Linux Essentials

For Raspberry Pi Users

Things I wish I knew when I started

- Bill AA6BD

MagPi Essentials Bash

Google this to get this free handbook

Bash: The command line interpreter

There are others

MANY variants in Linux-land

What is Linux?

Linux is a version of Unix operating system

- . There are many variations of Linux
- . This is the Raspberry Pi Desktop, a version of Debian Raspberry Pi OS for Intel and AMD
- . Mostly identical
- . Watch 32 bit vs 64 bit

Debian

- .Debian versions are named after characters from Toy Story
- . To see the version, use Terminal:
- \$ cat /etc/os-release
- •DON'T TYPE \$

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Linux vs. Windows

THINGS ARE DIFFERENT

LibreOffice Impress != Microsoft Powerpoint

They are not better or worse, but are different

File separator

/ Linux

\ Windows

Manage screens: start > preferences > screen configuration

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Linux on Windows

Windows Subsystem for Linux

- .Commands are the same
- .Device support is different
- .Program binary versions must match processor
- .Watch for 32 vs 64 bit
- .Windows has compatibility layer
- .Linux? You must install

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GUI vs Command Line

- . GUI Graphical User Interface
- . like Windows
- . Command line: Terminal
- . Like Windows command prompt
- . Many things are easier to do with the Command Line
- . Usually you can use either

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Let's explore the GUI (LXDE)

Start >

Logout: To end your session and shutdown

System notifications area

To move a window: place mouse in window, press alt and move Useful if window does not all fit in visible space

Different distros of Linux have different GUI's

Command basics

All Linux commands are case sensitive

- . Cat != cat
- .Commands are cryptic abbreviations

User prompt shows essential information

- . pi@raspberry:~ \$
- . pi == user
- . In Pi OS, pi was default user, but you can now change it
- . raspberry == hostname
- . ~ == directory relative to home/pi

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Configuration

Hostname == name for this computer

Start > Preferences > Raspberry Pi Configuration

\$ sudo raspi-config

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Directory structure

https://linuxhandbook.com/linux-directory-structure/

Root

- home
- lots of others

Demo File Manager GUI

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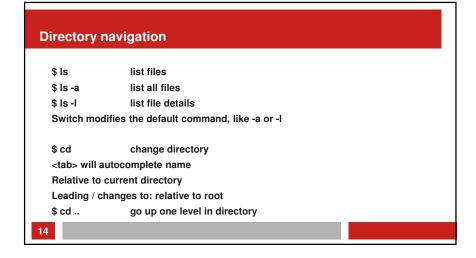
Where am I?

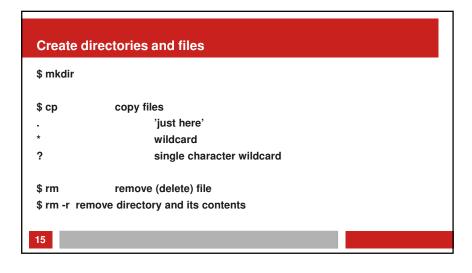
\$ pwd print working directory

\$ man pwd find out more about this command

\$ pwd -- help to get help on this command

General command structure \$ Command < options > < file >





Move and copy files	
\$ mv	move files to new location
\$ cp	copy files to new location
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View file contents

\$ cat <filename> concatenate (show) file, oldest first \$ tac <filename> shows newest first, good for log files

\$ head show first part of file

\$ tail show last part of file

\$ less see beginning of file

Use space bar to see next screen

Press q to exit

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Useful cat commands

\$ cat /etc/os-release
\$ cat /proc/cpuinfo

\$ cat /proc/meminfo

\$ df how much space is used

\$ free memory usage

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Search with grep

\$ grep <word> <file>

Or

\$ cat <file> | grep -i <word>

| pipe output of one command to input of another command

-i insensitive to case

<word> or regular expression

EXAMPLES:

\$ cat /etc/os-release

\$ cat /etc/os-release | grep bull

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Where are applications

\$ whereis <options> <app>

\$ whereis python

\$ which python which python is opened by default

\$ locate <filename>

May need to install:

\$ sudo apt install locate

more

If you want to see output more slowly, use

\$ dpkg --help

\$ dpkg --help | more output a page at a time, use space to advance

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Update your system

\$ apt Advanced package tool

\$ sudo super user do

\$ sudo apt-get update update the package directory

\$ sudo apt-get upgradeupdate installed software

Do this before you install any new packages

This may take a w-h-i-l-e

\$ sudo apt-get install <package>

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Search for package

\$ apt-cache search <package>

\$ apt-cache search firefox

Helps to identify package name

Use firefox-esr to install firefox

\$ sudo apt install firefox-esp

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Package vs. compile and install

Package is great if available but may not be most current version

You may have to build from source

\$ curl to download

\$ make to compile

\$ sudo make install to install

Commands are usually provided with code

You may need to download dependencies

Let's install and run an application: HamClock

cd

sudo apt install curl make g++ xorg-dev libx11-dev

rm -fr ESPHamClock

curl -O https://www.clearskyinstitute.com/ham/HamClock/ESPHamClock.zip

unzip ESPHamClock.zip

cd ESPHamClock

make -j 4 hamclock-800x480

sudo make install

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And run

Run hamclock:

\$ hamclock &

(& means to run it and return right away)

Or

\$ cd ~/ESPHamClock

\$ make -j-4 hamclock-1600x960

for larger clock

\$ sudo make install

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Hamclock information

https://clearskyinstitute.com/ham/HamClock

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Installing software from the GUI

Not available on Linux other than Raspberry Pi OS

Start > Preferences > Recommended Software

Start > Preferences > Add / Remove Software

Ham Radio software: Build-a-Pi or 73Linux

github.com/km4ack

What's next

Arduino clocks: NTP, GPS, WWV, Realtime

Basics of Raspberry Pi

Ham radio on Raspberry Pi: Build-a-Pi

NanoVNA – antenna analyzer and more