

2C330334

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Program
TEST 31

Software Test TEST - 01
 - Standardization of Analysis till 2020
 with module - 1

2. - Virtual Machine

a) Virtual Machine

- Virtual Machine is a technique using which the system can use many types of OS.
- There may be a host OS and the guest OS. In the traditional OS type, a system usually contains only one type of OS implementation but using Virtual OS we can have more than one OS in the system installed to make our tasks easy.

Processor	Program	Implementation	VM1	VM2	VM3
Processor	Program	Implementation	Process1	Process2	Process3
Processor	Program	Implementation	VM1	VM2	VM3
Processor	Program	Implementation	Virtual Machine		
VMware				Implementation	
Hardware					Hardware
		Kern			

D	D	M	M	Y	Y	Y	Y

In other words virtual machine uses the principle of abstraction. Abstraction is nothing but hiding the details and displaying only the essential or required details on the system.

Here the background details of having a totally different OS in the system is abstracted and only the essential details that are needed for the user are displayed.

The very good example of the Virtual machine is the Oracle Virtual box. Using this software the system having windows as the host operating system we can also install an alternative Operating System such as Ubuntu on the system.

Using Virtual machine the system will behave like two or different systems totally having the functions of the different operating Systems separately. Using this system of Virtualization has many benefits.

- The system can utilize the benefit of using 2 or more operating Systems while having only one computer.
- The virtualization concept helps the user to reduce the amount of

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hardware required for multiple system.

Therefore it reduces the cost.

The scalability of Virtual machines is more.

The Virtual machine as said uses the concept of guest OS and host OS.

Therefore the host OS being the important or the main OS in the system has access to all the software and directories and files in the system, by using the Virtual machine concept we can also utilize the soft files and documents in host OS.

If the host Operating system has any issue or problem causing virus in the system it usually does not affect the guest OS.

The protection and security is one very important property when it comes to Operating System and here using Virtual machine OS we can also get the guest OS password protected and Increase the security

One very important and good example of Virtual machine is JVM

i) JVM

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* JVM - Java Virtual Machine

Java Virtual Machine provides an environment for the Java programs to be executed.

JVM - Java Virtual Machine

D	D	M	M	Y	Y	Y	Y

2 b) System Calls

System Calls are the various calls or commands given to the system for its working.

The Any process to be executed in a system needs to be called for its use.

There are many types of System Calls.

- 1) Process Control
- 2) Device Management
- 3) File Management
- 4) Instruction Management / Manipulation
- 5) Communication Systems
- 6) Protection

1) Process Control

This type of system call is used to establish the controls for a process.

• end, abort

- create process, terminate process
- get process attributes, set process attributes
- read, write

The calls like above mentioned end, abort, create process, terminate process etc. are used for process control.

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Every process in a System needs to be created and terminated using the System calls.

The process needs to be ended if it is completed or in some case abruptly ended or aborted due to some technical issues.

The other functions such as set and get process attributes are used to utilize the attributes of a process.

Ex : Windows - CreateProcess()

TerminateProcess()

Unix - Fork(), exec()

2) Device Management

Devices should be managed in a system using the device management or manipulation System calls.

Some of the calls are:

create

end, abort

get device attributes, Set Device attributes

read, write

Some of the above mentioned calls are used for device management in OS.

The devices need to be establishing a connection to the os

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To establish that connection and utilize the resources of the device and OS this type of system call is used.

3) File Management

To manage or manipulate the files in a system we have a set of system calls called the file management system calls.

- create file
- terminate file
- read file
- write file
- get file attributes
- set file attributes

The above are some of the system calls used for file management in OS. These files in the OS need separate system calls for its creation, termination. To read or write data from or into the file also we have a separate set of system calls called & read file or write file.

The attributes of a file can be accessed using get file attributes & set file attributes system calls.

Ex: `create file()`, `read file()`, `fopen()` & `fclose()`

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4) Information Management

The information in the system is also managed or manipulated using a separate set of system calls called the Information management System call.

get information attributes set information attributes
end assert
read write

These are some of the system calls used for this purpose.

The information in a system is written or read using calls.

The Information System calls is used to store data and access it.

5) Communication,

Communication is an essential component of System calls.

Any process can be executed only after establishing a communication channel or link.

The communication can be done using 2 types of process communications.

Shared memory and message Passing

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Shared memory uses minimum number of system calls because it has a dedicated shared memory location to do that. Message passing uses more system calls.

6) Protection

Protection is the most important property of any OS.

A user needs to get his OS protected from malware or viruses and from hackers.

For this password protection is used.

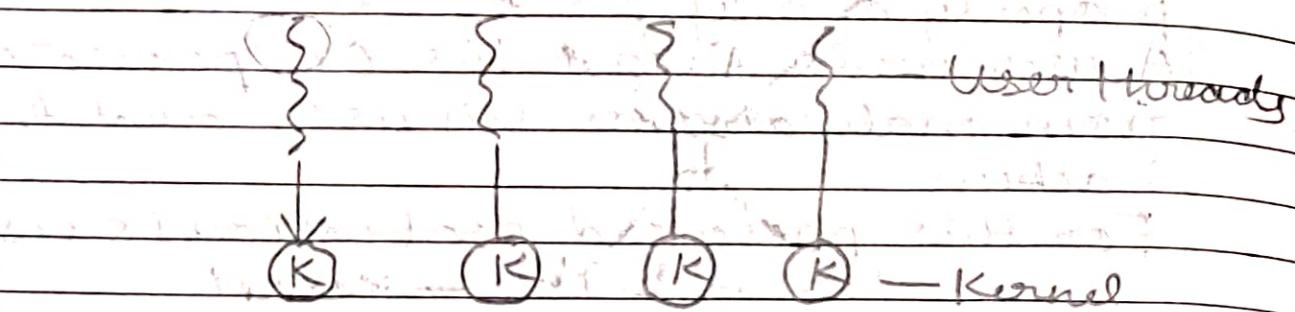
D	D	M	M	Y	Y	Y	Y

Module - 2

3 b) Multi threading models

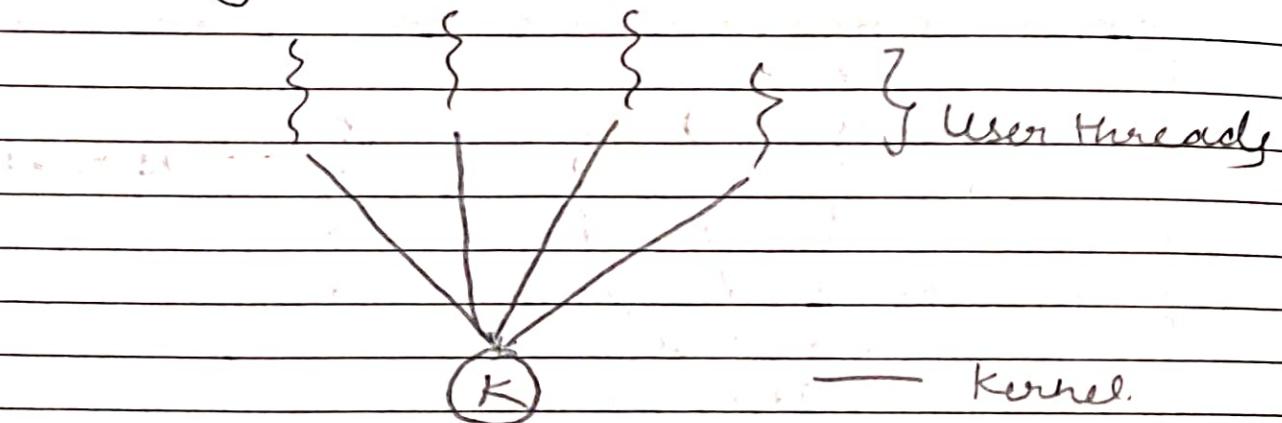
i) One to one model

In this type one user thread is connected to one kernel thread.



ii) Many to One model

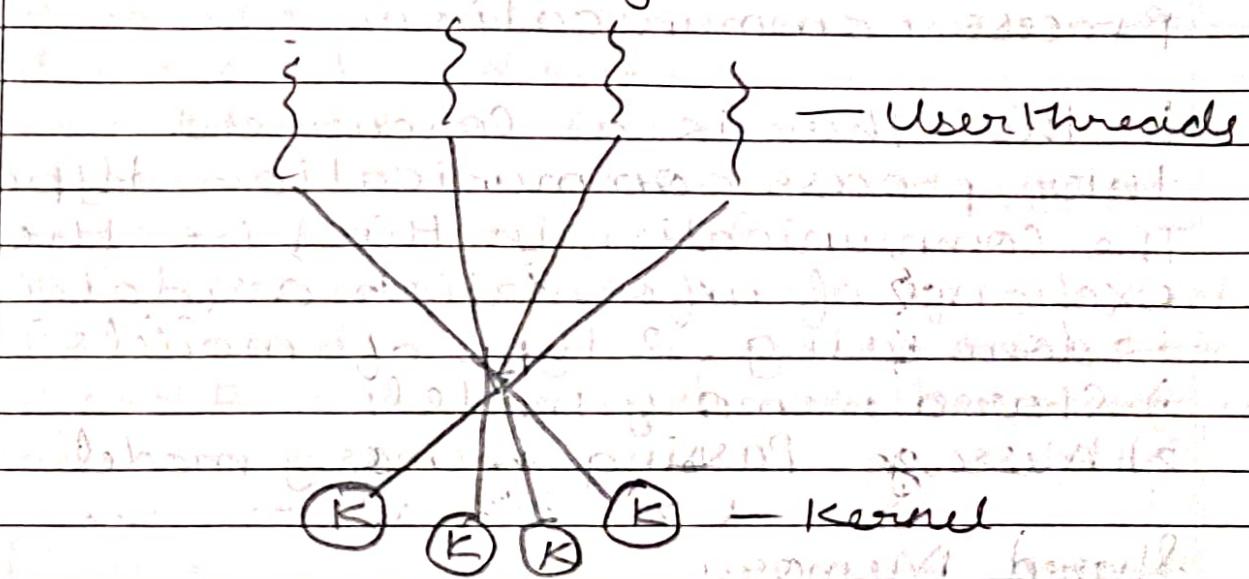
In this type many users ^{threads} are connected to only one kernel.





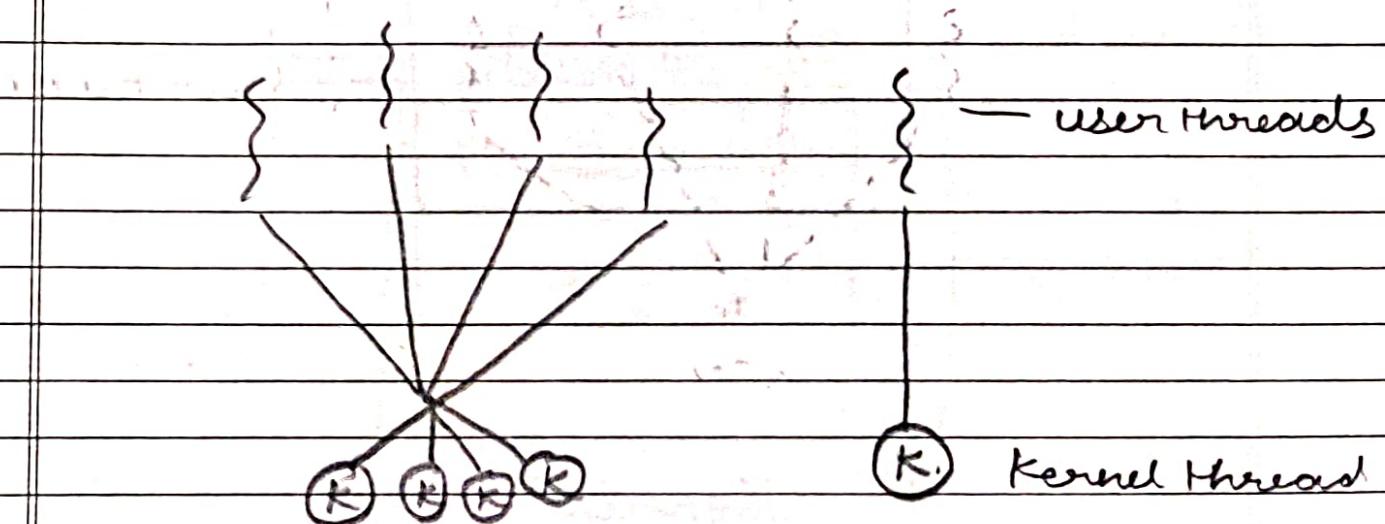
3) Many to Many

In this type many user threads are connected to many kernels



Two level model

It is extension of M:N but in this each user thread has dedicated link



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3a) Inter Process Communication

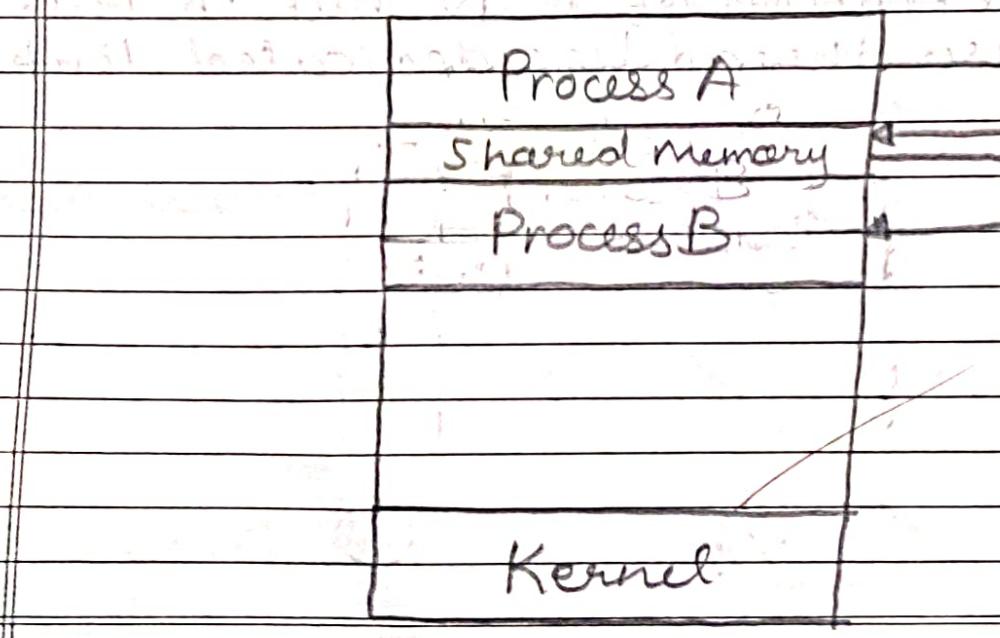
The communication between processes can be established using Inter Process communication

In this there is a Concurrent Inter process communication type. The communication in this, i.e. the exchange of information or data is done using 2 types of models.

- 1) Shared memory model
- 2) Message Passing memory model

Shared Memory

In this type we have a dedicated shared memory location.



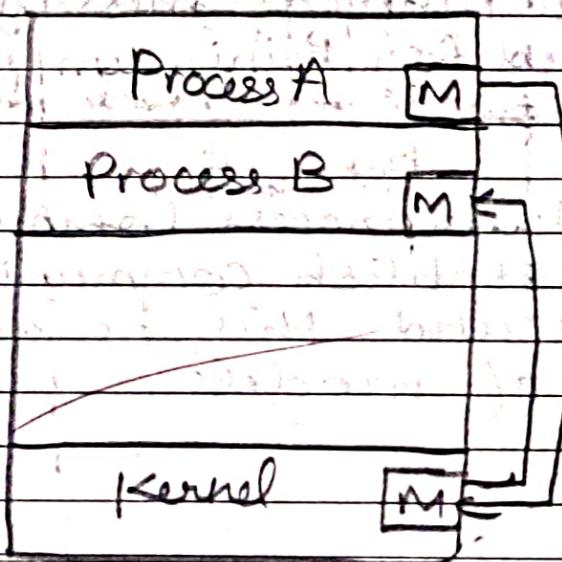
D	D	M	M	Y	Y	Y	Y

In this type of model if a Process A wants to communicate with process B. There is a shared memory which helps to do that. The process A sends the instruction or information to the shared memory where it is stored. The process B then goes to the shared memory and accesses the information sent by A.

It has very minimum system calls. The Shared memory gives access to both process A and B thereby making the communication easy.

Message Passing

This message passing model uses multiple system calls to send and receive the messages.





In this type the M is the message to be sent.

The process A if it wants to communicate with process B it sends the message to the kernel and then the message is sent there. The process B comes to the kernel reads the message and takes it.

So the kernel is used completely for the communication in this type of model.

Since there is so much instruction to be passed and sent it can uses the kernel so there are more systematically used in this type of model.

Shared memory can be used when there are more number of instructions to be shared whereas message passing can be used for minimum number of information.

Therefore Interprocess Communication is used to establish communication between 2 processes and this is done using the 2 types of models.

D	D	M	M	Y	Y	Y	Y

Inter process Communication needs to have protection or security, responsiveness etc to make the process smooth

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1. a) fork

2. a)

3. b)

4. b)

5. d) ~~Z X~~