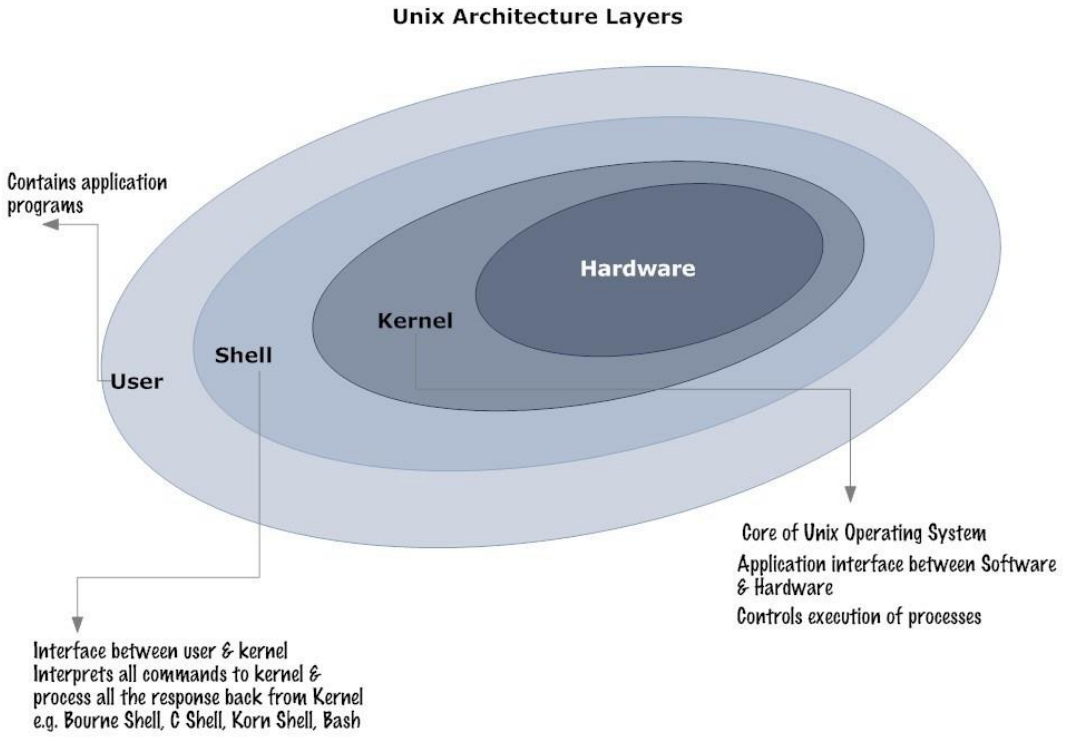
LINUX

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

Linux Architecture



Architecture Components

- **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.

- **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. C Shell, Bourne Shell and Korn Shell are most famous shells which are available with most of the Unix variants.

- **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. There are over 250 standard commands plus numerous others provided through 3rd party software. All the commands come along with various optional options.

- **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.

Development Commands

Files and Directory management

Files

Different files are available such as flat files, compressed files, hidden files and system files.

Listing Files

Short list

ls

Long list

ls -l

Long list all files and directories sorting by modification time in descending order

ls –lart

Details about all the listed columns −

- First Column: represents file type and permission given on the file. Below is the description of all type of files.
- Second Column: represents the number of memory blocks taken by the file or directory.
- Third Column: represents owner of the file. This is the Unix user who created this file.
- Fourth Column: represents group of the owner. Every Unix user would have an associated group.
- Fifth Column: represents file size in bytes.
- Sixth Column: represents date and time when this file was created or modified last time.
- Seventh Column: represents file or directory name.

Listing hidden files

ls –a

File handling

Create/Edit file

vi filename

echo “welcome to unix” > filename

Create Empty file

touch filename

> filename

Append content to a file

```
echo “this is the line 1” >> filename
echo “this is the line 2” >> filename
echo “this is the line 3” >> filename
echo “this is the line 4” >> filename
echo “this is the line 5” >> filename
echo “this is the line 6” >> filename
echo “this is the line 7” >> filename
echo “this is the line 8” >> filename
echo “this is the line 9” >> filename
echo “this is the line 10” >> filename
echo “this is the line 11” >> filename
echo “this is the line 12” >> filename
echo “this is the line 13” >> filename
echo “this is the line 14” >> filename
echo “this is the line 15” >> filename
echo “this is the line 16” >> filename
echo “this is the line 17” >> filename
echo “this is the line 18” >> filename
echo “this is the line 19” >> filename
echo “this is the line 20” >> filename
echo “this is the line 21” >> filename
echo “this is the line 22” >> filename
echo “this is the line 23” >> filename
echo “this is the line 24” >> filename
echo “this is the line 25” >> filename
echo “this is the line 26” >> filename
```

Display content of a file

Display whole content

cat filename

Display incremental content

more filename

Display first 10 lines

head filename

Display last 10 lines

tail filename

Counting number of lines in a file

wc –l filename

File operation (copy, move, rename, delete)

cp filename filename1

mv filename1 filename2

rm filename2

Directory Commands

You can go in your home directory anytime using the following command –

cd ~

Here ~ indicates home directory. If you want to go in any other user's home directory then use the following command −

cd ~username

To go in your last directory you can use following command –

cd -

To go to the parent directory

cd ..

cd ../..

Absolute path

Fully qualified path start with '/' provided from root till the child.

cd /

mkdir /home/hduser/dirname

Relative path

Access the rest of the child path from the parent path.

cd ~

mkdir dirname

Create directory structure from parent directory, here all three dir1,2,3 will be created using option 'p'.

mkdir -p /home/hduser/dirname/dir1/dir2/dir3

Change Dir

cd dirname

cd ..

Move dir

mv dirname targetdir

Remove Dir

rmdir targetdir

Remove dir recursively

rm -r targetdir

Admin commands:

Create and delete Users

sudo useradd inceptez

sudo userdel inceptez

Create and delete groups

sudo groupadd inceptez

sudo groupdel inceptez

Permissions

Types - Owner, group and others

ls -l /home/hduser

-rwxr-xr-- 1 inceptez inceptez 1024 Nov 2 00:10 myfile

drwxr-xr--- 1 inceptez inceptez 1024 Nov 2 00:10 mydir

Here first column represents different access mode ie. permission associated with a file or directory.

The permissions are broken into groups of threes, and each position in the group denotes a specific permission, in this order: read (r), write (w), execute (x) –

- The first three characters (2-4) represent the permissions for the file's owner. For example -rwxr-x**r--** represents that onwer has read (r), write (w) and execute (x) permission.

- The second group of three characters (5-7) consists of the permissions for the group to which the file belongs. For example -rwxr-x**r--** represents that group has read (r) and execute (x) permission but no write permission.

- The last group of three characters (8-10) represents the permissions for everyone else. For example -rwxr-x**r--** represents that other world has read (r) only permission.

Change mode:

Change permission of the owner and provide read and write access.

chmod u+rw filename

Change permission of the group and provide read and write access.

chmod g+rw filename

Change permission of the others and provide read and write access.

chmod o+rw filename

Number	Octal Permission Representation	Ref
0	No permission	---
1	Execute permission	--x
2	Write permission	-w-
4	Read permission	r--

Changing owners and Groups

Change owner from hduser to inceptez

sudo chown inceptez filename

Change group from hduser to inceptez

sudo chgrp inceptez filename

Common default directories:

Directory	Description

/	This is the root directory which should contain only the directories needed at the top level of the file structure.
/bin	This is where the executable files are located. They are available to all user.
/dev	These are device drivers.
/etc	Supervisor directory commands, configuration files, disk configuration files, valid user lists, groups, ethernet, hosts, where to send critical messages.
/lib	Contains shared library files and sometimes other kernel-related files.
/home	Contains the home directory for users and other accounts.
/usr	Used for miscellaneous purposes, or can be used by many users. Includes administrative commands, shared files, library files, and others
/var	Typically contains variable-length files such as log and print files and any other type of file that may contain a variable amount of data
/sbin	Contains binary (executable) files, usually for system administration. For example *sbin utility for useradd commands etc.*.

Misc Admin commands

Shows the location the java

whereis java

Check the version of linux

cat /etc/issue

Identify all running process

ps –ef

Identify specific running process (bash)

ps –ef | grep bash

Kill a process running

kill -9 processid

Disk size commands

Disk free

df -k path

Disk usage

du -k path

Environment variables

env

History of the commands used

history

Grep

grep sometext filename.txt

Execute a shell script

vi scriptname.bsh

a='hi how are you'

echo $a

bash scriptname.bsh

Variables

a='hi how are you'

echo $a

export $a

Compression

gzip filename

gunzip filename.gz

Communication commands

ssh username@hostname