

# Nathaniel Felsen

## contact

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Green card holder

## core engineering

Architecting,  
Automation, System,  
Network, Security,  
Scaling, Deploying,  
Logging, Algorithmic,  
Unit Testing,  
Troubleshooting

## scripting & programming

Python, Bash, Perl

## runtimes

Bare metal, VM,  
Containers,  
Public Cloud,  
Private Cloud

## AI Infrastructure

GPU,  
Parallel filesystems,  
Slurm, BCM, Infiniband,  
RoCE

## datastores

MySQL, PostgreSQL,  
Redis, HDFS, HBase,  
ElasticSearch, RDS,  
Bloomd, Neo4j, Weka

## monitoring

Prometheus, Grafana,  
Datadog, Splunk, ELK,  
Open telemetry

## configuration management

Ansible, Puppet,  
Terraform, Helm,  
CloudFormation

## soft skills

Leadership,  
People management,  
Project management,  
Incident response

## experience

Feb 2018  
Dec 2024

### Tesla

*SRE, HPC and AI Infrastructure*

Led AI infrastructure development and operations, improving cluster deployments, monitoring, and security with a strong emphasis on automation.

- Deployed multiple large clusters (over 100K GPUs in multiple datacenters)
  - Utilized H100, A100, A40, MI250, and MI300x
  - Implemented Infiniband and RoCEv2 for networking
  - Used Weka for parallel filesystem
- Developed and led a team of engineers to build Tesla's HPC platform, adopting new technologies and spearheading Kubernetes integration within the organization.
- Implemented fully automated bare-metal server provisioning by integrating Netbox, MAAS, Vault, Ansible, and Python scripts, streamlining processes and improving efficiency.
- Centralized and automated BIOS configuration management.
- Enhanced monitoring capabilities by introducing
  - A comprehensive monitoring of hardware and infrastructure services
  - Prometheus and many custom Prometheus exporters
  - Log collection using Splunk
  - Custom tools to remediate issues automatically
- Strengthened security posture by
  - Implementing an egress management layer
  - Collaborating with InfoSec teams to populate audit reports
  - Integrating a custom IAM layer
  - Adding an EDR solution
- Successfully established an intern program, contributing to team growth and development.
- Diagnosed and resolved issues and incidents.
- Participated in the 24x7 on-call rotation.

Palo Alto, California

Nov '22 to Dec '24

*SRE, Vehicle Software - Data Platforms*

Feb '18 to Nov '22

Led the infrastructure development for a groundbreaking hybrid cloud data platform. Orchestrated the handling of trillions of events per day from diverse sources, including cars, factories, and energy products, leveraging open-source technologies and cloud services. Drove innovation in a data-centric world, delivering unparalleled scalability, performance, security, and durability.

- Architected the first iteration of the platform on-prem using Hadoop on bare metal servers to handle urgent needs.
- Migrated services to run in Kubernetes using Helm.
- Reimplemented the platform using a hybrid cloud-native approach, leveraging AWS on top of our private cloud.
- Implemented CI/CD using Bazel and Jenkins.
- Implemented monitoring using Prometheus, Cloudwatch, Grafana, and Splunk.
- Made the platform multi-cloud with a presence worldwide, including in China and Europe.
- Ensured GDPR compliance for the platform.
- Troubleshot issues and incidents.
- Participated in the 24x7 on-call rotation.

Jun 2014  
Feb 2018

**Medium**  
*DevOps Engineer*

San Francisco, California

- Transformed Medium into a DevOps-centric organization
  - Educated the engineering organization on goals and best practices.
  - Created an IAC Infrastructure using CloudFormation and Ansible.
  - Developed continuous integration and continuous deployment pipelines for services.
  - Created a highly scalable logging infrastructure using ELK and Kinesis.
  - Introduced new SaaS tools to better monitor metrics and trace requests.
  - Collected top-level metrics to track engineering efforts.
- Took over management of the team called the Watch.
  - On-boarded and coached new team members.
  - Scheduled on-call rotation.
  - Reported team activity and business key metrics to the broader organization.
  - Created documentation to assist with on-call work.
  - Took over Quality Engineering efforts.
  - Troubleshoot issues and incidents.
- Managed the various databases in our infrastructure.
  - Improved overall performance and cost of DynamoDB.
  - Scaled Neo4j to handle the current QPS and dataset.
  - Migrated internal services from Redis to ElastiCache.
  - Introduced new databases, including RDS Aurora.
  - Created backup systems to secure our databases in other AWS accounts.
- Brought AWS expertise to Medium.
  - Migrated from AWS classic to VPC.
  - Provided regular presentations on new AWS technologies.
  - Moved services to Docker / ECS.
  - Architected new services to better leverage AWS services.
  - Created ETL pipelines to stream data from DynamoDB to Redshift using Lambda.
  - Added multiple CDNs to our architecture.
  - Implemented DDOS protection and rearchitected load balancing for better scalability.
- Migrated Superfeedr to AWS.
- Conducted onboarding presentations on our architecture for new hires.

Mar 2013  
Jun 2014

**Jive Software**  
*DevOps Engineer and Service Architect*

San Francisco, California

- Created a complete solution for CI/CD for legacy and new services.
- Participated in creating the company's internal framework to manage services.
- Managed all multi-tenant customer-facing services.
- Automated provisioning and orchestration of resources.
- Puppetized a number of services previously managed by hand.
- Added numerous DevOps tools to our infrastructure.
- Deployed a solution to manage logs (Logstash, Kibana, Elasticsearch).
- (Re)Architected several services to comply with industry best practices.
- Improved infrastructure monitoring.
- Administered Hadoop and HBase clusters.
- Troubleshoot issues and incidents.
- Added documentation and processes to hand off service management to other teams.

Sept 2012  
Feb 2013

**Square**  
*Service Reliability Operation Engineer*

San Francisco, California

- Joined Square as the first member of the SROE organization
- Created & documented all aspects of building SROE team (runbooks, checklists, change policies...)
- Defined the team roadmap as well as work prioritization
- Ran daily and weekly meetings on Change management (ITSM) and Infrastructure metrics review
- Made daily changes to our infrastructures in staging and production
- Supported the engineering team with operations tasks (supplied hardware, created vips, db, dns changes etc...)
- Monitored infrastructure
- Troubleshoot issues and incidents
- Took part of the 24x7 oncall rotation

Sept 2010  
Sept 2012

**OnLive**  
*Lead Service Reliability Engineer*

Palo Alto, California

- Led a team of SRE of varying skill levels across multiple shifts (2 deeps), including weekend and grave
- Ensured that tasks and projects get proper execution and resources
- Monitored infrastructure
- Added new monitoring scripts and tools to gain visibility on the platform and services
- Developed new commands to operate the infrastructure
- Automated recurring tasks
- Re-architected services to make them more reliable
- Trained new employees
- Improved, Updated and Added documentations of our process in the wiki
- Rolled out new code and new content to production
- Troubleshoot issues and incidents
- Post mortem analyses

Aug 2007  
Sept 2010

**Orb Networks (Acquired by Qualcomm)**  
*Server Operations / Linux Developer*

Oakland, California

- Managed the operations: Responsible for System, Network and Security of the development, pre-production and production environment
- Ported our desktop application Orb Caster to Linux (RPM/Deb and partners appliances)
- Developed embedded software for orb's home consumer products Orb Music and Orb TV
- Improved the architecture of the web applications Mycast V1 and V2
- Redesigned the database architecture schema to get high availability and geographic load balancing
- Automated recurring tasks (build & release of software, firmware, website, sales tax report)
- Developed, integrated and deployed server side applications for streaming, crash reporting, registration

Mar 2006  
Aug 2007

**Qualys**  
*Linux System Administrator*

Redwood Shores, California

- Managed Staging, Quality Assurance and Development servers that are involved in running the QualysGuard service.
- Developed web based tools and applications for Setup, Administration, Maintenance and Troubleshooting of the production environment
- Built and deployed new server hardware for the QualysGuard service.
- Performed ongoing system maintenance, administration, and troubleshooting.
- Deployed new systems and security patches.
- Analyzed performance and identify system bottlenecks
- Made a proof of concept on the log management
- R&D on the integration of QualysGuard in open source and commercial solutions

## publication

Jul 2017

**Effective DevOps with AWS**

Packt Publishing

Sept 2018

**Effective DevOps with AWS - 2nd edition**

Packt Publishing

Scale gracefully and maintain outstanding performance with your AWS-based infrastructure using DevOps principles – still available on [amazon.com](https://amazon.com)

## additional experience

Aug 15  
Aug 18

**Holberton School of Software Engineering**  
Mentor

San Francisco, California

- Interacting regularly with students to talk about real-life software engineering issues.
- Mentoring students through their formations

Feb 08  
Oct 08

**Acadopia**  
Technical co-founder

San Francisco, California

- Chose the technologies and tools to use for the initial product
- Architected the application
- Developed the application with 2 other engineers

Dec 07  
Feb 08

**NewsBox Facebook application**  
Web Developer

San Francisco, California

- Architected the server infrastructure
- Developed the Back-End, Front-End and User Interface

Mar 05  
Dec 05

**Hawkeye**  
Developer

Paris, France

Took part in developing the open source project, hawkeye

Jan 05  
Dec 05

**Cristal**  
Security consultant (contractor)

Paris, France

- Involved with 2-3 application/network penetration tests a month.
- Created Reports for the client during the vulnerability discovery, remediation and mitigation processes.

Jan 05  
Dec 05

**Epita**  
Teacher's Assistant

Paris, France

Taught engineering students C, Unix programming and algorithmic

## education

2024

**Engineering Leadership Certificate**

Cornell University

2001–2006

**Master's** in Computer Science (MScS)  
Graduated with honors

EPITA, Paris, France