

The Process

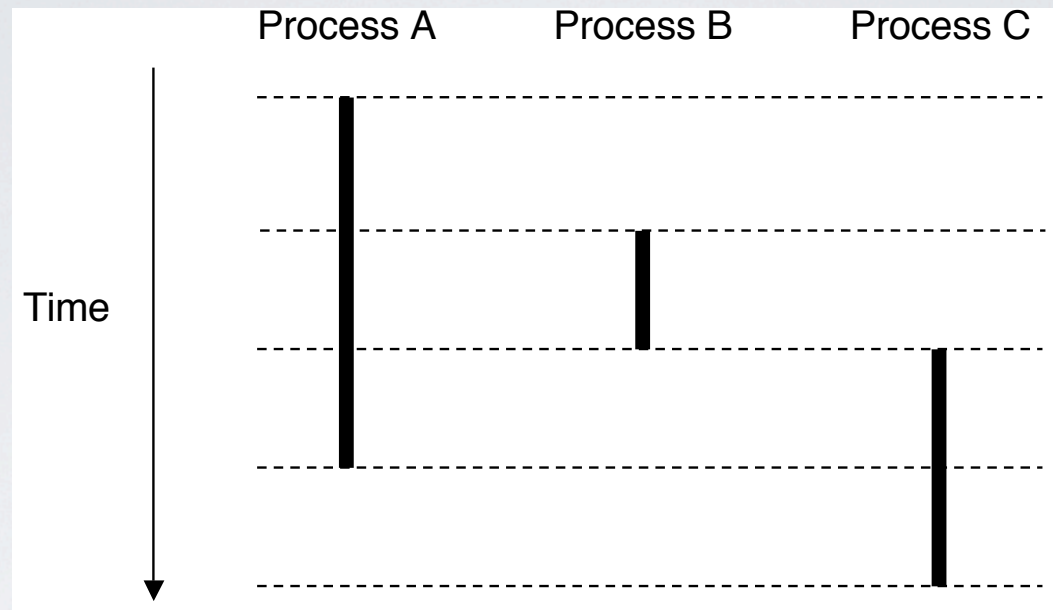
CS351 : Saelee

Objective of the OS

Abstractions

OS = Overhead

Logical control flow

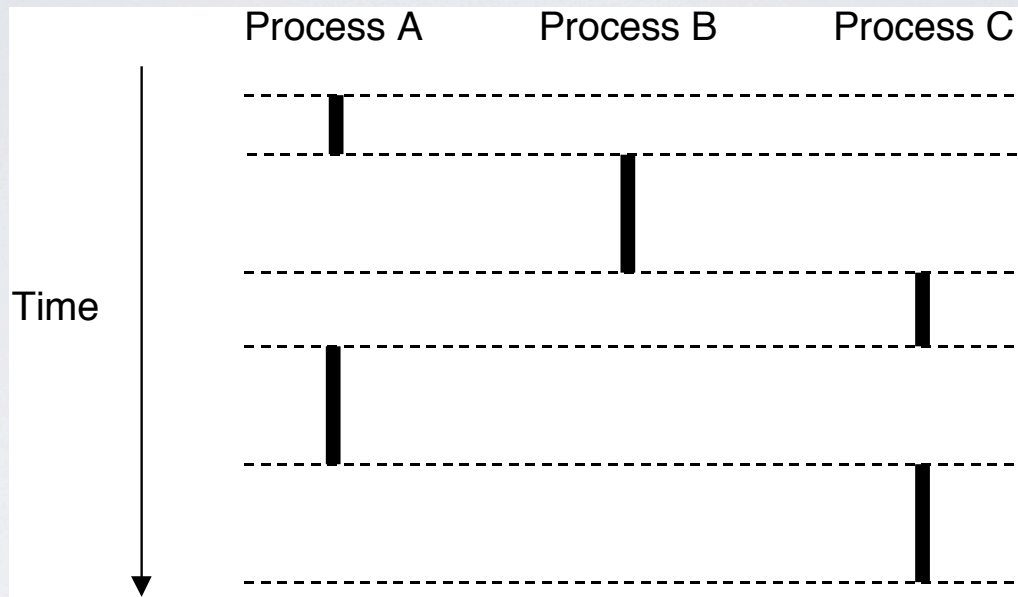


Logical control flow

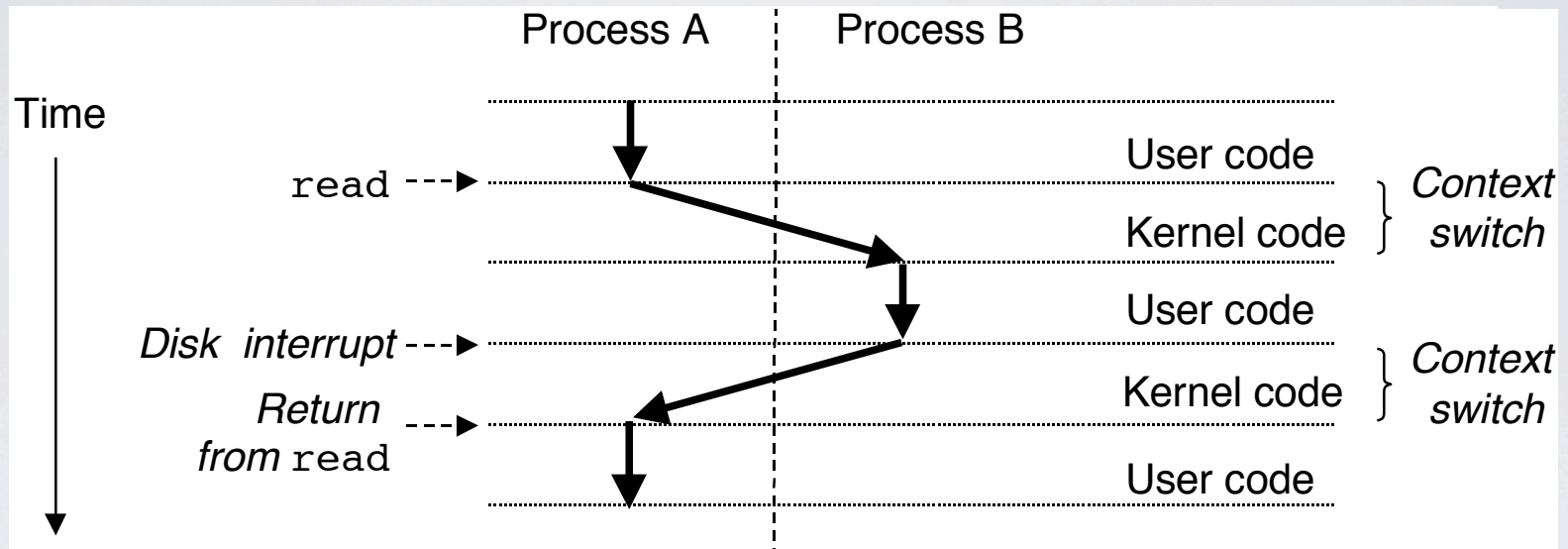
logical “thread” of execution

self-contained

concurrency
(vs. parallelism)



Physical control flow

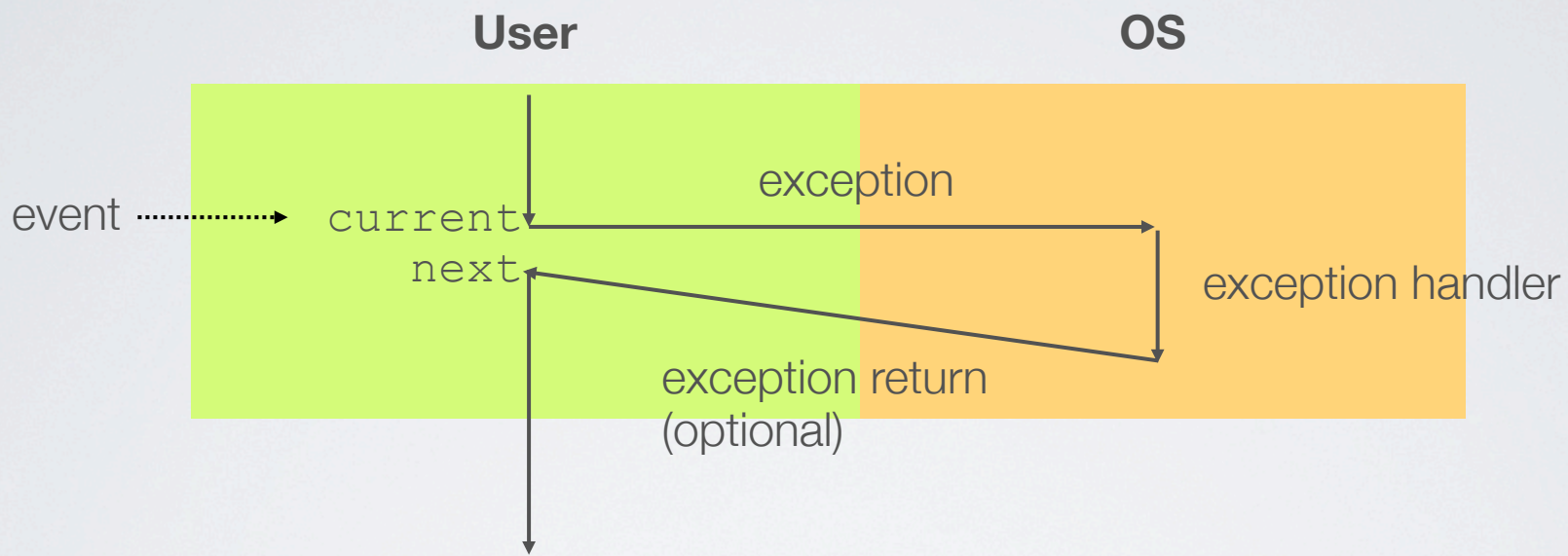


Context switches

driven by exceptions

Exceptional control flow

OS intervention



synchronous exceptions

current instruction

Trap

intentional

return to “next” instruction

e.g., system call

Fault

unintentional

retry or abort instruction

e.g., page fault,
protection fault,
div-by-zero

Abort
unintentional
unrecoverable

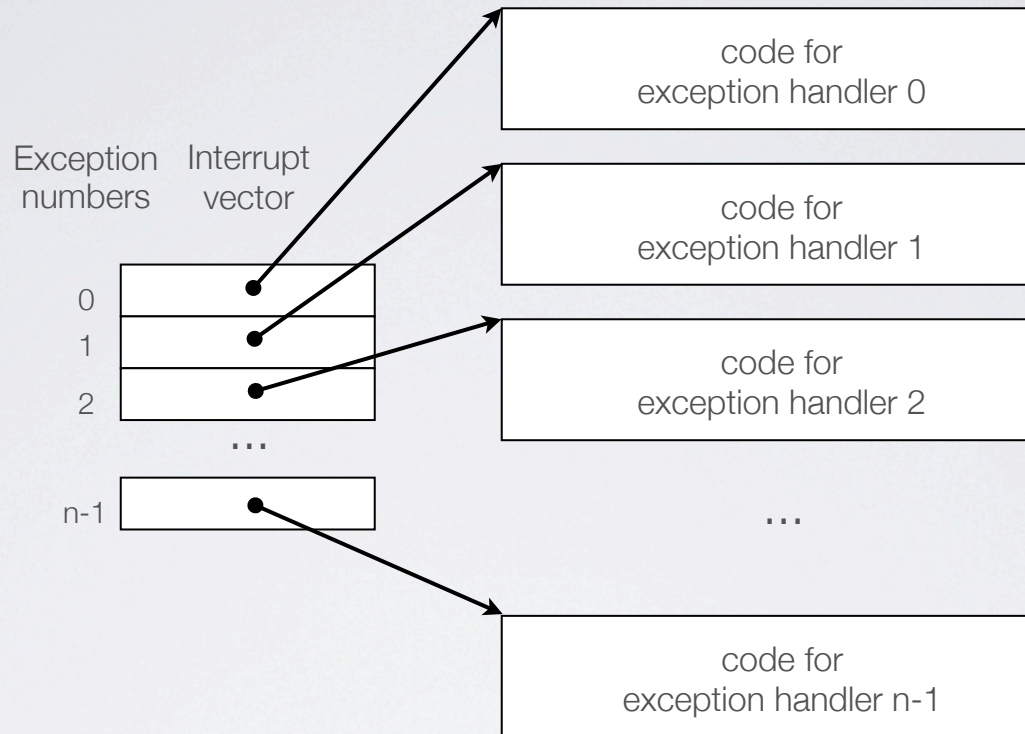
asynchronous exceptions

hardware / software origin

hardware “interrupts”
interrupt pin

e.g., keyboard interrupt,
periodic clock interrupt

e.g., ctrl-C, ctrl-alt-del,
power switch

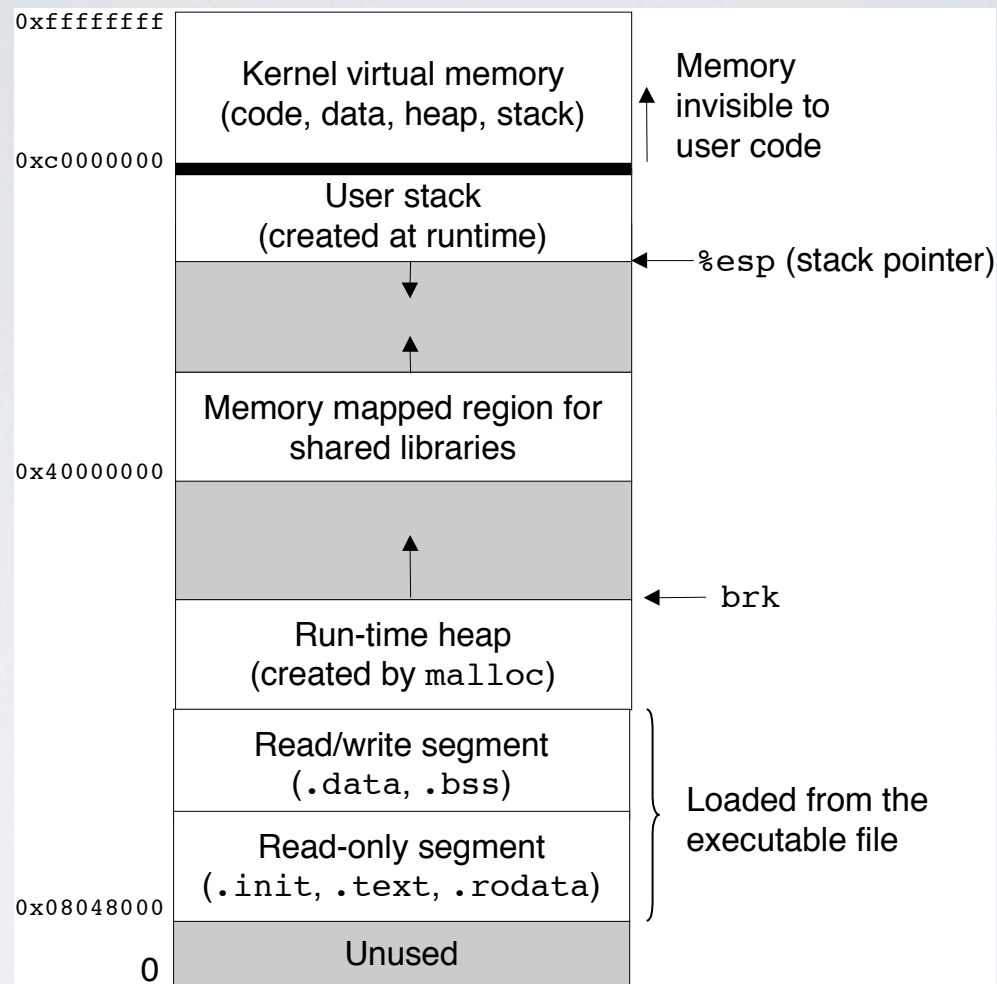


Interrupt vector

vs. polled I/O

software interrupts?
asynchronous notification

Memory Access



Logical address space

“Virtual” memory
array of bytes

Physical memory

Implementation?

Caching Memory “Hierarchy”

Mapping & Allocation

Utilization

Fragmentation

Interprocess communication