login: Mon Sep 11 23:36:26 on ttys000
(base) piscis@piscis ~ % ssh hl116@raspberrypi.local
hl116@raspberrypi.local's password:
Linux raspberrypi 6.1.21+ #1642 Mon Apr  3 17:19:14 BST 2023 armv6l

The programs included with the Debian GNU/Linux system are free software;
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individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Mon Sep 11 23:36:50 2023 from 2601:2c6:4e00:4430:8cbd:68f9:8f24:7d08
hl116@raspberrypi:~$ sudo apt update
Hit:1 http://raspbrian.raspberrypi.org/raspbian bullseye InRelease
Hit:2 http://archive.raspberrypi.org/debian bullseye InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
All packages are up to date.
hl116@raspberrypi:~$
```

sudo apt update

```
hl116@raspberrypi:~$ sudo apt upgrade
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
hl116@raspberrypi:~$
```

sudo apt update

```
piscis — hl116@raspberrypi: ~ — ssh hl116@raspberrypi.local — 80x24
hl116@raspberrypi:~$ ping google.com
PING google.com(rq-in-f101.1e100.net (2607:f8b0:4023:1004::65)) 56 data bytes
64 bytes from rq-in-f101.1e100.net (2607:f8b0:4023:1004::65): icmp_seq=1 ttl=57
time=30.3 ms
64 bytes from rq-in-f101.1e100.net (2607:f8b0:4023:1004::65): icmp_seq=2 ttl=57
time=28.2 ms
64 bytes from rq-in-f101.1e100.net (2607:f8b0:4023:1004::65): icmp_seq=3 ttl=57
time=21.4 ms
64 bytes from rq-in-f101.1e100.net (2607:f8b0:4023:1004::65): icmp_seq=4 ttl=57
time=30.3 ms
64 bytes from rq-in-f101.1e100.net (2607:f8b0:4023:1004::65): icmp_seq=5 ttl=57
time=22.6 ms
64 bytes from rq-in-f101.1e100.net (2607:f8b0:4023:1004::65): icmp_seq=6 ttl=57
time=21.7 ms
64 bytes from rq-in-f101.1e100.net (2607:f8b0:4023:1004::65): icmp_seq=7 ttl=57
time=25.7 ms
```

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