Nhập Môn CNTT – Thực Hành

Introduction to Linux

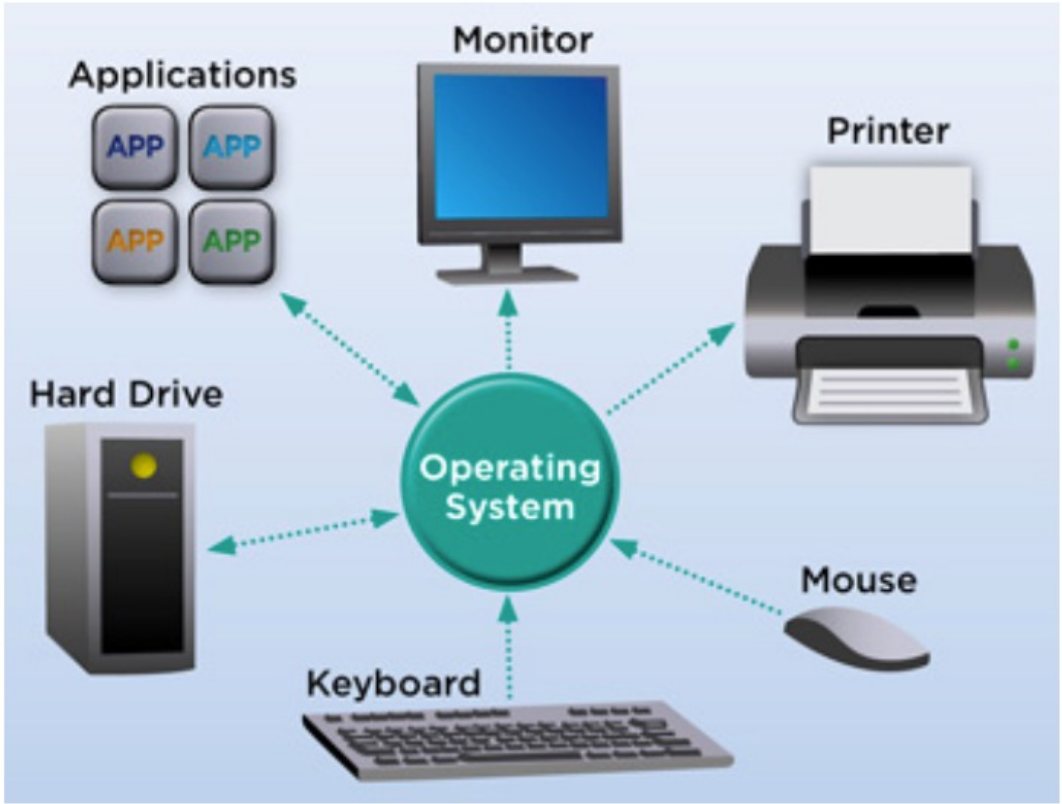
AGENDA

- Learning Objectives
  - A collection of tools and topics that all CS students should know
- Topics
  - Operating system
  - Linux distribution
  - Bash shell / Powershell/ Command line
  - Work with directories & files
  - Editors (Vim, Emacs, …)
  - Shell script
  - Programing environment

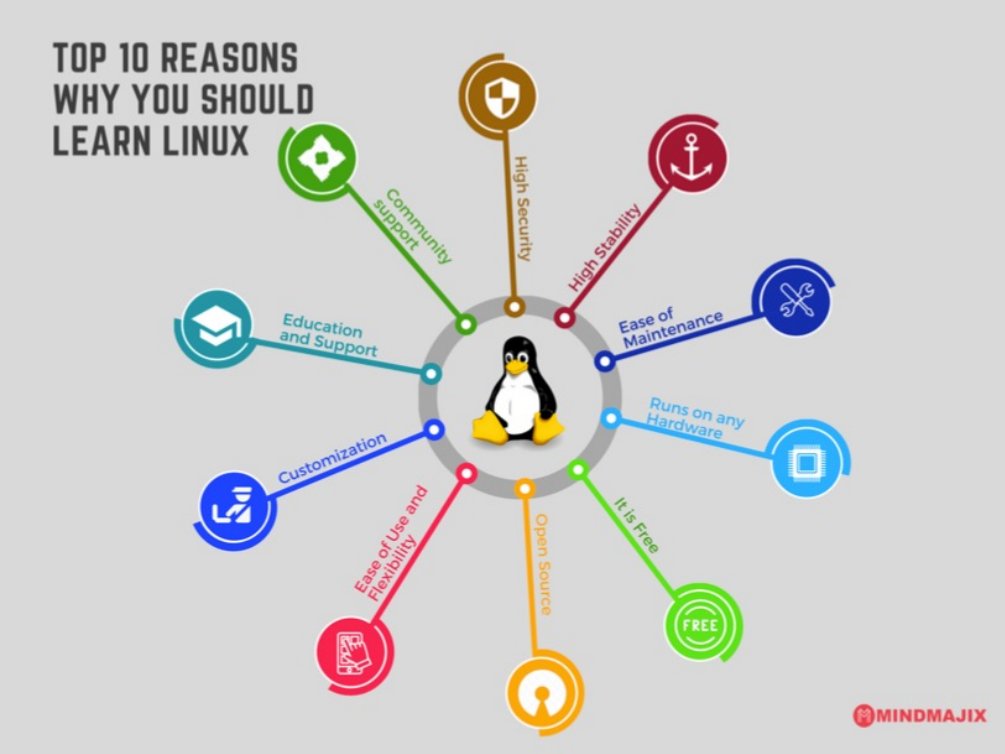
Warming Up

- How to type properly
  - https://www.typingclub.com/sportal/program-3.game
- How fast can you type?
  - Let's try: https://play.typeracer.com/

Operating System



Why Linux



Read more: https://mindmajix.com/reasons-why-you-should-learn-linux

A BRIEF HISTORY OF LINUX AND UNIX

- Unix
  - First developed in 1969 at Bell Labs by Dennis Ritchie and Ken Thompson
  - Many key ideas still used today
    - “Everything is a file”
    - Multiple users, hierarchical file system
    - “Glueing” together lots of smaller files
    - Documentation included
  - macOS is a unix operating system in disguise!
- Linux
  - Developed in 1992 by Linus Torvalds, who also developed git!

Linux Distributions

- Debian
  - Ubuntu (and its derivatives)
  - Linux Mint
  - Kali Linux
  - Linux lite
  - Raspbian
  - Tails OS
  - Knoppix, etc

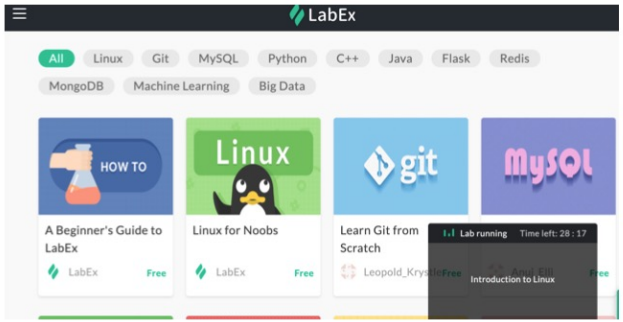
Debian based OS use the Debian Package (dpkg) for managing software (.deb), -apt

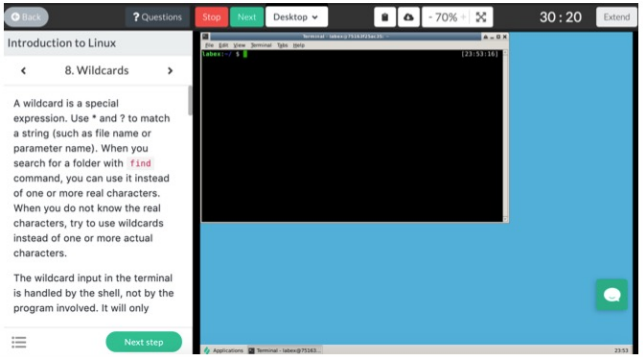
Linux Distributions

- Red Hat Linux
  - Red Hat Enterprise Linux (RHEL)
  - Fedora
  - CentOS
  - Linux lite
  - EduLinux
  - Scientific Linux
  - Knoppix, etc

These distros utilize the Redhat Package Manage (.rpm), yum for managing software.

Where to learn





Link: https://labex.io/courses/linux-basic-commands-practice-online

Where to learn

Linux Fundamentals

Paul Cobbaut

Publication date 2015-05-24 CEST

Abstract

This book is meant to be used in an instructor-led training. For self-study, the intent is to read this book next to a working Linux computer so you can immediately do every subject, practicing each command.

This book is aimed at novice Linux system administrators (and might be interesting and useful for home users that want to know a bit more about their Linux system). However, this book is not meant as an introduction to Linux desktop applications like text editors, browsers, mail clients, multimedia or office applications.

More information and free .pdf available at **http://linux-training.be** .

Link: http://linux-training.be/

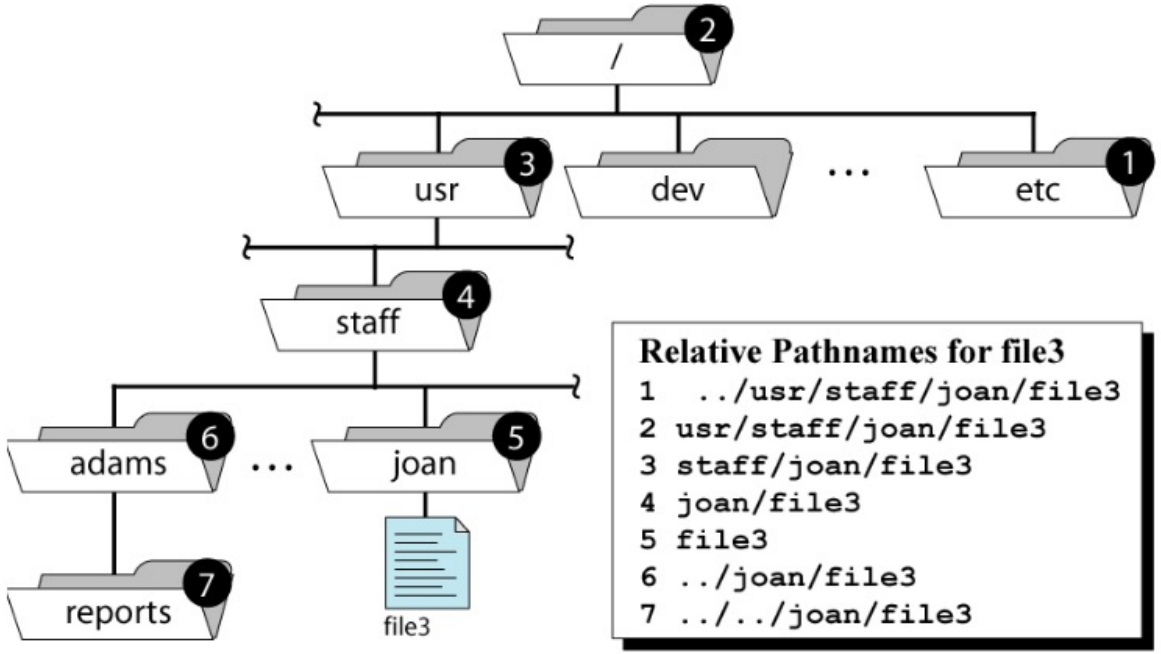
Where to learn

Link: https://vietjack.com/

UNIX FILE SYSTEM

directory	description
`/`	Root directory that contains all directories
`/bin`	Applications/programs (i.e. binaries)
`/dev`	Hardware devices
`/etc`	Configuration files
`/home`	Contains user's home directories
`/proc`	Running programs (processes)
`/tmp, /var`	Temporary files
`/usr`	Universal system resources

Linux Pathname

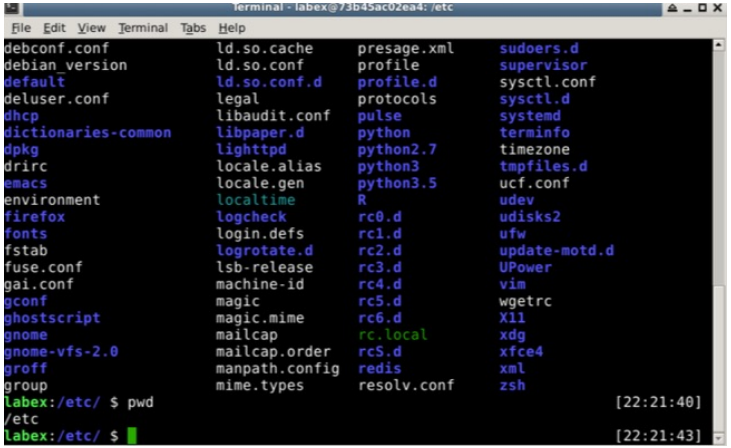


RELATIVE DIRECTORIES

directory	description
`.`	References the working directory
`..`	References the parent of working directory
`~username`	username's **home** directory
`~/Desktop`	Your desktop

THE SHELL

- Shell: an interactive program that allows the user to interact with the operating system and its applications
- Why use a shell vs. the GUI (Graphical User Interface)?
  - Many complicated tasks are easier to do on the command line
  - Useful for working on remote servers
  - Programmable
  - Customizable



- Linux terminal emulator
- Gnome-terminal
- Kconsole
- xTerm
- Powershell (in windows)

BASIC SHELL COMMANDS

command	description
`pwd`	**P**rint current **w**orking **d**irectory
`cd`	**C**hange working **d**irectory
`ls`	List files in working directory
`man`	Bring up manual for a command
`exit`	Log out of shell

SYSTEM COMMANDS

command	description
`clear`	Clears all output from console
`date`	Output the system date
`cal`	Output a text calendar
`uname`	Print information about the current system

DIRECTORY COMMANDS

directory	description
`ls`	List files in working directory
`pwd`	**P**rint current **w**orking **d**irectory
`cd`	**C**hange working **d**irectory
`mkdir`	Make a new directory
`rmdir`	Remove the given directory (must be empty)

COMMAND LINE ARGUMENTS

- There aren't any consistent definitions when it comes to command line arguments, but for this class we will use the following way to describe the anatomy of a command

COMMAND LINE ARGUMENTS

- Much like methods in Java take arguments, so do commands on the command line
- Flags are modifiers which change a programs behavior slightly, and they are usually prepended with a -
- For example, to list all files in long-list format, run the following
  - $ ls -l
- Flags can be combined, to list all files in long-list format and list hidden files
  - $ ls -la
- Commands also take arguments, such as file names
- To view all files , in long-listing format, inside of dir1
  - $ ls -l dir1

FILE COMMANDS

directory	description
`cp`	Copy a file
`mv`	Move a file (also used to rename files)
`rm`	Remove the given file
`touch`	Create empty file, or change time-modified

- *Warning*: The above commands do **not** ask for confirmation. Be careful moving or copying files, as you might overwrite existing files!
- Check the man pages for flags to prevent this behavior

SHORTCUTS

- Auto-complete pathname: tab
- Force to terminate a command: Ctrl + c
- End or exit the terminal: Ctrl + d
- Put Current program to background: Ctrl + z
- Move to beginning of a line: Ctrl + a
- Move to the end of a line: Ctrl + e
- Remove current line: Ctrl + k
- Move up: Ctrl + p
- Move down: Ctrl +n

WILDCARDS

```
ls a*
mv a* dir_name/
ls a?bc.sh
ls a[abcdcio]st.sh
ls ??st*
ls [clst]*
ls [clst][io]?t*
ls *abc*
ls users-[0-9][a-zA-Z0-9][0-9]*
ls users-[0-9][a-zA-Z0-9][a-zA-Z]*
ls users-[0-9][a-zA-Z0-9][a-zA-Z]*
ls users-[0-9][!0-9][a-zA-Z]*
```