What is Unix ?

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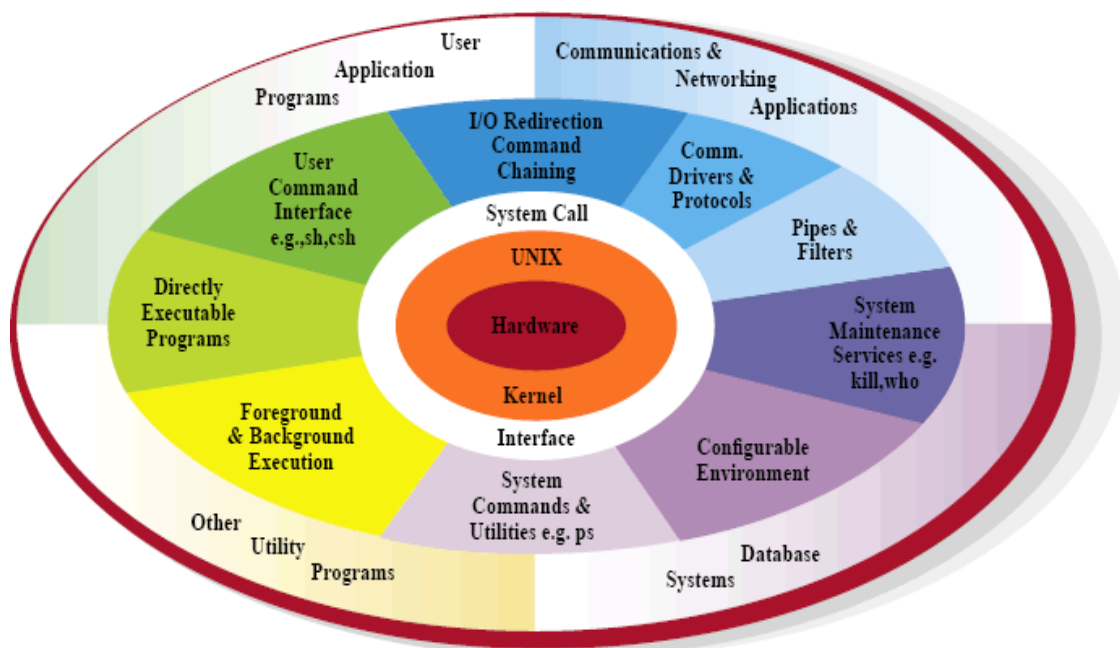
The computer programs that allocate the system resources and coordinate all the details of the computer's internals is called the **operating system** or the **kernel**.

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.

- Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.

- There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.

- 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 a multitasking environment.

Unix Architecture

Here is a basic block diagram of a Unix system

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The main concept that unites all the versions of Unix is the following four basics

- **Kernel**− The kernel is the heart of the operating system. It interacts with the 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. The shell uses standard syntax for all commands. C Shell, Bourne Shell and Korn Shell are the most famous shells which are available with most of the Unix variants.

- **Commands and Utilities** − There are various commands and utilities which you can make use of 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 options.

- **Files and Directories** − All the data of Unix is organized into files. All files are then organized into directories. These directories are further organized into a tree-like structure called the **filesystem**.

System Bootup

If you have a computer which has the Unix operating system installed in it, then you simply need to turn on the system to make it live.

As soon as you turn on the system, it starts booting up and finally it prompts you to log into the system, which is an activity to log into the system and use it for your day-to-day activities.

Login Unix

When you first connect to a Unix system, you usually see a prompt such as the following

Login:

To log in

- Have your userid (user identification) and password ready. Contact your system administrator if you don't have these yet.

- Type your userid at the login prompt, then press **ENTER**. Your userid is **case-sensitive**, so be sure you type it exactly as your system administrator has instructed.

- Type your password at the password prompt, then press **ENTER**. Your password is also case-sensitive.

- If you provide the correct userid and password, then you will be allowed to enter into the system. Read the information and messages that comes up on the screen, which is as follows.

```
login : hayder
hayder's password:
Last login: Sun Jan 14 09:32:32 2019
$
```

You will be provided with a command prompt (sometime called the **$** prompt) where you type all your commands. For example, to check calendar, you need to type the **cal** command as follows

```
$ cal

February 2019
Su Mo Tu We Th Fr Sa
        1  2
 3  4  5  6  7  8  9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28


$
```

Change Password

All Unix systems require passwords to help ensure that your files and data remain your own and that the system itself is secure from hackers and crackers. Following are the steps to change your password

Step 1 − To start, type password at the command prompt as shown below.

Step 2 − Enter your old password, the one you're currently using.

Step 3 − Type in your new password. Always keep your password complex enough so that nobody can guess it. But make sure, you remember it.

Step 4 − You must verify the password by typing it again.

```
$ passwd
Changing password for hayder
(current) Unix password:******
New UNIX password:*******
Retype new UNIX password:*******
passwd: all authentication tokens updated  successfully

$
```

Note − We have added asterisk (*) here just to show the location where you need to enter the current and new passwords otherwise at your system. It does not show you any character when you type.

Listing Directories and Files

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*.

You can use the **ls** command to list out all the files or directories available in a directory. Following is the example of using **ls** command with **-l** option.

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```
$ ls -l
total 19621
drwxrwxr-x  2  hayder hayder   4096 Dec 25 09:59 uml
-rw-rw-r--  1   hayder hayder   5341 Dec 25 08:38 uml.jpg
drwxr-xr-x  2  hayder hayder   4096 Feb 15  2006 univ
drwxr-xr-x  2    root  root     4096 Dec  9  2007 urlspedia
-rw-r--r--  1    root  root   276480 Dec  9  2007 urlspedia.tar
drwxr-xr-x  8    root  root     4096 Nov 25  2007 usr
-rwxr-xr-x  1    root  root     3192 Nov 25  2007 webthumb.php
-rw-rw-r--  1  hayder hayder   20480 Nov 25  2007 webthumb.tar
-rw-rw-r--  1  hayder hayder    5654 Aug  9  2007 yourfile.mid
-rw-rw-r--  1  hayder hayder  166255 Aug  9  2007 yourfile.swf

$
```

Here entries starting with **d.....** represent directories. For example, uml, univ and urlspedia are directories and rest of the entries are files.

Who Are You?

While you're logged into the system, you might be willing to know : **Who am I**?

The easiest way to find out "who you are" is to enter the **whoami** command −

```
$ whoami
  hayder

$
```

Try it on your system. This command lists the account name associated with the current login. You can try **who am i** command as well to get information about yourself.

Who is Logged in?

Sometime you might be interested to know who is logged in to the computer at the same time.

There are three commands available to get you this information, based on how much you wish to know about the other users: **users**, **who**, and **w**.

```
$ users
  hayder ali yasir

$ who
```

```
hayder  ttyp0 Oct 8 14:10 (limbo)
ali     ttyp2 Oct 4 09:08 (calliope)
yasir   ttyp4 Oct 8 12:09 (dent)


$
```

Try the **w** command on your system to check the output. This lists down information associated with the users logged in the system.

Logging Out

When you finish your session, you need to log out of the system. This is to ensure that nobody else accesses your files.

To log out

•Just type the **logout** command at the command prompt, and the system will clean up everything and break the connection.

System Shutdown

The most consistent way to shut down a Unix system properly via the command line is to use one of the following commands

Sr.No.	Command & Description
1	**Halt** Brings the system down immediately
2	**init 0** Powers off the system using predefined scripts to synchronize and clean up the system prior to shutting down
3	**init 6** Reboots the system by shutting it down completely and then restarting it
4	**Poweroff** Shuts down the system by powering off
5	**Reboot** Reboots the system
6	**Shutdown** Shuts down the system

You typically need to be the super user or root (the most privileged account on a Unix system) to shut down the system. However, on some standalone or personally-owned Unix boxes, an administrative user and sometimes regular users can do so.