

COMP4337/9337 Securing Fixed and Wireless Network

Warmup Activity: Hardware Compatibility Check

Due: 13.02.2022 2300 hrs

Objectives

This lab preparation is intended to:

- Introduce the labs and the corresponding requirements for COMP4337/9337 and
- Check if students' devices meet hardware requirements for performing the labs and the final project.

Overview

Note: At the end of this lab, you are required to fill a hardware compatibility survey available on Moodle (<https://moodle.telt.unsw.edu.au/mod/feedback/view.php?id=4463854>)

COMP4337/9337 uses hands-on laboratory sessions to support problem-based learning to enhance the student-learning experience. To provide a consistent and coherent environment in running labs and the assignment across students, we will give a set of devices, as follows:

- a headless Raspberry Pi 4,
- an ASUS Bluetooth Low Energy (BLE) dongle (optional), and
- an ALFA USB Wi-Fi Network Adapter (optional).

We presume that students already own the following devices:

- a desktop/laptop computer that supports [VMware](#), SD card reader, and Wi-Fi,
- an Android/iOS device with BLE,
- a BLE-enabled device (e.g., smart-watch, wireless headphone, etc.), and
- a USB Flash Drive with a minimum 8GB capacity (optional).

Note that it is important to check if the student's personal computer meets the hardware requirements. If the student's computer does not support BLE and/or Wi-Fi monitor mode, we will provide an ASUS BLE dongle and/or an ALFA USB Wi-Fi dongle.

Assessment and Marking

The deadline for this preparation is **13.02.2022 2300 hrs**. **No marks** will be awarded for this preparation.

Submission

To report whether your personal computer is compatible to run labs and the assignment, please fill out the following form on Moodle

(<https://moodle.telt.unsw.edu.au/mod/feedback/view.php?id=4463854> .)

Important! Please fill out the form by the deadline; otherwise, you will encounter issues when performing the labs and final project.

Bluetooth Low Energy Hardware Check

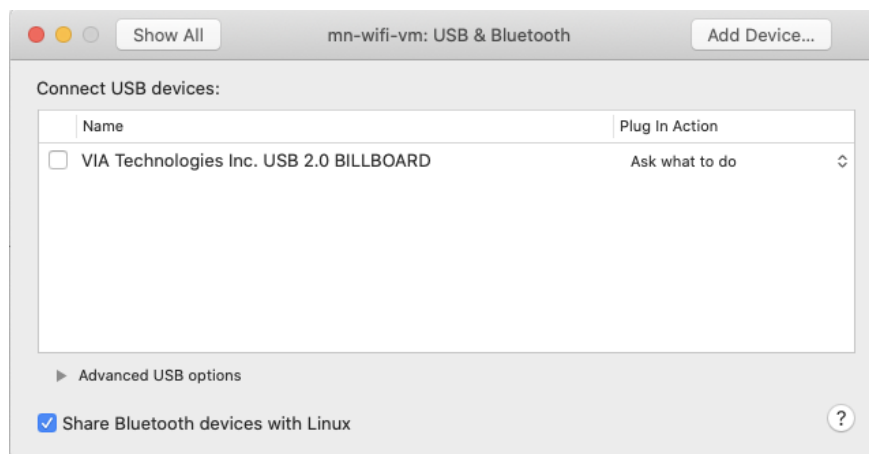
This instruction will help determine whether your hardware supports Bluetooth Low Energy (BLE) to run the labs and the assignment.

Important! It is known that most recent laptops come with built-in BLE adapters. However, not all adapters are suitable to run COMP4337/9337 labs and the assignment.

1. Make sure that VMware is installed on your laptop. Follow the instructions on [CSE Website](#) to install. Please select the operating system that matches your personal computer.
2. On your personal computer, download the `sfwn` VMWare image [here](#). Make sure you have an adequate internet connection as this will download a Linux image of approximately 3GB in size. Extract the downloaded image (`sfwn.7z`) to any directory. Please note that the extracted Linux image will take around 11 GB in size.

Note: Please continue to download the Linux image although your personal computer is running Linux, as some labs are using this image. You may also need to install 7-zip to extract the image. Download here <https://www.7-zip.org/download.html>. Please note that you can use other image extracting tools as suitable.

3. After extracting the image, run the Linux image by opening `sfwn.vmx` file. Insert `kali` as the username and password when prompted.
4. On VMware virtual machine setting, from the top menu bar, click on Virtual Machine and select settings. On the removable device pane, select USB & Bluetooth and tick the "Share Bluetooth devices with Linux" tick box on the bottom of the window. See the image below for reference.



5. Open a Terminal and type the following command. Type `kali` if asked for a password:

```
$ sudo service bluetooth start
```

6. Type the following command to list available Bluetooth interfaces:

```
$ sudo hciconfig
```

For each available Bluetooth interface (e.g., `hci0`, `hci1`, etc), type the following command:

```
$ sudo hciconfig hci0 lestates
```

Note: Replace `hci0` with available Bluetooth interfaces.

- a. If you get the following output, then you may need a BLE dongle.

```
Read LE supported states on hci0 returned status 1
```

- b. If you get outputs like these, then your hardware supports BLE for the labs, and there is no need to get an additional BLE dongle.

```
Supported link layer states:
```

```
YES Non-connectable Advertising State
```

```
YES Scannable Advertising State
```

```
YES Connectable Advertising State
```

```
YES Directed Advertising State
```

```
YES Passive Scanning State
```

```
YES Active Scanning State
```

```
YES Initiating State/Connection State in Master Role
```

```
YES Connection State in the Slave Role
```

```
...
```

RFMON Mode Hardware Check

This instruction will guide you to determine whether your Wi-Fi adapter supports Monitor mode and whether an additional Wi-Fi dongle is required. Wi-Fi monitor mode is required to run Lab 2 (Hacking Wireless Networks), in which we will use Kali Linux Live USB to perform the lab.

Please follow these instructions depending on your operating system.

For Mac users:

It is known that Live Kali Linux has several issues in hardware compatibility. You will need an ALFA Wi-Fi adapter to run Lab 2. You will need to perform the lab using `sfwn` VMware image instead.

Your hardware compatibility assessment ends here; please log in to Moodle and fill out the survey (<https://moodle.telt.unsw.edu.au/mod/feedback/view.php?id=4463854>)

For PC users:

Please prepare a Kali Linux Live USB by downloading Kali Linux 2020.04 image and flashing them into a USB Flash Drive.

Preparing a Kali Linux Live USB

1. On your personal computer, head to <https://www.kali.org/downloads/> and download [Kali Linux 64-Bit \(Live\)](#). Note that it will download a file of around 3.3GB.

2. Download Balena etcher, a tool to flash the image to a USB Flash Drive, [here](#).
3. Plug the USB Flash Drive onto your personal computer. Then open Balena Etcher to flash the downloaded image. Select the appropriate image file and the USB Flash Drive device on Balena Etcher. Click Flash to start flashing the image. Please note that you can use any other relevant tool to create a bootable USB drive if necessary.
4. Wait until the process is finished, and note that this may take several minutes. Upon completion, the USB Flash Drive is ready to use.

Booting the Live USB

1. Start by plugging the USB drive into a USB port. We will need to change the BIOS boot sequence. Now restart your computer.
2. During the initial start-up screen, press ESC, F1, F2, F8 or F10. (Depending on the company that created your version of BIOS, a menu may appear.)
3. When you choose to enter BIOS Setup, the setup utility page will appear.
4. Using the arrow keys on your keyboard, select the BOOT tab. All the available system devices will be displayed in order of their boot priority. You can reorder the devices here.
5. Move USB to be first in the boot sequence.

Note: If you cannot find USB or Removable Devices among the device options, your BIOS may list it under Hard Drive Devices. In that case, you will need to:

- Move Hard Drive Devices to the top,
 - Expand to show all hard drive device options,
 - Move the USB device to the top of that hard drive list.
6. Save the change and then exit the BIOS Setup.
 7. The computer will restart using the new settings, booting from your USB drive.
 8. **Stay alert!** Depending on your BIOS, you may be prompted with a message to Press any key to boot from an external device, and you will only have a few seconds to respond. If you do nothing, your computer will go to the next device in the boot sequence list, which will likely be your hard drive.

Checking RFMON Compatibility

1. Login to Kali Linux by typing `kali` as username and password.
2. Open a Terminal and type the following:

```
$ iw list
```

3. Make sure you see `monitor` listed in supported interface modes:

```
Wiphy phy0
```

```
...
```

```
Supported interface modes:
```

```
...
```

```
* managed
```

```
* AP
```

```
* monitor
```

```
...
```

Note: The output of `iw list` is really long and detailed. Make sure you find the "Supported interface modes" section. The relevant section is shown in the example above.

4. If `monitor` is listed, then you may not need an additional Wi-Fi dongle. Otherwise, you will need to get a Wi-Fi dongle and use `sfwn` VMware image instead.

Your hardware compatibility assessment ends here; please log in to Moodle and fill out the survey (<https://moodle.telt.unsw.edu.au/mod/feedback/view.php?id=4463854>)