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# Tomás Iyer

## Staff Software Engineer — Distributed Systems

### SUMMARY

Staff engineer with twelve years on storage and streaming infrastructure. I work on the parts of a system that are hard to change later: consistency models, failure handling, capacity envelopes and the migration plans that get you from the old design to the new one without a maintenance window. Most recent work is a multi-region event store serving 1.4 million writes a second at four nines of availability. I write design documents that other teams can act on, and I prefer boring, instrumented solutions to clever ones.

### TECHNOLOGY MATRIX

| AREA | PRIMARY TOOLS | DEPTH | YEARS |
|---|---|---|---|
| **Languages** | Go, Rust, C++17/20, Python, TypeScript, SQL | ■■■■■ Expert | 12 |
| **Distributed systems** | Raft, consistent hashing, CRDTs, exactly-once pipelines, backpressure design | ■■■■■ Expert | 9 |
| **Data stores** | PostgreSQL, ScyllaDB, ClickHouse, Redis, S3-compatible object stores | ■■■■□ Advanced | 10 |
| **Streaming** | Kafka, Redpanda, Flink, NATS JetStream, schema registry design | ■■■■□ Advanced | 7 |
| **Platform & runtime** | Kubernetes, Nomad, containerd, eBPF tracing, Linux performance tuning | ■■■■□ Advanced | 8 |
| **Infrastructure as code** | Terraform, Pulumi, Ansible, ArgoCD, GitHub Actions, Buildkite | ■■■□□ Proficient | 8 |
| **Observability** | OpenTelemetry, Prometheus, Grafana, Tempo, continuous profiling | ■■■■□ Advanced | 6 |
| **Security & compliance** | mTLS, envelope encryption, KMS integration, SOC 2 evidence automation | ■■■□□ Proficient | 5 |

### EXPERIENCE

**Staff Software Engineer** — Jan 2022 — present
**Halcyon Data — Remote (Lisbon)**
Stack: Go, Rust, ScyllaDB, Kafka, Kubernetes, Terraform, OpenTelemetry

- Technical lead for the multi-region event store: 1.4M sustained writes/s, 99.99% availability over the last eight quarters, p99 append latency 7 ms.
- Designed and executed the migration from the single-region v1 store to the new architecture — 340 TB moved online, zero customer-visible downtime, rollback point preserved at every stage.
- Cut steady-state infrastructure spend 41% (about €2.1M a year) by replacing a hot-standby topology with quorum reads and right-sizing the compaction fleet.
- Introduced a deterministic simulation harness for failure testing; it has caught 23 correctness bugs before release, four of which would have caused data loss.
- Mentor three senior engineers and run the storage design-review forum.

### Senior Software Engineer

Mar 2018 — Dec 2021

**Northbeam Systems — Porto, Portugal**

Stack: C++, Python, PostgreSQL, Redis, Kubernetes, Prometheus

- Rebuilt the ingestion path for the telemetry product: throughput up 6×, cost per billion events down 72%.
- Owned the query planner for the time-series engine; median dashboard load time went from 4.1 s to 0.6 s.
- Led the incident-response rotation redesign that reduced mean time to mitigate from 46 minutes to 11.

### Software Engineer

Aug 2014 — Feb 2018

**Ferrolane Labs — Lisbon, Portugal**

Stack: C++, Go, MySQL, RabbitMQ, Ansible

- Built the order-matching service for a marketplace processing €400M of volume a year.
- Wrote the company's first load-testing framework, still in use, and the capacity model derived from it.

## SELECTED PROJECTS & MEASURED IMPACT

| PROJECT | TECHNOLOGY | WHAT CHANGED | IMPACT |
|---|---|---|---|
| **Meridian event store**<br>Halcyon Data · 2023—2026 | Rust, Raft, ScyllaDB, io_uring | Replaced a single-region append log with a quorum-replicated, multi-region store; added tiered storage to object storage after 30 days. | **1.4M writes/s** |
| **Online 340 TB migration**<br>Halcyon Data · 2024 | Go, Kafka, dual-write shadow reads | Dual-write and verify pipeline with automated consistency sampling and a documented abort path at each of nine stages. | **0 s downtime** |
| **Deterministic failure simulator**<br>Halcyon Data · 2023 | Rust, custom scheduler, fault injection | Runs the full cluster under a seeded scheduler with injected partitions, clock skew and disk faults; failures replay exactly. | **23 bugs caught** |
| **Telemetry ingestion rewrite**<br>Northbeam Systems · 2020 | C++, lock-free ring buffers, protobuf | Replaced a thread-per-connection parser with a batched, zero-copy path and adaptive backpressure. | **6× throughput** |
| **Query planner overhaul**<br>Northbeam Systems · 2019 | C++, cost-based planning, PostgreSQL | Cost-based operator reordering plus a result cache keyed on time-window granularity. | **4.1 s → 0.6 s** |
| **Capacity model and load harness**<br>Ferrolane Labs · 2016 | Go, Ansible, Prometheus | Reproducible load profiles derived from production traces, used to size every release since. | **3 outages avoided** |

## OPEN SOURCE

| | | |
|---|---|---|
| `github.com/tomasiyer/quorumkit` | Raft implementation with a pluggable transport and a test suite built on deterministic simulation. | 4.2k stars |
| `github.com/tomasiyer/otel-goflight` | Low-overhead OpenTelemetry sampler for high-cardinality Go services. | 1.1k stars |
| `github.com/apache/flink` | Contributor: state-backend compaction fixes and two RocksDB configuration regressions. | 31 commits |
| `github.com/scylladb/scylla` | Contributor: repair scheduling bug and documentation for multi-DC quorum reads. | 9 commits |
| `tomasiyer.example.dev/notes` | Engineering notes on storage design, migrations and simulation testing; roughly 40,000 readers a month. | 38 articles |

## EDUCATION

**MSc, Computer Science (Distributed Systems)**
Instituto Superior Técnico, Lisbon · 2012 — 2014

**BSc, Computer Engineering**
University of Coimbra · 2009 — 2012

## CERTIFICATIONS

**Certified Kubernetes Administrator**
CNCF · 2024

**AWS Solutions Architect — Professional**
Amazon Web Services · 2022

## TALKS & WRITING

- “Migrating 340 terabytes without a maintenance window” — Systems Distributed, 2025.
- “Deterministic simulation is cheaper than you think” — Rust Nation, 2024.
- “Backpressure as a product decision” — QCon London, 2023.
- Reviewer, USENIX ATC industry track, 2024 and 2025.