

# Pedro Henrique Prior

Systems & Infrastructure Engineer

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## OVERVIEW

Systems engineer with a low-level software and infrastructure focus. Operate 200+ VM high-availability clusters and hardened networks; build fault-tolerant distributed systems and performance-sensitive C++/Rust code for embedded and edge environments. Strong background in Linux internals, real-time data pipelines, and network infrastructure. Currently building high-performance networking tooling around Linux kernel interfaces (io\_uring, eBPF). Seeking systems, infrastructure, or network engineering roles.

## EXPERIENCE

### Infrastructure Engineer · Montemil Industrial

Feb 2025 – Present

- Operate a 200+ VM Proxmox VE high-availability cluster sustaining 99.9% uptime; tune VM performance with CPU pinning to reduce contention on latency-sensitive workloads.
- Manage L2/L3 network infrastructure: switches, routers, VLAN segmentation, and industrial machine connectivity.
- Codify infrastructure as code with Ansible and Terraform; run Kubernetes for stateless services with CI/CD pipelines and distributed tracing (Jaeger).
- Build observability with Zabbix, Prometheus, and Grafana for system health and machine telemetry.
- Run backup and disaster recovery with Proxmox Backup Server, NFS, and snapshot replication (onsite and offsite).
- Segment and secure traffic with VLANs and pfSense firewalls; enforce TLS/mTLS across internal services.
- Harden systems to CIS benchmarks; automate user provisioning and health checks with Python and Bash.

### Systems Engineer · OXKERN (own product)

May 2025 – June 2026

- Built a cross-platform C++17/20 control application (Qt6/QML front end, CMake build for Windows/MSVC and Linux/GCC) for an industrial plasma cutting power source.
- Implemented an asynchronous serial protocol layer over asio: frame encoding/decoding, checksum validation, explicit timeouts, and a watchdog for real-time communication with industrial hardware; integrated Modbus RTU/TCP via a RAII wrapper over libmodbus.
- Designed a licensing subsystem with RSA-2048 signatures, SHA-256 hashing, hardware fingerprinting, and feature flags using OpenSSL.
- Implemented C++ ML inference and predictive-maintenance pipelines on time-series sensor data: EMA-based anomaly detection, remaining-useful-life forecasting, and health scoring.
- Engineered fault-tolerant operation with sub-second failover and data-persistence guarantees for 24/7 edge deployments.
- Validated correctness with a Catch2 test suite and a fault-injection simulation framework (unit, integration, failure-mode analysis).

### Software Developer · Gertech Industrial Solutions

Oct 2023 – Dec 2024

- Built C++ and Rust critical systems for embedded Linux, processing large daily sample volumes in real time.
- Implemented lock-free ring buffers for real-time sensor ingestion, reducing drop rates under load.
- Implemented high-availability, high-parallelism servers in C++ and C# with fine-grained concurrency.
- Set up ARM cross-compilation and emulation toolchains (GCC, QEMU, CMake) and automated build pipelines.
- Developed graphical libraries for touchscreen HMI; automated industrial build and deployment processes with Python and Bash.

## SKILLS

**Languages** · C++ (17/20), C, Rust, Python, Bash

**Systems & Networking** · Linux internals, io\_uring, multithreading, concurrency, lock-free data structures; asio async I/O; TCP/IP, UDP, VLANs, routing; tcpdump, Wireshark, perf

**Infrastructure** · Proxmox VE/HA, Kubernetes, Docker, Terraform, Ansible, pfSense, TLS/mTLS, OpenSSL

**Build & Testing** · CMake, Catch2, GDB, Valgrind, sanitizers (ASan/UBSan), Git

**Observability & CI/CD** · Prometheus, Grafana, Zabbix, Jaeger; GitHub Actions, GitLab CI

**Embedded & Real-Time** · ARM cross-compilation (GCC, QEMU), Qt/Embedded Linux, RS-485/Modbus (libmodbus), real-time control

**Backend & Data** · gRPC, Protocol Buffers, REST, PostgreSQL, SQLite, Redis

## EDUCATION

**B.Sc. in Computer Science** · Unochapecó, Brazil

2023 – 2027 (expected)