Perry's Résumé - Payments & New Ventures Engineering

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Senior software engineer with 30+ years shipping systems where a wrong answer is expensive: pipeline SCADA, real-time telemetry, and for the last several years, money. Designed a complete monetary platform (ledger, identity, privacy and settlement) and proved it with multi-year agent-based simulations; shipped a key-custody application to households; built and operate a production generative-AI service in Python. Works from conception to deployment with minimal supervision, records every architectural decision so the next engineer inherits the reasoning, and uses AI-assisted development daily under one rule: nothing the model asserts ships until a test, an execution or a derivation confirms it. (PDF, Text)

Technical Skills

- **Languages**: Python (15+ yrs, production services and libraries), C++ (25+ yrs), Rust, C, Solidity, JavaScript/TypeScript/WASM, SQL; JVM platform operations (Ignition SCADA deployment and scripting automation)
- **Payments & Ledgers**: double-entry and agent-centric accounting, settlement without global consensus, credit-limit enforcement, stable-value issuance and control, license/payment integration (Ed25519-signed licensing, crypto and Stripe checkout), invoicing
- **Digital Money**: stablecoin and tokenized-asset mechanics (ERC-20/721), issuance policy and oracle design, privacy-preserving bearer instruments, identity-gated transfer; the trade space between stablecoins, tokenized deposits and CBDCs
- **Identity & Security**: WebAuthn/FIDO2 passkeys (self-hosted relying party), PKI, Ed25519, mTLS 1.3, Shamir secret sharing (SLIP-39), zero-knowledge proofs, threat and malfeasance analysis
- **AI-Assisted Development**: Claude / Claude Code agent orchestration, multi-model code review, LLM service architecture (Anthropic API, Ollama, MLX), prompt and KV-cache engineering
- **Cloud & Services**: service boundary and API design, REST/JSON, streaming NDJSON, Docker, Cloudflare Workers and Zero Trust, CI/CD, Nix reproducible builds, health and telemetry endpoints, multi-tenant session isolation
- **Quality**: test-first on protocol and money code, deterministic simulation harnesses, recorded real-data regression suites, cross-language shared test vectors, code audits and review

Experience

IT/OT Solutions Engineer - *Vantage Engineering* (Spruce Grove, AB 2026–Present)

Owning delivery end to end: from the security boundary to the business tooling built on top of it.

- Developed `localwebauthn`, a self-hosted WebAuthn relying-party library (TypeScript/NPM, browser and server sides): phishing-resistant passkey login with no third-party identity provider and no central credential store whose capture would yield every account.
- Built dev, staging and production deployment infrastructure for Ignition SCADA (a JVM platform), with automated regression testing of its Python scripting; changes are validated before production rather than in it.
- Delivered business tooling for vendor quotes, invoicing, timekeeping and expensing, giving users direct control while preserving the accountant's controls over the ledger.
- Developed a secure unidirectional (data diode) field-data path at a fraction of commercial product cost, without relaxing its guarantee.

R&D Consultant & Architect - *Dominion R&D Corp.* (Remote, 2009–Present)

Retained by fintech, energy and industrial clients to design and build the parts that have to be right the first time.

Monetary Platform: Alberta Buck

- Designed the **Alberta Buck**, a complete asset-backed monetary platform: identity-aware ERC-20 ledger with on-chain credit-limit enforcement against insured collateral (ERC-721), an on-chain credential registry, a privacy-preserving bearer-note layer (Groth16 SNARKs), and PID-controlled issuance against a commodity-basket price reference.
- Proved stability the way a ledger should be proven: a deterministic multi-backend EVM simulation harness (in-process `pyrevm`, `anvil`, `tevm`) producing byte-identical results, driving agent-based economies (borrowers, savers, arbitrageurs, market makers, adversarial whales) through five simulated years across a ten-configuration experiment matrix.
- Compiled the identity and wallet kernel to browser WebAssembly so credential ceremonies and receipt verification run client-side, with no server trust; Rust/Python/JS kernels share byte-identical test vectors.
- Wrote a decision record for every architectural ruling, plus threat and malfeasance analysis and a phased transition roadmap, published as a maintained corpus.
- Contributed upstream to `snarkjs` (PRs #631, #632): documentation and tests pinning an undocumented verifier ABI, and a developer-onboarding harness.

Production AI Service: BUCKy

- Designed, built and operate `BUCKy`, a public generative-AI assistant (Python) over a ~100K-token knowledge base, live at perry.kundert.ca.
- Three interchangeable inference backends (hosted Anthropic API, Ollama, MLX) behind one API contract, keeping model and hosting decisions reversible.
- Cut per-query serving cost roughly 10x: provider prompt caching on the hosted path; on the self-hosted path, the knowledge-base KV cache is precomputed once and cloned copy-on-write per session.
- Operational surface: per-session concurrency slots with TTL reclamation, streaming responses, CORS allow-listing, health and throughput telemetry, warm-start cache persistence, and Zero Trust delivery; diagnosed and fixed restart races that had caused multi-hour outages.

Payments, Licensing & Libraries

- Created `crypto-licensing` (Python): Ed25519-signed license issuance with DNS-published verifying keys (the DKIM model), offline validation, and payment-triggered issuance.
- Created and maintain `cpppo`, the widely used Python EtherNet/IP and CIP protocol library, and `ezpwd-reed-solomon`, C++/JS Reed-Solomon codecs used by aerospace and defence developers.
- Guide client teams through cryptographic, distributed-systems and AI architecture; review code and mentor engineers through the unfamiliar parts.

Creator - *SLIP-39 Seed Backup & Recovery* (Remote, 2021–Present)

Shipped multi-party key custody to households: no single burglar, fire or lawyer holds the whole secret.

- Build and ship python-slip39 and the SLIP-39 macOS/win32 App: Shamir group-threshold seed generation and backup, printable recovery cards, macOS/win32 platform installers, and invoicing with multi-party on-chain payout.
- Authored Trezor's python-shamir-mnemonic PR #51: recovery in the face of loss or corruption, and re-issue of groups in already-deployed sets (essential for organizational custody).

Distributed Systems R&D - *Holo Ltd.* (Kelowna, BC 2018–2020)

Architected and validated prototypes of HoloFuel's partition-tolerant transaction engine.

- Designed agent-centric mutual-credit accounting scaling linearly rather than quadratically; each agent holds its own signed transaction chain, settling bilaterally during partitions.
- Validated simultaneous atomic settlement across deliberately partitioned networks.
- Built statistical models and PID control for value stability across distributed agents (holofuel-model, Python).

Software Engineer - *clearGRID Ltd.* (Kelowna, BC 2017–2022)

Replaced proprietary radio telemetry with commodity hardware by recovering signal the vendor discarded as noise.

- Built a real-time receiver decoding 64 concurrent channels from a 25 Msps I/Q stream on commodity x86 and ARMv8, sustained with no dropped samples.
- Built a recorded-signal regression harness so every algorithm change was measured against real captured field data.

Sr. IT Advisor - *Enbridge Pipelines* (Edmonton, AB 2002–2009)

Reduced the risk profile of pipeline control with a fault-tolerant protocol still in operation.

- Architected a Reed-Solomon erasure-coded multi-route SCADA protocol, maintaining integrity and operation through communications degradation and failure.
- Delivered RTU firmware for 24/7 control at under 1 defect per 10,000 lines, measured in the field.

Software Developer - *Hewlett-Packard* (Calgary, AB 1989–1996)

- Re-engineered RTAP's core SCADA alarm engine on DFA state machines: deterministic, auditable state transitions, still deployed continent-wide 30+ years on.

Open Source & Publications

- python-slip39, crypto-licensing, cpppo, ezpwd-reed-solomon, localwebauthn, holofuel-model
- Papers on monetary system design, identity, cryptographic protocol composition and consensus: perry.kundert.ca/range/finance/; alberta-buck

Education

B.Sc. Computer Science - *University of Calgary* (Calgary, AB 1984–1989)