OPERATING SYSTEMS

Operating System and Structures

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OS Operations

- The OS operates in **dual mode.**
- **Dual-mode** operation allows OS to protect itself and other system components
- The two modes are **User mode** and **kernel mode**
- The OS manages the mode by setting the **Mode bit** provided by hardware
- The mode bit helps to distinguish whether the OS in kernel mode or user mode
- User mode is when executing harmless code in user applications

OS Operations

- Kernel mode (a.k.a. system mode, supervisor mode, privileged mode) when executing potentially dangerous code in the system kernel.
- Certain machine instructions (privileged instructions) can only be executed in kernel mode.
- Kernel mode can only be entered by making system calls.
- User code cannot flip the mode switch

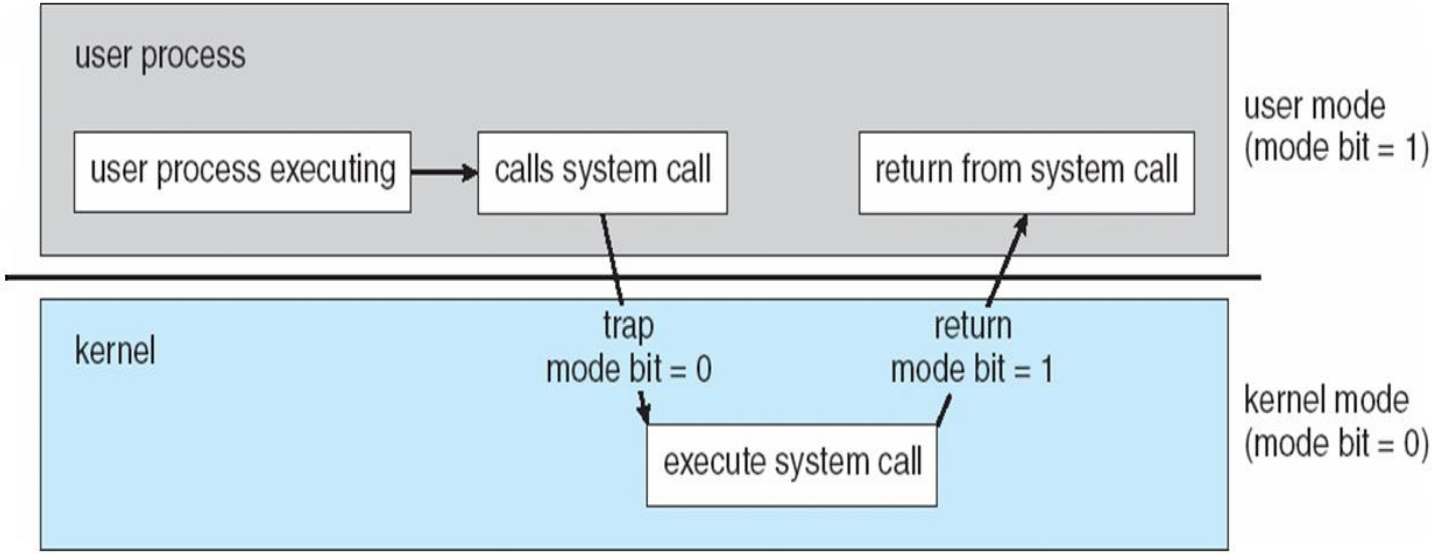
OS Operations

- User Mode
  - Less Privileged
  - Exception can cause single process crash
  - Private virtual address space
- Kernel Mode
  - High Privileged
  - Exception can crash OS
  - Single Virtual address space

Programs frequently switch between both kernel mode and user mode

OS Operations

- Timer will be set to prevent infinite loop / process hogging resources
  - Set interrupt after specific period
  - When counter zero generate an interrupt
  - Operating system increments counter



THANK YOU

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