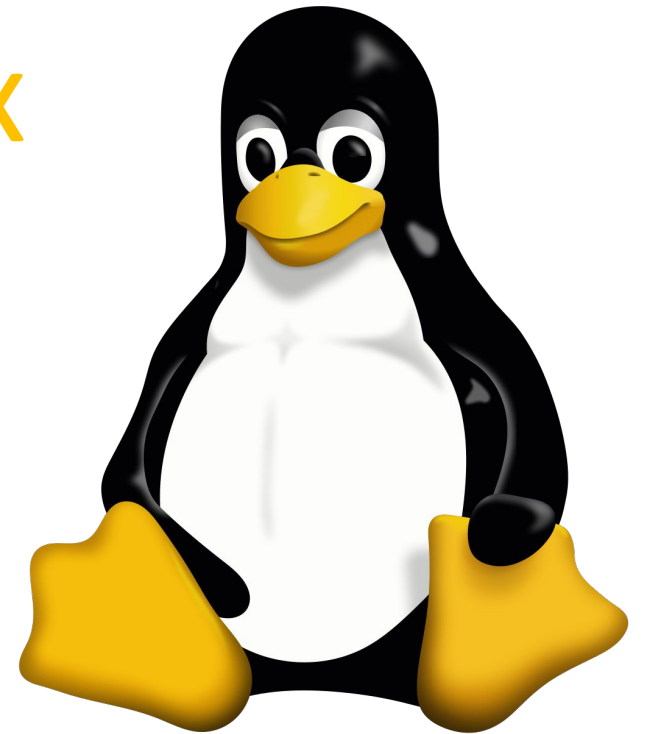


CL-2006 Operating Systems Lab

Introduction to Linux

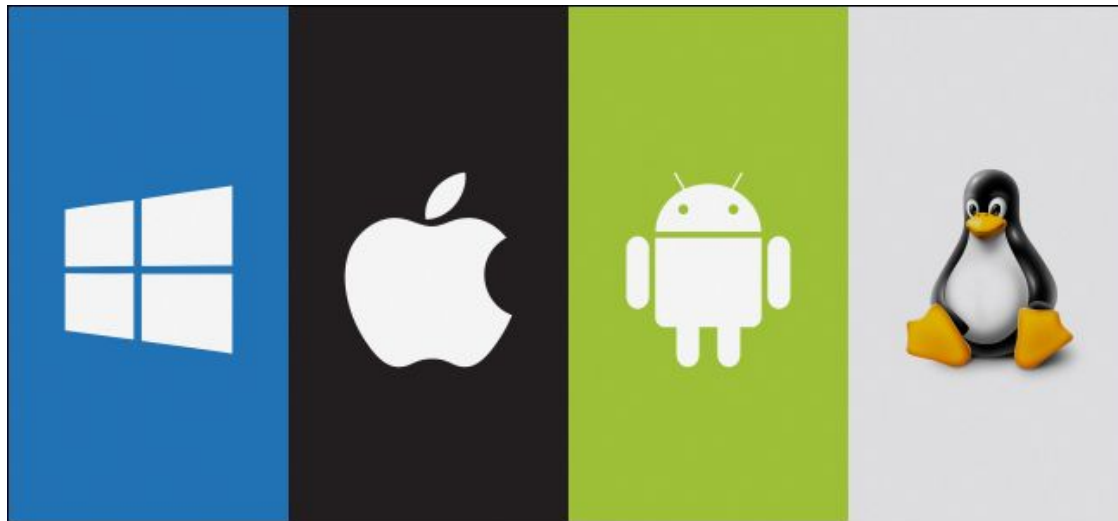
Lab 1

Section B1 and B2

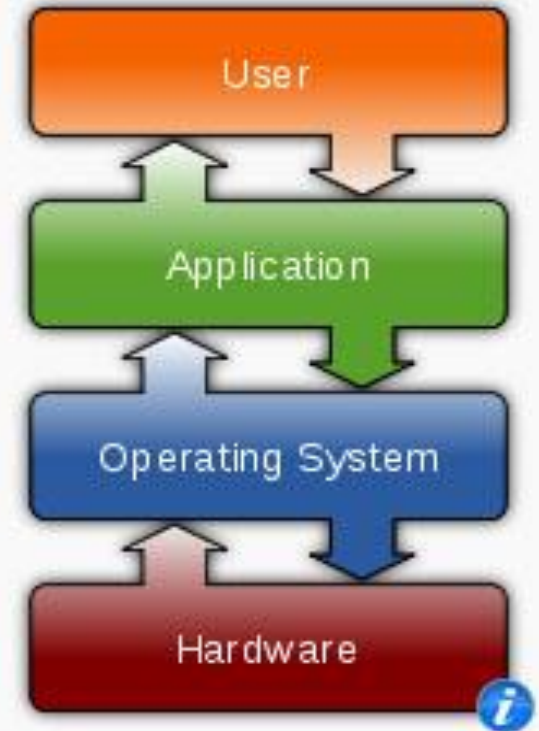


What is Linux?

It's an Operating System



Operating systems



Common features

- Process management
- Interrupts
- Memory management
- File system
- Device drivers
- Networking (TCP/IP, UDP)
- Security (Process/Memory protection)
- I/O

Introduction: What is Unix?

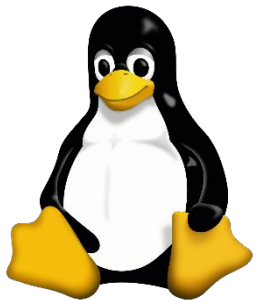
- An operating system
- Developed at AT&T Bell Labs in the 1960's
- Command Line Interpreter
- GUIs (Window systems) are now available



The GNU Project

- The **GNU Project** is a free software, mass collaboration **project** that Richard Stallman announced on September 27, 1983.
- GNU STANDS FOR(GNU's NOT UNIX)
- Established by Richard Stallman, who believes that software should be free from restrictions against copying or modification in order to make better and efficient computer programs.





History of Linux

- A famous professor Andrew Tanenbaum developed **Minix**, a simplified version of UNIX that runs on PC
- Minix is for class teaching only. No intention for commercial use
- In sept1991, while attending the University of Helsinki , **Torvalds** became curious about operating systems and frustrated by the licensing of MINIX, which limited it to educational use only. He began to work on his own operating system which eventually became the Linux kernel.



What is Linux?

Linux + GNU Utilities = Free Unix



- Linux is an OS core written by Linus Torvalds and others AND



- a set of small programs written by Richard Stallman and others. They are the GNU utilities.

<http://www.gnu.org/>

Linux Has Many Distributions



Why Use Linux?

Open Source Nature

- What is it like when you buy a car, but you cannot see what's under the hood? Similar is the case with when you use a Windows-powered system.
- However, in contrast, Linux is completely an [open source](#) project. You can have a look at the source code of a Linux OS, which is a plus.

Open Source Linux “<https://github.com/torvalds/linux>”

Why Use Linux?

Secure

Let's face it; Windows OS is vulnerable to different types of attacks (or hacks). However, Linux is not as vulnerable as Windows. It sure isn't invulnerable, but it is a lot more secure.

Perfect For Programmers

Linux supports almost all of the major programming languages (*Python, C/C++, Java, Perl, Ruby, etc.*). Moreover, it offers a vast range of applications useful for programming purposes.

Why Use Linux?

Can revive older computers

- As the operating systems evolve, so do their hardware requirements increase exponentially. For instance, if you purchase a genuine copy of Windows 10, you will have to meet the minimum hardware requirements to run it successfully, and you cannot run it on just about any low-end system.
- Nevertheless, with Linux, you could even utilize one of your oldest computer systems to achieve a task. However, that does not mean that every Linux distribution would work with **256 MB** of RAM coupled with an outdated processor. However, there are options which you can install on such low-end systems as well (such as Puppy Linux).

Why Use Linux?

Software Updates

- Microsoft pushes a software update when it receives a set of problems or if something major needs to be fixed. On the other hand, you would observe a software update to address a little problem.
- So, with Linux, you will notice more updates to fix the problems you might be facing. You will not only encounter a larger number of software updates, but you will also observe much faster software updates.

Why Use Linux?

Free to Use

- Linux is accessible to the public for free! However, that is not the case with Windows!
- You will not have to pay **100-250 USD** to get your hands on a genuine copy of a Linux distribution (such as Ubuntu, Fedora). So, it is entirely free.

Why Use Linux?

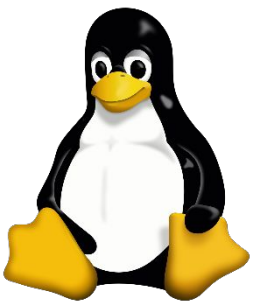
Better Community Support

- You do not need to hire an expert to solve a problem you are facing on your Linux system. You just need to search for a similar thread on the web for a solution or post a thread to let others solve the problem. Within minutes of posting a thread on [any of the Linux forums](#), you may expect a reply along with a detailed solution which would finally help resolve your problem at no cost!

Why Use Linux?

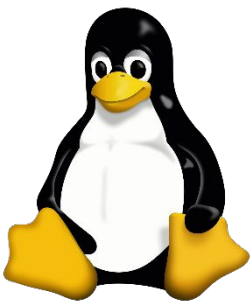
Privacy

- Microsoft certainly tries to anonymize the data collected from every user. However, it does not look convincing with Microsoft's latest Windows 10. It has already received an [enormous amount of criticism of how it collects data](#), what it should collect and what it should not.
- In contrast, Linux would be the perfect solution for a privacy buff. First of all, Linux distributions do not collect much data (or none). Moreover, you will not be needing additional tools to protect your privacy.



Who uses it

- NSA created Security Enhanced Linux (SELinux) to develop better allow the control of dynamic security policies. The architecture they created has been mainstreamed into Linux and ported to other operating systems including Solaris, and Free BSD.
- IBM, HP, and Sun contribute heavily to Linux and OSS (Open Source Software)
- Even Microsoft's position on OSS has softened and they are now contributing code to various projects.



Facts about Linux

- **There are 20,323,379 lines of code in the Linux kernel** as of 2018. That might sound like a lot but it's actually the smallest the kernel has been for some time
- **Linux is used by every major space programme** in the world, [including NASA](#) and [the ESA](#). Private space companies like SpaceX also leverage it, with the latter having completed 65 space missions
- **Linux totally dominates supercomputers.** As of 2018 [100% of the world's 500 fastest supercomputers run Linux](#).
- **Android is the most successful operating system** on the planet — *bar none* — with over 2 billion active monthly users worldwide, [according to Google](#). And what does Android run on? Why the Linux kernel, of course!
- **Ubuntu is the the worlds most popular Linux-based desktop operating system.** It boasts an estimated 20 million users worldwide. Linux marketshare is estimated at 2-3% of all desktop computer use.

Any Questions?

