Vijay Sai Krishnamoorthy

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Education

University of Southern California — Los Angeles, CA
Master of Science in Computer Science | GPA: 3.86/4.0 — *Jan 2019 - May 2020*

Skills

- **Languages**: C++, Python, C, Golang, JavaScript, Hack, Shell Script, HTML, CSS **Databases**: MongoDB, PostgreSQL, MySQL and SQLite
- **Frameworks and Tools**: Node.js, Flask, Docker, Ethereum, IPFS, GDB, Valgrind, IPTables, Envoy Proxy, LUKS Encryption, Coverity

Experience

Meta — Menlo Park, CA
Production Engineer - Hardware Security Module — *July 2020 - Present*

- Deployed and managed **1000+** Hardware Security Modules at scale to Datacenters by building tools and automation **[Python]**
- Developed a **thrift service** to abstract the HSM hardware and vendor complexities for other services. **[C++]**
- Secured sensitive critical keys at Meta by **re-designing the architecture of the code signing service** to use private keys backed by Hardware Security Modules (HSM) infrastructure instead of software keys. **[Python, Objective-C]**
- Built a **cgo library** from the ground-up that implements PKCS#11 API, an industry-standard interface to allow signing tools like OpenSSL to talk to Hardware Tokens. **[Go]**
- Designed a highly secure solution to manage the private keys of the most important **Root CAs** at Meta and built tools to aid certificate rotation automation. **[Python]**
- Enabled external firmware vendors to securely use Meta's internal HSM service infrastructure instead of AWS KMS for firmware signing by building a Web App from scratch. **[React, Hack, C++]**
- Developed **monitoring dashboards and alerts** to track one of the largest HSM deployments in the world. **[Python]**
- Led multiple projects to improve **reliability** of the HSM thrift service. **[Python, Bash]**

Akamai Technologies — Bangalore, India
Software Engineer II - Enterprise Threat Protector (ETP) — *July 2016 - December 2018*

- Designed an endpoint module on the proxy that classifies the customer traffic using Radix Tree, applies configurable **customer rate limit rules** to defend IP spoofing DoS attacks and blocks known attackers. **[C, C++ and Iptables]**
- Developed a **configuration manager** that validates, applies, and distributes the incoming dynamic configuration to the respective components inside each cloud instance and reports the respective status. **[Go]**
- Implemented a **statistics collector module** and integrated it with Grafana for monitoring the network. **[C, C++]**
- Implemented Cisco's **WCCPv2.0** protocol to enable transparent redirection from a router to the branch-level cache. **[C]**

Biomedical Imaging Group Lab, University of Southern California — Los Angeles, CA
IT Support — *May 2019 - Present*

- Hosted the lab's website (neuroimage.usc.edu) and an open-source Discourse forum using **MoinMoin, Nginx, and Apache**. To enable deployment agility, all the components were shipped as a single Docker container.
- Developed a web application for 100+ researchers to store and retrieve bio-medical images of patients with certain characteristics in the brain. **[Node.Js, MongoDB, HTML, CSS]**
- Developed a tool to monitor the servers' health and resource utilization and capacity limit the users. **[Python, Bash]**

Projects

- **Octane Software Defined Network [C, C++]**: An enterprise network management architecture developed to define and apply user-level and network-level ACLs. The primary router, also acting as a software load balancer, performs deep packet inspection and relays the traffic to an active relevant router.
- **YOVO - You Only Verify Once [Python, Ethereum, HTML, CSS]**: Decentralized, secure and tamper-proof blockchain solution for permanent verification of university degree documents, thereby reducing the time and money spent.
- **Interrobang [Python, NLTK, and Google Cloud NLP]**: A machine learning and NLP solution to help users choose content through summarized intriguing questions. It also has a self-evaluation feature to let the user retrospect.
- **Citrus [OpenPose, Python, HTML, CSS]**: An application that promotes fitness and helps reduce city traffic - Users perform squats at the destined kiosks. Citrus verifies the correctness and awards the users with Lime bike credits upon challenge completion.

Additional Experience & Achievements

- Presented a tech talk to a 1500+ live audience at Meta's Production Engineering Summit on **Securing code signing keys using Hardware Security Modules (HSMs)**
- Received **Spot Award** for contributing to Enterprise Threat Protector's success
- Winner of **CyberMiles Award** at Blockathon'19 for developing YOVO