INTER-PROCESS COMMUNICATION

Interprocess Communication or IPC provides a mechanism to exchange data and information across multiple processes, which might be on single or multiple computers connected by a network . Typically, applications can use IPC, categorized as clients and servers.

A process can be of two types:

- **Independent process.**
- **Co-operating process.**

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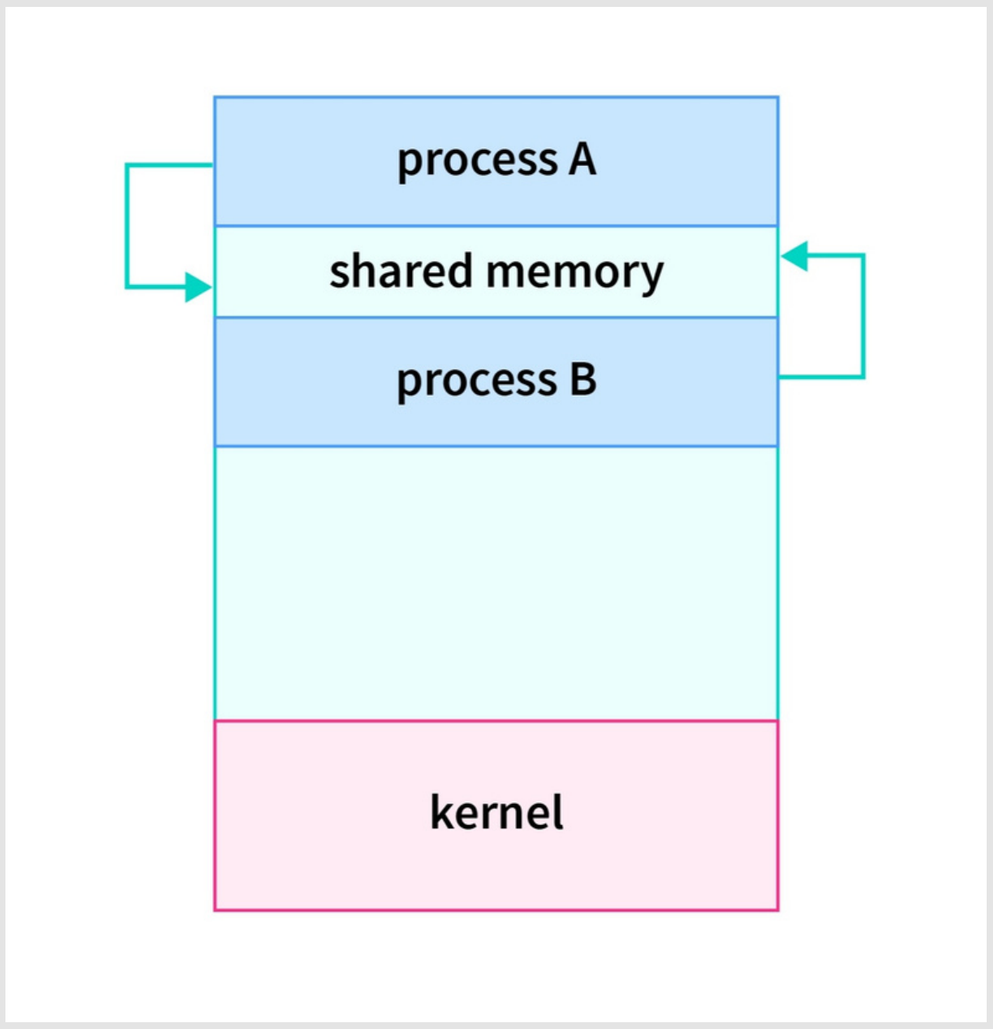
SHARED MEMORY

Shared memory is a memory shared between two or more processes. Each process has its own address space; if any process wants to communicate with some information from its own address space to other processes, then it is only possible with IPC (inter-process communication) techniques.

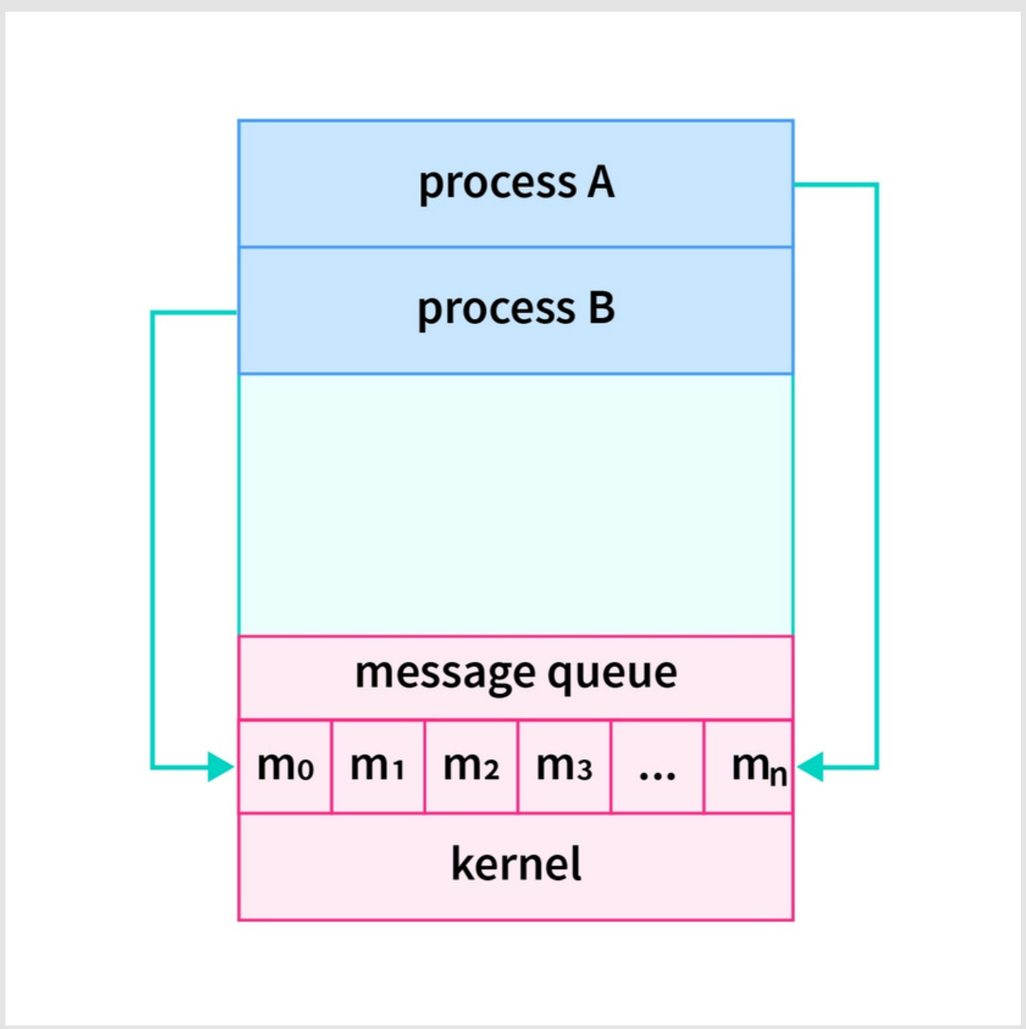
DIAGRAM



MESSAGE PASSING

Message passing model allows multiple processes to read and write data to the message queue without being connected to each other. Messages are stored on the queue until their recipient retrieves them. Message queues are quite useful for interprocess communication and are used by most OS.

DIAGRAM



Role of Synchronization in Inter Process Communication

“It is one of the essential parts of inter process communication. Typically, this is provided by interprocess communication control mechanisms, but sometimes it can also be controlled by communication processes..

- These are the following methods that used to provide the synchronization:

1. **Mutual Exclusion**
2. **Semaphore**
3. **Barrier**
4. **Spinlock**

Mutual Exclusion:-
It is generally required that only one process thread can enter the critical section at a time. This also helps in synchronization and creates a stable state to avoid the race condition.

Semaphore:-
Semaphore is a type of variable that usually controls the access to the shared resources by several processes. Semaphore is further divided into two types which are as follows:

1. Binary Semaphore
2. Counting Semaphore

- These are a few different approaches for Inter- Process Communication:

1. **Pipes**
2. **Shared Memory**
3. **Message Queue**
4. **Direct Communication**
5. **Indirect communication**
6. **Message Passing**
7. **FIFO**