

Tiny Kernel

Project members:

Antony S Chirayil (14)

Mathew Koshy (37)

Nihal Narayan (43)

R. Midhun Suresh (47)

Abstract

Every computer science enthusiast is proficient in their operating system of choice. They may even know its underlying working from an old operating system course they took in college. However, it is usually the case that their knowledge and understanding is limited to theory and writing low-level system code is often considered an insurmountable challenge.

This project hopes to change this attitude by developing a minimal yet functional 32-bit operating system that can be used in conjunction with theoretical teaching to promote and introduce systems programming. A minimal kernel guarantees easier to read source code (as opposed to the 27 million SLOC Linux kernel) and provides a gentler introduction to kernel development.

The kernel will include a full keyboard and mouse driver and will have support for VGA text-mode and graphics. It will also contain a limited libc implementation with a streamlined build process.

Additionally, this project will serve as an illustration for good development practices (code reuse, clean architecture, unit testing).

The 32-bit kernel will be written in C (and possibly some C++) with a little of assembly for the truly low-level aspects. A modern language such as Rust was deliberately not chosen because they often hide certain implementation details that would potentially lead to gaps in knowledge.

References

1. https://wiki.osdev.org/Main_Page
2. Operating Systems: Design and Implementation, Andrew S. Tanenbaum, and Albert S. Woodhull
3. Operating System Concepts, Avi Silberschatz, Peter Baer Galvin, and Greg Gagne