

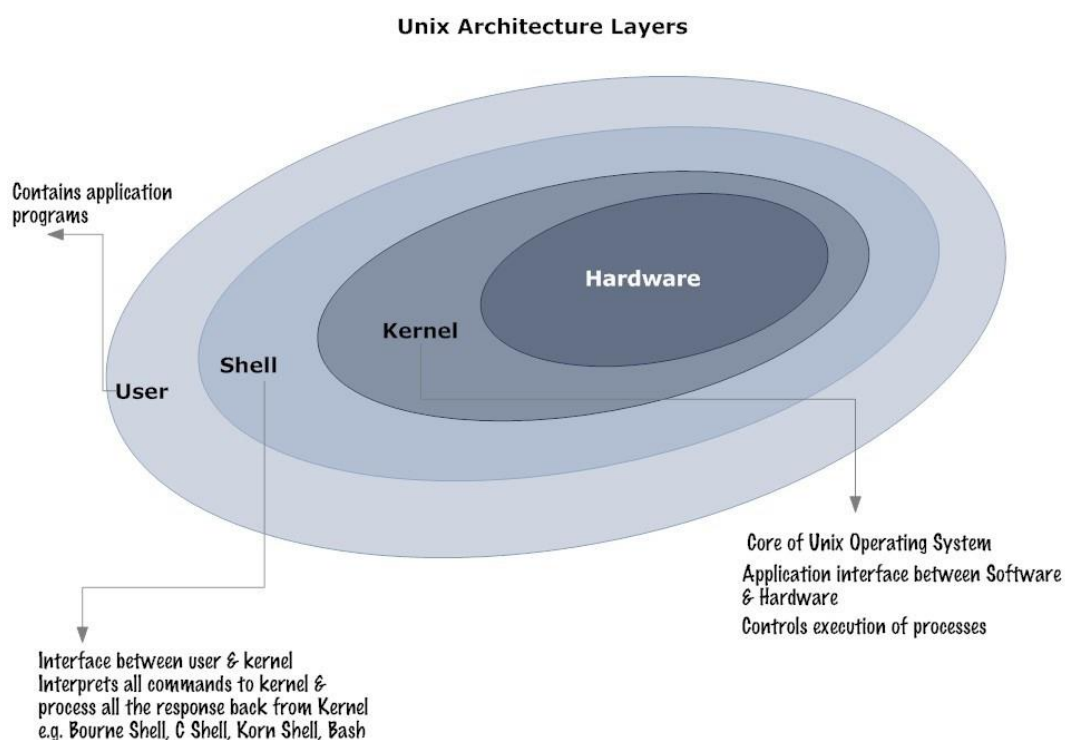


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## LINUX

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 dirs/links in the 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 file1**

Add some content in the above file after typing 'i'.

Delete a line : **esc+dd**

Delete a word : **esc+dw**

Delete a character : **esc+x**

Search for a word: **esc /wordtofind**

Goto a line number: **esc :linenumber**

Undo: **esc+u**

Redo: **ctrl+R**

To save type **Shift+: wq**

To quit without saving **Shift+: q!**

**Create/Replace a file with few content**

**echo 'welcome to unix' > filename1**

**Append content to a file**

**echo "this is the second line" >> filename1**

**Create Empty file**

**touch filename2**

**> filename3**

## 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 file2**

**mv file2 file3**

**rm file3**

## 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 ~hduser**

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

`cd -`

To go to the parent directory

`cd ..`

`cd ../..`

### Create Dir

#### Relative path

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

`cd ~`

`mkdir dirname`

#### Absolute path

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

`mkdir /home/hduser/dirname2`

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

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

### Change Dir

`cd dirname`

`cd ..`

### Move dir

`mv dirname dirname1`

## Remove Dir

`rmdir ~/dirname1`

`rm -r ~/dirname1`

## Admin commands:

Create Users, set password, switch user and exit out

`sudo useradd inceptez`

`sudo passwd inceptez`

`su inceptez`

`exit`

## Permissions

Types - Owner, group and others

`ls -l /home/hduser`

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-xr--` represents that owner 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-xr--` 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-xr--` represents that other world has read (r) only permission.

## Change mode:

Number	Octal Permission Representation	Ref
0	No permission	---

1	Execute permission	--x
2	Write permission	-w-
4	Read permission	r--

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

**chmod 000 filename**

**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**

### Changing owners and Groups

Change owner from hduser to inceptez

**sudo chown inceptez filename1**

Change group from hduser to inceptez

**sudo chgrp inceptez filename1**

### Misc commands

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 /**

Disk usage

**du -k /tmp**

History of the commands used

**history**

Grep

**grep line22 filename**

Compression

**gzip filename**

**gunzip filename.gz**