

Axel Hoffmann

Backend Engineer | Rust, Distributed Systems & Kubernetes

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PROFILE

Backend engineer with 3+ years of experience building production distributed systems and event-driven platforms. Strong in Rust, PostgreSQL/TimescaleDB, NATS JetStream and Kubernetes/GitOps, with end-to-end ownership from domain design to production operations. Based in Brussels and open to remote roles in international teams.

TECHNICAL SKILLS

Languages: Rust, TypeScript, PHP, SQL

Backend: Axum, Tokio, sqlx, AdonisJS, Laravel, REST / OpenAPI, hexagonal architecture, CQRS, event-driven

Data & messaging: PostgreSQL, TimescaleDB (time series, continuous aggregates), NATS JetStream, MQTT 5.0, Redis

Infrastructure: Kubernetes / OKD, GitOps (Argo CD, Tekton, Kustomize), Docker, Proxmox, CI/CD

Security & IoT: OIDC / OAuth2 (Authentik), JWT RS256 / JWKS, multi-tenant RBAC, LoRaWAN / ChirpStack, FIWARE Smart Data Models

EXPERIENCE

Backend Engineer

2023 – present

STARI, Research & Innovation Support (ULB & FARI) · Brussels

- Built and launched [SPARC](#), an IoT platform running in production across ULB campuses, owning the Rust backend, the web application and the OKD infrastructure. Eight-crate workspace backed by 673 automated tests.
- Designed an idempotent multi-protocol ingestion pipeline (LoRaWAN / ChirpStack, MQTT 5.0, HTTP) on NATS JetStream, with dead-letter queues and TimescaleDB storage (hypertables, continuous aggregates, compression).
- Structured the domain core in hexagonal architecture with CQRS separation enforced at compile time, making it impossible to write telemetry through the API.
- Secured the platform end to end: OIDC authentication (Authentik, RS256 / JWKS, no shared secret) and fail-closed multi-tenant RBAC implemented as pure functions.
- Automated delivery through a full GitOps chain on OKD (Tekton, Argo CD, Kustomize, Sealed Secrets) with hardened pods, reducing deployment to a single merge.
- Delivered the university's research web platforms: Tandem (language exchange) and IRIS (application submission) in AdonisJS, [Infofin](#) in Laravel.

SELECTED PROJECT

[Digital Twin Framework](#) · TypeScript · BullMQ · Redis · Kysely · S3

Open-source (MIT) framework for building digital-twin applications, developed for FARI: layered pnpm monorepo, scheduled collectors, processing pipelines, asset management with presigned S3 uploads, BullMQ queues, a scaffolding CLI and OpenAPI generation.

EDUCATION

Bachelor's in Computer Science, Networks & Telecommunications

2020 – 2023

HEH, Haute École en Hainaut, Belgium

LANGUAGES

French: native

English: B2