# Assignment 2 :-
## Structure of Operating System

Monolithic kernel.
- It is a single, large, static executable file that contains all code needed to run the kernel and manage hardware of a computer.
- It allows for faster communication both different parts of kernel and the hardware, since everything is in same address space & doesn't need to passed through multiple layers of abstraction.
- This can make monlithic kernel more efficient & faster.
- kernel is more difficult to maintain & extend, since all code is in a single, large file.
- There is no chance of hiding. Every procedure is visible to every other procedure
- OS is written as a collection of procedures that are linked together into a single large executable Program.
- Each procedure in the system is free to call any other process. calling any procedure makes the system very efficient.
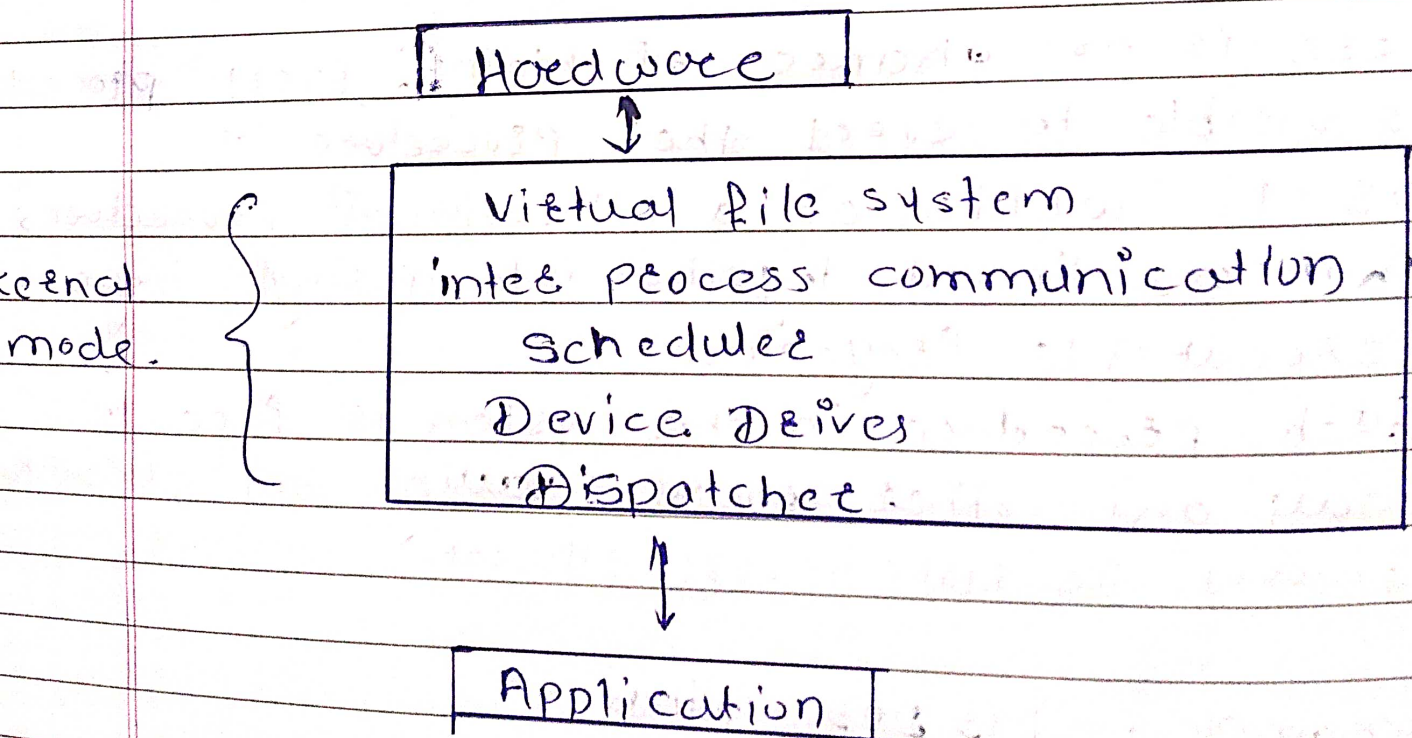

- Example :- MS DOS, Linux.

## Advantages :-

1) The execution of architecture is so fast.

2) All memory managment, file management and process schedwing is performed under one space.

3)

## Disadvantages :-

1) If any service fails entire system failed

2) for adding any type of new service it must be modified by user.

## Architecture :-

```
┌──────────────────┐
│    Hardware      │
└──────────────────┘
         ↕
┌─────────────────────────────────────┐
│     Virtual file system             │
│     inter process communication     │
│     Scheduler                       │
│     Device Drives                   │
│     Dispatcher.                     │
└─────────────────────────────────────┘
         ↕
┌──────────────────┐
│   Application    │
└──────────────────┘
```

kernel
mode.

(2) Micro kernel.

- since kernal is core part of OS, so it is for handling most important services only.
- Most imp services are inside kernal and rest of OS services are present inside system application program.
- Users are able to interact with those not-so-imp services within system application.
- Micro kernal is solely responsible for most imp services of OS, and are followed:-
  - Inter process - communication
  - Memory Management
  - CPU - Sheduling.
- It is called micro because it is designed to be as small as possible, typically only containing code needed to manage their hardware and communication beth different parts of system.

Advantages :-
- architechture is small & isolated hence it can function better.
- Expansion of system is easier

Disadvantages :-
- can not be more efficient.

Example is Eclipse IPE

Exo keenal.
- It is a type of Os keenal that is designed to peovide a minimal set of absteactions ove the hoedwoee of comp, leaving most of the managment of hoedwaee eesouecey to the applications that eun on the system.
- this ensutes that theee is no foeced obsteaction, which is what make exokeenel diffeeent feom miceo-keenel. and monolithic keenels.

Advantages :-
1. Significant petfoemance inceeajey
2. Applications can make moee efficient & itelligent use of hoedwoee eesouecey.
3. Ease development and testing of new opeatting system ideas.

Disadvantages :
1. complexity in design of exokeenel inteefaces
2. less consisteng.

# Virtual machine.

- A virtual machine is a software program that emulates the hardware of a computer, allowing it to run multiple OS and applications in isolation from one another.
- Each virtual machine runs on its own set of virtual hardware, with its own OS and applications.
- VM's are used for testing & development, running multiple OS on a single physical machine.
- Virtual machine are created and managed using a software program called a hypervisor

## Advantages :-
1. Easy maintenance, availability, and convenient recovery.
2. No protection problems

## Disadvantages :-
- VM's are not as efficient as a real one when accessing the hardware.
- One virtual machine can be affected by other running virtual machines, depending on workload.