



SNS COLLEGE OF TECHNOLOGY

Kurumbapalayam (Po), Coimbatore – 641 107

An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with A Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

COURSE NAME : 23CST202-OPERATING SYSTEMS

II YEAR / IV SEMESTER

Unit 1-OVERVIEW AND PROCESS MANAGEMENT

Topic : Process Concept

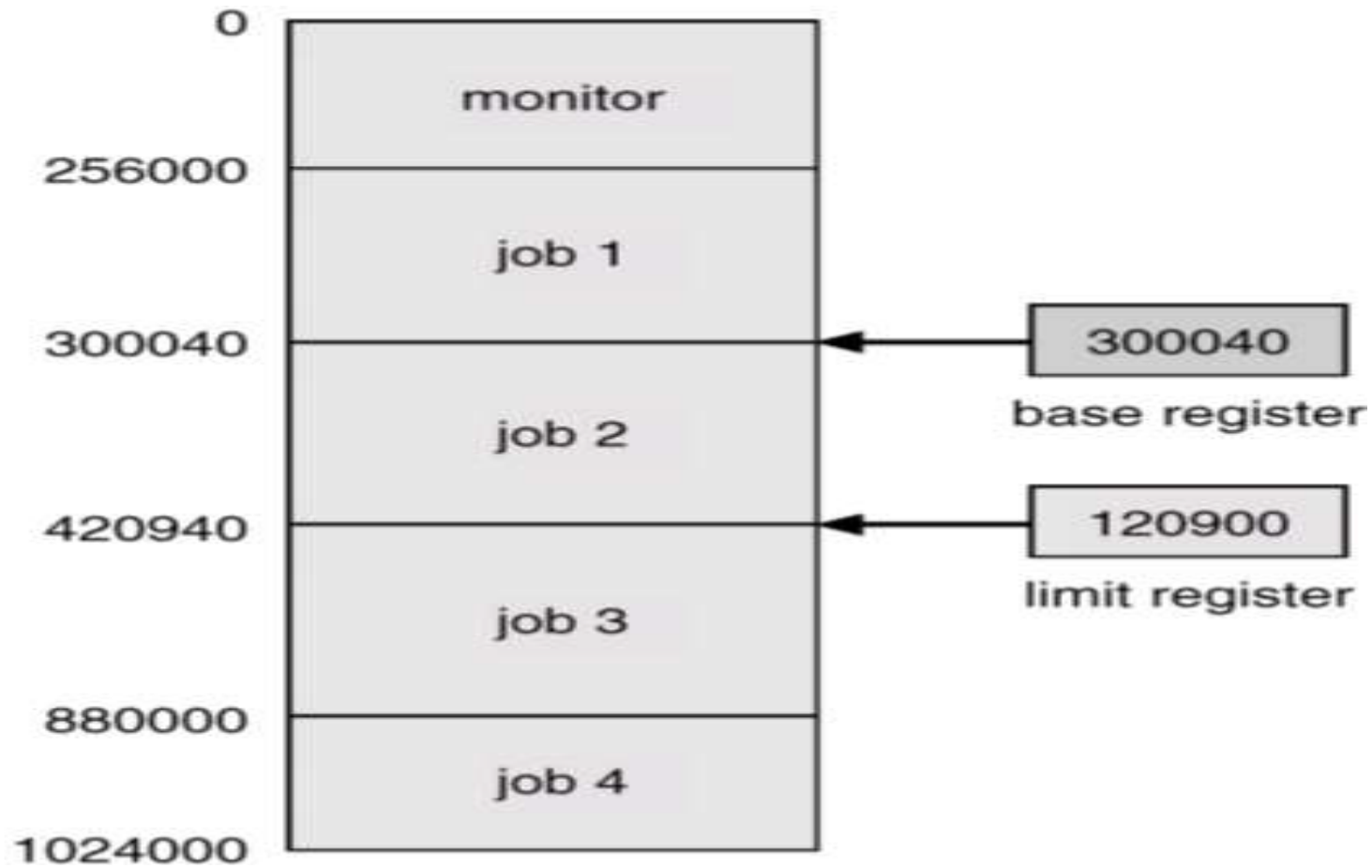
Process Concept



An operating system executes a variety of programs:

- ☞ Batch system –jobs
- ☞ Time-shared systems –user programs or tasks
- Textbook uses the terms *job* and *process* almost interchangeably.
- Process –a program in execution; process execution must progress in sequential fashion.(program is passive entity, whereas process is an active entity →life form, life)
- A process includes:
 - ☞ Program code
 - ☞ program counter
 - ☞ Contents of processor registers
 - ☞ Stack (process stack containing temporary data such as subroutine parameters, return addresses and temporary variables)
 - ☞ data section (containing global variables)

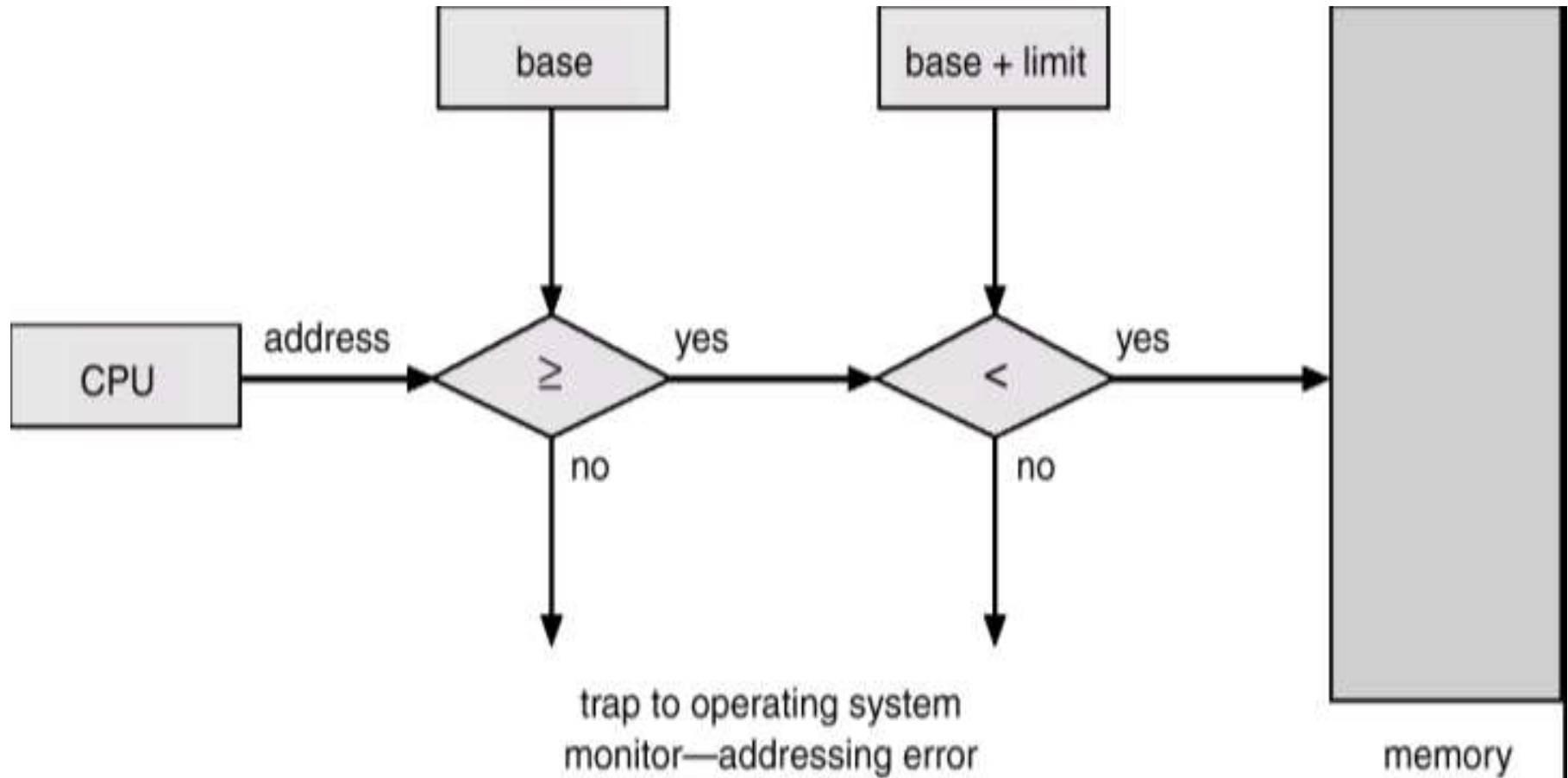
Use of A Base and Limit Register



Hardware Address Protection

300040

$300040 + 120900 = 420940$



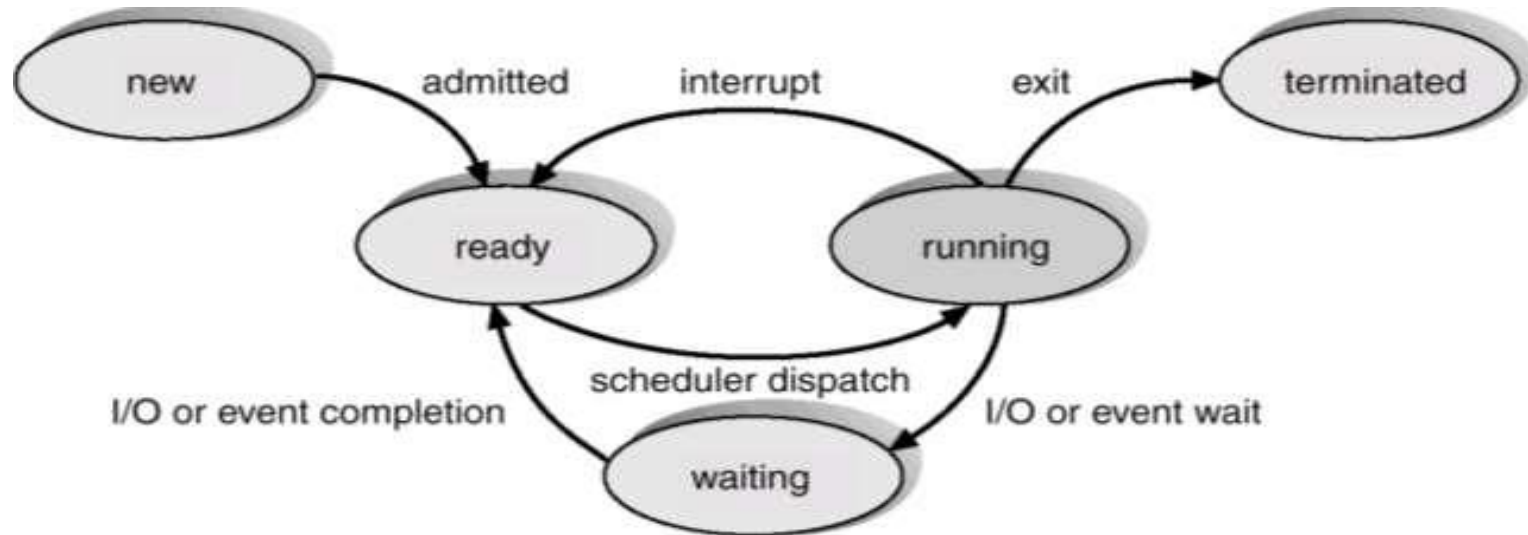
Process State



As a process executes, it changes *state*

- ➔ **new:** The process is being created.
- ➔ **running:** Instructions are being executed.
- ➔ **waiting:** The process is waiting for some event to occur.
- ➔ **ready:** The process is waiting to be assigned to a processor.
- ➔ **terminated:** The process has finished execution.

Diagram of Process State



Interrupt → when time slice/quantum is over

Scheduler dispatch → that is CPU is assigned

Note: only one process can be running on any processor at any instant.

Many process may be ready or waiting however

Process Control Block (PCB)



Each process is represented in the O.S by a PCB (process/task control block)

Information associated with each process.

- Process state (new, ready, running, waiting, halted)
- Program counter
- CPU registers (accumulator, index registers, stack pointer, general purpose register)
- CPU scheduling information (process priority, pointer to next PCB in queue)
- Memory-management information (base register, limit register, page table/segment table pointer)
- Accounting information (amount of CPU or real time used, time limits, jobs or process no.)
- I/O status information (list of i/o devices allocated to this process, a list of open files)

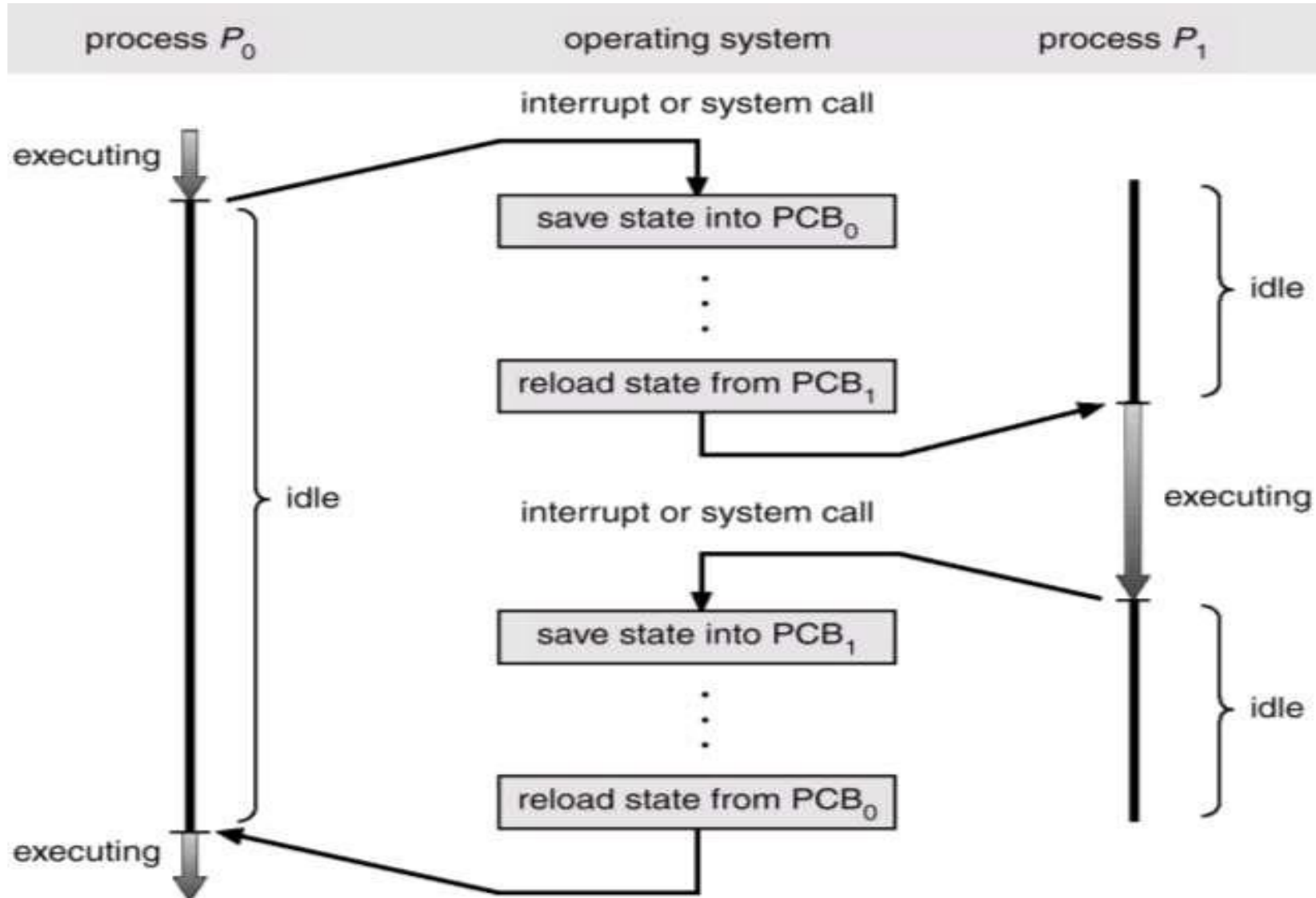
Process Control Block (PCB)

pointer	process state
process number	
program counter	
registers	
memory limits	
list of open files	
⋮	

Pointer : pointer to the next PCB in the list (ready queue)



CPU Switch From Process to Process





THANK YOU