

# Pratham K

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## TECHNICAL SKILLS

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**Tools:** Git, Docker, GDB, Strace, GNU Make, CMake, Meson, Autotools

**Languages:** Bash / POSIX sh, C, C++, Python, Rust, TypeScript, Zig

**Miscellaneous:** CI/CD, Self Hosting, Linux Kernel Configuration, Software Packaging, Systems Administration

## PROFESSIONAL EXPERIENCE

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### Software Engineer

Feb 2024 – Present

*Dyte*

- Developed benchmarking tools for discovering bottlenecks in **Golang** and **TypeScript** microservices, leading to better reliability under heavy load, and a **25%** performance boost under certain hot paths
- Refactored **RabbitMQ** usage across various services, improving peak throughput from **8k msg/s** to **40k msg/s**, helping scale the real-time communication layer to serve more customers

### System Engineer

Aug 2023 – Feb 2024

*Subconscious Compute*

- Integrated code coverage visualization and performance reports in CI using **Rust** language tooling like **grcov**, **flamegraph**, and system profiling tools like **perf** to catch performance regressions and facilitate code coverage
- Developed Dockerfiles and Bash/Powershell scripts for CI pipelines to execute tests, and cross-compile release packages to various targets on Windows, Linux (**deb** and **rpm** formats) and MacOS platforms
- Implemented observability into system events on MacOS using the **Endpoint Security** library to generate alerts and execute user-specified actions in their response
- Led the end-to-end development of various backend services adhering to third-party protocol specifications, including an Apple **MDM** server to remotely manage devices and enforce policies

## OPEN SOURCE EXPERIENCE

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### Package Maintainer and Core Team Member

2022 – Present

*KISS Linux Community*

- Participated in the packaging and upkeep of software packages including Compiler Toolchains, Containerization Tools and Browsers, working with build systems like **CMake** and **Meson**, and writing **runit**-based service scripts
- Developed automation projects to streamline the maintenance workflow, including the implementation of a sandboxed multi-stage rootfs bootstrap script utilizing **unshare** and **bubblewrap**: [maintainer-utils](#)

### Open Source Contributor

2022 – Present

*Notable Contributions To Projects Used In Personal FOSS Endeavours*

- Resolved a bug in **Chromium** that caused page crashes on **GCC** builds due to undefined behavior: [#4546610](#)
- Contributed new interfaces, portability fixes, and support for mouse events to **termbox2**, a TUI library: [termbox2](#)
- Implemented validation for nullable fields in the GraphQL schema in **tailcall** as part of a paid bounty: [#521](#)
- Fixed a crash in the **nouveau** driver's firmware loading code due to erroneous usage of the Linux DMA API: [#24](#)

## PROJECTS

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**vmm** | *Rust, Linux KVM*

Jan 2024 - Present

- Developed a **Qemu**-like hypervisor from scratch utilizing the Linux **KVM** APIs, implementing low-level bootstrap code involving paging, long mode and the Linux Boot Protocol, capable of booting Linux images into userspace

**dabba.rs** | *Rust, User Namespaces, CGroups, slirp4netns*

Sep 2023 - Present

- Developed a small, fully rootless container runtime akin to **runc** using Kernel APIs like **User Namespace** and **CGroups**, with the ability to run basic **OCI**-complaint container images, using **OverlayFS** to mount layers
- Implemented networking between the container namespace and host using **TAP** devices via **slirp4netns**, allowing programs to connect to the internet from the container and expose ports to the host system

**landbox** | *C, Make, Linux Syscalls*

Oct 2022 - Present

- Developed a CLI and helper library inspired by **bubblewrap**, using the Linux **Landlock** API for filesystem sandboxing allowing restriction of read, write and execute permissions for arbitrary paths