ROBERTO H JACOB DA SILVA

Redmond, Washington, USA

Email: robertohjdasilva@hotmail.com | LinkedIn: www.linkedin.com/in/robertohjdasilva | Website: rjsilva.org

PRINCIPAL SOFTWARE ENGINEER | DISTRIBUTED SYSTEMS, OBSERVABILITY & NETWORKING

Inventor (29 U.S. Patents) | Author | Creator of Engineering with a Heart

Principal Software Engineer with 20+ years of experience designing large-scale distributed systems, networking software, and observability platforms used to diagnose and stabilize complex production environments. An engineer and architect with deep roots in Ethernet switching, IP networking, virtualization, and telemetry systems, and recent leadership in distributed tracing and automated diagnostics at cloud scale. Inventor of 29 U.S. patents across networking, distributed systems, and cloud infrastructure, and author of the memoir Impossible Crossing. Combines deep systems programming expertise with architectural leadership focused on reliability, visibility, performance, and operational transparency.

CORE EXPERTISE

- Observability & Diagnostics
- Distributed Systems, Virtualization & Cloud Platforms
- Networking, Ethernet Switching & Telemetry
- Systems Programming

PROFESSIONAL EXPERIENCE

Microsoft, **Principal Software Engineer**, 2022 – Present (Redmond, WA)

- Lead architect and primary developer of an **observability and diagnostics platform** for a distributed VM orchestration system used in large-scale CI/CD infrastructure, applying deep expertise in distributed systems, telemetry, and performance analysis across both networking and cloud platforms.
- Designed and implemented **end-to-end distributed tracing using OpenTelemetry** across multiple services, capturing gRPC communication, asynchronous coroutine execution, and scheduler operations, reducing incident investigation time by **83% (4.2 hours → 10 minutes)**.
- Built a **custom distributed trace analysis platform**, including a high-performance trace database, ingestion pipeline, and developer UI enabling trace timeline visualization and **diagnostics-driven debugging** of complex distributed workflows.
- Developed **automated post-run diagnostics for distributed traces**, detecting failures, instrumentation gaps, and performance regressions while identifying critical execution paths across large CI workloads.
- Redesigned the **trace ingestion architecture**, evolving from early prototypes based on Grafana Tempo and Azure Storage to a dedicated ingestion pipeline, reducing indexing time for large trace datasets from **~40 minutes → <10 minutes** and historical trace comparison latency from **~2 minutes → <5 seconds**.

- Strengthened platform reliability by diagnosing and resolving systemic issues across distributed CI infrastructure and implementing **Linux cgroups-based resource isolation**, reducing pipeline failure rates from **20% → <5%**, eliminating production OOM incidents, and improving VM lifecycle stability.

Lenovo, **Principal Software Engineer**, 2014 **–** 2022 (Remote, USA)
- Architected hybrid cloud infrastructure, network telemetry, and enterprise networking software for data center and edge platforms; recognized as Lenovo Master Inventor for sustained innovation.
- Led design of telemetry-driven network visibility solutions for Lenovo switches, including analytics use cases for congestion detection, resource overutilization, and operational insight.
- Contributed to private cloud and virtual networking architecture, including multi-site network extension, embedded switching, and performance optimization for network functions virtualization.

IBM, **Principal Software Engineer**, 2013 – 2014 (San Jose, CA)
- Developed automated testing, logging, and diagnostics infrastructure for distributed enterprise and networking systems, improving reliability, debuggability, and engineering productivity.

Nokia, **Staff Software Engineer,** 2003 – 2013 (Calabasas, CA)
- Designed distributed networking software and high-availability telecom/data-center infrastructure, including Ethernet switching, virtual chassis, link aggregation, IP forwarding, PPP, and protocol-level systems for carrier-scale platforms.

WRITING & THOUGHT LEADERSHIP

- Author — *Impossible Crossing: An Inspirational Journey of Hope, Perseverance, and the Pursuit of Dreams (Amazon, 2022)*.
- Co-author — *Performance Optimization Strategies for Network Functions Virtualization* (Lenovo Press article, LP1495, 2021).
- Co-author — *Introduction to Lenovo Network Telemetry* (Lenovo Press article, LP0894, 2018).
- Founder & Author — *Engineering with a Heart*, a platform for essays on human-centered innovation and responsible technology (https://rjsilva.org).

PATENTS & AWARDS

- Inventor of 29 U.S. patents spanning networking, distributed systems, observability, cloud computing, and IoT.
- Lenovo Master Inventor; recipient of multiple engineering excellence awards at Lenovo and Nokia.

EDUCATION

- B.S.E. in Electronics Engineering — Instituto Tecnológico de Aeronáutica (ITA), Brazil.