

A

Seminar report

on

# “Unix Operating System”

Submitted in partial fulfillment of the requirement for the award of degree  
of Bachelor of Technology in Computer Science

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## **Preface**

I have made this report file on the topic **UNIX Operating System**; I have tried my best to elucidate all the relevant detail to the topic to be included in the report. While in the beginning I have tried to give a general view about this topic.

My efforts and wholehearted co-operation of each and everyone has ended on a successful note. I express my sincere gratitude to .....who assisting me throughout the preparation of this topic. I thank him for providing me the reinforcement, confidence and most importantly the track for the topic whenever I needed it.

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## **History of UNIX**

### 1970s

In the 1970s Brian Kernighan coined the project name *Unics* as a play on *Multics*, (Multiplexed Information and Computing Service). Unics could eventually support multiple simultaneous users, and it was renamed *Unix*

### 1980s

AT&T licensed UNIX System III, based largely on Version 7, for commercial use, the first version launching in 1982. This also included support for the VAX. AT&T continued to issue licenses for older Unix versions. To end the confusion between all its differing internal versions, AT&T combined them into UNIX System V Release 1. This introduced a few features such as the vi editor and curses from the Berkeley Software Distribution of Unix developed at the University of California, Berkeley. This also included support for the Western Electric 3B series of machines.

### 2000s

In 2000, SCO sold its entire UNIX business and assets to Caldera Systems, which later on changed its name to The SCO Group.

The dot-com bubble (2001–2003) led to significant consolidation of versions of Unix. Of the many commercial variants of Unix that were born in the 1980s, only Solaris, HP-UX, and AIX were still doing relatively well in the market, though SGI's IRIX persisted for quite some time. Of these, Solaris had the largest market share in 2005

## What is UNIX

- v The UNIX Operating System (OS) is a large program (mostly coded in C) that turns the computer into a useable machine.
- v It provides a number of facilities:
  - management of hardware resources
  - directory and file system
  - loading / execution / suspension of programs
- v **Unix** (officially trademarked as **UNIX**, sometimes also written as **UNIX**) is a multitasking, multi-user computer operating system originally developed in 1969 by a group of AT&T employees at Bell Labs, including Ken Thompson, Dennis Ritchie, Brian Kernighan, Douglas McIlroy, and Joe Ossanna. The Unix operating system was first developed in assembly language, but by 1973 had been almost entirely recoded in C, greatly facilitating its further development and porting to other hardware. Today's Unix system evolution is split into various branches, developed over time by AT&T as well as various commercial vendors, universities (such as University of California, Berkeley's BSD), and non-profit organizations.
- v The Open Group, an industry standards consortium, owns the UNIX trademark. Only systems fully compliant with and certified according to the Single UNIX Specification are qualified to use the trademark; others might be called *Unix system-like* or *Unix-like*, although the Open Group disapproves<sup>[1]</sup> of this term. However, the term *Unix* is often used informally to denote any operating system that closely resembles the trademarked system.
- v During the late 1970s and early 1980s, the influence of Unix in academic circles led to large-scale adoption of Unix (particularly of the BSD variant, originating from the University of California, Berkeley) by commercial startups, the most notable of which are Solaris, HP-UX and AIX, as well as Darwin, which forms the core set of components upon which Apple's Mac OS X, Apple TV, and iOS are based.<sup>[2][3]</sup> Among all variants of Unix, the most widely used are Linux<sup>[citation needed]</sup>, which is used to power data centers, desktops, mobile phones, and embedded devices such as routers, set-top boxes or e-book readers. Today, in addition to certified Unix systems such as those already mentioned, Unix-like operating systems such as MINIX, Linux, Android, and BSD descendants (FreeBSD, NetBSD, OpenBSD, and DragonFly BSD) are commonly encountered. The term *traditional Unix* may be used to describe an operating system that has the characteristics of either Version 7 Unix or UNIX System V.

## Commands

### Directory commands

- cd** Change the working directory
- find** Find a file by name or by other characteristics
- mkdir** Make a directory
- rmdir** Remove a directory

### File manipulation

- commandscat** Concatenate and display a file
- cp** Copy a file
- grep** Search a file for a specific text string
- mv** Move or rename a file
- rm** Remove a file

### Display commands

- date** Print the date and time
- ls** List the contents of a directory
- pwd** Display the working directory pathname
- tail** Display the end of a file

### Process commands

- exit** Terminate a process
- kill** Terminate or send a signal to a process
- passwd** Create or change a password
- ps** Display the status of a process
- telnet** Connect to a remote system using the Telnet protocol

## Pathnames

- v A *pathname* is a sequence of directory names (separated by /'s) which identifies the location of a directory.
- v There are two sorts of pathnames
  - absolute pathnames
  - relative pathname

### 3.1 Absolute Pathnames

- v The sequence of directory names between the top of the tree (the *root*) and the directory of interest.
- v For example:

/bin

/etc/terminfo

/export/user/home/ad

/export/user/home/s3910120/proj1

### 3.2 Relative Pathnames

- v The sequence of directory names below the directory where you are now to the directory of interest.
- v If you are interested in the directory proj1:

proj1 if you are in s3910120

s3910120/proj1 if you are in home

home/s3910120/proj1 if you are in user

## Memory Management

### UNIX Memory Management Policies

- v Swapping
  - Easy to implement
  - Less system overhead
- v Demand Paging
  - Greater flexibility

#### Swapping

- v The swap device is a block device in a configurable section of a disk
- v Kernel allocates contiguous space on the swap device without fragmentation
- v It maintains free space of the swap device in an in-core table, called map
- v The kernel treats each unit of the swap map as group of disk blocks
- v As kernel allocates and frees resources, it updates the map accordingly

#### Demand Paging

- v Not all page of process resides in memory
- v Locality
- v When a process accesses a page that is not part of its working set, it incurs a page fault.
- v The kernel suspends the execution of the process until it reads the page into memory and makes it accessible to the process

## Interrupt

When a process terminates abnormally it usually tries to send a signal indicating what went wrong. C programs (and UNIX) can trap these for diagnostics. Also user specified communication can take place in this way.

Signals are software generated interrupts that are sent to a process when an event happens. Each signal has a default action which is one of the following:

- 1 The signal is discarded after being received
- 2 The process is terminated after the signal is received
- 3 A core file is written, then the process is terminated
- 4 Stop the process after the signal is received

Each signal defined by the system falls into one of five classes:

- 1 Hardware conditions
- 2 Software conditions
- 3 Input/output notification
- 4 Process control
- 5 Resource control

### ***Why Use UNIX?***

- v multi-tasking / multi-user
- v lots of software
- v networking capability
- v graphical (with command line)
- v easy to program
- v portable (PCs, mainframes,  
super-computers)

## Applications

### Storage Consultancy

- v Expert advice on all forms of storage technologies.
- v Storage management software.
- v Solutions that can grow and evolve as your business does.
- v Experienced fully trained and accredited consultants.
- v Independent recommendations on storage technologies.
- v Full project management to implement storage technologies.

### Backup & Recovery Consulting

- v Identify inefficiencies with your current backup and recovery environment that may be costing you time and money.
- v Ensure your backup and recovery architecture meets your changing production environment and SLAs.
- v Configure and optimize all aspects of your backup and recovery environment.

### Middleware & Database Administration

- v Installation and configuration of WebLogic and Websphere application servers in highly available clustering environment.
- v Understanding the complexities of infrastructure design and maintenance, analyze architecture and security issues Hardening productions environments.
- v Assisting clients in aspects of deploying J2EE applications and connecting to back end resources.
- v Providing development and production environments. Finding performance bottlenecks and tuning of existing Websphere or WebLogic applications servers.

## References

- ^ What is a "Unix-like" operating system? Unix.org FAQ
- ^<http://marketshare.hitslink.com/operating-system-market-share.aspx?qprid=8&qpcustomd=0>
- [http://developer.apple.com/library/mac/#documentation/MacOSX/Conceptual/OSX\\_Technology\\_Overview/SystemTechnology/SystemTechnology.html#/apple\\_ref/doc/uid/TP40001067-CH207-BCICAIFJ](http://developer.apple.com/library/mac/#documentation/MacOSX/Conceptual/OSX_Technology_Overview/SystemTechnology/SystemTechnology.html#/apple_ref/doc/uid/TP40001067-CH207-BCICAIFJ)