


Introduction To Linux

Part 1/2

L. Ochilo (JOOUST), C. Ndegwa (UoN)

Outline Of Presentation

- Rationale for the course
- Introduction to Linux
- Installation of Linux on a PC
- Linux directory structure
- Hands on exercise:

  Basic linux commands

  Teach yourself

Rationale For the Course

- **Most students are already familiar with Windows and use of GUI.**
- **Linux is not the first OS for many.**
- **It is however widely used for data analysis; some analysis software only work in a Linux environment.**
- **The terminal is a powerful tool for analysis; it may be the only option available in some cases.**

Introduction to Linux

- **What is Linux?**

  It is an operating system, assembled under model of free and open-source software development and distribution. It was first written by Linus Torvalds.
- **Linux operating systems share the Linux kernel.**
- **Several distributions are available:**

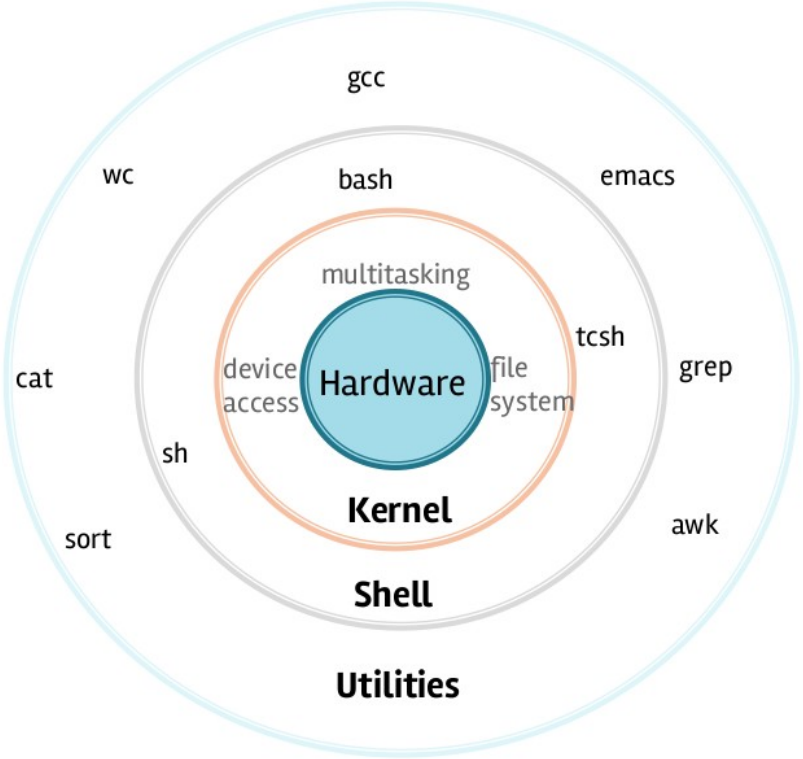
Linux Distributions

- **Linux is packaged as a Linux distribution.**
- **A distribution (distro) contains supporting libraries and system software and kernel.**
- **SUSE Linux Enterprise and Red Hat Enterprise Linux are commercial distributions.**
- **The principles used in Linux are derived from the Unix OS, dating from the 70’s and 80’s.**
- **Most modern distributions are pre-compiled and ready to use; others e.g. Gentoo come in source code which the user can easily compile.**

Introduction to Linux

- **What is Linux?**

  Structure:



The Linux Shell

- **It is a program that interprets commands before sending them to the operating system.**
- **What the shell provides:**
  - Built-in commands
  - Programming control structures
  - Environment variables
- **A number of shells are supported by Linux. Most commonly used is Bash (Bourne-again Shell).**

Where is Linux used?

- Linux executes on many embedded systems (devices whose OS is designed into the firmware).
- These include spacecraft, automobile and TV.
-
-
- Add more items to this list

Introduction to Linux

Why Linux?

- It is free and open source.
- Powerful for use in analysis of large-scale data.
- Can easily be installed in personal desktops.
- It is readily available.

Installing Linux On Your PC

- **Different options are available:**

  Installation of Linux Virtual Machine

  - using VirtualBox on Microsoft Windows enables access via Windows.
  - VirtualBox can be downloaded from here:

    https://www.virtualbox.org/wiki/Downloads

  Create a dual boot

  - both Microsoft Windows and Linux are installed side by side; you choose which one to boot.

  – Using the first method, you don’t have to partition your hard drive; in the second approach you cannot avoid partitioning.

Getting Started With Linux

- **Boot your computer such that Linux is the OS selected.**
- **Open the terminal using any of the following procedures:**
  - ctrl+alt+T
  - Right click the screen, and from the drop-down menu, select *Open in Terminal*.

Getting Started With Linux

- **Commands Basics**
  - The general format of a Linux command is:

```
[username@scc1 ~]$ command --option argument
```

  - User name, system (computer) name, current directory.
  - *command*: tells Linux to take a certain action.
  - *option*: changes the way a command carries out the action.
  - *argument*: provides the necessary input/output required by command

Some Basic Linux Commands

Type the following commands at the terminal. What is the effect of each?

- `whoami`
- `hostname`
- `hostname -i`
- `echo “Hello World”`
- `echo $Home`
- `date`
- `id`
- `watu`

Some Basic Linux Commands

Type the following commands at the terminal. What is the effect of each?

- `whoami` – the user who has logged in
- `hostname` – name of this computer
- `hostname -i` – show the ip of host
- `echo "Hello World"` – print characters in quotes to screen
- `echo $Home` – print environment variable
- `date` – print current date and time
- `id` – display user ID.
- `watu` – a bad command

Command Options

- **Open the terminal in a folder and observe the effect of the following options on the ls command:**

  ls -l

  ls -lt

  ls -ls

  ls -lrs

  ls - lrt

- **NB: You can clear the terminal screen using the command *clear*.**

Access Rights on Files

- **10-symbol string; if d is present at beginning, it indicates a directory, otherwise – indicates a file.**
- **First group of 3 gives file permissions for owner; the middle 3 for group to whom file belongs; last 3 – everyone else.**
- **r (or -): indicates read permission (or otherwise)**
- **w (or -): indicates write permission (or otherwise)**
- **x (or -): indicates execution permission (or otherwise.**

Examples

-rwxrwxrwx a file that everyone can read, write and execute (and delete).

-rw------- a file that only the owner can read and write, and also execute.

Some Commonly Used Commands

- **Type the command *history* at the terminal. What result does it give?**
- **Now press the up and down arrows and see the results of this action.**
- **To redo a command, just press enter when it appears. For the last command, use !!**
- **To go further back in command history, use ! followed by the number label in history e.g. !518**
- **What is the effect of <Del> and <Backspace>?**

Some Commonly Used Commands

Teach-Yourself

- **Linux contains simple tutorials to guide you in using commands. Certain commands help you to access these tutorials. The format is**
  - *command* --help
  - man *command*
  - info *command*

    e.g.
  - date --help

Some Commonly Used Commands

Teach-Yourself

- **Use the format above to find out the meaning of the following commands used in Linux, and how to use them:**
  - diff
  - grep
  - less
  - cat
  - ls

The less Command

- **It displays the contents of a file in an interactive way.**
  - less *filename*
- **Usage**
  - Navigate file contents using *up* and *down* keys.
  - Forward search: / word to search; backward search: ? word to search.
  - To quit, press q.
  - Often used alongside the pipe operator, “|”

The pipe operator, |

- **It is used to feed the contents of a file as input to another command, e.g.**

  cat file1 | secondcommand

- **Example**

  ls /usr/bin | sort -f | less

- **Contents of the folder** /usr/bin **are listed, they are piped to the sort command, and then to less.**


To be continued...