LINUX Introductions

INTRODUCTION TO LINUX



**What is Operating System ?**

Operating system is an interface between user and the computer hardware. The hardware of the computer cannot understand the human readable language as it works on binaries i.e. 0's and 1's. Also it is very tough for humans to understand the binary language, in such case we need an interface which can translate human language to hardware and vice-versa for effective communication.

**Types of Operating System:**

* Single User - Single Tasking Operating System
* Single User - Multitasking Operating System
* Multi User - Multitasking Operating System

**Single User - Single Tasking Operating System**

In this type of operating system only one user can log into system and can perform only one task at a time.

**E.g.: MS-DOS**

**Single User - Multi tasking operating System**

This type of O/S supports only one user to log into the system but a user can perform multiple tasks at a time, browsing internet while playing songs etc.

**E.g.: Windows -98,Xp,vista,Seven etc**.

**Multi User - Multi Tasking Operating System**

These type of O/S provides multiple users to log into the system and also each user can perform various tasks at a time. In a broader term multiple users can logged in to system and share the resources of the system at the same time.

**E.g.: UNIX, LINUX etc.**

## HISTORY OF UNIX

In the beginning, there was AT&T.

Bell Labs’ Ken Thompson developed UNIX in 1969 so he could play games on a scavenged DEC PDP-7. With the help of Dennis Ritchie, the inventor of the “C” programing language, Ken rewrote UNIX entirely in “C” so that it could be used on different computers. In 1974, the OS was licensed to universities for educational purposes. Over the years, hundreds of people added and improved upon the system, and it spread into the commercial world. Dozens of different UNIX “flavors” appeared, each with unique qualities, yet still having enough similarities to the original AT&T version. All of the “flavors” were based on either AT&T’s System V or Berkeley System Distribution (BSD) UNIX, or a hybrid of both.

**During the late 1980’s there were several of commercial implementations of UNIX:**

* + Apple Computer’s A/UX
  + AT&T’s System V Release 3
  + Digital Equipment Corporation’s Ultrix and OSF/1 (renamed to DEC UNIX)
  + Hewlett Packard’s HP-UX
  + IBM’s AIX
  + Lynx’s Real-Time UNIX
  + NeXT’s NeXTStep
  + Santa Cruz Operation’s SCO UNIX
  + Silicon Graphics’ IRIX
  + SUN Microsystems’ SUN OS and Solaris
  + and dozens more.

The Open Standards Foundation is a UNIX industry organization designed to keep the various UNIX flavors working together. They created operating systems guidelines called POSIX to encourage inter- operability of applications from one flavor of UNIX to another. Portability of applications to different gave UNIX a distinct advantage over its mainframe competition.

Then came the GUIs. Apple’s Macintosh operating system and Microsoft’s Windows operating environment simplified computing tasks, and made computers more appealing to a larger number of users. UNIX wizards enjoyed the power of the command line interface, but acknowledged the difficult learning curve for new users. The Athena Project at MIT developed the X Windows Graphical User Interface for UNIX computers. Also known as the X11 environment, corporations developed their own “flavors” of the UNIX GUIs based on X11. Eventually, a GUI standard called Motif was generally accepted by the corporations and academia.

During the late 1990’s Microsoft’s Windows NT operating system started encroaching into traditional UNIX businesses such as banking and high-end graphics. Although not as reliable as UNIX, NT became popular because of the lower learning curve and its similarities to Windows 95 and 98. Many traditional

UNIX companies, such as DEC and Silicon Graphics, abandoned their OS for NT. Others, such as SUN, focused their efforts on niche markets, such as the Internet.

Linus Torvalds had a dream. He wanted to create the coolest operating system in the world that was free for anyone to use and modify. Based on an obscure UNIX flavor called MINIX, Linus took the source code and created his own flavor, called Linux. Using the power of the Internet, he distributed copies of his OS all over the world, and fellow programmers improved upon his work. In 1999, with a dozen versions of the OS and many GUIs to choose from, Linux is causing a UNIX revival. Knowing that people are used to the Windows tools, Linux developers are making applications that combine the best of Windows with the best of UNIX.

## UNIX Principles

* + **Everything is a file:-** UNIX system have many powerful utilities designed to create and manipulate files. The UNIX security model is based around the security of files. By treating everything as a file, you can secure access to hardware in the same way as you secure access to a document.
  + **Configuration data stored in text: -** Storing configuration in text allows an administrator to move a configuration from one machine to another easily, provide the ability to roll back a system configuration to a particular date and time.
  + **Small, Single-Purpose Programs: -** UNIX provides many utilities.
  + **Avoid captive user interfaces:-**
  + **Ability to chain programs together to perform complex tasks:-** A core design feature of UNIX is that output of one program can be the input for another. This gives the user the flexibility to combine many small programs together to perform a larger, more complex task.

## GNU Project/ FSF

* + GNU project started in 1984

1. Goal: Create ‘free’ UNIX clone
2. By 1990, nearly all required user space application created. Example:-gcc, emacs, etc.
   * Free Software Foundation

a) Non-Profit organization that manages the GNU project.

## GPL – GNU (General Public License)

* + primary license for open source software
  + encourages free software
  + All enhancements and changes to GPL software must also be GPL
  + Often called ‘copy left’ (All rights reversed)

# Linux Origins

* + **LINUS TORVALDS**

1. Finnish college student in 1991
2. Created Linux Kernel
   * When Linux Kernel combined with GNU applications, complete free UNIX like OS was developed.

**Why Linux?**

* + Fresh implementation of UNIX APIs
  + Open source development model
  + Supports wide variety of hardware
  + Supports many networking protocols and Configurations
  + Fully supported

1. Linux is a UNIX like OS: Linux is a similar to UNIX as the various UNIX versions are to each other.
2. Multi-User and Multi-tasking: Linux is a multi-user and multi-tasking operating system. That means that more than one person can be logged on to the same Linux computer at the same time. The same user could even be logged into their account from two or more terminals at the same time; Linux is also Multi-Tasking. A user can have more than one program executing at the same time.
3. Wide hardware support: Red Hat Linux support most pieces modern x86 compatible PC hardware.
4. Fully Supported: Red Hat Linux is a fully supported distribution Red Hat Inc. provides many support programs for the smallest to the largest companies.