UNIX Operating Systems

Ch. 01 : Maurice J. Bach, "The Design of the Unix Operating System", Pearson Education, ISBN:81-7758-770-6.

Topic

- History of UNIX OS
- Characteristics of UNIX OS
- Parts of UNIX OS
- Flavors of UNIX OS

History

- The UNIX operating system was born in the late 1960s.

- By Ken Thompson and Dennis Ritchie of Bell Labs, and has since grown to become the most widely used operating system.

- In the time since UNIX was first developed, it has gone through many different generations.

- Some differ substantially from the original version, like Berkeley Software Distribution (BSD) or Linux.

- Others, still contain major portions that are based on the original source code.

Characteristics of UNIX OS

- **Multi-user & Multi-tasking** - most versions of UNIX are capable of allowing multiple users and each run multiple tasks. This is standard for most modern OSs.

- **Over 30 Years Old** - UNIX is over 30 years old and it's popularity and use is still high.

- **Large Number of Applications** – there are an enormous amount of applications available for UNIX operating systems. They range from commercial applications such as CAD, Maya, WordPerfect, to many free applications.

Characteristics of UNIX OS

- **Free Applications and Even a Free Operating System** - of all of the applications available under UNIX, many of them are free.

- **Less Resource Intensive** - in general, most UNIX installations tend to be much less demanding on system resources.

- **Internet Development** - Much of the backbone of the Internet is run by UNIX servers. Many of the more general web servers run UNIX with the Apache web server - another free application.
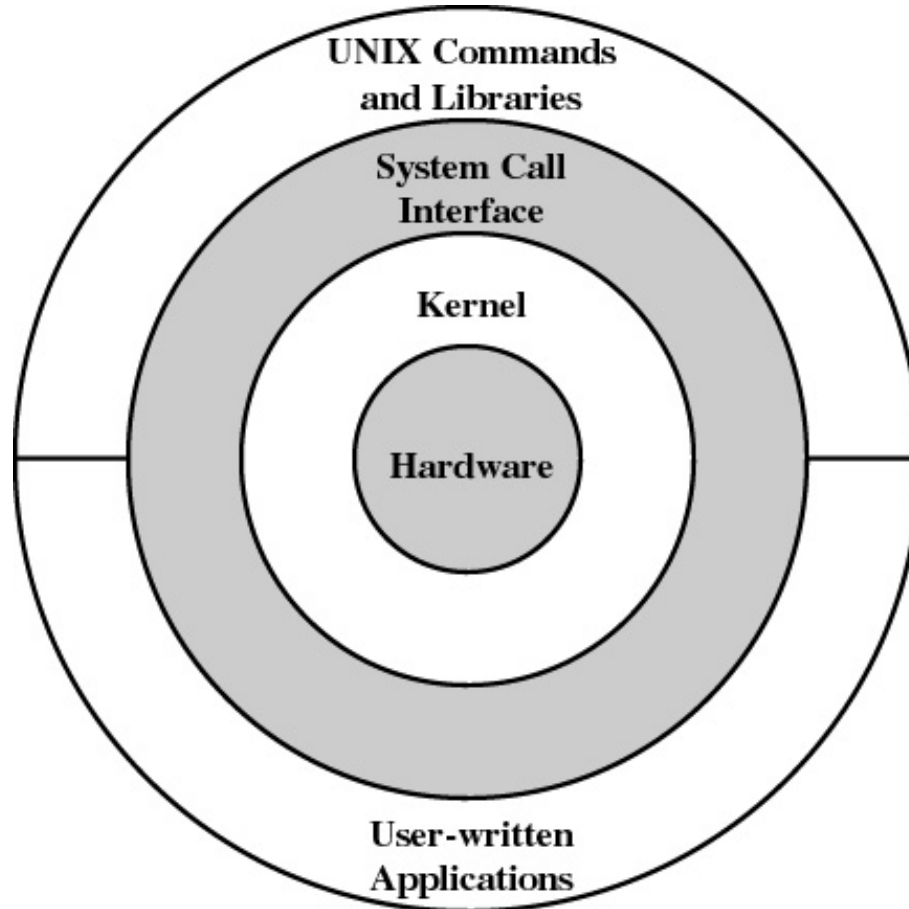
UNIX

Figure 2.15 General UNIX Architecture

Parts of UNIX OS

- **The Kernel** - handles memory management, input and output requests, and program scheduling. Technically speaking, the kernel is the OS. It provides the basic software connection to the hardware.

- **The Shell and Graphical User Interfaces (GUIs)** - basic UNIX shells provides a "command line" interface which allows the user to type in commands. These commands are translated by the shell into something the kernel can comprehend, and then executed by the kernel.

Parts of UNIX OS

▪ **The Built-in System Utilities** - are programs that allow a user to perform tasks which involve complex actions. Utilities provide user interface functions that are basic to an operating system, but which are too complex to be built into the shell. Examples of utilities are programs that let us see the contents of a directory, move & copy files, remove files, etc...

▪ **Application Software & Utilities** – these are not part of the operating system. They are additional programs that are bundled with the OS distribution, or available separately. These can range from additional or different versions of basic utilities, to full scale commercial applications.

Flavors of UNIX OS

These can be grouped into two categories:
Open Source and Proprietary

Proprietary: (redistribution and modification prohibited or restricted; not free)

- Solaris
- IRIX – T
- Mac OS X and many others...

Flavors of UNIX OS

Open Source: (source code is readily available and free to modify)

- FreeBSD
- Linux Distributions - RedHat and the Fedora Project (maintained by RedHat)
- Mandrake
- Debian
- SuSE
- Slackware and many others...

Linux is a open source UNIX-based OS that was originally developed in 1991 by Linus Torvalds, a Finnish undergraduate student.

Unix Vs Linux

BASIS FOR COMPARISON	LINUX	UNIX
Cost	Linux can be freely distributed, downloaded freely	Different flavors of Unix have different cost structures according to vendors
Development and Distribution	Linux is developed by Open Source development it is distributed by various vendors.	Unix is developed by AT&T as well as various commercial vendors and non-profit organizations.
User	Everyone. From home users to developers and computer enthusiasts alike.	Mainly developed for mainframes, servers and workstations except OSX, Which is designed for everyone.
Security	More Secure	Secure than windows
Released on	1992	1969

Linux Vs Windows

BASIS FOR COMPARISON	LINUX	WINDOWS
Cost	Free of cost	Expensive
Open source	Yes	No
Customizable	Yes	No
Security	More secure	Vulnerable to viruses and malware attacks.