CPSC 457
Operating Systems

Lecture 4

Processes and Threads

Last Time

Booting

Types of Operating Systems

Operating System Organization

Processes

Address Space

Files and Files Systems

System Calls

Processes

Program

Code (instructions) in a file

Process

Instructions being executed, with access to data

Multiprogramming and Multiprocessing

Multiprogramming
Make use of the CPU when we're waiting for I/O

Multiprocessing
Psudeoparallelism

Want to react to things in a timely fashion

Process Operations

Process Creation

Process Execution

Process Termination

Process Tracking

Process Scheduling

Process Communication

Process Creation

Process Termination

Process Execution

Process Information

Context Switch

Scheduling

Interprocess Communication

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Break Time

Threads

Light-weight

Sometimes we can use different "threads of execution" in the same address space.

Webserver - Motivation

Server

- Receive Requests — **Fast**
- Open the file with the page — **Blocking, possibly slow**
- Transmit that data to the requestor — **Blocking**

Thread Design

Thread Execution

Thread Lifespan

Where do we implement threads?

Assignment 2

Review

- Multiprogramming/Multiprocessing
- Process Operation
  - Creation
  - Execution
  - Process Information
  - Context Switching
  - Scheduling & Communication
  - Termination

- Threads
  - Motivation
  - Concepts
  - Context Switching
  - Kernel vs User Threads

Next Time

How do we decide which process to run and when?