Programación Concurrente

José Roberto Quevedo

What is a Process?

A process is more than the program code, which is sometimes known as the text section. It also includes the current activity, as represented by the value of the program counter and the contents of the processor's registers. A process generally also includes the process stack, which contains temporary data, and a data section, which contains global variables. [1]

Associated concepts

Process State

Process Control Block

What is a Thread?

A thread is a basic unit of CPU utilization; it comprises a thread ID , a program counter, a register set, and a stack. It shares with other threads belonging to the same process its code section, data section, and other operating-system resources, such as open files and signals. [1]

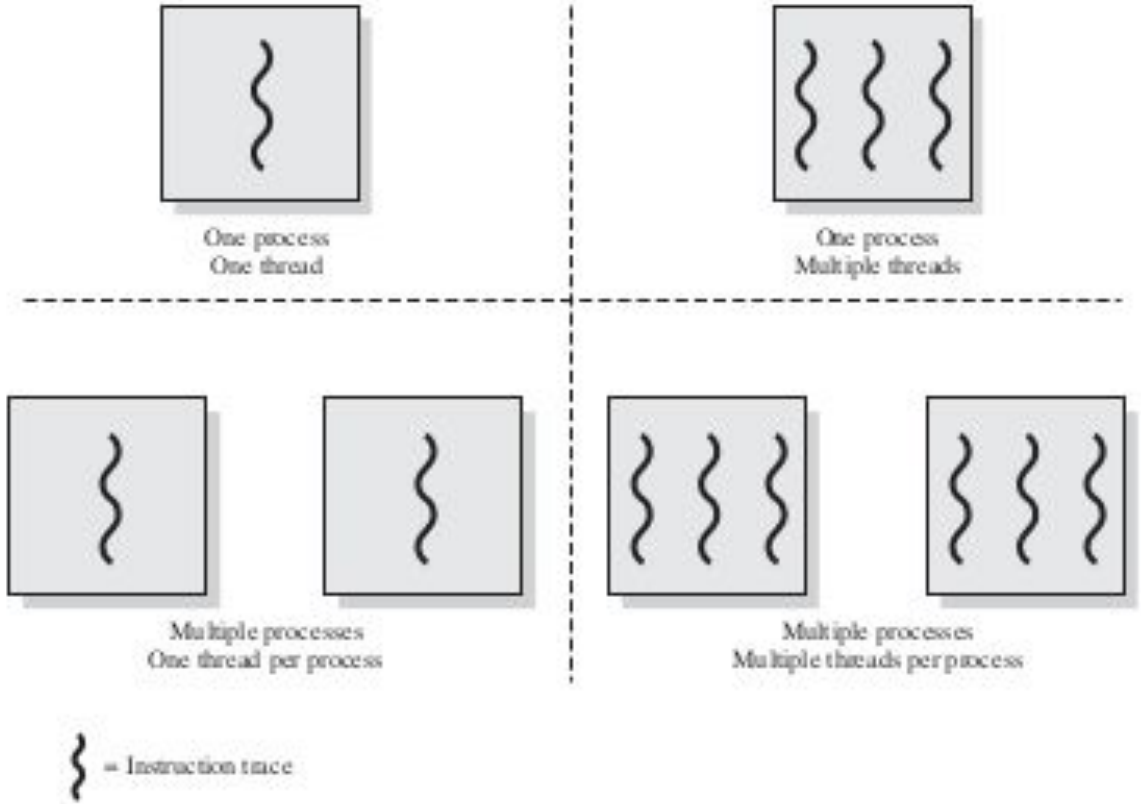

Figure 4.1 **Threads and Processes [ANDE97]**

Critical Section

Consider a system consisting of n processes {P_0, P_1,..., P_{n-1}}. Each process has a segment of code, called a **critical section**, in which the process may be changing common variables, updating a table, writing a file, and so on. [1]

Critical Section

The critical-section problem is to design a protocol that the processes can use to cooperate. Each process must request permission to enter its critical section. The section of code implementing this request is the entry section. The critical section may be followed by an exit section. [1]

Critical Section

1. Mutual Exclusion
2. Progress.
3. Bounded waiting

Semaphore

A semaphore S is an integer variable that, apart from initialization, is accessed only through two standard atomic operations: wait() and signal() . [1]

In java are Called acquire() and release().

EJEMPLOS

Bibliografía

[1]A. Silberschatz, P. Galvin and G. Gagne, Operating system concepts, 9th ed. Wiley, 2013.