

Perry's Résumé - Lead Software Architect

Perry Kundert <perry@kundert.ca> +1-780-970-8148

2026-10-19 07:00:00

Hands-on software architect who has run a custom development and R&D consultancy since 2009, and shipped secure, high-reliability systems for 30+ years before and alongside it. Takes client work from discovery and scoping through architecture, implementation, deployment and the 2 AM stack trace. Sets engineering standards by writing them down: decision records, test harnesses, staged deployment pipelines, so the next developer inherits the reasoning and not just the code. Uses AI-assisted development daily under one rule: nothing the model writes ships until a test, an execution or a review I can defend confirms it. (PDF, Text)

Technical Skills

- **Architecture & Technical Leadership:** solution and integration architecture, API and service boundary design, architecture decision records, engineering standards, code review, mentoring developers through unfamiliar domains, legacy modernization against systems that cannot be taken offline
- **Client Delivery:** discovery and requirements with business stakeholders, solution design, scoping consulting engagements, proof-of-concept to production, communicating risk and tradeoffs to non-technical owners
- **AI-Assisted Development:** agent orchestration, multi-model code review, test-gated acceptance of generated code, security review of model output; LLM service architecture (Anthropic API, Ollama, MLX), prompt and KV-cache engineering
- **Web Applications & APIs:** Python services (REST/JSON, streaming NDJSON, multi-tenant session isolation), JavaScript/TypeScript (browser and Node/NPM packages), WebAssembly, SQL, CORS and origin isolation, WebAuthn/FIDO2 passkey authentication
- **DevOps, Cloud & Reliability:** Docker, CI/CD, Nix reproducible builds, dev/staging/production pipelines with automated regression testing, Cloudflare Workers and Zero Trust, Linux service hardening and supervision, health and telemetry endpoints, warm-start state persistence, key backup and recovery design
- **Security:** threat modelling, PKI, Ed25519, mTLS 1.3, secret sharing (SLIP-39), zero-knowledge proofs, self-hosted identity with no third-party credential store
- **Languages:** Python (15+ yrs), C++ (25+ yrs), JavaScript/TypeScript, Rust (5+ yrs), C, Go, Solidity, SQL

Experience

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

Owning delivery end to end: from the security boundary to the business applications 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: a capability the vendor does not offer. Changes are validated before production rather than in it.
- Deliver custom business applications to replace suboptimal SAAS offerings.
- Developed a secure unidirectional (data diode) field-data path at a fraction of commercial product cost, without relaxing its guarantees.

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

Custom development and architecture consultancy retained by energy, fintech and industrial clients to design and build the parts that have to be right the first time.

Client Architecture & Delivery

- Scope, architect and deliver custom systems directly with client stakeholders: from requirements and solution design through implementation, deployment and long-term support.
- Guide client development teams through cryptographic, distributed-systems and AI architecture; review their code and mentor engineers through the unfamiliar parts.
- Built `datasim`, a Docker-based simulation environment (dozens to hundreds of concurrent simulated PLCs, each with its own network stack) with a web API and browser front end. Records and replays real field data and injects latency, loss and bandwidth limits, so a vendor's system was measured against degraded networks before a production cutover rather than after.
- Delivered rugged satellite-connected monitoring, communications and video systems across Alberta oilfields; field-serviceable and diagnosable from 400 km away.
- Mitigated a critical security flaw in a major enterprise collaboration suite, deployed globally.

Production AI Service: BUCKy

- Designed, built and operate BUCKy, a public generative-AI assistant (Python) grounding a ~100K-token knowledge base, live at perry.kundert.ca and bucky.kundert.ca.
- Three interchangeable inference backends (hosted Anthropic API, local Ollama, direct MLX) behind one stable API contract, so model and hosting decisions stay 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.
- Built the operational surface: per-session concurrency slots with TTL reclamation, streaming responses, CORS allow-listing, health and throughput telemetry, and warm-start cache persistence cutting a 15-minute cold start to seconds.

Platform Architecture: Alberta Buck

- Designed a complete asset-backed monetary platform (identity, ledger, privacy and settlement): Solidity contracts, an on-chain credential registry, and a zero-knowledge bearer-note layer, with the identity and wallet kernel compiled to browser WebAssembly so verification runs client-side with no server trust.
- Proved it with a deterministic multi-backend simulation harness producing byte-identical results across five simulated years and a ten-configuration experiment matrix.
- Wrote a decision record for every architectural ruling, plus threat analysis and a phased roadmap, maintained as a living corpus rather than a one-time deliverable. Delivered concurrently with full-time client work through AI-accelerated development, with no model assertion admitted to the design until confirmed by execution or independent derivation.

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

Architected and validated prototypes of HoloFuel's distributed transaction engine.

- Designed a partition-tolerant mutual credit system achieving cryptographic finality without global consensus; agent-centric accounting scaling linearly rather than quadratically.
- Validated simultaneous atomic settlement across deliberately partitioned networks.

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

Replaced expensive proprietary radio telemetry with commodity hardware.

- 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 algorithm changes were measured against real captured field data rather than synthetic benchmarks.

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

Reduced the risk profile of a hydrocarbon pipeline control system with a cryptographically secure, fault-tolerant multi-route protocol, still in operation today.

- Architected a Reed-Solomon erasure-coded multi-route protocol for real-time SCADA, maintaining integrity and continued operation through communications degradation and failure.
- Developed RTU firmware for continuous 24/7 control at under 1 defect per 10,000 lines, measured in the field; deployed hundreds of units across critical infrastructure sites.

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

Re-architected the core alarm engine of a SCADA automation product.

- Rebuilt RTAP's alarm engine on DFA state machines, letting end users configure distributed safety-critical workflows with deterministic, auditable transitions; still deployed in pipeline SCADA continent-wide, 30+ years on.

Open Source

- cpppo: the widely used Python EtherNet/IP and CIP industrial protocol library.
- localwebauthn: TypeScript/NPM WebAuthn passkey library, browser and relying-party sides.
- crypto-licensing: Ed25519-signed software licensing with DNS-published keys and REST license-server operations.
- python-slip39: cross-platform (macOS/win32) Shamir secret sharing application for seed backup and recovery.
- ezpwd-reed-solomon: C++/JavaScript/Python Reed-Solomon and BCH codecs, used by aerospace and defence developers globally.

Education

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