

Nathan McCarty

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*Experienced backend and systems engineer with a focus in Rust seeking a full time job and short term consulting roles.
Highly experienced with Nix and passionate about reproducible builds and thoroughly testing software.*

Skills

Tech Stack Rust | Go | Python | Nix | C# | F#
Specialties Systems Engineering | Backend | Consensus Protocols
Personal Interests Climbing | Hiking | MakerLife

Professional Experience

Software Engineer

UNIVERSITY OF KENTUCKY - HUMAN DEVELOPMENT INSTITUTE

Oct 2024 - May 2025

Lexington, KY - Remote

- Develop web portal for the Retain/Stay at Work KY project
- Various odd job technical tasks for the department

PHP Wordpress Frontend

Owner/Engineer

STRANGER SYSTEMS

Jun 2023 - Present

Lexington, KY - Remote

- Provide consulting services centered around the Rust programming language
- Train existing teams and new hires on Rust
- Assist starting new projects in Rust and incrementally introducing Rust into existing projects
- Provide review of Rust codebases and feedback on existing development practices
- Assist with embedded development and product prototyping

Rust Embedded Subject Matter Expert

Senior Systems Engineer

MATTER LABS

Mar 2023 - Jun 2023

Lexington, KY - Remote

- Develop and maintain consensus protocol implementation in Rust

Rust Consensus Subject Matter Expert

Senior Systems Engineer

ESPRESSO SYSTEMS

Nov 2020 - Feb 2023

Lexington, KY - Remote

- Engineering lead for the consensus team
- Design and develop novel BFT consensus protocol in Rust
- Develop framework for local simulation of BFT protocol behavior over configurable antagonistic networking conditions
- Assist with the Devops pipeline
- Advise team members on toolchain issues and technical questions

Rust Consensus Team Lead Subject Matter Expert

Systems Engineer

FINDORA

Jun 2020 - Nov 2020

Lexington, KY - Remote

- Implement hybrid Proof of Stake byzantine fault tolerant consensus with sortition in Rust
- Re-implement command line interface for creating and managing assets and transactions on a Findora ledger in Rust
- Develop the software ecosystem for the Findora platform, including validator code and libraries for interacting with the ledger, in both Rust and WebAssembly
- Create bash and python scripts to automatically produce and update documentation

Rust WASM Python Consensus CLI

Operations Specialist

VETDATA

Aug 2019 - Jun 2020

Lexington, KY

- Manage, deploy, and support client endpoints for proprietary data extraction pipeline
- Write custom, problem specific, data analysis applications in C#, F#, and Python
- Perform research and analysis on client data to identify and correct issues
- Participate in DevOps pipeline by identifying and correcting software bugs

C# ETL Systems Administration

Service Analyst II/Contractor

COMMONWEALTH OFFICE OF TECHNOLOGY

Mar 2019 - Aug 2019

Frankfort, KY

- Utilize C# and PowerShell to automate system processes
- Managed and provided support for a deployment of over 20,000 Windows 7 and Windows 10 workstations across the various agencies constituting the state government of Kentucky
- Performed System Administration and Identity Management tasks
- Diagnosed issue with and provided support for the petascale network storage system
- Assisted in state wide migration to Office365

C# Powershell Windows Systems Administration IAM

ITS Technical Support Technician

UNIVERSITY OF KENTUCKY

Mar 2018 - Mar 2019

Lexington, KY

- Provided tier two and three technical support for the faculty, students, and staff of the university
- Performed System Administration tasks on Windows and Linux Systems
- Identified and diagnosed network issues
- Assisted in roll out of new campus-wide wifi system
- Maintained HIPAA compliance as well as other security standards

Systems Administration Windows IAM

Self Employed

SELF EMPLOYED

Aug 2017 - Mar 2018

Lexington, KY

- Provided in home and in person technical support as well as refurbished laptops for resale

Data Scientist/Student Intern

UNIVERSITY OF KENTUCKY

Jan 2017 - Aug 2017

Lexington, KY

- Developed administrative tools for HPC clusters in Java, Python, and C#
- Maintained and administered high performance systems used by the research community
- Maintained multiple visualization and containerization environments utilizing Hyper-V, VMWare ESX-i/ vSphere, Docker/Kubernetes, and LXC
- Used Ansible to automate system deployment. Setup and maintained a multidatacenter petascale Ceph based object storage system
- Developed a prototype system for serializing, persisting, and migrating snapshots of running computations via low level Docker API functionality
- Migrated department website from drupal to wordpress
- Maintained and administered an OpenStack deployment

Systems Administration Java C#

Technical Customer Support Representative

UNIVERSITY OF KENTUCKY

Dec 2014 - Jan 2017

Lexington, KY

- Provided tier two technical support for the faculty, students, and staff of the university
- Performed systems administration tasks on Windows and Linux systems
- Performed Identity management tasks
- Maintained and administered the UK Software Download site
- Migrated the download site from Windows and apache to Ubuntu and nginx, maintained and administered the associated MySQL database, containerized the application, introduced high availability with HAProxy. Utilized ansible to automate system deployments and updates

Systems Administration

Projects

Idris 2 by Highly Contrived Example

- Work in progress “by example” book covering Idris 2 and Dependent Typing

2023 - Current

<https://static.stranger.systems/idris-by-contrived-example/>

Asuran

- Deduplicating, encrypted archiver for secure and efficient backups
- Currently written in rust, plan to rewrite in Idris

2018 - 2021 (On Hiatus)
<https://gitlab.com/asuran-rs>

HotShot

ESPRESSO SYSTEMS

- BFT Consensus protocol based on Hotstuff plus sortition that I was the engineering lead for

2020 - 2023
<https://github.com/EspressoSystems/HotShot>