ANNA WILCOX

Software/Platform Engineer | C++ | Python | Ruby on Rails | Linux

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PROFILE

I am a Software Architect and Engineer with experience in all stages of Agile and a passion for Security and Compliance. I am a fast learner, and bring my curiosity to complex issues to distill them down to their fundamental parts. This allows me to make effective action plans and then deliver reliable solutions. I will make your organisation more secure, more efficient, and more fun with innovative software and automation.

OVERALL SKILLS

Programming languages and environments: C++, Python, Ruby, Rust, C; Cocoa, Qt 5, Qt 6, Win32
Database systems: PostgreSQL, Microsoft SQL Server, SQLite
Low-level experience: Linux kernel development, firmware validation, x86, Power, Arm, SPARC, MIPS
DevOps tooling: GitLab CI/CD, GitHub Actions, Travis CI, Jenkins, Docker Compose

EXPERIENCE

System Software Engineer, Wilcox Technologies (Consulting) — 2024-2025

- Fixed compiler, toolchain, and ABI issues in GCC, LLVM, and Rust.
- Ported systemd to the musl libc to move a client's workloads from NixOS to Adélie Linux.
- Authored patches, code reviews, and documentation for Open Source / Libre Software projects.
- Wrote three Ruby on Rails based Web applications, and managed their deployment and other infrastructure using Docker Compose, GitLab CI/CD, and private container registry.

Software Architect and Systems Automation Engineer, IBM — 2021-2023

Cross-organisation team leadership in both pro-active and re-active situations:

- Defined and implemented industry-leading firewall automation, saving 1,211 hours of operator time per quarter, using Python and IBM Cloud PostgreSQL.
- Worked in cross-functional team to collect requirements, create designs, validate security, implement and test automation, and integrate with ServiceNow requests and tickets.
- Delivered REST API for monitoring and administration, including OpenAPI (Swagger) docs.
- Deployed and managed container services using Quay and OpenShift. Implemented daily vulnerability scans and cryptographic image signing/verification to meet security goals.

Security and Compliance focal in software development activities:

- Design and implementation of division-wide threat model template, including dialogues with executives. Engaged teams to drive adoption and understanding of threat model process.
- Spoke at two "Dev Guild" org-wide events, in addition to weekly knowledge sharing sessions.
- Cultivated team-wide security posture by creating diagrams and leading hands-on workshops.
- Built and maintained Travis CI/CD pipeline from scratch: Automated SAST and DAST, unit and regression tests, end-to-end request flows, signing, and vulnerability triage/response.

Systems Automation Engineer, AAGICo — 2020

Designed and implemented a NETCONF server for generic Linux systems:

- Collected requirements using text-based messaging and teleconferencing.
- Developed NETCONF server in Python, ensuring modular design with flexible functionality determined at runtime. End-to-end unit tests and COTS NETCONF tools including YumaPro.

System Software Engineer and Integrator, Adélie Software — 2017-2020

Founded and led an open-source Linux distribution project focused on security, reliability, stability, and portability:

- Tested the musl libc for POSIX® conformance. As org contact for The Open Group, secured contracts to use official POSIX® test harness. Identified issues and submitted fixes.
- Wrote build recipes for open source packages.
- Ported the Firefox browser, ORC JIT, and KDE software packages to the IBM Power platform. Tested on IBM pSeries, Apple G5, and Raptor Talos systems.
- Identified, debugged, and fixed issues in Linux kernel GPU/DRM drivers.
- Sent quality, security, and portability fixes to dozens of upstream projects.
- Audited package tree for correct and valid SPDX license descriptors and corrected identified issues. While doing this, also submitted license metadata fixes to Fedora, Gentoo, and Alpine.
- Implemented and maintained a hardware inventory system in Ruby on Rails.
- Designed and wrote marketing Web site using static site generator with HTML 5 and CSS 3.
- Wrote weekly sprint summaries to inform community members and project stakeholders.

Led the effort to create an installation and deployment system for the OS:

- Defined scope including desired automation and script support. Created a YANG model representing deployable Linux system images.
- Gathered requirements and ensured appropriate prioritisation of use cases, balancing the needs of users with available time and development resources.
- Implemented the system in C++14. Tooling used Boost and the user interface used Qt 5. Achieved 97% test coverage using Ruby RSpec and Aruba framework. Automated testing for changes and merge requests by writing custom GitLab CI/CD pipelines.
- Wrote both user-facing and developer-facing documentation.

Senior Software Developer, MediaNexus — 2013-2017

Designed and implemented a scalable Python ad management platform. The system used PostgreSQL for all campaign data.

- Wrote greenfield ad server in asyncio, then scaled it to 14,000 requests/second per node.
- Implemented caching using Redis and Aerospike, with metrics stored in Elasticsearch.
- Designed and created front-end portal using Python Flask and jQuery.

Cloud Portal Developer, Centarra Networks — 2012-2013
Implemented management modules in a cloud portal to allow customers to manage network devices and bare-metal servers in a similar way to cloud VPS.

- Implemented a JavaScript-based disk partitioning system.
- Worked with OS vendors (Ubuntu, Debian, FreeBSD, Oracle) on automated deployment in bare-metal networked environments. Installed OSes via iPXE to SAS and/or RAID disks.
- Authored DHCP and TFTP servers in Python gevent to manage network boot infrastructure.

Lead Software Engineer, Wilcox Technologies — 2009-2012
Led the design and implementation of four successful mobile and Web projects.

- Created UIs using Cocoa/Cocoa Touch, Core Graphics, Core Data, and Core Animation. Implemented a game engine in portable, high-performance C.
- Architected eBay and Etsy API library in C++98 that was ported to 9 different platforms including Windows, Mac, iOS, Solaris, and AIX.
- Wrote a library to retrieve data from SOAP, XML-RPC, and REST APIs into native C++ structures, and implemented a library to create multi-part MIME uploads using C++ that was open sourced.
- Designed icons and marketing materials using Adobe Illustrator and Photoshop.
- Used Python and Scala to convert legacy HTML pages into a structured SQLite database.
- Developed an artwork portfolio management system in Ruby on Rails, TypeScript, and jQuery. Leveraged RSpec and Selenium to achieve 100% automated test coverage.

SOFT SKILLS
12+ years of experience listening to the needs and voices of people from all walks of life to ensure software development projects are successful and deliver value to all involved stakeholders.

Effective communication of technical concepts to wide audiences using audio/visual presentation and Q&A formats. Passionate about bringing out the best in all team members and sharing information with people of different levels of technical knowledge.

When I'm away from the computer, I enjoy playing the guitar and piano. Music is an important part of my life and I love making shared playlists with my team. I am also owned by three cats.

OPEN SOURCE
Contributed to many projects: Mozilla Firefox, systemd, Valgrind, LLVM, the Linux kernel, the Rust compiler, and KDE. Responsibly disclosed CVE-2018-1000221 in pkgconf. Created and still maintain *gcompat*, a library to allow applications built for glibc-based Linux platforms to run on the musl libc.

For a complete list, see <www.awilfox.com/oss>.

REFERENCES
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