PROCESS FUNCTIONS

UNIX System Call:

fork system call creates new process

exec system call used after a fork to replace the process' memory space with a new program

Process Control Block:

In operating system each process is represented by a process control block(PCB) or a task control block. Its a data structure that physically represent a process in the memory of a computer system. It contains many pieces of information associated with a specific process that includes the following.

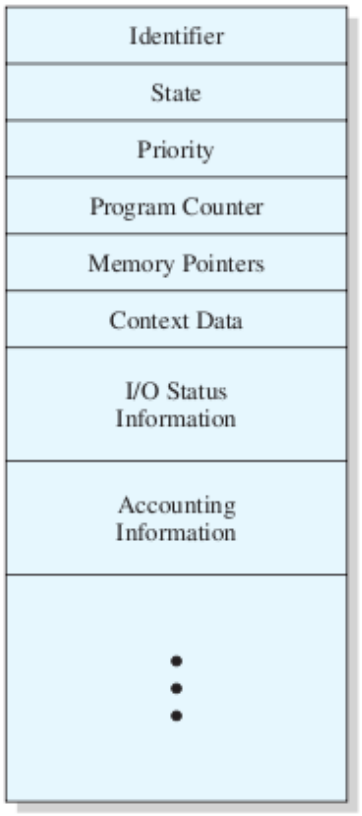

Fig1.2: Process Control Block

- **Identifier**: A unique identifier associated with this process, to distinguish it from all other processes.
- **State**: If the process is currently executing, it is in the running state.
- **Priority**: Priority level relative to other processes.
- **Program counter**: The address of the next instruction in the program to be executed.
- **Memory pointers:** Includes pointers to the program code and data associated with this process, plus any memory blocks shared with other processes.
- **Context data**: These are data that are present in registers in the processor while the process is executing.
- **I/O status information:** Includes outstanding I/O requests, I/O devices (e.g., tape drives) assigned to this process, a list of files in use by the process, and so on.

• **Accounting information:** May include the amount of processor time and clock time used, time limits, account numbers, and so on.

Process Termination:

After a process has been created, it starts running and does whatever its job is: After some time it will terminate due to one of the following conditions.

1. Normal exit (voluntary).
2. Error exit (voluntary).
3. Fatal error (involuntary).
4. Killed by another process (involuntary).

Process States:

Each process may be in one of the following states:

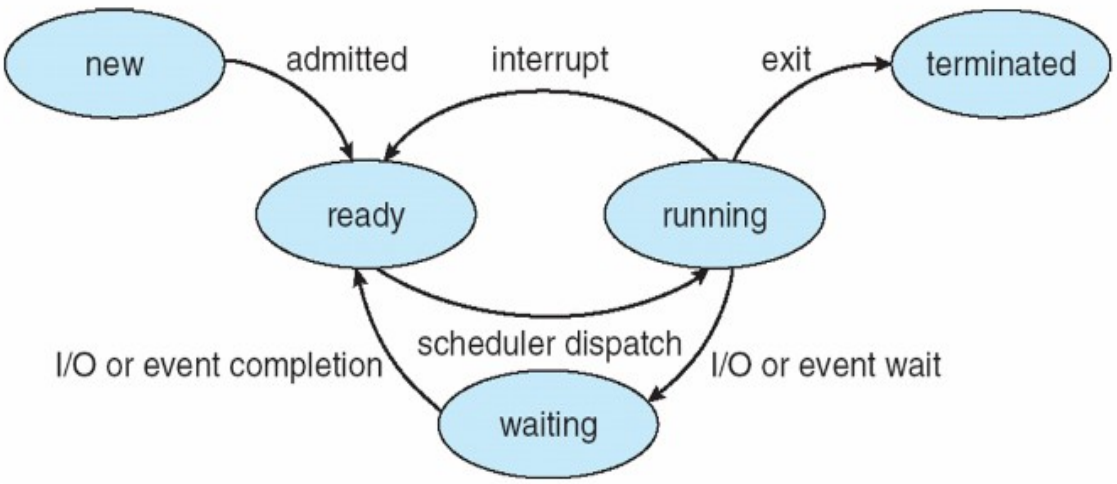

Fig1.3: Process state Transition diagram

- **New**: The process is being created.
- **Running:**Instructions are being executed.
- **Waiting:** The process is waiting for some event to occur (such as I/O completion or reception of a signal)
- **Ready:**The process is waiting to be assigned to a processor.
- **Terminated:** The process has finished execution.

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