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嵌入式系統

Lab 01: Raspberry Pi 安裝

銘傳大學 電腦與通訊工程學系 羅嘉寧

SD 卡格式化

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- ▶ 下載 SDFormatter:
https://www.sdcard.org/cht/downloads/formatter_4/



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Raspberry Pi 安裝

燒錄 SD 卡 (Windows)

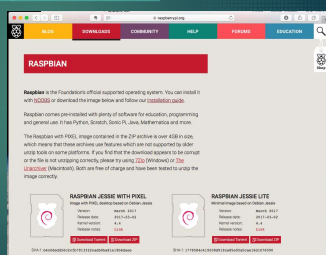
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- ▶ 下載 Win32DiskImager
<https://sourceforge.net/projects/win32diskimager/>

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下載作業系統

- ▶ 下載 RASPBIAN JESSIE WITH PIXEL
<https://www.raspberrypi.org/downloads/raspbian/>



燒錄 SD 卡 (Mac)

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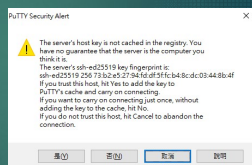
- ▶ 下載 Etchers: <http://etcher.io>



Putty /SSH

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- ▶ 接受憑證



沒改密碼前禁止
連上 Internet

Putty /SSH

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- ▶ Login: pi /raspberrypi

```
login as: pi
pi@raspberrypi.local's password:
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 Mar 3 16:27:37 2017 from fe80::1dd0:e91f:eea5:7087%eth0
SSH is enabled and the default password for the 'pi' user has not been changed.
This is a security risk - please login as the 'pi' user and type 'passwd' to set
a new password.
pi@raspberrypi:~$
```

CHECK POINT 1

修改預設密碼

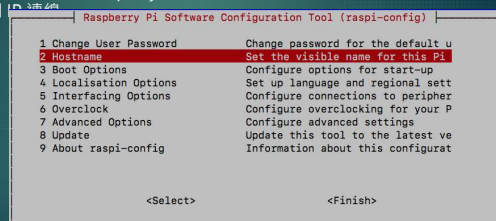
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```
pi@raspberrypi:~$ passwd
Changing password for pi.
(current) UNIX password:
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
pi@raspberrypi:~$
```

RPi2 改 hostname

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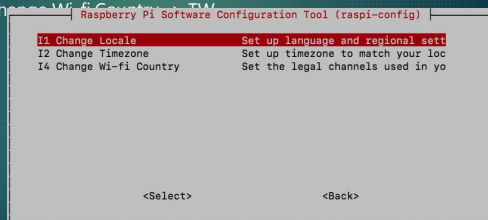
- ▶ sudo raspi-config, 選 2
- ▶ 改 hostname 後, putty 可直接用 `hostname.local` 而不用 IP 連線



RPi2 改時區/Wifi

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- ▶ 4. Localisation Options
- ▶ I2 Change Timezone -> Asia/Taipei
- ▶ I3 Change Wi-fi Country -> TW



關機

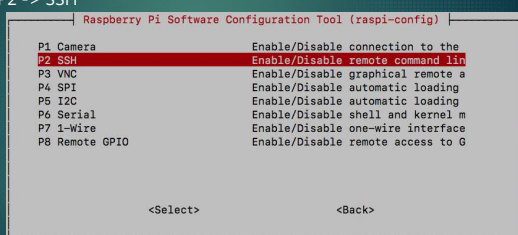
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- ▶ 關機
- ▶ sudo shutdown now
- ▶ 重開機
- ▶ sudo shutdown now -r
- ▶ Putty 以新設定的 hostname 連線至 *localhost*

RPi2 enable SSH

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- ▶ 5. Interfacing Option
- ▶ P2 -> SSH



RPi2 加入帳號

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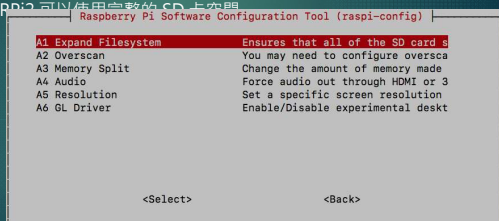
- ▶ sudo adduser *ppap*

```
pi@ppap:~$ sudo adduser ppap
Adding user 'ppap' ...
Adding new group 'ppap' (1001) ...
Adding new user 'ppap' (1001) with group 'ppap' ...
Creating home directory '/home/ppap' ...
Copying files from '/etc/skel' ...
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
Changing the user information for ppap
Enter the new value, or press ENTER for the default
Full Name []: Apple Pen
Room Number []:
Work Phone []:
Home Phone []:
Other []:
Is the information correct? [Y/n] y
pi@ppap:~$
```

RPi2 expand file system

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- ▶ 7. Advanced Options
- ▶ A1 Expand File System
- ▶ 讓 RPi2 可以/使用全部的 SD 卡空間



將帳號加入 sudoer

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- ▶ cd /etc ; sudo vi /etc/group
- ▶ 將帳號加入 sudo 的 group

```
GNU nano 2.2.6 File: /etc/group Modified
uucp:x:10:
man:x:12:
proxy:x:13:
kmem:x:15:
dialout:x:20:pi
fax:x:21:
voice:x:22:
cdrom:x:24:pi
floppy:x:25:
tape:x:26:
sudo:x:27:pi,ppap
audio:x:29:pi
dip:x:30:
www-data:x:33:
backup:x:34:
operator:x:37:
list:x:38:
irc:x:39:
src:x:40:
Get Help WriteOut Read File Prev Page Cut Text Our Pos
Exit Justify Where Is Next Page UnOut Text To Spell
```

設定 WiFi

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- ▶ 參考 <https://www.raspberrypi.com.tw/2152/setting-up-wifi-with-the-command-line/>
- ▶ `sudo nano /etc/network/interfaces`
- ▶ 加入 `auto wlan0`

```

# This file is automatically generated by the network manager.
# Please note that this file is written to be used with dhclient.
# For static IP, consult /etc/dhcpd.conf and 'man dhclient.conf'.

# Include files from /etc/network/interfaces.d:
source-directory /etc/network/interfaces.d

auto lo
iface lo inet loopback

iface eth0 inet manual

auto wlan0
allow-hotplug wlan0
iface wlan0 inet manual
wpa-conf /etc/wpa_supplicant/wpa_supplicant.conf

allow-hotplug wlan1
iface wlan1 inet manual
wpa-conf /etc/wpa_supplicant/wpa_supplicant.conf

"interfaces" (readonly) 21 lines, 531 characters

```

啟動 WiFi

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- ▶ 參考 <https://www.raspberrypi.com.tw/2152/setting-up-wifi-with-the-command-line/>
- ▶ `sudo ifdown wlan0`
- ▶ `sudo ifup wlan0`
- ▶ `sudo kill -9 $(ps -ef | grep wpa | awk '{print $2}')`
- ▶ `sudo wpa_supplicant -B -i wlan0 -c /etc/wpa_supplicant/wpa_supplicant.conf`
- ▶ 或
- ▶ 重新開機
- ▶ `sudo shutdown now -r`

設定 WiFi – 802.1x_MCU

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- ▶ `sudo nano /etc/wpa_supplicant/wpa_supplicant.conf`
- ▶ 加入
- ▶ `network={`
- ▶ `ssid="802.1x_MCU"`
- ▶ `scan_ssid=1`
- ▶ `proto=WPA`
- ▶ `key_mgmt=WPA-EAP`
- ▶ `pairwise=CCMP`
- ▶ `eap=PEAP`
- ▶ `identity="SchoolID"`
- ▶ `password="Password"`
- ▶ `phase2="auth=MSCHAPV2D"`
- ▶ `}`

在家 LAN DHCP上網

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- ▶ 刪除 cmdline.txt 中 IP 設定, 修改 /etc/network/interfaces
- ▶ `# /etc/network/interfaces`
- ▶ `auto lo`
- ▶ `iface lo inet loopback`
- ▶ `iface eth0 inet dhcp`
- ▶ `auto eth0`
- ▶ `auto wlan0`
- ▶ 連線:
- ▶ putty 可直接用 `localhost.local` 而不用 IP 連線

設定 WiFi – CSIE513

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- ▶ `sudo nano /etc/wpa_supplicant/wpa_supplicant.conf`
- ▶ 加入
- ▶ `network={`
- ▶ `scan_ssid=1`
- ▶ `ssid="CSIE513"`
- ▶ `psk="1111111111"`
- ▶ `proto=RSN`
- ▶ `key_mgmt=WPA-PSK`
- ▶ `pairwise=CCMP`
- ▶ `auth_alg=OPEN`
- ▶ `}`

網路連線測試及更新系統

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- ▶ 參考 <https://www.raspberrypi.org/documentation/raspbian/updating.md>
- ▶ `sudo apt-get update`
- ▶ `sudo apt-get dist-upgrade`

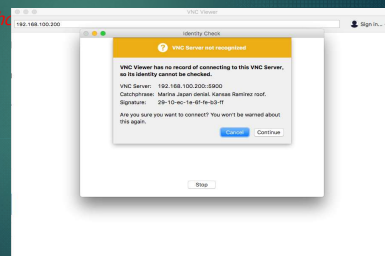
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CHECK POINT 2

Windows 安裝 vnc viewer

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- ▶ <https://www.realvnc.com/download/viewer> *加註冊
一個 VNC 帳號 *
- ▶ 利用 IP 位址或 A



終端機必備的多工良伴tmux

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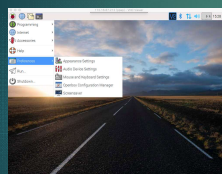
- ▶ 簡易說明 <http://blog.chh.tw/posts/tmux-terminal-multiplexer/>

Ctrl + c	建立新的視窗;
Ctrl + d	卸載目前的 client;
Ctrl + t	與先前選擇的視窗間切換;
Ctrl + n	移動到下個視窗;
Ctrl + p	移動到上個視窗;
Ctrl + x	刪除目前的視窗;
Ctrl + r	重新命名目前的視窗;
Ctrl + s	將目前的視窗分離到兩個區塊;
Ctrl + z	顯示各分割區塊的號碼 (用來切換到不同的區塊)
Ctrl + o	切換到下個區塊;
Ctrl + l	列出所有快捷鍵的說明;
Ctrl + w	列出目前 client 的視窗, 可以用數字鍵切換;

設定 VNC Server

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- ▶ 選右上角 VNC, 登入帳號



RPi 2 安裝 VNC server

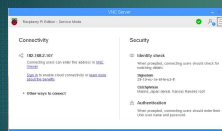
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- ▶ `sudo raspi-config`
- ▶ 5. Interfacing Option
- ▶ P3 -> VNC
- ▶ 7. Advanced Option
- ▶ A5 -> Resolution -> DMT Mode 16 1024x768

設定 VNC Server

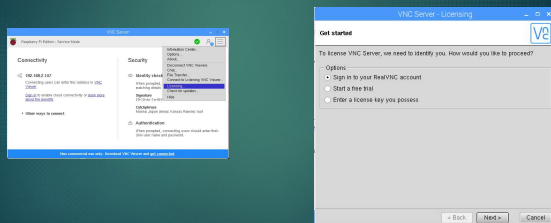
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- ▶ 選左上角 Menu



設定 VNC Server

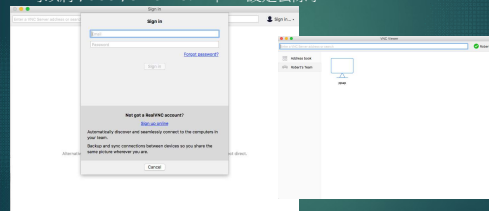
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PC 設定 VNC Viewer 登入

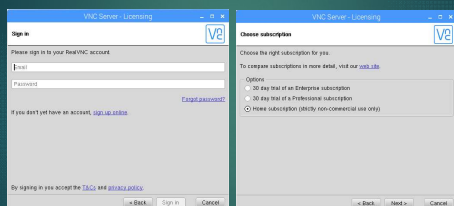
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以後無論 RPi2 連 WiFi 用什麼 IP, 都可以直接找到並登入,
可以將 /boot/cmdline.txt 中 IP 設定去除了



設定 VNC Server

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CHECK POINT 3

設定 VNC Server

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