

Zhonghua (Laisky) Cai

Ottawa, ON, Canada

job@laisky.com · 873-569-8887 · LinkedIn: <https://www.linkedin.com/in/laisky-cai-14237926/>

GitHub: <https://github.com/Laisky> · Blog: <https://blog.laisky.com/> · CV: <https://cv.laisky.com/>

Summary

Senior Software Engineer with 10+ years building Linux-based services, security infrastructure, and developer tooling in Go and Python. Hands-on experience building PKI from scratch, including certificate issuance and revocation, TPM-based integrity measurement, attestation-backed identity, and hardware-protected key management. Delivered production security platforms end to end and led cross-functional engineering initiatives. Background spans confidential computing, distributed systems, and cloud platforms, with remote collaboration across globally distributed teams.

Skills

- **Languages & Linux:** Go and Python (10+ years each): secure services, concurrency, CLI tooling, automation, async I/O, and data pipelines. Linux systems engineering, troubleshooting, performance profiling, and operational tooling. JavaScript / TypeScript.
- **PKI & Certificate Management:** Root and intermediate CA architecture; leaf certificates; certificate signing requests (CSRs); certificate issuance, validation, and revocation; certificate revocation lists (CRLs); X.509 extensions and OIDs; TLS / mTLS; attestation-backed certificate issuance; zero-trust authentication and authorization.
- **Hardware-Backed Security:** TPM-based system integrity measurement; remote attestation; confidential computing / TEE (Intel SGX, AMD SEV-SNP, Intel TDX); YubiKey PIV-based administrator authentication; multi-party authorization and key custody; KMS; protection of sensitive credentials and cryptographic material.
- **Secure Services & Infrastructure:** gRPC, REST APIs, Protocol Buffers; access controls, tenant isolation, image signing, and secure deployment pipelines; distributed systems, state management, crash recovery, and fault tolerance. SDKs, CLIs, technical documentation, and operational runbooks.
- **Cloud & Automation:** AWS, GCP, Azure; Kubernetes, Docker, Terraform, Ansible, CI/CD (GitHub Actions / GitLab CI); observability through tracing, metrics, and logging; infrastructure configuration and automation.
- **AI / LLM:** Production LLM gateway, agent workflows, MCP servers, and RAG / PageIndex memory systems. Multi-provider routing, streaming, failover, access control, and metered billing. AI-assisted development with Codex, Claude Code, and GitHub Copilot.

Experience

Independent Software Engineering Consultant

Remote · Oct 2024 – Present

- Designed and delivered a TEE-hardware-rooted zero-trust platform for financial-services clients on GCP, using Intel TDX Confidential VMs and GKE Confidential Space to cryptographically remove single-operator trust dependencies from production operations.
- Expanded the platform into a TEE PaaS for heterogeneous confidential workloads, including isolated AI agents, on a shared attested foundation. Owned architecture, implementation, security controls, and operational integration.
- Re-architected a client's agent platform on GCP Agent Sandbox, replacing always-on runtimes with dynamically scheduled, per-request sandboxes that reduced operating costs while preserving isolation and responsiveness.
- Maintain **one-api**, a production Go LLM gateway with multi-provider routing, MCP aggregation, multi-tenant access control, and metered billing. Built Go / Python agent workflows and a modular RAG / PageIndex memory system.

Senior Software Engineer, Platform & Confidential Computing

Shanghai BaseBit Technologies · Apr 2022 – Oct 2024

- Built a complete PKI from scratch for a TEE security platform, covering root and intermediate CAs, leaf certificates, CSR processing, certificate issuance and validation, revocation through CRLs, and X.509 extension / OID handling. Issued identity certificates to devices following successful TEE attestation.
- Implemented TPM-based system integrity measurement and YubiKey PIV-based administrator authentication, with multi-party authorization for sensitive operations and key custody. Integrated hardware-backed trust into authentication and credential-protection workflows.
- Built a Go SGX SDK and runtime and designed a confidential Kubernetes platform with remote attestation, image signing, RBAC, and safe deployment / upgrade pipelines. Partnered with product and customer-facing teams on regulated financial and healthcare workloads, including code review and threat modeling.

Senior Software Engineer / Tech Lead, Cloud Security Platform

Qihoo 360 (Government & Enterprise Security Group) · Feb 2019 – Apr 2022

- Tech-led Go microservices delivery for enterprise multi-tenant cloud security SaaS (CWPP / CSPM), covering telemetry pipelines, vulnerability management, and incident-response workflows.
- Hardened service boundaries, release safety, and on-call tooling; investigated production failures and applied SRE practices to reduce incident MTTR and stabilize customer-facing SLAs.

- Coordinated delivery across PM, QA, platform, and engineering teams; mentored engineers and supported customer rollouts and post-deployment troubleshooting with globally distributed counterparts.

Platform Architect, Cloud PaaS

Shanghai PATEO (Connected Vehicles / IoV) · Jan 2018 – Feb 2019

- Owned platform reliability for 300+ Go microservices and thousands of containers supporting connected-vehicle services, including observability, capacity planning, release engineering, and on-call operations.
- Architected go-fluentd, a Go streaming log-ingest middleware sustaining ~1 Gbps, with backpressure, buffering, and crash recovery, feeding downstream analytics, observability, and security-detection pipelines.
- Standardized CI/CD pipelines and operational runbooks across product teams, improving deployment consistency, troubleshooting, and release efficiency.

Senior Software Engineer, Python Data Pipelines & Async Services

Movoto (US Real Estate) · Dec 2016 – Dec 2017

- Optimized Linux-based Python pipelines processing millions of listings and 300M+ addresses through profiling-driven refactors and async I/O, improving ingestion throughput.
- Built and open-sourced kipp, a Tornado / asyncio developer framework for maintainable Python services and reusable backend tooling.
- Collaborated remotely with US headquarters across time zones, supporting production delivery through clear technical documentation and asynchronous communication.

Earlier Roles

- **DevOps Lead**, SAIC Motor E-Commerce · 2015 – 2016 · Led a five-engineer team; Kubernetes adoption; build platform handling ~1,000 builds/day; infrastructure automation.
- **Python Engineer**, Shanghai Qisense · 2014 – 2015 · AWS fleet automation with Ansible; Linux-based data / ML pipelines.
- **Research Engineer**, China Meteorological Bureau · 2012 – 2014 · Forecast verification systems and scientific software.

Education

B.S., Atmospheric Science (Math / Physics concentration), Lanzhou University, 2012

To Whom It May Concern,

I am honored to write this letter of recommendation for Zhonghua CAI, a highly accomplished software engineer at BaseBit Technologies. Over the past two and a half years, I have had the opportunity to work closely with Zhonghua in his role as a key member of our system security team within the infrastructure department, primarily tasked with research and development in the groundbreaking field of Confidential Computing. With more than a decade of experience in software engineering, he has consistently impressed us with his technical expertise, innovation, and leadership.

At BaseBit, Zhonghua has been critical in the design and implementation of several confidential computing services. His deep knowledge in trusted execution environments (TEE) using Intel SGX and AMD SEV technology has enabled him to lead several major projects, including the development of a process-level TEE SDK, zero-trust PKI (Public Key Infrastructure), and Confidential Kubernetes Clusters. These contributions have significantly enhanced the security and integrity of our computing infrastructure, particularly in our efforts to maintain cutting-edge, secure, and scalable systems.

In addition to his technical contributions, Zhonghua is extremely passionate about sharing knowledge and fostering a culture of collaboration. His commitment to continuous learning is strong in the numerous internal and external technical talks and workshops he has both hosted and participated in. He has also demonstrated remarkable initiative by developing several productivity tools that benefit the entire engineering team, such as an interactive documentation platform and an LLM (Large Language Model) aggregation platform which have streamlined workflows and improved development efficiency across teams.

Zhonghua's combination of technical proficiency, initiative, collaborative spirit, and leadership make him an invaluable asset to any organization. I am confident that wherever his career takes him, he will continue to make significant contributions to the field of software engineering and system security.

It is with great enthusiasm that I recommend Zhonghua CAI for any future opportunity. Should you require any further information, please do not hesitate to contact me directly.

Sincerely,

Percy Zhao 510.599.3088 *percy zhao @ hotmail.com*
Chief Technology Officer 2024-10-16

BaseBit Technologies Co., Ltd.

Apr 17, 2025

To Whom It May Concern,

I am pleased to recommend ZHONGHUA CAI for software engineering and architecture roles. During his tenure as Systems Architect in the Cloud Platform department at PATEO Network Technology Service Co., Ltd (January 2018 – February 2020), I observed his technical mastery and pragmatic approach firsthand.

ZHONGHUA led the maintenance and enhancement of our core PaaS platform built on Baidu Cloud, GitLab CI, DC/OS, Kubernetes, and proprietary PATEO technologies. His contributions supported over 300 microservices and thousands of container instances—integral to our mission-critical services supporting millions of vehicles. Notably, he engineered a high-performance logging service in Go that efficiently managed multi-Gbps data streams, markedly improving system stability and performance.

Beyond his technical prowess, ZHONGHUA excelled in providing critical technical guidance and coordinating across teams. His ability to clarify requirements, troubleshoot cross-system issues, and implement effective solutions consistently elevated the productivity of our development teams.

ZHONGHUA CAI is a dedicated and results-driven engineer with exceptional skills in system architecture and team collaboration. I am confident he will make a significant and lasting contribution to any technical organization.

Sincerely,

TANG YAN

Yantang@pateo.com.cn

Chief Architect

PATEO Network Technology Service Co., Ltd