1st Internal

2C303.25

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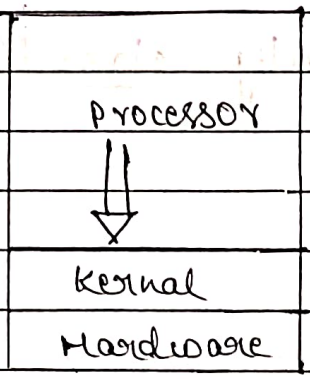
Module-01

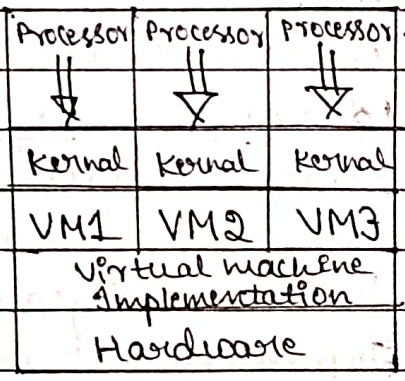
2. (a) **Virtual machine :-**

The fundamental idea behind the virtual machine is to abstract the hardware in a single computer for several different computing executing environment there by executing the program in different own by their computer.

* To execute a Virtual machine for the process have the seperate processor with its own memory.
* If the host is the main memory installed in the system by installing the other system in the host system referred to as guest host.



(a) Nonvirtual machine



(b) Virtual Machine.

* The first virtual machine is appeared in virtual machine operating system for IBM mainframes in 1972.
* Here we will provide a seperate processor for each implementation of the virtual machine.

Benefits :-

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1) Able to use the same hardware.
2) multiple execution of the program by seperate processor.
3) If the host has a virus means it will affect only the operating system not affect the host and guest host.
4) System consolidation: two or more systems can use a same system.
5) The OS supports and manages the entire machine.

2.(b) System calls refers to the command given by the user to execute the program in different ways.

System calls are broadly classified into six categories as follows:-

1) Process control
2) File management.
3) Device management.
4) Information management.
5) communication.
6) Protection.

Process control calls system load, execute, end and many other attributes.
* Process has to be ~~born~~ created, launced, monitored, resuming, Assuming and eventually stopped.
* If one process has to be paused or ended immediately the other process has to be resumed.
* If you want to create a new process then,

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the parent process has to be wait or wait until the event occur. The process sent back a signal when the event occur.

2) File management operation calls system create file, delete file, read and write set/get attributes.
* If you treated any file that has to be opened and write or read on the process.
* File management operations helps in the direction of ordinary file.

3) Device management operation calls request device, read and write repolistion, attach or detach Device, set/get attributes.
* If one process uses the device and return that Device to the operating system while others uses the same device.

4) Information management calls system include data; File process and device management.
* Information management calls care if the information transferred b/w the OS and the users. it will give the information about how many users or data are current working and version of the operating system.

5) communication calls system send/retrive; create/delete and attach/detatch.
* Here there is a communication between the user and the operating System.
2 Types:- 1) Shared memory 2) Message Passing.

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6) Protection mechanism helps to protect these system calls by providing the protection among them.

Module 2

3) @ Inter process communication is a type of system call facilitates the direct connection ~~between the user and operating system.~~ or communication with other process.

There are 2 Types of communication:-

1) Shared memory.
2) Message Passing.

1) Shared Memory

* The memory of the shared data is transferred by the communication processes, into which the writing or read on the memory.
* It is useful for sharing the large amount of data.
* The system call is used when you wanted to create a shared memory.
* The communication is faster, it there is no system call.

2) Message Passing

* The ~~Free~~ Exchange of data between the processes to read and write using objects.

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* It is useful while transferring the small block of data.
* The system call is used always during the writing or read on the memory.
* The communication is slower.

3.(b) Multithreading Model

for the supporting purpose of the thread ~~we~~ will be provided.

i) The user level for user thread.
ii) By kernal for kernal thread.

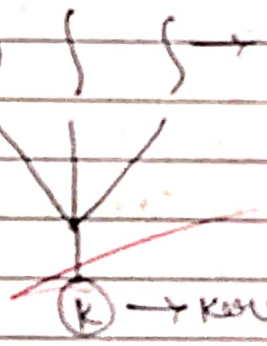
The relationship between the user thread and kernal thread is accomplished by three model:-

i) Many to one model.
ii) One to One model
iii) Many to Many model.

* The kernal thread are directly managed by the OS.

i) Many to One model

Here, the user thread mapping down to the one kernal thread



Advantage:

* For the thread we have the thread library hence the threads are efficiently available.

Disadvantage:

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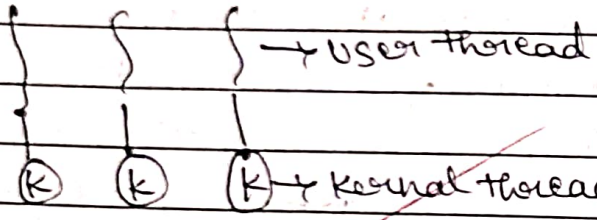
* unable to run the multiple thread in parallel in multiprogramming.
* If the System blocks the computing execution call then the entire process will collapse.
Ex:- GNU Portable thread, Solaris Green thread.

2) One to one model

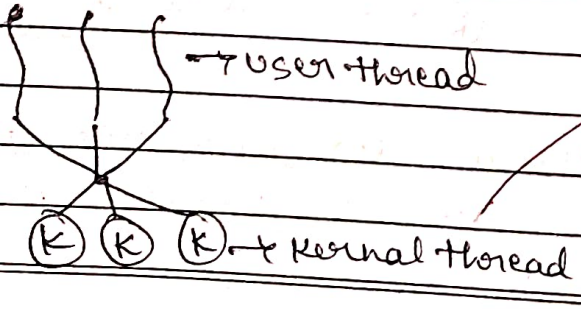
The one user thread mapped to the one seperate kernal thread.



Advantage :-
* able to run the multiple thread in parallel.
* If the process System blocks then the entire process will not be collapsed.

Disadvantage :-
* User use the ~~ke~~ User thread by creating the corresponding kernal thread.
Ex :- Linux.

3) Many to Many model :
Here, the user thread complexed to the number of kernal thread.



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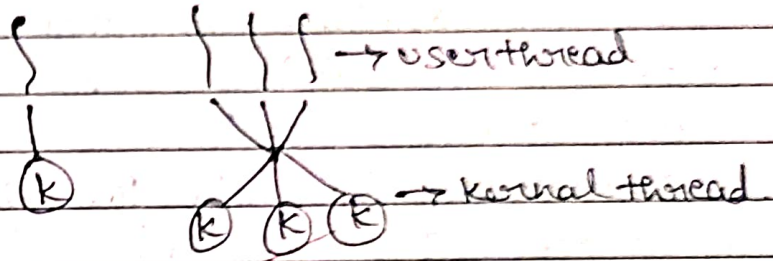
Two level thread

* The variation in the many to many model is referred to as Two level thread



Advantage:-

* Able to run the multiple thread in parallel.

Quiz

1) (a) fork
2) (c) When process is using the CPU. ✓
3) (a) communication within the process. ✗
4) (b) Program counter. ✓
5) (b) 5 ✓