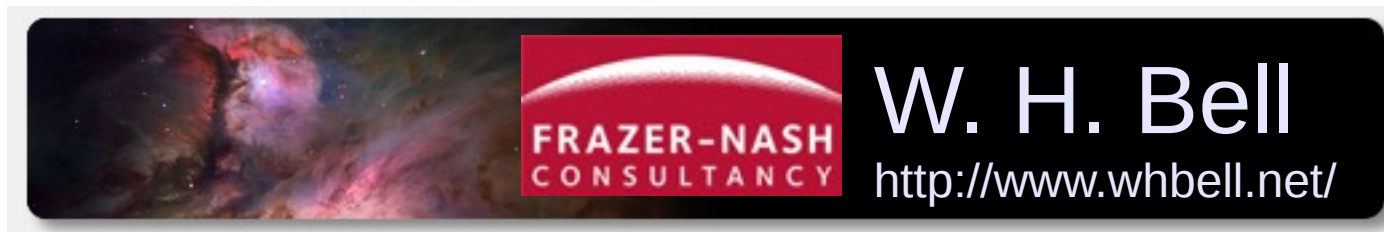


Linux & Bash

A quick introduction

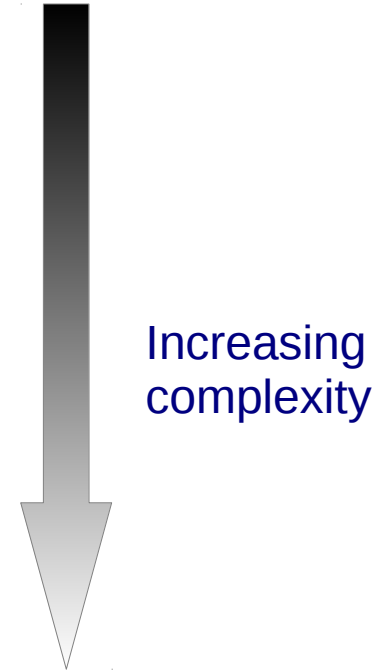


<http://www.fnc.co.uk>

Raspberry Pi Day
University of Strathclyde
12/12/2015

Outline

- Raspberry Pi specific
- Basic Linux commands
- Package manager
- Bash programming
- Conclusions



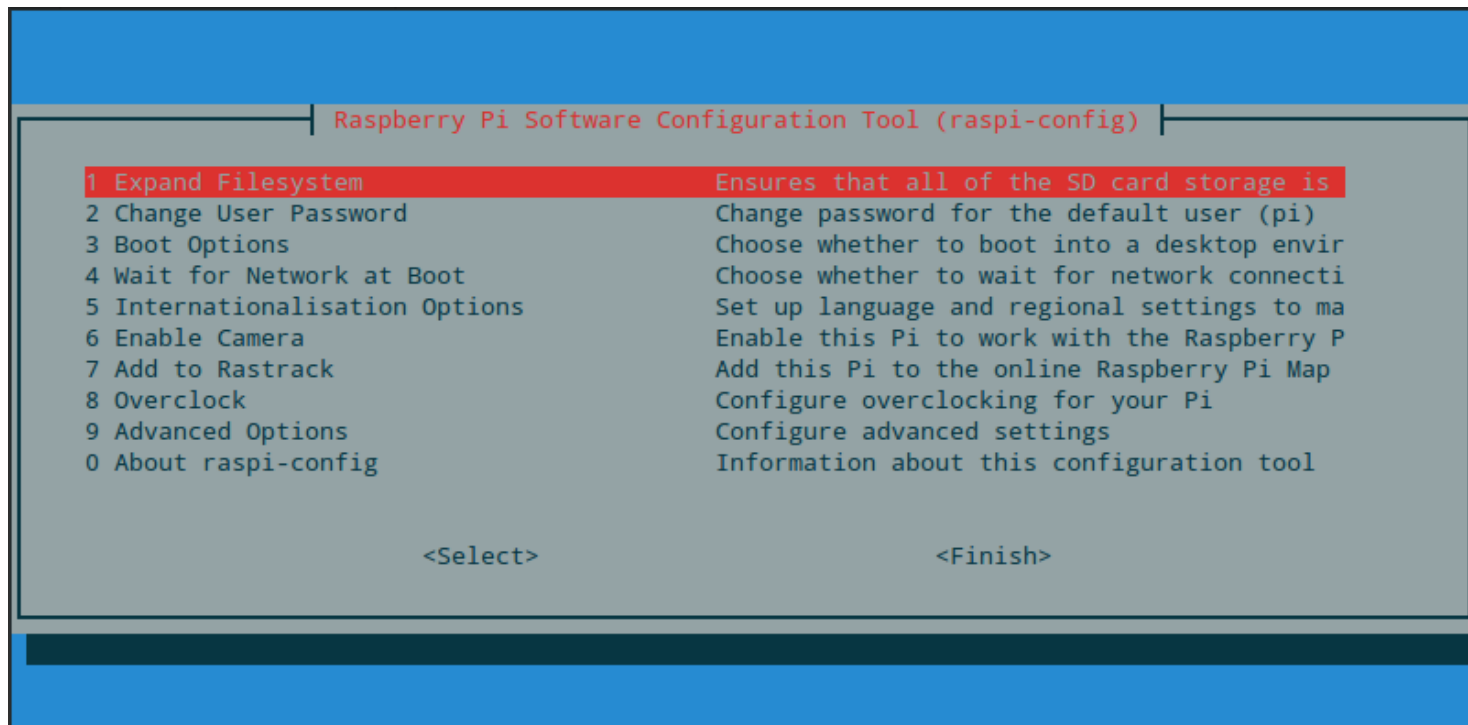
Talk assumes that Raspbian Linux has been installed.

Configuration

- Can configure with command line (or GUI in latest Raspbian).

```
pi@raspberrypi ~ $ sudo raspi-config
```

then use cursors, tab and return.



Basic commands

- `man` – manual pages
- `ls` – list files
- `cd` – change directory
- `mkdir` – make directory
- `cp` – copy files
- `rm` – remove files
- `dd` – image copy
- `find` – find files
- `grep` – search for text in files
- `df` – disc space usage
- `less` – view a file
- `nano` – basic editor
- `rsync` – synchronise files

There are many more basic Linux commands. These are just the beginning.

Advanced Package Tool (apt)

- Packages can be updated,

```
pi@raspberrypi ~ $ sudo -s  
root@raspberrypi:/home/pi# apt-get update; apt-get upgrade -y
```

- installed

```
pi@raspberrypi ~ $ sudo apt-get install xfig
```

- and removed

```
pi@raspberrypi ~ $ sudo apt-get remove xfig  
pi@raspberrypi ~ $ sudo apt-get autoremove # remove dependencies
```

Bash programming

- Any LXTerminal or ssh connection to a Raspberry Pi will start a Bash interpreter.
 - The default shell can be changed if required
- Bash provides an easy way to stick several programs together.
 - However, big Bash programs should probably be written in other languages such as Python.

Synchronise home directories

```
#!/bin/bash

mount /dev/sdb2 /mnt

if [[ $? != 0 ]]; then
    echo "Error: mount failed"
    exit 1
fi

destdir="/mnt/home/pi/"

sourcedir="/home/wbell/data/pi/"

rsync -av --delete $sourcedir $destdir

if [[ $? != 0 ]]; then
    echo "Error: rsync failed"
    exit 1
fi
```

```
umount /mnt

if [[ $? != 0 ]]; then
    echo "Error: umount failed"
    exit 1
fi

echo ">> Copy completed"
```

This is a simple program to synchronise the /home/pi directory in an SD card reader with a local copy.

```
chmod 755 syncSDCard.sh
./syncSDCard.sh
```

Collect Scratch programs

```
#!/bin/bash
if [[ $# != 1 ]]; then
    echo "Usage: $0 <directory>"
    exit 1
fi
search_dir=$1
collection_dir="$HOME/cool_python"
mkdir -p $collection_dir
today=$(date -I)

for file in $(find $search_dir -name '*.py' | grep -v "python_games"); do
    file_name=$(basename "$file")
    new_name=${file_name/".py"/"_$today.py"}
    mv "$file" "$collection_dir/$new_name"
done
```

A program to move Python programs to a new directory

```
chmod 755 movePython.sh
./movePython.sh $HOME
```


Outlook

- There are lots of useful Linux commands and features that improve productivity.
- Further examples and documentation can be found in The MagPi:
 - <http://www.raspberrypi.org/magpi>
 - where a longer introduction to Bash is given in Issues 10, 12 and 16.