

# Petros Angelatos

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## Summary

In the past 8 years I co-founded balena.io, designed and built its software architecture, grew the company to 100 people, and raised over \$14M in funding. During this time I developed deep expertise in multiple areas ranging from web technologies, microservices, database and API design to the Linux operating system, systems programming, and embedded devices.

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## Experience

### **balena.io** ([website](#)) / Founder & CTO

FEBRUARY 2012 - NOVEMBER 2020, LONDON & SEATTLE

Complete set of tools for building, deploying, and managing fleets of connected Linux devices with over 150k active devices on the platform.

#### Engineering Management

- Managed diverse, remote engineering team of 50 people
- Conducted hundreds of interviews and grew team from 3 to 50 engineers
- Led the architecture of the product spanning hardware design, operating systems, backend & network architecture, API design, frontend architecture
- Scaled infrastructure, supporting exponential product and usage growth
- Led several R&D breakthroughs and their path to production

#### Technical Expertise

- **Frontend** React, HTML5, CSS, WebGL, Incremental Computation
- **API Design** REST, GraphQL, OData
- **Monitoring** SLAs, Performance metrics, Prometheus, Netdata
- **Security** TLS, JWT, OAuth, Browser Sandbox, Cryptographic Principles
- **Databases** Data modelling, Normalization, Indexing, SQL, Datalog
- **Scaling** Sharding, Replication, Caching, CAP, CRDTs
- **Containers** docker, runc, systemd-nspawn, k8s
- **Infrastructure** AWS (incl VPC, EKS, S3, RDS, IAM), CI/CD, Jenkins
- **Networking** OpenVPN, TCP/IP, DNS, Avahi, DHCP, ARP, NTP
- **Linux** Filesystems, cgroups, namespaces, systemd
- **Embedded** I<sup>2</sup>C, SPI, GPIOs, DTBs, FCC certification, Schematic review

#### Notable R&D Results

##### Docker on ARM ([blog post](#))

First port and public release of Docker on the ARM architecture

##### Schedule Optimization with Linear Programming ([blog post](#))

Modelled our company meeting requirements as a set of constraints and used linear programming to find the optimal schedule

##### Docker ARM emulation on x86 ([blog post](#))

Patched QEMU for transparent ARM emulation on x86 and integrated it with the Dockerfile build process

##### NodeJS Linux LKL ([github repo](#))

NodeJS native bindings to Linux kernel instance running in userspace.  
Allows manipulating Linux filesystems from any operating system

##### balenaEngine ([website](#))

- Hardened docker engine against power offs and intermittent network
- Optimised IO operations during pulling to minimise flash wear
- Shrunk binary size by 75% for space constrained devices

##### Docker binary deltas ([blog post](#), [presentation](#))

- Implemented librsync based docker image delta algorithm
- Up to 70x less bandwidth transferred over the wire

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### **Kamibu Ltd** / Founder & Software Engineer

DECEMBER 2010 - JANUARY 2012 - ATHENS, GREECE

Worked with a small team to build FinalPromise, a browser-based 3D MMORPG

#### - FinalEngine ([github repo](#))

- Implemented JavaScript 3D renderer on top of WebGL
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- Implemented a high performance JavaScript physics engine
  - **XSTEER** ([promo video](#))
  - Implemented mobile application that streamed a phone's IMU sensors in real-time over the local network to allow controlling web based games with a joystick experience

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**Zino** ([archived git repo](#)) / Software Engineer

DECEMBER 2008 - DECEMBER 2010, ATHENS, GREECE

Greek social network for teenagers

- Feature development in HTML/CSS/PHP/JavaScript
  - Implemented realtime chat and presence server in NodeJS 0.4
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- Conferences**
- balenaEngine: a Moby based container engine for IoT / Dockercon**  
NOVEMBER 2017, COPENHAGEN
- Presented the binary space saving techniques and binary delta algorithm used in balenaEngine. ([video](#))
- Bringing DevOps to Devices - Modern Update Approaches for Embedded Linux / ELC**  
MAY 2016, SAN DIEGO, CA
- State of the art overview of remote update strategies on embedded devices ([video](#))
- Introducing resinOS: An Operating System Tailored for Containers and Built for the Embedded World / ELCE**  
OCTOBER 2016, BERLIN
- Presented techniques used in resinOS for multi-board compatibility, minimal footprint, and robust remote updates ([video](#))
- Running ARM containers on x86 platforms / FOSSCOMM**  
APRIL 2016, ATHENS
- Presented the inner workings of QEMU ARM emulation during a x86 docker build
- P2P Web Video Conferencing / FOSSCOMM**  
JUNE 2010, ATHENS
- Presented the state of the art on peer to peer browser connections, covering UDP hole punching and NAT traversal
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- Teaching**
- Web Development Class** ([website](#))  
SEPTEMBER 2010 - JANUARY 2011, ATHENS
- Semester long Web Development class. Taught 200 university students HTML, CSS, Javascript, PHP, MySQL.
- Security Class** ([website](#))  
MAY 2014, ATHENS
- Broad security seminar on web application security, HTTPS, cryptography, GPG, Tor, OTR, and Bitcoin.
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- Education**
- National Technical University of Athens**  
SEPTEMBER 2008 - SEPTEMBER 2010 (DROP OUT), ATHENS
- Electrical and Computer Engineering
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- Programming Languages**
- 10+ years of JavaScript, NodeJS, Python  
6+ years of Golang  
4+ years of Rust
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- Languages**
- English: Fluent Speaker  
Spanish: Intermediate  
Greek: Native Speaker
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