

Smart-Building Report

Simon Remington

January 26, 2019

Contents

1	Introduction	3
2	Setting-up Raspberry Pi	3
2.1	Obtaining the Raspberry Pi Operating System	3
2.2	Windows flashing	3
2.3	Linux flashing	4
2.4	The Secure Shell	5
3	New Paragraph	5
4	this is section	6
4.1	this is sub	6

1 Introduction

This is the report to for Smart Building Project. It covers the procedures I have taken so far.

This report is not a tutorial, nor does it cover all the rabbit holes and dead end to achieve my goal.

2 Setting-up Raspberry Pi

2.1 Obtaining the Raspberry Pi Operating System

The RPI image can be obtained from:

<https://www.raspberrypi.org/downloads/raspbian/>

The image is: Raspbian Stretch Lite, a minimal image based on Debian Stretch. The lite image is for a headless install. All communication to the RPI is made via ssh.

Version: November 2018

Release date: 2018-11-13

Kernel version: 4.14

Download and unpack the image.

I have used both Windows and Linux Debian to create the bootable operating system so that I get a greater knowledge and understanding of completing the flash process.

2.2 Windows flashing

Check the hash, SHA-256 of the image.

Use Windows built-in certUtil -hashfile Path/To/File/file.img SHA256 to compute the hash. Obtainable on both Windows 7 and 10 machines.

Insert the SD card into a Window's machine.

Use Etcher to flash image, obtained from:

<https://www.balena.io/etcher/>

Download Etcher and install.

Using Etcher, select source (Path to .img), Destination (Tath to SD card) Flash the card.

Dismount then remount SD card. Donot repair the card when asked to by Windows.

CMD into the card then create an empty file named ssh with no extension, this can be accieved by entering the following command at the prompt:

```
C:\>type nul > ssh
```

This will give secure shell access at boot time.

Info can be found at:

<https://www.raspberrypi.org/documentation/configuration/wireless/headless.md>

Create a file named wpa_,supplicant.conf

Info can be found at:

https://manpages.debian.org/stretch/wpasupplicant/wpa_supplicant.conf.5.en.html/

Add following to the file:

```
ctrl_interface=DIR=/var/run/wpa_supplicant GROUP=netdev
update_config=1
country=IE
```

```
network={
    ssid="Your-network"
    key_mgmt=NONE # Use for no password
```

```
network={
    ssid="Your-network"
    key_psk="Your-password"
}
```

Now boot the Raspberry Pi, this SD card can be used in any machine that recognises the Debian Stretch OS.

This card is for the arm6 instruction set of the chip, it is capable of running in machines with the arm7 architecture, but not the other way around.

2.3 Linux flashing

Download Stretch.img and unpack.

Check hash at the prompt with:

```
user@host:~$ sha1sum /Path/To/file.img
```

Find the SD card.

```
user@host:~$ df -h
```

Dismount SD card.

```
user@host:~$ umount /dev/The SD card
```

Run the following command:

```
user@host:~$ sudo dd bs=4M status=progress if=~ /Path/To/stretch-lite.img  
of=/dev/The SD card
```

Info can be found at:

[https : //elinux.org/RPi_Easy_SD_Card_Setup](https://elinux.org/RPi_Easy_SD_Card_Setup)

When SD card is written, mount the card and create files ssh, WPA

```
user@host:~$touch ssh
```

```
user@host:~$touch wpa_supplicant.conf
```

Use an editor and create file contents as above for Windows.

2.4 The Secure Shell

Download and install Bitvise Available at:

[https : //www.bitvise.com/](https://www.bitvise.com/)

3 New Paragraph

well hello there

4 this is section

4.1 this is sub