Manjeet Pandey

Backend Engineer · C++ · Distributed & Edge Systems

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EXPERIENCE

Software Developer — NubeIO Jan 2025 — Present

C++20 dataflow engine for IoT edge controllers. Extensions run as separate processes and talk to the engine over Cap'n Proto RPC, with shared-memory state and SQLite storage.

- **Performance:** optimized the engine for low-power ARM devices, cutting latency across search, evaluation and storage (search up to 7x faster) and reducing contention on concurrent hot paths.
- **Reliability:** hardened process lifecycle handling (restarts, heartbeats, shutdown) so the engine stays stable on long-running devices.
- **Security:** worked on process-level isolation for third-party extensions, with per-extension identities and permissions.
- **Platform:** worked on the NATS messaging layer that exposes the engine to other services, built its process supervisor, and set up multi-architecture builds for edge hardware.

Software Engineer (Contract) — FynePDF Nov 2025 — Sep 2026

Online PDF tools platform (fynepdf.com) with a C++ processing engine and a TypeScript API (Hono, Postgres, S3).

- **PDF engine:** built the native C++ engine on PDFium that powers the platform's tools, from compression (up to 99% smaller files) and OCR to document conversion.
- **Backend:** designed an asynchronous job pipeline so heavy PDF processing runs off the request path and scales independently of the API, with results stored in S3.
- **AI features:** built document indexing and chat so users can search and ask questions across their PDFs.
- **Platform:** built out the SaaS foundation, including subscription billing, plan-based usage limits, transactional email and automated deployments.

Software Developer — Cloco Nepal Aug 2023 — Dec 2024

- Led a Python + Vue.js product from design through production deployment.
- Ran its AWS infrastructure (EC2, RDS, Lambda, Cognito, S3) and built the CI/CD pipelines.

Full-Stack Intern — CapyKalam Feb 2022 — May 2023

- Built web apps in Kotlin and React, including third-party payment integration.

PROJECTS

Heimdall — AI agent egress checkpoint (Python, mitmproxy, Docker) Oct 2026

- Hackathon project. AI agents run in a sandbox with placeholder keys, and every outgoing request goes through a proxy that applies rules, LLM review and PromptGuard. Blocked all 21 key-theft attacks in testing and handled ~90 req/s under load.

edge-proxy — HTTP reverse proxy (C++20, Boost.Asio) 2026

- Async proxy on Boost.Asio coroutines and Beast, with a bench/profiling harness: **~62.5K req/s, p99 1.2 ms** on one thread at 64 connections.

kv-store — replicated key-value store (C++20) 2026

- Write-ahead log with snapshots and log rotation for crash recovery, and primary-to-replica replication over HTTP.

SKILLS

- **Core:** Distributed systems, concurrency, performance optimization, REST APIs, CI/CD
- **Languages:** C++20, Go, Python, TypeScript, SQL, Kotlin
- **Systems:** Cap'n Proto, NATS, Boost.Asio, shared-memory IPC, SQLite, PostgreSQL/PostGIS, PDFium
- **Infra:** Linux, Docker, CMake, armhf/aarch64 cross-builds, AWS, GitHub Actions, Drone CI
- **Web:** Hono, Django, React/Next.js, React Native

EDUCATION

B.E. Computer Engineering — Pulchowk Campus, Tribhuvan University 2018 — 2023

Final-year project & co-authored paper: *Nepali OCR* (TU, 2023) · AWS Certified Cloud Practitioner