

## **(a) The Kernel**

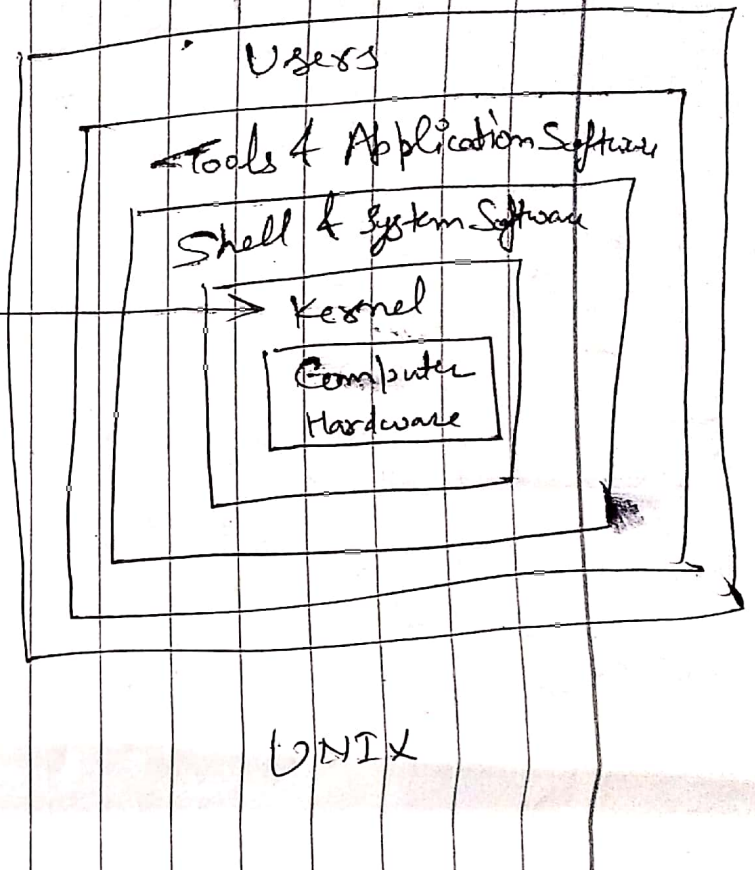
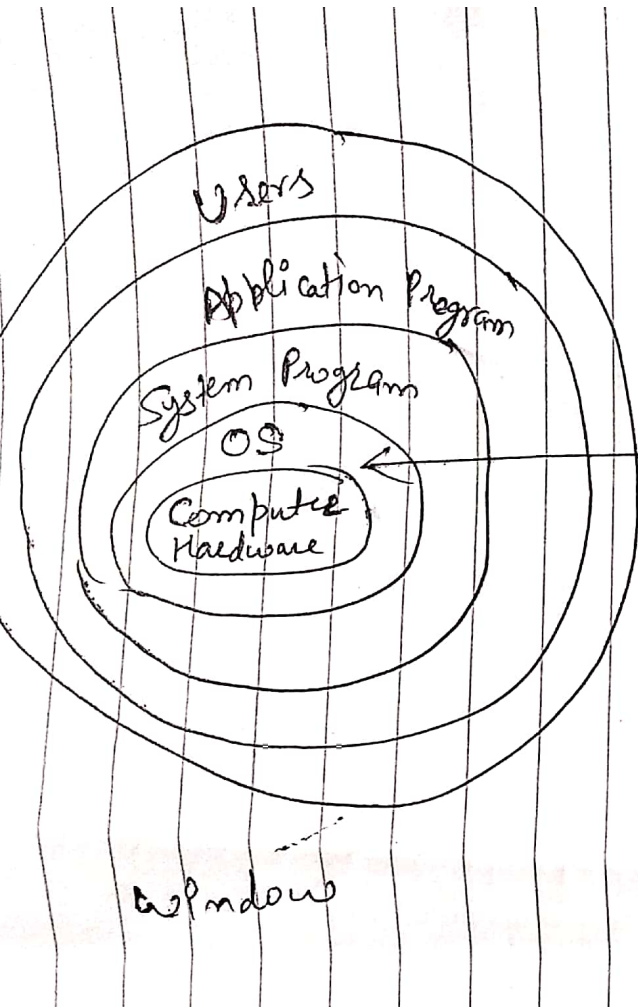
- Kernel is the heart of the operating system.
- It supports the file system, processor scheduling, memory management and other operating system functions through system calls.

## **(b) The shell and system commands**

- The shell provides an easy connection between the user and the kernel, like a human interpreter, who stands between two people speaking two different languages. It accepts the user commands, interprets them and gets them executed.
- The other system commands are there to help user to do various operations.

## **(c) Tools and application programs**

- This level of the UNIX contains UNIX tools. The actual tools vary from one implementation to other.
- Some of them are the compilers, word processors, source code managers etc.



## 7.2 FEATURES OF UNIX OPERATING SYSTEM

- The salient features of UNIX operating system are: -
  1. Multitasking Capability.
  2. Multiuser Capability.
  3. Time Sharing.

4. Communication.
5. System Portability.
6. Command Interpreter.
7. System Security & Protection.
8. DOS/UNIX Interface.
9. Online Documentation.
10. Graphics.

### **1. Multitasking Capability: -**

- UNIX has the capability of multitasking, which means the capability to perform multiple tasks simultaneously.
- e.g. UNIX can print one document, edit another and also sort a list of files at the same time.

### **2. Multiuser Capability: -**

- UNIX is a multiuser system, which means it permits several users to use the same computer in order to carry out their computing jobs.
- This is achieved by connecting several terminals to a single powerful computer and each user on a terminal can run programs, access files and print documents at the same time.
- This multiuser capability of the UNIX system saves considerable amount of time by allowing a number of persons to work on a project at the same time.

### **3. Time-sharing: -**

- UNIX is a time sharing system, which means it can serve several users simultaneously by sharing its time among them.

- Each user's program is loaded into memory from the disk and the scheduler provides a time slice for each user, executes his program for a time slice, moves to other user's programs successively, in a cycle. Once the cycle is completed for all users, it moves back to the program from where it began. Since the clock speed is very fast, each user feels that the system is responding to only his terminal.

#### **4. Communication: -**

- UNIX supports two main types of communications.
- These are: -
  - *Communication between different terminals connected to the same computer.*
  - *Communication between users of computers at different locations. These computers may differ in type and size. They may be located in different offices, different countries or even continents. This communication is achieved through telephone lines, microwave links & satellite communication.*

#### **5. System Portability: -**

- UNIX can run on a variety of computers.
- The ease of implementation of UNIX on different computers is termed as portability.
- This enables a user to safely upgrade to a better computer without fearing about altering his operating system.
- The ability to port UNIX from one type or manufacture of one computer to another has been the main reason for the success and acceptance of UNIX.

## 6. Command Interpreter: -

- A built-in-shell in UNIX interprets the command typed by the user, thus enabling the operating system to execute the command.
- In UNIX command names are actually executable file names.
- Therefore as the user enter the command the shell locates the corresponding files and gets it executed by the operating system.

## 7. System security and Protection: -

- There exist several levels of security in UNIX.
- The first level is system security. This ensures that anybody can't just start running UNIX on the system. First a standard login & password procedure is followed.
- Another level of security is related to accessing files. There are three permissions namely read, write and execute (rwx) which can be assigned.

## 8. DOS/UNIX Interface: -

- A user can switch from UNIX to DOS in his terminal. The user can execute programs available under DOS and store DOS data file and program in the UNIX system hardware.

## 9. Online Documentation: -

- UNIX provides an online help to the user. This online help enables the users to understand the proper syntax of system commands, tools and utilities with their description with examples.

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- These come under man and learn command, which are similar to help command in DOS.

## 10. Graphics: -

- For engineering design and 3D graphics, powerful graphic workstations are used and for these UNIX operating system is preferred rather than DOS.

## 7.3 WORKING WITH UNIX

- At the beginning of every terminal session the login prompt appears.
- The purpose of login prompt is to identify the user and allow access to the system only after verifying the identity of the user.
- It then requests for a password. After entering the correct password UNIX starts its work and \$ prompt appears on the screen.
- The \$ prompt is also called the shell prompt.
- UNIX is case sensitive. For all UNIX sessions only lower case letters are used.

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