Lecture - 19
BDL

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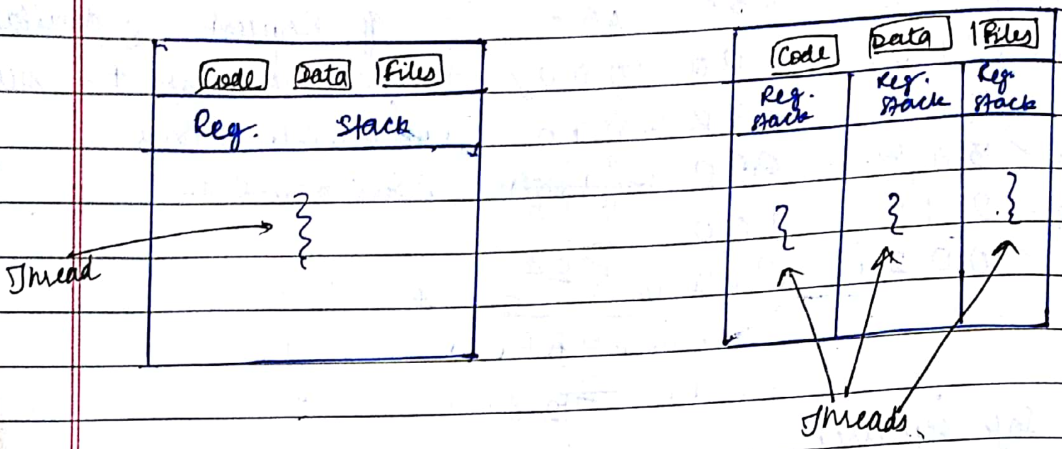
Threads



Thread -
It is the basic unit of process used for CPU utilization consisting of thread-id, program count, register set and the stack.

Advantage of thread over multiple processes -
1) Context switching
2) Sharing (of resources)

Disadvantages of thread over multiple processes -
1) Blocking
2) Security

Types of threads -

User-level thread - It is implemented in user level libraries ~~rather than via system calls~~., so thread switching doesn't need to call OS

Advantages -
It doesn't require modification to OS.
Each thread is represented by a PC, registers, stack and a small control block, all stored in the user process ~~state~~ address space
Creating a thread, switching b/w threads and synchronization b/w threads can all be done without any intervention of the kernel.

- Thread switching is not much more expensive than a procedure call.
- Lack of coordination b/w threads and OS kernel.
- ∴ a process as a whole gets one time slice irrespective of ~~another~~ whether the process has one thread or thousand threads.
- This time the threads require non blocking system call. Otherwise entire process will block within the kernel even if there are runnable threads left in the process.

Difference b/w threads and process

- Unlike processes, threads are not independent of one another
- Unlike processes, all threads can access every address in the task.
- Unlike processes, threads are designed to assist one another.

Similarities

- Like processes, threads share CPU and only one thread is active at a time.
- Like processes threads can create children
- Like processes threads within a process execute sequentially
- Like processes, if one thread is blocked, another thread can run.