Lecture-4

B Du

classmate
Date 29/01/18
Page

Process scheduling (CPU scheduling)

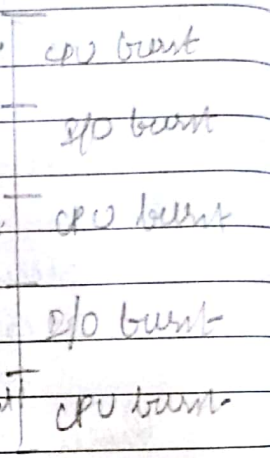
In a time-shared multiprogramming system, process scheduler selects the best available process to make it look as if the switchings and operations are not distinguishable to user.

CPU burst time - amt. of time, a process uses the CPU

I/O burst time - amt. of time, particular process spends for I/O operations.

CPU bound process - generates I/O rqsts, infrequently, more computation.

I/O bound process ↓ spends more time on I/O than on computations.



CPU bound processes may have large CPU bursts, whereas I/O bound processes may have many short CPU bursts.

not usually found ← Long term scheduler - uses a good process mix of I/O bound and CPU bound processes.

usually found ← Medium-term scheduler - Advantageous to remove a process from memory and bring back later decreasing the degree of multiprogramming. This is called Swapping scheme.

CPU scheduling performed to prevent CPU from sitting idle as when -

- a process is waiting in ready list.
- a process goes from running to blocked state.
- a process goes from blocked to ready state.

Short-term scheduling (CPU scheduler)

- Non-preemptive scheduling

A scheduling discipline is non-preemptive if once the CPU has been allocated to the process, the process keeps the CPU until it releases the CPU either by terminating or switching to the waiting state.

- Preemptive scheduling

Once the CPU has been allocated to a process, the process keeps the CPU until it releases the CPU by forcefully switching to the ready state.

Context switching

It is the activity of the process to store and restore the state or context of a CPU in PCB, so that the process execution can be resumed from the same point in future.

Scheduler → i/p → waiting processes

- Short term
- Long term
- Medium term

o/p → order of giving CPU control

i/p

Dispatcher - The module that gives control of the CPU to the process selected by scheduler.

Dispatch latency - The time dispatcher takes to stop one process and start another running is known as the dispatch latency.

Functions of dispatcher involves.

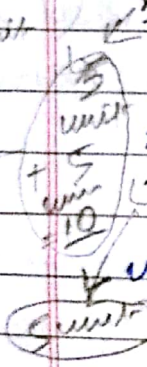
- switching context
- switching to user mode
- jumping to the proper loc^2 in the user program to restart that program.

CPU scheduling criteria

1. CPU utilization
2. Throughput
3. Turnaround time
4. Waiting time
5. Response time
6. Service time

A process always ends with a CPU burst, never with an I/O burst

1. CPU utilization - We want to keep CPU as busy as possible. In real system, it ranges from 40% (lightly loaded) to 90% (heavily loaded system).
2. Throughput - No. of processes completed per unit time.



3. Turnaround time - The amount of time a process requires to complete it task. Time interval from the time of submission to the time of completion.
4. Waiting time - The amount of time, a process waits in the ready queue.
5. Response time - Time from submission of request to first response (in an interactive system)
6. Service time - How much time a process uses the CPU. Also called CPU burst time.