SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

19ECT312 – EMBEDDED SYSTEM DESIGN

III YEAR/ VI SEMESTER

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UNIT 4 : EMBEDDED OPERATING SYSTEM AND MODELING

TOPIC 4.2   Inter Process Communication

INTER PROCESS COMMUNICATION

What is 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

➢Synchronization is a necessary part of interprocess communication

➢It is either provided by the interprocess control mechanism or handled by the communicating processes
Examples:

Semaphore
➢ A semaphore is a variable that controls the access to a common resource by multiple processes

➢The two types of semaphores are binary semaphores and counting semaphores.

Mutual Exclusion
➢Mutual exclusion requires that only one process thread can enter the critical section at a time

➢This is useful for synchronization and also prevents race conditions.

Barrier

➢A barrier does not allow individual processes to proceed until all the processes reach it

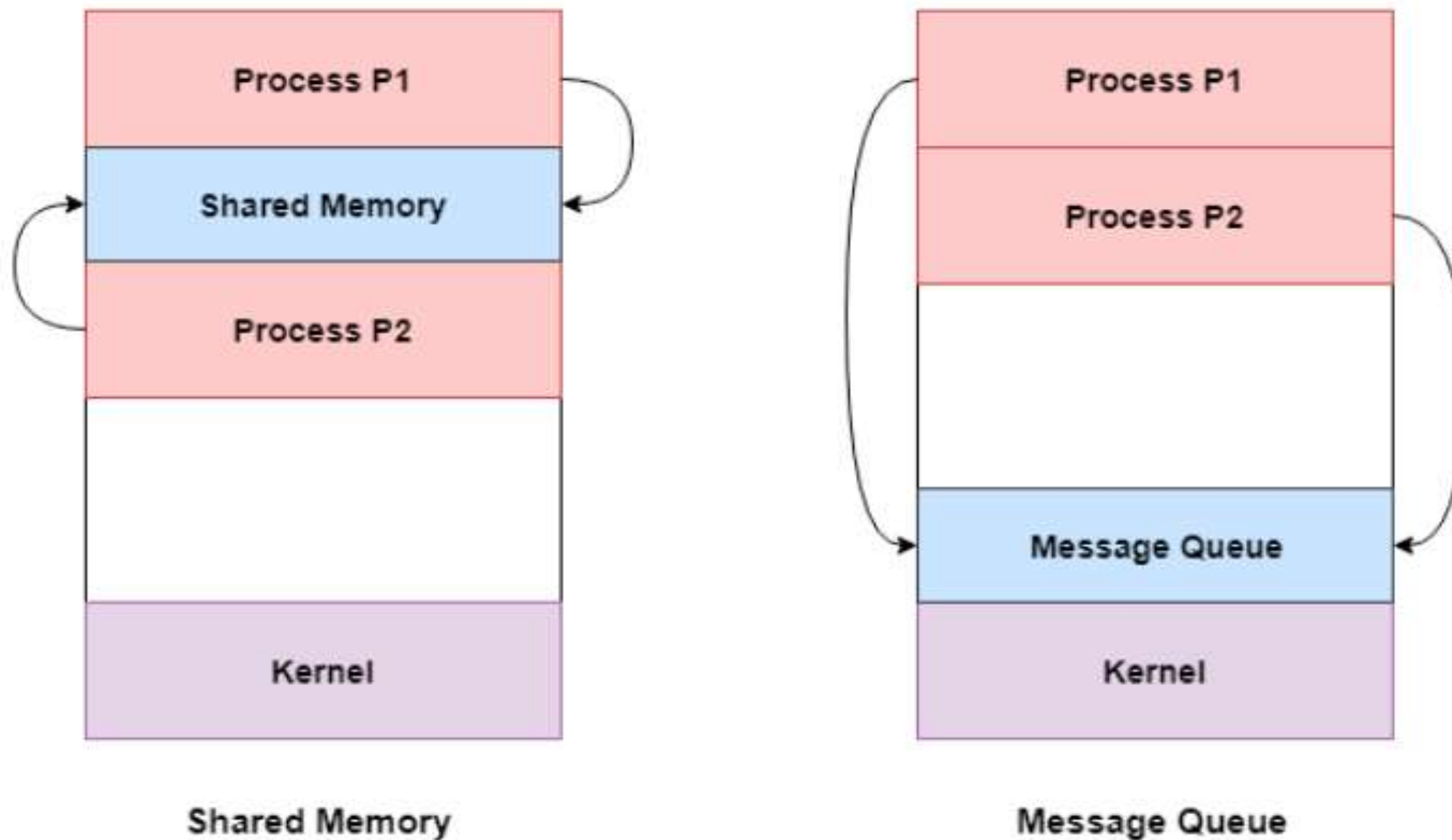➢Many parallel languages and collective routines impose barriers

Spinlock

➢This is a type of lock. The processes trying to acquire this lock wait in a loop while checking if the lock is available or not

➢This is known as busy waiting because the process is not doing any useful operation even though it is active.

Interprocess Communication Approaches

Approaches to Interprocess Communication

Shared Memory

Message Queue

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Interprocess Communication Approaches

Pipe

➢A pipe is a data channel that is unidirectional

➢Two pipes can be used to create a two-way data channel between two processes

This uses standard input and output methods. Pipes are used in all POSIX systems as well as Windows operating systems.

Socket

➢The socket is the endpoint for sending or receiving data in a network

➢This is true for data sent between processes on the same computer or data sent between different computers on the same network

➢Most of the operating systems use sockets for interprocess communication.

File

➢A file is a data record that may be stored on a disk or acquired on demand by a file server

➢Multiple processes can access a file as required. All operating systems use files for data storage.

Interprocess Communication Approaches

Signal

➢Signals are useful in interprocess communication in a limited way They are system messages that are sent from one process to another

➢ Normally, signals are not used to transfer data but are used for remote commands between processes

Shared Memory

➢Shared memory is the memory that can be simultaneously accessed by multiple processes

➢This is done so that the processes can communicate with each other. All POSIX systems, as well as Windows operating systems use shared memory.

Message Queue

➢Multiple processes can read and write data to the message queue without being connected to each other

➢Messages are stored in the queue until their recipient retrieves them. Message queues are quite useful for interprocess communication and are used by most operating systems

THANK YOU