Hako - A Web Based Operating System

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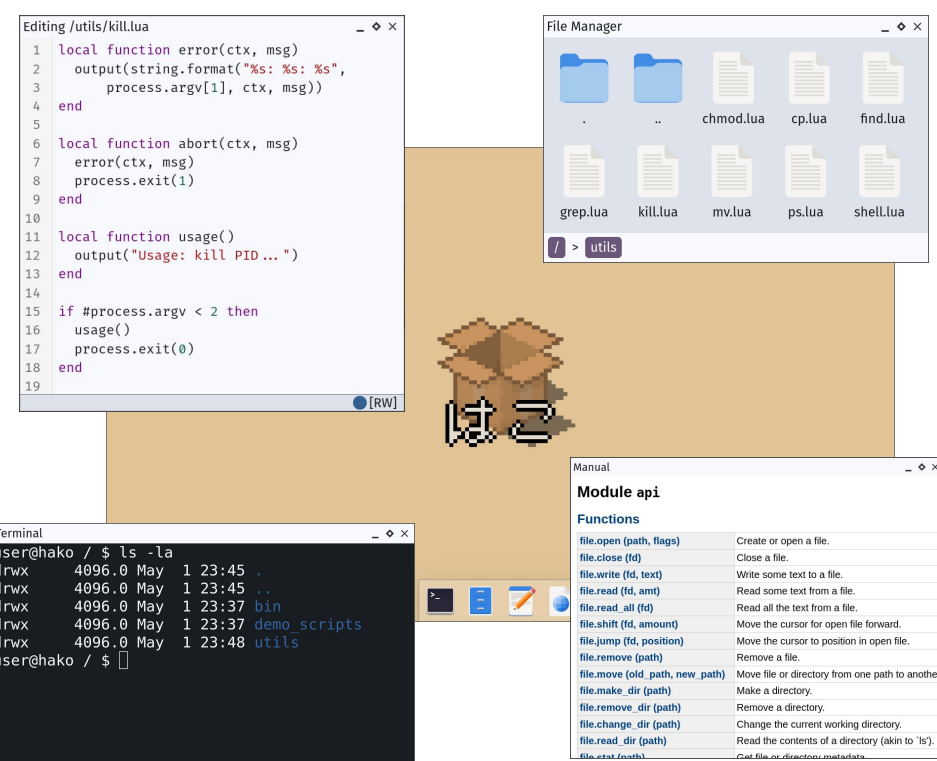Niall Ryan, BSc. Computer Science
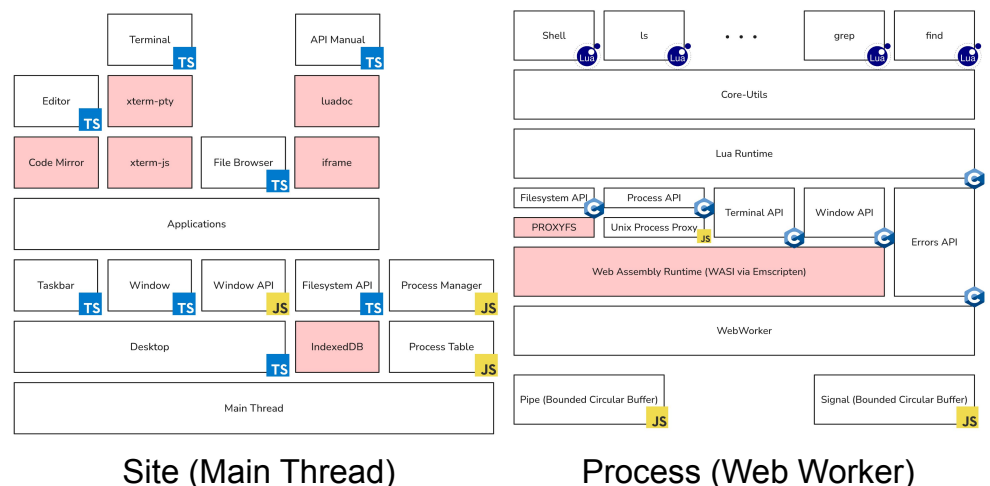
Supervisor: Prof. Stephen Blott

What is Hako?

Hako is a fully client-side, Unix-inspired programming environment that simulates an operating system in the browser. Designed for systems literacy, it combines a window manager, shell, terminal, and file system to teach programming as an act of engaging with real system architecture.

Why?

- Programming education often hides system complexity
- Other tools hide details sacrificing systems literacy
- Setting up development environments is cumbersome
- Legacy in native systems makes them harder to learn
- Make learning Unix more accessible to all
- Enhance learning by encouraging exploration

Layered Architecture

Site (Main Thread)   Process (Web Worker)

Software Process

- Dogfooding
- Staging
- Rapid Prototyping
- Refactoring
- Lean Development (Kanban)
- CI/CD
- Pair Programming
- Code Reviews

What is Systems Literacy?

The level of understanding and competence in interacting with and manipulating system-level components like file systems, processes, and low level operating system APIs.

Tech Stack

WebAssembly   C23   Meson   Lua

TypeScript   SvelteKit   Nix   Golang

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