ParadiseOS

Spring 2025 - Version 0.1.0

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Overview

Vision

ParadiseOS is an 32-bit, x86, multi-core, general-purpose, micro-kernel operating system. The project focuses on creating a modular, extensible architecture that provides the foundation for further development and testing of key OS concepts. Features in development include process & memory management, inter-process communication, and basic programs for testing the functionality of the OS. The end goal of ParadiseOS is to provide a flexible educational platform where users can design, swap, and implement custom memory and process managers. This would enable them to experiment with different operating system concepts in a modular environment. The idea is to serve as a hands-on-tool for students in OpSys at RPI helping them understand and tinker with core OS functionality in real-time on their own machines.

Stack

- C
- x86 Assembly
- Bash
- GNU Make
- QEMU
- Docker

Goals

1. Memory primitives
2. Process primitives
3. A working scheduler
4. A working memory manager

Timeline

I. January
  - Research micro-kernel architecture
    - *Operating Systems Design and Implementation (Ed. 3)* (Tanenbaum & Woodhull)
  - Design a kernel API to write application servers on top of
    - Process management primitives
    - Memory management primitives
  - Interrupt service routines
  - PS/2 Keyboard Handling
    - Characters actually appearing on screen as you type

II. February
  - Inter-process communication
    - Pipes
    - Signals
  - Process scheduler
    - Handle threads/process-tree
  - Memory manager
    - Allocation/de-allocation
    - Permissions

III. March
    - Basic programs
        - Shell
        - Calculator
        - Number guessing
    - Testing
        - Kernel Debugging
        - Testing above programs

IV. April
    - Enable Floating point unit
    - LibC port
        - Translate system calls to server requests

Team

Anthony Fabius - Taking RCOS for credit, Coordinator

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