Introduction To UNIX

- OBJECTIVES

- What is an Operating System
- History of unix Operating system
- Unix Architecture
- More features of unix
- Unix Flavors
- Linux Flavors

COURSE OBJECTIVES OF UNIX

CO1	**Ability to understand the knowledge of UNIX Shell commands & UNIX System APIs and apply the functionality of the same.**
CO2	Ability to analyse the given commands & shell programs, to identify the errors and generate the desired outputs.
CO3	Ability to design UNIX shell scripts and System programs, for the given requirements.
CO4	Ability to conduct experiments to demonstrate the various commands of UNIX Shell and System APIs.

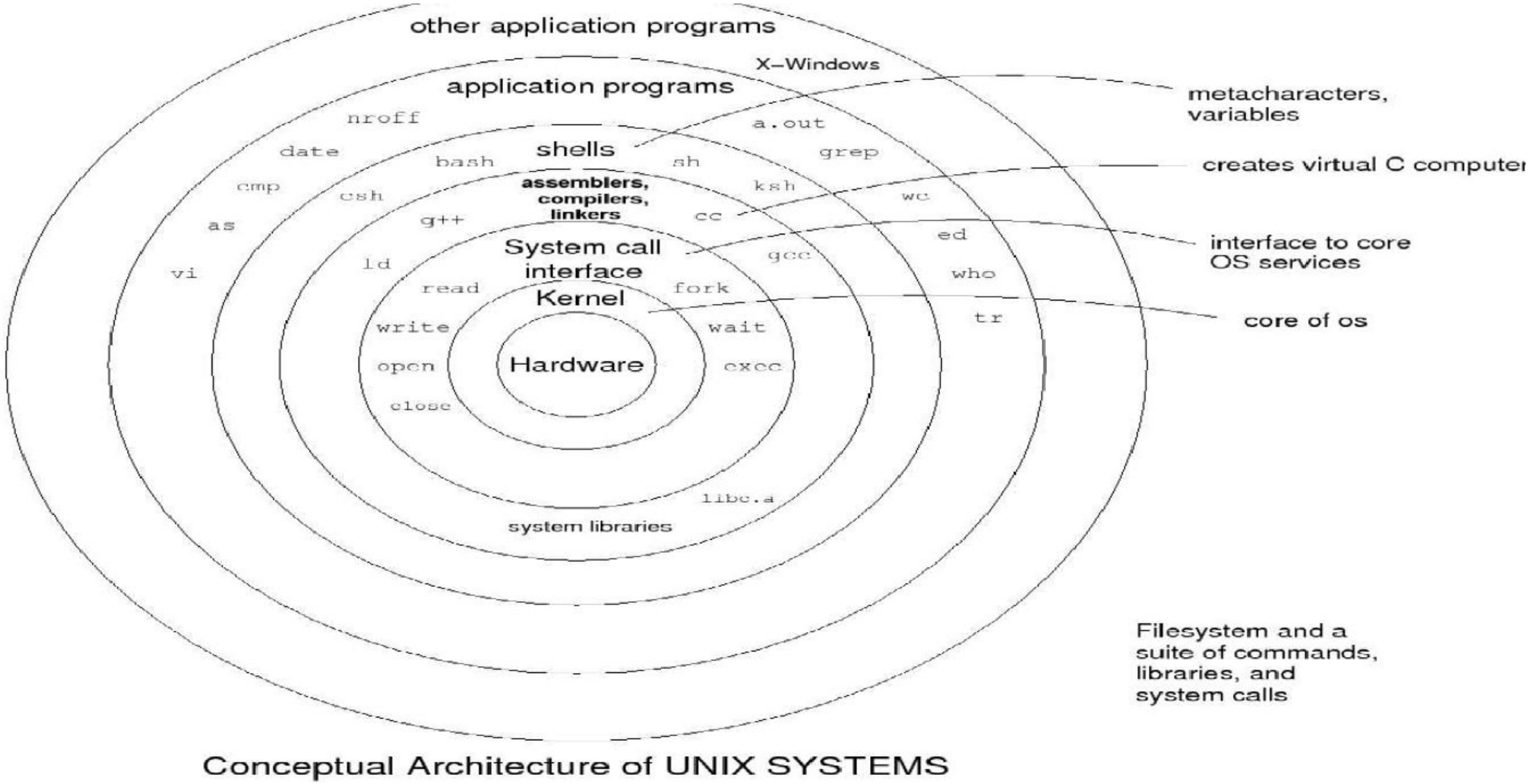
What Is an Operating System?

- Interface between Users and the Hardware.
- Take care of Storage Management.
- Take care of I/O device management.
- Takes care of Process Management
- Takes care of File Management.
- Kernel is the Core Component of the Operating System

History of the UNIX Operating System

- 1969 AT&T Bell Labs UNICS system -designed by Ken Thompson & Dennis Ritchie
- 1970 UNICS finally became UNIX
- 1973 UNIX rewritten in C, making it portable to different hardware
- Mid 1970s University of California at Berkeley (BSD) contributed many
- important features like vi, C shell etc.
- 1982 AT & T came back and started commercial production-Editions ->Systems
- Late 1980s AT & T released SVR4 unification of SV3.2,BSD,SunOs & XENIX
- 1991 Linux from Linus Torvalds
- 1990s POSIX Standard, MIT introduced X-Windows
- History of the UNIX Operating System
- www.scmGalaxy.com, Author - Rajesh Kumar

UNIX Architecture – Kernel & Shell

- 

Conceptual Architecture of UNIX SYSTEMS

UNIX Architecture – Kernel & Shell

- The architecture of UNIX can be divided into three levels of functionality-
- The lowest level is the kernel which is the core of OS & communicates directly to H/w. Kernel is represented by file /stand/unix or /unix .
- The next level is the shell, which acts as the interface b/w user & kernel.
- The shell is represented by sh(Bourne Shell), csh(C shell),ksh(Korn Shell), bash(Bash shell).
- To know running shell use echo $shell.
- The highest level is utilities, or application programs which provides utility functions.

UNIX Architecture – Kernel & Shell

- The highest level is utilities, or application programs which provides utility functions.

- Though there are over a thousand commands on the system, they all use a handful of functions, called system calls, to communicate with the kernel.
- All unix flavors use the same system calls and are described in the POSIX specification.
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More Features of UNIX

Hierarchical file system

- Multi tasking
- Multi user
- The building block approach
- Pattern matching (wildcard characters)
- Toolkit(Applications, RDBMSs, Languages etc..)
- Programming facility
- Documentation

Flavors of UNIX & **Clone of UNIX**

- Digital Unix
  IRIX
  SCO Open Server
  SCO UnixWare
  IBM-AIX
  HP-UX
  Sun - Solaris

- •Red Hat

- Calders
- SuSE
- Mandrake
- DebianIBM -AIX

General Purpose Utilities

- Unix provides various general purpose utilities having diverse functionality . Some of them are:
- cal, date.
- echo, bc.
- printf, passwd.
- man,who,uname,tty.
- mailx ,stty etc.
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Content of the Manual Pages

- Syntax:
- man –[k|X] keyword
- in which X is the number of one of the manual sections
- Examples:
- $ man ls *Display the “ls" man page.*
- $ man -k cat *Display entries with keyword "cat".*
- $ man passwd *Display the "passwd" man page-Section 1.*
- $ man 4 passwd *Display the "passwd" man page-Section 4.*

General Purpose Utilities who Command

Syntax

Who command

Reports information about users. who are currently logged on to a system.

- Examples:
- $ who
- root tty1p5 Jul 01 08:01
- user11 tty1p4 Jul 01 09:59
- user12 tty0p3 Jul 01 10:01.
- $ who am i
- user12 tty0p3 Jul 01 10:01

The date Commandand Cal Command

- **Syntax:**
- **date** Reports the date and time.
- Example:
- $ date
- Fri Jul 1 11:15:55 EDT 2005.
- **Syntax:**
- **cal** Reports the calendar of 2020 September(Current month).
- Example:
- $ cal 8 2020 for Aug 2020
- $ cal 2020 for the full calendar of year 2020

The passwd Command

- **Syntax:**
- **passwd** Assigns a login password.
- Example:
- $ passwd
- Changing password for user1
- Old password:
- New password:
- Re-enter new password:
- clear Clears Terminal screen

Echo,printf and mailx command

- echo: is used to print messages. Ex:ex: $ echo Deepanshu
- $echo $SHELL prints the shell version.
- printf: is an alternative to echo.
- ex:ex: $ printf “Deepanshu” [enter]
- mailx: is the universal mailer to send or receive mails.
-
- $mailx Deepanshu
- subject: Attention
- call me now [ctrl-d]
- Will send the mail to Deepanshu.

Uname :Knowing your Machine characteristics

- uname command displays certain features of the operating system running

on your machine .By default,it simply displays the name of the Operating system.uname and uname –r display the operating system name and version number of the kernel,respectively.

$uname

SunOS

The Current Release and Implementation Name (-r and –s).

$Uname –r

5.8

$uname –s

SunOS

tty,sty commands

- tty : Knowing your Terminal
- Since Unix treats even terminals as files,it’s reasonable to expect a command that tells you the filename of the terminal you are using.
- $tty
- /dev/pts/10
- The terminal filename is 10(a file named 10) resident in the pts directory.
- The directory in turn is under the /dev directory.
- stty :Displaying and Setting Terminal Characteristics
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Stty:Displaying and Setting Terminal Characteristics

- Different Terminals have different characteristics and it's possible that your terminal may not behave in the way you expect it to.
- The stty command helps to change settings and displays it.
- $stty -a
- stty uses a large number of keywords (options that look different) but we'll consider a handful of them.
- -a option displays the current settings .The Output shows among other things ,the baud rate(the speed) of the terminal in this case.