Engineer

Performance Tuning

30 achievements

Connect the parts of your system

The work collected under “Performance Tuning” shows one part of a working system. We can help connect that part to the rest of your operation. Finding the queries and the missing indexes behind a system that has got heavier every year, and fixing the ones that matter.

Explore our services Get in touch →

Find a comparable challenge

Follow an example that resembles your situation. Its review describes the decisions behind the result, beyond the technology label. 30 days of electricity data in 180 ms — 180 ms to aggregate a month of meter readings

30 days of electricity data in 180 ms Get in touch →

30 days of electricity data in 180 ms

Engineered hourly electricity-consumption aggregation variants in Python, SQL and Bash + Jq, with the Python benchmark processing one 30-day JSONL dataset in 180ms.

Made a geographical data pipeline 50x faster

Recorded a 50x geographical data-pipeline improvement in the founder’s Utiligize work through SQL and data-model changes across PostgreSQL, MS SQL and Google Cloud BigQuery.

Improved GIS map performance 10x on PostgreSQL

Improved geographical map application performance by 10x through strategic database transition from MSSQL to PostgreSQL, including the data cutover, optimizing processing and data security.

Resolved 1,000 issues in geographical data

Resolved 1,000 issues in geographical data and time-series data, using GDAL, ArcGIS, PostGIS, Mapbox, QGIS, SQL (PL/pgSQL, Transact-SQL), Bash, ensuring high-quality big data processing.

Ran 100 PostgreSQL, MS SQL, BigQuery warehouses

Architected, created, and managed 100 PostgreSQL, MS SQL, and Google BigQuery data warehouse databases with primarily GIS and time-series data, optimizing performance and scalability.

Ran 10 PostgreSQL and MS SQL servers on Ubuntu

Designed, deployed, and maintained 10 PostgreSQL and MS SQL servers on Ubuntu Linux VPS, ensuring optimal server performance and reliability.

Accelerated PostgreSQL performance by 10x

Accelerated PostgreSQL performance by 10x via strategic indexing, partitioning, and query optimization, enhancing database efficiency for user, tenant, geospatial, and time-series electrical data.

Directed full-stack GIS map development

Directed full-stack GIS map development, overseeing PostgreSQL, Mapbox, ReactJS, and NodeJS to deliver an integrated solution.

Overhauled internal processes, saving 8,000 hours

Overhauled internal processes, saving 8,000 hours by improving software architecture, systems, and scheduling efficiency.

Saved 150 hours a month across 30 projects

Enhanced project efficiency, saving 150 hours per month across 30 projects by optimizing workflows and resource management.

Administered 40 websites on Apache and Nginx

Administered 40 websites on Ubuntu Linux hosting servers with Apache and Nginx, ensuring high availability and performance.

Engineered 600 PL/pgSQL ETL/ELT pipelines

Engineered 600 PL/pgSQL-based ETL/ELT pipelines to streamline complex data processing workflows across multiple PostgreSQL development and production environments.

Designed a JSON passthrough from Postgres to API

Designed a JSON passthrough architecture where PostgreSQL functions return complete JSON forwarded verbatim by the Go API, eliminating intermediate unmarshalling and decoupling the frontend from schema changes.

Time-ordered keys for a growing data model

Adopted UUID v7 time-ordered identifiers (PostgreSQL 18) as entity keys to reduce B-tree index fragmentation and speed up queries.

Modeled 348 tables across 34 Postgres schemas

Modeled the maritime domain into 348 normalized tables across 34 PostgreSQL schemas — professionals, companies, ships, jobs, reviews and the rest — with SMALLINT lookups and UUID v7 keys.

Built the Next.js 16 frontend: SSR, SSG and CSR

Built the Next.js 16 frontend with deliberate SSR, SSG and CSR strategies, and a reusable prefetched-server-page factory that removes the N+1 fetch cascade from each authenticated page moved onto it.

Delivered full Progressive Web App support

Delivered full Progressive Web App support — installable and offline-capable — with Workbox runtime caching via next-pwa.

Moved slow work onto a River job queue

Moved slow work off the request path onto a River job queue — 15 worker modules, 8 scheduled tasks and 20 pg_cron jobs — so a request returns while the work behind it carries on.

Built fail-closed rate limiting and anti-abuse

Built fail-closed abuse controls — 22 Redis-backed rate limiters, Cloudflare Turnstile, request idempotency and an origin lock — so the platform sheds bots and floods instead of trusting its callers.

Built first-party analytics inside PostgreSQL

Built first-party product analytics in PostgreSQL — 47 functions over partitioned event tables that prune themselves — pseudonymised behind a rotating salt and gated on the visitor's consent.

Built a loyalty wallet, leagues and badges

Built the loyalty and reputation system — 67 functions over a 31-table ledger, with leagues, badges and a redemption shop — taking a row lock on the balance to close the double-spend window.

Public services on a small server

Hosted the company's public services on a single-core 512 MB host — a git forge, a web server for seven domains, Tor, two alternative-protocol servers and intrusion banning — treating 464 MB of usable memory as the design constraint; backup automation is a separate implementation.

Built dead-man's-switch host monitoring

Built dead-man's-switch monitoring that pings only while memory and disk are healthy, so a degraded host raises an alert by going silent — and caught six variable names saying "free" where the check correctly measured "available", an order of magnitude apart on a 464 MB box.

Built a multilingual Hugo site in 3 languages

Built a multilingual static site in Hugo across 108 template files including 53 partials, publishing every page in four representations from one content tree in three languages, and again under seven focused subdomains built from that same tree.

A safety net that no longer costs half an hour

Cut the site's browser-driven quality gate from 1,636 seconds to 615 by scheduling its checks longest-first through a worker pool bounded to four lanes, after measuring that alphabetical order cost 320 seconds against 224.

Cut the stylesheet bundle from 87 KB to 31 KB

Cut the stylesheet bundle from 87 KB to 31 KB by taking a base64 font out of it, and dropped 756 KB across 22 files that were published on every deploy and referenced by nothing.

Vendored a QR encoder in 522 lines

Vendored a QR encoder — Reed-Solomon over GF(256), fixed module layout, eight mask patterns — in 522 lines rather than take a third runtime dependency, and verified it by reading the finished matrix back with an independently written decoder.

A bounded event pipeline for a macOS app

Bounded event buffers and logging after a recorded macOS incident with 41 MB per second growth and 111 GB of compressed pages on a 36 GB machine; a recorded full test run reduced core log lines from 610,996 to 1,411.

Adopted Swift 6 strict concurrency over C

Adopted Swift 6 complete strict concurrency with no actors, bridging a blocking C event loop to the main actor through one producer, one consumer and one ordering — after establishing that a task per event loses the ordering the interface depends on.

Took the test suite to 8.9 seconds

Took the test suite from six tests over a sixty-second limit to 135 passing in 8.9 seconds by profiling the main thread and removing the two calls it sat inside for 3,989 samples out of 4,017.

Focus the engineering effort

Bring a representative dataset, the questions it must answer and the current bottleneck. We can agree how to measure quality, throughput and recovery.

See what it costs Get in touch →

Put the subject in your context

Tell us how “Performance Tuning” appears in your own system. We can help choose the relevant service and define the work around it.

Explore our services

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