
IT 1100 : Introduction to Operating Systems

Introduction

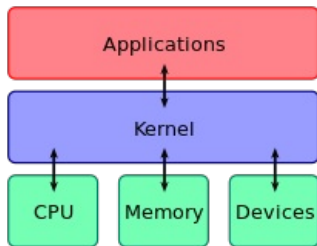
What is an OS?

Read the Webpage

- [Computer Basics](#)

An operating system (sometimes abbreviated as “OS”) is the program that, after being initially loaded into the computer by a boot program, manages the hardware and all the other programs in a computer.

All Operating Systems are built on a Kernel which is the software of the Operating System used to speak to the hardware. It is this core package that separates Operating Systems one from another.



From there a User Interface is added that allows users to have some control over the hardware. Without some type of Operating System the computer is useless.

The Kernel of the OS -

- Connects hardware. Allows the computer parts to work together.
 - Manages processes (CPU) and memory (RAM). You will have many programs wanting to use the hardware. The operating system allows these programs to work together, deciding whose turn it is to use which hardware.
 - Controls access to the hard disk and other memory media.
 - Enables programs to use the network.
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The user interface of the OS (UI) -

- Provides a UI. Without the OS, we have no way to control what the hardware does.
 - Provides interaction with filesystems. Without the OS, we have no way to access our files that are stored on the hard drive or even on the USB drive.
 - Allows us to install and use additional third-party programs. The OS also does many more things behind the scenes that make our lives easier.
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There are 3 main Operating Systems in use today:

- Microsoft Windows with Windows Phone. Founded by Bill Gates.
- Mac OS X with Apple iOS. Founded by Steve Jobs (deceased).
- Linux Family with Google Android. Founded by Linus Torvalds.

Windows is built on an NT kernel. Mac OS X is built on the XNU kernel (a hybrid of the BSD and Mach kernels). OS's in the Linux Family are built on the Linux kernel. Programs written based on one kernel cannot work on OS's based on another kernel. Programs must be written specifically to work on Windows, Mac, or Linux.

What is Linux?

Watch the Video

- [youtube link](#)
- [Another](#) (on your own time)

This next website is for reference only. It is a wonderful website written by the makers of Linux.

The Linux Development Project:

- [tldp](#)
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History of Linux

Unix- The original open source operating system, was started by a group of employees, including Ken Thompson and Dennis Ritchie at AT&T's Bell Laboratories in 1969.

Open Source- In those days, most software was created Open Source. Open Source means that the program code is open to the public. It doesn't always mean free, but it always means that you can see and edit the code to your liking and redistribute the changes as your own.

GNU Public License- By the late 1970's many companies were no longer distributing their code as open source. They were switching to binary distribution (.exe) or they were licensing it so that it could not be altered. This is called Proprietary Software. A man named Richard Stallman started the Open Source Movement in the early 1980's and eventually created the GNU Public License. The GNU Public License grants these rights to the end user:

- Use the software for any purpose
 - Change the software to suit your needs
 - Share the software with friends and neighbors
 - Share the changes you make Once a piece of software is given this license, the software must retain this license even if you make changes to that code.
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History of Linux

Because Unix was created as Open Source and was at the time, free, many versions came into existence. One of these was Minix.

Minux- M stands for minimized operating system. It was created by a man named Andrew S. Tanenbaum as a learning tool for his University. It was written in the late 1980's and written specifically for the IBM computer. It was not released on an Open Source license. Although, inexpensive, it cost to purchase Minux.

Linux- Back in 1991, a Computer Science student named Linus Torvalds purchased a new computer. The fact that he didn't like the DOS operating system that came with his new computer and the proprietary limitations of Minux got him interested in operating systems and from this he created his own operating system called Linux. In the beginning, he simply wanted more functionality for his personal computer. In the end, his purpose was to create a free operating system kernel so that others would not have the same frustrations as he did. Although not a direct descendent, Linux is a close cousin to Unix.

History of Linux

- Main points:
 - Linux is related to Unix
 - [This](#) is an interesting chart.
 - Note where OSX evolved from
 - What we learn about Linux will be very similar to how things are in the OSX world!
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Current state of Linux

Watch the video

- [Youtube link](#)

Look at the charts on [Wikipedia](#) (Don't read the page)

- Under **Desktops and laptops** notice that Windows has a huge majority of the market. Why do you think that is?
 - Under **Mobile Devices** notice that Android has the majority, while iOS has most of the remainder. What is Android and iOS? The mobile version of the Linux and OS X Operating System (respectively). Android uses the Linux kernel and is an embedded version of the Linux OS. The Android phones are dependent on the Android OS to work.
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Current state of Linux

- Under **Public Servers** on the internet (these are the web servers and other servers that average people and average businesses use) notice that although Windows has its fair share of the market, Linux holds the majority.
 - Under **Mainframes and Supercomputers** (these are the machines that house the "cloud" and run the big companies, such as google, amazon, facebook, etc.) notice that Linux holds nearly all of the market.
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Distros

What is a distro? A Linux Distribution or ("distro" for short) is an Operating System built on the Linux kernel. Even though they are all different, they are grouped as the Linux Operating System then distributed as different "distros".

Briefly check out this page - [Distro families](#) Notice the 3 main distribution families:

- **Redhat- CentOS** is a common distribution of this group, used by Godaddy and other web-service resellers.
 - **Debian-** In this class we are going to specifically focus on the **Ubuntu** distribution of this group. How many different versions are there of the Ubuntu distro? Look to the left and down of the Debian name. We will use the main Ubuntu branch.
 - **Slackware Linux-** The most Unix-like of the three. The most common of this group is the **SuSe(OpenSUSE)** distro.
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Why the command line?

CLI (Command Line Interface) or headless Operating System : Advantages and Disadvantages - requires little hard-drive space - requires very low resources to run this text-based system - can do anything the GUI interface can do if you know how - more control over what and how the OS works - only user interface option is the keyboard - learning curve to be able to use it

GUI?

GUI (Graphical User Interface) Operating System : Advantages and Disadvantages - easy to use and easy to learn user interface. - has the option of mouse and keyboard user interface - typically easy to learn and easy to adapt to new interfaces - can use GUI interface and CLI interface on the same system - takes hard-drive space, processor power and RAM to run the graphical interface. - less control through the GUI system (someone has to program the buttons to work)

On public servers and mainframes a GUI based system is not required and often not desired. The graphical interface requires resources to allow it to run, but servers are not accessed by the general public and therefore only require minimal user interface allowing more resources for programs.

GUI and CLI

You can install a CLI (Command Line Interface) Operating System that will free up those resources allowing for faster processing and delivery of the server data. The Ubuntu distribution has a CLI version of their Operating System.

If you are using a GUI OS, you can still use text-mode commands in all three major OS's: Windows, Mac OS X, and Linux. About 95% of the Linux commands we will learn work on Mac OS X (Unix based) and many work on Windows 10 as well. The concept of command line will help you no matter which OS you use at work and home.

One last [link](#)

****A linux installation has already been prepared for you. You will learn how to access it from home. You don't need to install Linux on your own computer.****

Now, Start the Book:

- [WES-Introduction](#)
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