Lecture # 6

Topics: Mode Switch / Full context Switch
        Process States
        Process transitions and State Diagram

Interrupting a Process
- Asynchronous interrupt
- Synchronous interrupt
- System Call

Main processor actions (**mode switch**):
1. It saves the context of the processor.
2. It sets the PC to the starting address of an OS program, the interrupt handler routine. The Interrupt Handler checks the cause of the interrupt and it might service the interrupt. One of the main tasks of the Interrupt Handler Routine is to protect the PCB of the process. Usually it is the only process that can modify information inside the PCB. (In more complicated situation, the Interrupt Handler will call a specific Interrupt Service Routine that will service the Interrupt).
3. Meanwhile the processor switched from the user mode to the system mode.

If the interrupt results in a full Process Switch (**full context switch**)
1. save the context of the processor.
2. update the PCB of the process that is currently in the Running state.
3. move the PCB of this process to the appropriate queue.
4. select another process for execution.
5. update the PCB of the new process.
6. update memory management data structures.
7. restore the context of the processor to that which existed at the time the selected process was last switched out of the Running state.

Process Switch times are pure overhead and are highly dependent on hardware support.

Process States
New - a process that just has been created but has not been yet admitted to the pool of executable processes.
Ready swapped - the process is in secondary memory, but is available for execution as soon as it is loaded into main memory.
Ready (active) - the process is in main memory and available for execution.
Running - the process is currently being executed.
Blocked - the process is in main memory and awaiting an event. The process doesn't have all the resources it needs.
Blocked swapped - the process is in secondary memory and it may wait for an event.
Terminated - the process has finished execution.

State Transitions & State Diagram (covered in class)