UNIX

INTRODUCTION

- UNIX is a computer Operating System which is capable of handling activities from multiple users at the same time.
- Unix was originated around in 1969 at AT&T Bell Laboratory by Ken Thompson and Dennis Ritchie.

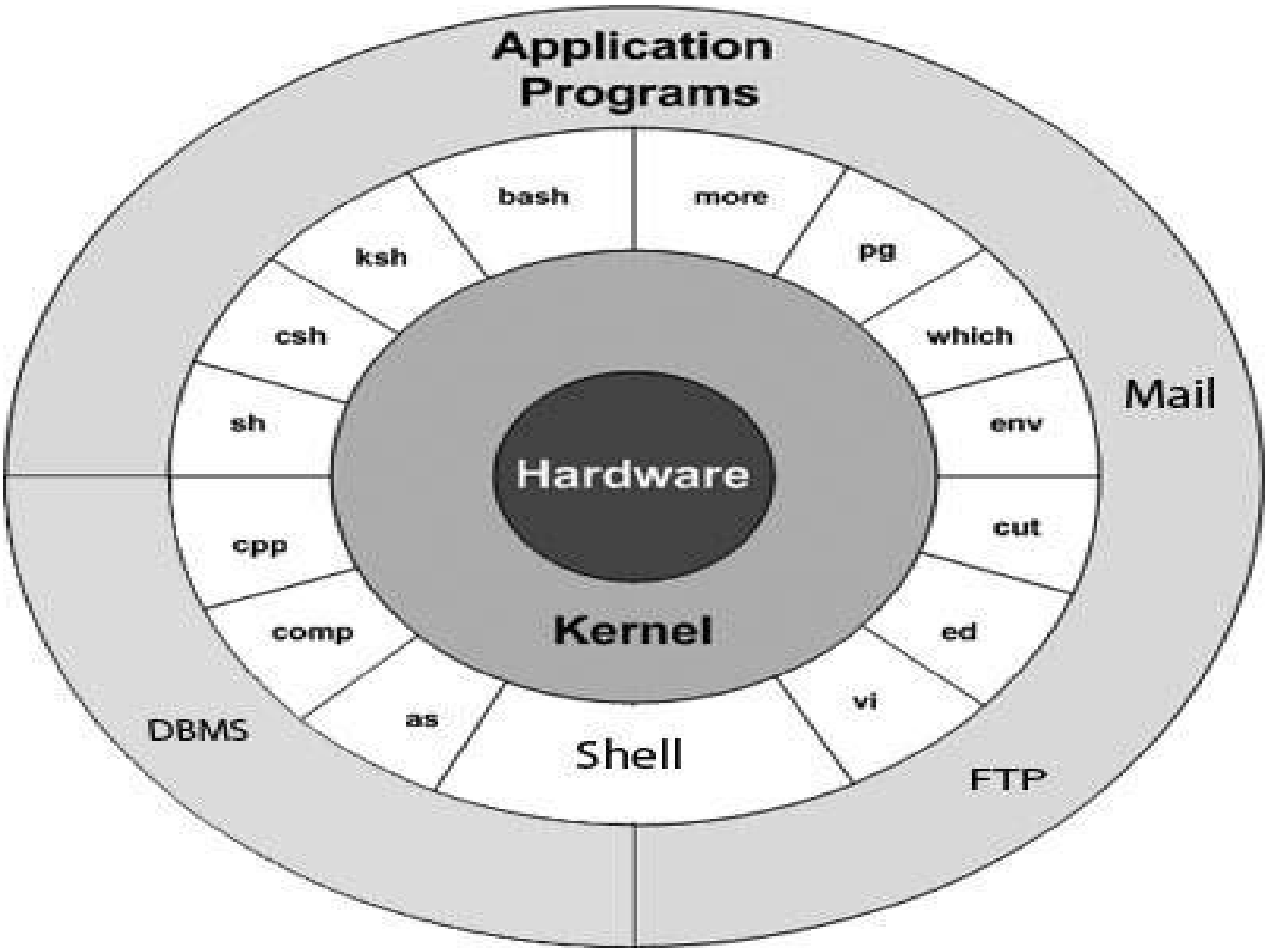
What is Unix ?

- The UNIX operating system is a set of programs that act as a link between the computer and the user.
- The computer programs that allocate the system resources and coordinate all the details of the computer's internals is called the **operating system or kernel.**

- Users communicate with the kernel through a program known as the shell.
- The shell is a **command line interpreter ;** it translates commands entered by the user and converts them into a language that is understood by the kernel.
- There are various Unix variants available in the market. Solaris Unix, AIX, UP Unix and BSD are few examples. **Linux is also a flavour of Unix which is freely available.**

FEATURES OF UNIX

- Several people can use a UNIX computer at the same time; hence UNIX is called a **multiuser system**.
- A user can also run multiple programs at the same time; hence UNIX is called **multitasking**.


Application Programs
bash
more
pg
which
env
cut
ed
vi
as
comp
cpp
sh
csh
ksh
Hardware
Kernel
Shell
Mail
FTP
DBMS

Unix Architecture:basic block diagram of a UNIX system

- The main concept that unites all versions of UNIX is the following four basics:
- 1) Kernel: The kernel is the heart of the operating system. It interacts with hardware and **most of the tasks like memory management, task scheduling and file management.**

- 2) **Shell:** The shell is the utility that processes your requests. When you type in a command at your terminal, the shell interprets the command and calls the program that you want.
- The shell uses standard syntax for all commands. **C Shell, Bourne Shell and Korn Shell** are most famous shells which are available with most of the Unix variants.

- 3) **Commands and Utilities**: There are various command and utilities which you would use in your day to day activities. cp, mv, cat and grep etc. are few examples of commands and utilities.

- 4) **Files and Directories**: All data in UNIX is organized into files. All files are organized into directories. These directories are organized into a tree-like structure called the filesystem.

UNIX COMMANDS

- **date**: Displaying both date and time

- **clear**:clearing the screen
- -> All UNIX systems offer the tput to clear the screen
- --> **tput clear** where clear is referred to as an argument

- **cal**: calendar

- **who**:who are the users?
- **ps**:viewing processes
- **ls**:listing files
- **>** (Directing output to a file)

- **cat:** display the file contents
- **wc** : Counting Number of lines, words and characters in file
- **bc:** Calculator
- **exit**: Signing off

echo

- To display the message(like echo hello)
- To evaluate shell variables(like
- ->a=8
- ->echo $a
- Try with this
- a = 8 [space on either side]

“echo” with escape sequence

- Escape sequence is two charcter string beginning with a \(backslash)
- For example: \c is an escape sequence
- \c place the prompt ($) and cursor (_) in same line
- echo “Enter filename\c”

- Note: echo escape sequence are a feature of System V.BSD doesnot recognise them but it supports the -n option as an alternative to the \c sequence
- echo -n “Enter filename\c”
  BSD
- Linux:
- echo -e “Enter filename\c”

Two commonly used escape sequence

- \t -->A tab which pushes text to the right by eight character positions
- \n-->A newline which creates the effect of pressing

printf:An alternative to echo

- printf “Enter filename\n”
- printf “My current shell is %s\n” $SHELL
- -> where %s format string act as a placeholder for the value of $SHELL
- ->%s is the standard format used for printing strings

- %d – decimal integer
- %o – Octal integer
- %x – Hexadecimal integer
- %f – Hexadecimal integer

passwd:changing your password

- **$passwd**
- passwd: changing password for lenovo
- Enter login password:
- New password:
- Re-enter new password:
- passwd(SYSTEM):passwd successfully changed for lenovo

Messages are quite common using passwd

- passwd(SYSTEM) :password too short- must be atleast 6 charcters
- passwd(SYSTEM):passwords must differ by at least 3 positions
- BAD PASSWORD: is too similiar to the old one
- passwd(SYSTEM): Too many failures- try later

Some of rules are expected to follow when handling your own password

- Don't choose a password similar to the old one
- Don't use commonly used names like names of friends,relatives,pets and so forth
- Change the password regularly
- Use a mix of alphabetic or numeric characters

uname:Knowing your machine characteristics

- **$ uname**
- By default, it simply displays the name of the operating system
- **$uname -r**
- returns the version of the kernel

$uname -n //first word of domain name

WHEN THINGS GO WRONG

- **Backspacing Doesn't Work**
- $password
- Use:[Ctrl-h] or [Delete] //erase the character

- **Killing a Line**:If a command line contains many mistakes, you could prefer to kill the line altogether without executing it
- Use:[Ctrl-u] //The line-kill character

- **Interrupting a Command**:A program goes on running for an hour and doesn't seem to complete
- [Ctrl-c] or [Delete]
- **Terminating a Command's Input:**
- cat command is used with an argument representing the filename
- Use cat command without argument what happens?
- Use:[Ctrl-d] //The end-of-file or eof character

- **The keyboard is locked**: due to pressing of key sequence [Ctrl-s]
- Use:[Ctrl-q] //release the lock & restore normal keyboard operation
- If the display from a command is scrolling too fast to halt output temporarily by pressing
- Use:[Ctrl-s]
- To Resume scrolling ,
- Use: [Ctrl-q]

- **“Enter” key Doesn't work**
- Use: [Ctrl-j] or [Ctrl-m]
- **The Terminal Behaves in a erratic manner.Your terminal settings could be disturbed**
- Use: stty sane //restore sanity

Script: Recording your Session

- **$script**
- Script started, file is typescript
- $_ //Another shell-child of login shell
- The prompt returns and all your keystrokes that you enter here get recorded in the file typescript.After your recording is over, you can terminate the session by entering **exit:**
- $exit
- Script done, file is typescript

tty: Knowing your terminal

- Unix treats terminal as files,it is reasonable to expect a command that tells you the filename of the terminal you are using
- The command is simple and needs no arguments
- $tty ==> /dev/pts/10
- Where terminal filename is 10 resident in the pts directory.This directory in turn under the /dev directory
- tty(teletype) command

- Solaris machine-your terminal names could be different
  - / dev/ tty01

stty:Displaying and setting terminal charcteristics

- stty uses a very large number of keywords(options that look different)
- -a(all) option displays the current settings
- $stty -a
- Output:Display the baud rate of the terminal(i.e 38,400)

Changing the settings

- Entering a password through shell script(echo)
- **$stty -echo** //Turns off Keyboard input
- Use:**$stty echo** **//Turns on**
- Changing the End-of-File Key(eof)
- **$stty eof \^a** //Instead of ctrl-d

Changing the interrupt key(intr)

$stty intr \^c //instead of delete

When everything Else fails(sane)

$stty sane //Restores sanity to the terminal

or to set the terminal to some standard values