✕   Lessons

Requirements

To setup your Raspberry Pi you will need:

- Raspberry Pi

- USB Mouse/keyboard

- HDMI Screen or monitor

- power supply and connecting cables

- Optional WiFi USB Dongle if not using Ethernet connectivity and not using a Pi 3 Model B

- Optional USB hub for Pis with only 1 USB connector (A+ and Zero)

- SD Card 8GB or larger - recommend 8GB (and adapter to be able to write SD card in laptop)

- Latest Raspbian image based on Debian Jessie : https://downloads.raspberrypi.org/raspbian_latest

The OS for the Raspberry Pi is installed on an SD card, which the Pi boots from. To create the SD card you need to download the image from https://www.raspberrypi.org/downloads/. For this lab

Creating the SD card

Select the latest Raspbian image based off Debian Jessie: https://downloads.raspberrypi.org/raspbian_latest.

Note: The instructions in this course assume you are using the latest version of Raspbian based on Jessie. They will not work on the older Wheezy based images as there were significant changes between versions.

Write the image to the SD card using the instructions for your laptop OS (this takes some time) Note that you cannot just copy the .img file to the SD card, you need to use the instructions below:

- Linux - https://www.raspberrypi.org/documentation/installation/installing-images/linux.md

- Mac OS - https://www.raspberrypi.org/documentation/installation/installing-images/mac.md

- Windows - https://www.raspberrypi.org/documentation/installation/installing-images/windows.md

Eject the SD card from your laptop and insert into the Raspberry Pi SD slot

Booting the Raspberry Pi

The first time you boot the Raspberry Pi you will need to have a Keyboard, Mouse and screen connected to the Pi to be able to do the initial configuration. You will also need network connectivity (Ethernet or WiFi). There is a quickstart guide available if you are new to the Raspberry Pi: https://www.raspberrypi.org/help/quick-start-guide/

Connect the power supply to the Raspberry Pi - you should see the boot sequence on the screen

The primary desktop is displayed when boot is complete
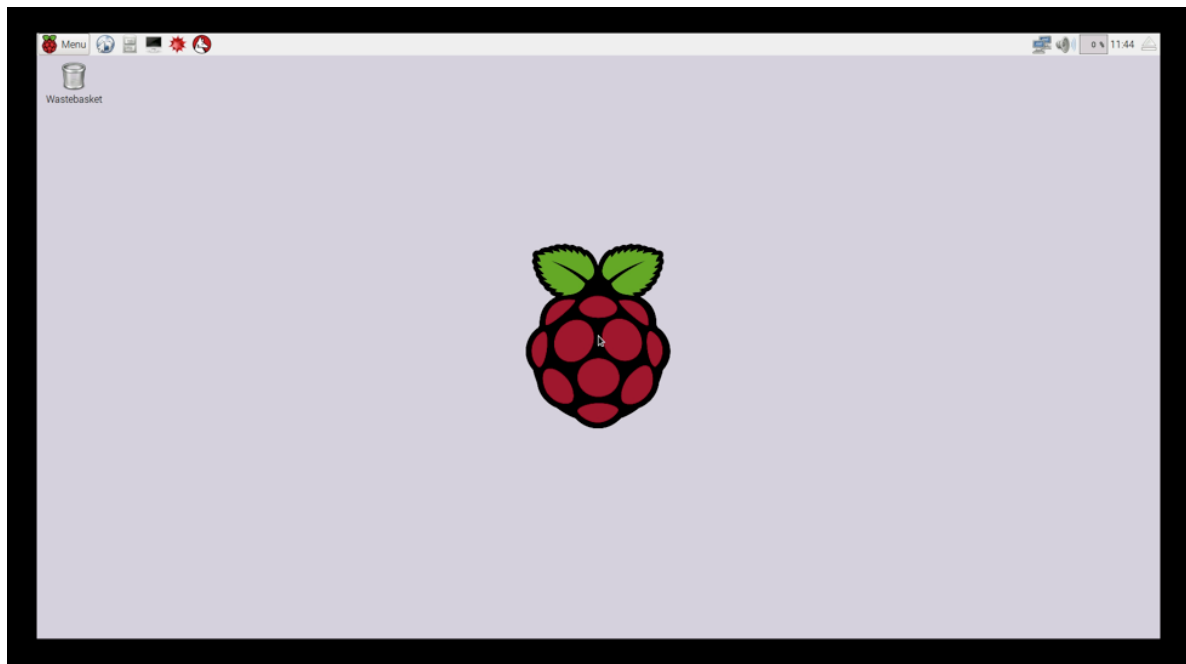
If you need to configure WiFi click on the network icon in the top right of the screen and select your WiFi network by clicking on the name. Enter the network credentials then you should be connected - further details about configuring WiFi can be found here: https://www.raspberrypi.org/documentation/configuration/wireless/README.md

Note: The rest of the setup needs to be done in a terminal window.
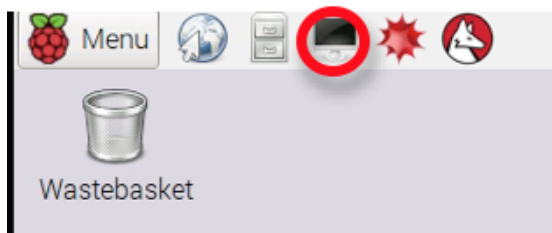
You can continue to work on the Raspberry Pi or switch to using a remote connection from your laptop - this will allow you to cut and paste from this document rather than having to type every command. To setup a remote connection you need the IP address of the Raspberry Pi. Enter the following command in a terminal window on the Raspberry Pi:

```
1   hostname -I
```

then use the appropriate instructions for your OS to access your raspberry pi:

- *Linux/Mac OS : https://www.raspberrypi.org/documentation/remote-access/ssh/unix.md*

- *Windows : https://www.raspberrypi.org/documentation/remote-access/ssh/windows.md*
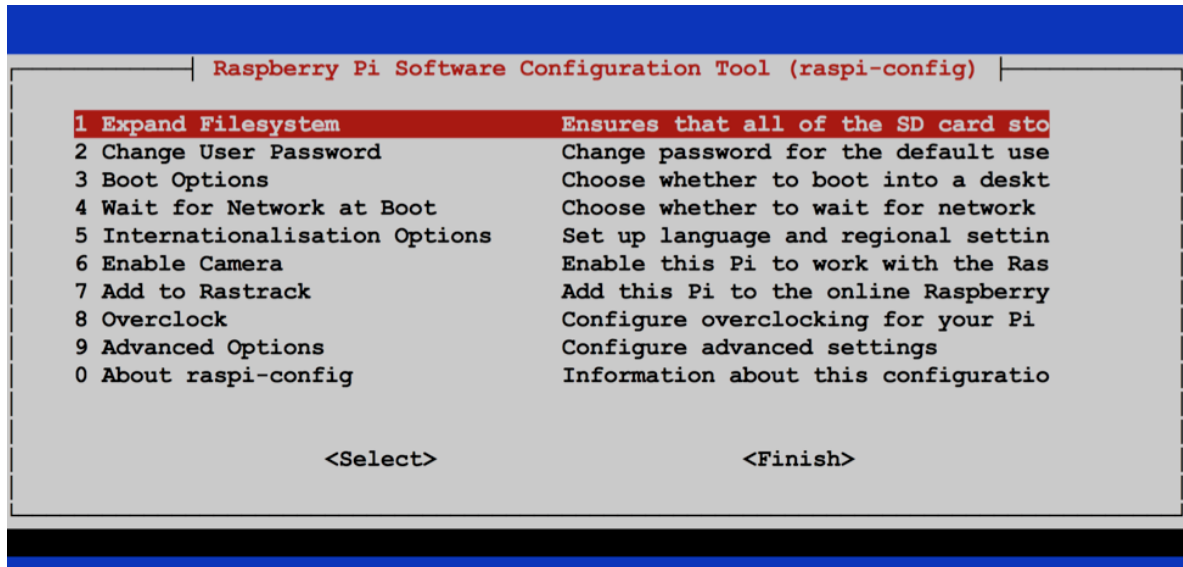
Configuring the Raspberry Pi

Update the configuration on the Raspberry Pi.

1. In a terminal window enter the following command

```
1   sudo raspi-config
```

You should now see the configuration tool:

To use the tool select from the main menu using the arrow keys then hit tab to jump to the select button. The space bar or enter key accepts the current selected action (Select or Finish). When an action has been performed use tab key to jump back to the list to select another option.

The following steps need to be taken in the configuration tool:

1-Expand Filesystem

2- Change User Password (default user is pi with default password raspberry)

5-Internationalisation Options (set the Locale/Timezone and Keyboard layout for your location. If using WiFi set your country to ensure correct use of WiFi frequencies)

9-Advanced Options:

A2-Hostname (give your pi a unique name)

A7-I2C (specify to load module as default)

Finish (select to reboot)

Your Raspberry Pi will reboot after finishing the configuration. If using a remote connection you will need to wait for the Raspberry Pi to reboot then reconnect (you should get the same IP address, if not use the hostname -I command to discover the new IP address assigned to your Pi.

Updating the firmware and Raspbian OS

Update all packages that have been updated since the Raspbian image was created.

Enter the following commands in a terminal window:

```
1   sudo rpi-update
2   sudo reboot -n
```

after the last command the Raspberry Pi will reboot. If using a remote terminal reconnect when the Raspberry Pi reboots. To update the raspbian OS enter the following commands:

```
1   sudo apt-get update
2   sudo apt-get -y upgrade
3   sudo apt-get -y autoremove
```

Setting up VNC server

VNC is a service that allows the Graphical User Interface of the Raspberry Pi to be access remotely using a VNC client. 1. Install the VNC server using the following command:

```
1   sudo apt-get install -y tightvncserver
```

2. Run VNC server and follow the prompts to set an access password. You don't need a view-only password unless you want to set one:

```
1   vncserver
```

3. Enter the following to setup VNC to run at system startup

```
1   cat >vncserver@.service <<EOF
2   [Unit]
3   Description=Remote desktop service (VNC)
4   After=syslog.target network.target
5
6   [Service]
7   Type=forking
8   User=pi
9   PAMName=login
10  PIDFile=/home/pi/.vnc/%H:%i.pid
11  ExecStartPre=-/usr/bin/vncserver -kill :%i > /dev/null 2>&1
12  ExecStart=/usr/bin/vncserver -depth 24 -geometry 1280x800 :%i
13  ExecStop=/usr/bin/vncserver -kill :%i
14
15  [Install]
16  WantedBy=multi-user.target
17  EOF
18  sudo mv vncserver@.service /etc/systemd/system/
19  sudo chown root:root /etc/systemd/system/vncserver@.service
20  sudo systemctl daemon-reload && sudo systemctl enable vncserver@1.service
```

To access the Raspberry Pi you will need a VNC client installed. There are a number of VNC Clients available. The Raspberry Pi web site includes instructions on how to set up and use RealVNC:

- Linux - https://www.raspberrypi.org/documentation/remote-access/vnc/linux.md

- Mac OS - https://www.raspberrypi.org/documentation/remote-access/vnc/mac.md

- Windows - https://www.raspberrypi.org/documentation/remote-access/vnc/windows.md

Updates for Node.js

Install npm and update to version 2. Version 1 cannot correctly build and install some of the native libraries needed.

```
1   sudo apt-get install -y npm
2   sudo npm i -g npm@2.x
```

For Node applications to be able to run Bluetooth scans it needs to be given permission:

```
1   sudo setcap cap_net_raw+eip $(eval readlink -f `which node`)
```

A couple of additional installs

The Iceweasel browser is a good browser to use for accessing NodeRED and Bluemix if working directly on the Raspberry Pi. There is also a nice editor called geany. To install the iceweasel browser and the geany editor run the following command:

```
1   sudo apt-get install -y geany iceweasel
```

Reboot pi to run all the updates

The Raspberry Pi is now ready. Please reboot before starting the course:

```
1   sudo reboot -n
```

[Mark as completed]