SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

19ECT312 – EMBEDDED SYSTEM DESIGN

III YEAR/ VI SEMESTER

UNIT 4 : EMBEDDED OPERATING SYSTEM AND MODELING

TOPIC 4.2 Inter Process Communication

INTER PROCESS COMMUNICATION

Inter process communication in embedded system

- Interprocess communication is the mechanism provided by the operating system that allows processes to communicate with each other
- This communication could involve a process letting another process know that some event has occurred or the transferring of data from one process to another

INTER PROCESS COMMUNICATION - Types

Types of Process

Independent process

- An independent process is not affected by the execution of other processes
- Independent processes are processes that do not share any data or resources with other processes

Co-operating process

- Interact with each other and share data or resources
- A co-operating process can be affected by other executing processes
- Inter-process communication (IPC) is a mechanism that allows processes to communicate with each other and synchronize their actions
- The communication between these processes can be seen as a method of cooperation between them.

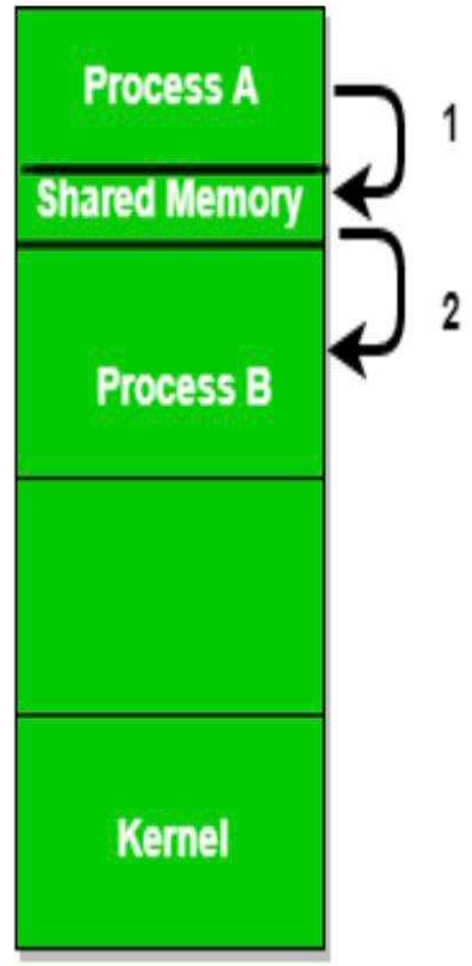
INTER PROCESS COMMUNICATION

The two fundamental models of Inter Process Communication

1. Shared Memory
2. Message Passing

SHARED MEMORY

- Communication between processes using shared memory requires processes to share some variable
- Suppose process1 and process2 are executing simultaneously, and they share some resources or use some information from another process
- Process1 generates information about certain computations or resources being used and keeps it as a record in shared memory
- When process2 needs to use the shared information, it will check in the record stored in shared memory and take note of the information generated by process1 and act accordingly
- Processes can use shared memory for extracting information as a record from another process as well as for delivering any specific information to other processes

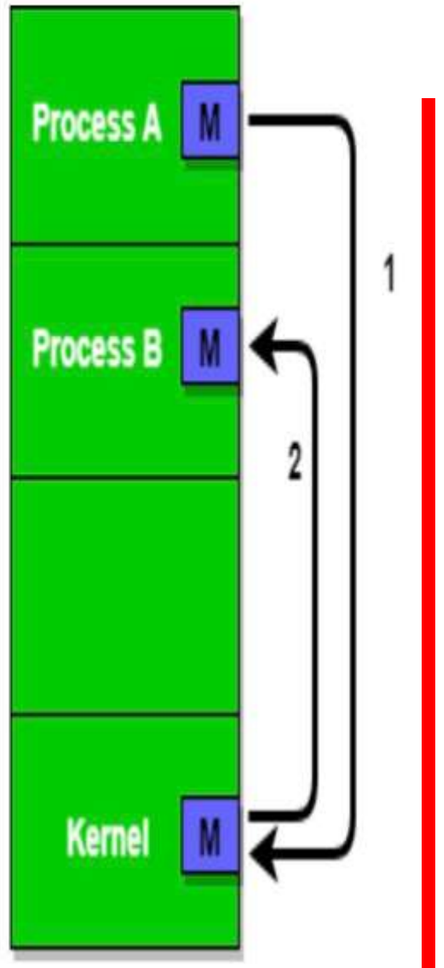


Message Passing

- Shared memory is a memory shared between all processes by two or more processes established using shared memory
- This type of memory should protect each other by synchronizing access between all processes
- Both processes, like A and B, can set up a shared memory segment and exchange data through this shared memory area

Shared memory Applications

- It is a way of passing data between processes
- much faster
- more reliable
- Shared memory allows two or more processes to share the same copy of the data.
- Suppose **process A** wants to communicate with process **B** and needs to attach its address space to this shared memory segment
- Process A will write a message to the shared memory, and Process B will read that message from the shared memory
- So, processes are responsible for ensuring synchronization so that both processes do not write to the same location at the same time.



Interprocess Communication Approaches

Advantages of IPC

- High efficiency and flexibility
- leading to better overall system performance
- span multiple computers or networks.

Disadvantages of IPC

- Increases system complexity
- Requires careful management of system resources
- lead to data inconsistencies if multiple processes try to access or modify the same data at the same time

THANK YOU