Modernising Tasking Manager Infrastructure

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DevOps Architect

Humanitarian
OpenStreetMap
Team

Humanitarian OpenStreetMap Team

- International non-profit NGO
- dedicated to humanitarian action
- focussed on open mapping
- community development
- contributions go to OpenStreetMap

HOT Impact Report

https://www.hotosm.org/annual-reports/2022-2023-impact-report/

“Solving the problems of a thousand people..

..with the help of a thousand people”

The impact!

2.2M

BUILDINGS

84K

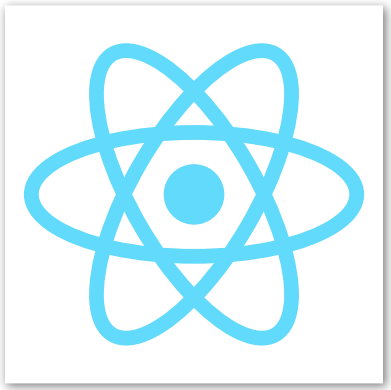
KM ROADS

CONTRIBUTORS

HOT Tasking Manager

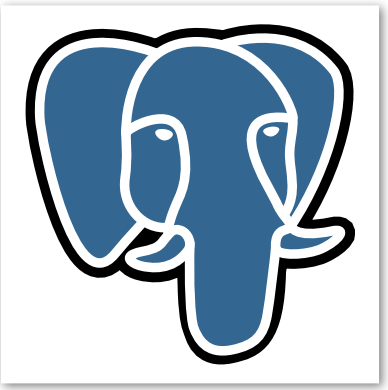
- coordination tool for collaborative mapping
- contributions go to OpenStreetMap
- mapped → uploaded → validated
- projects can be for any purpose

Tech Stack



Frontend - React

Backend - Python

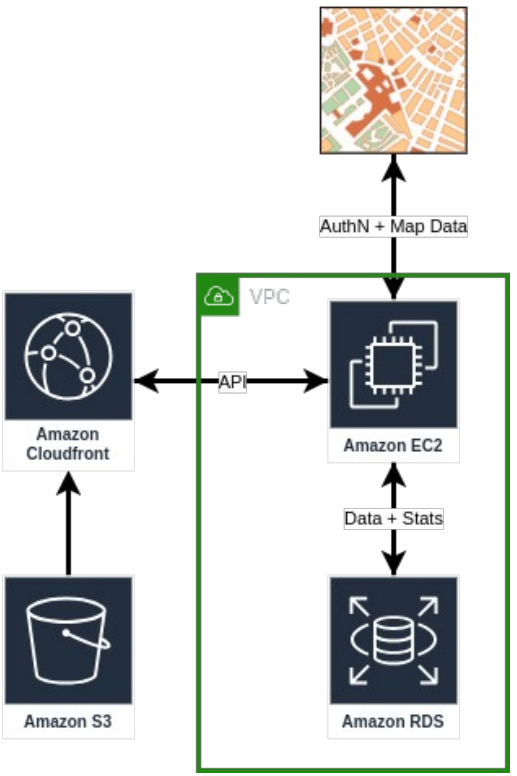


Database – PostgreSQL

Infrastructure – AWS

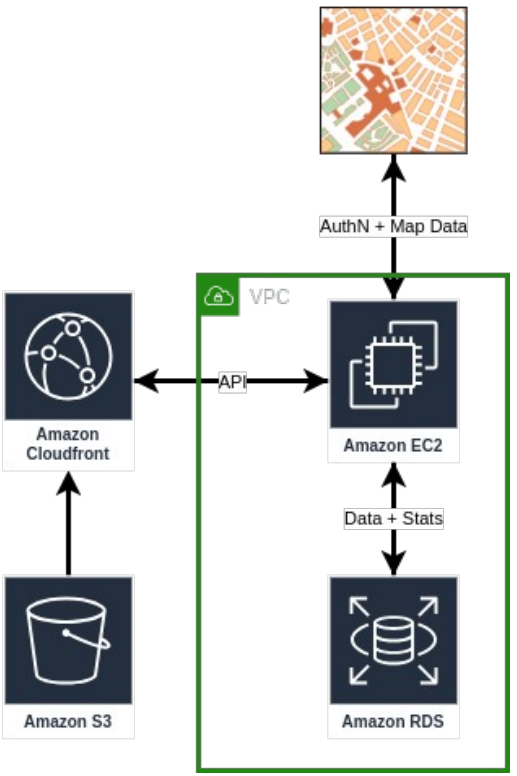
Identity & Data – OSM.ORG

Current Architecture



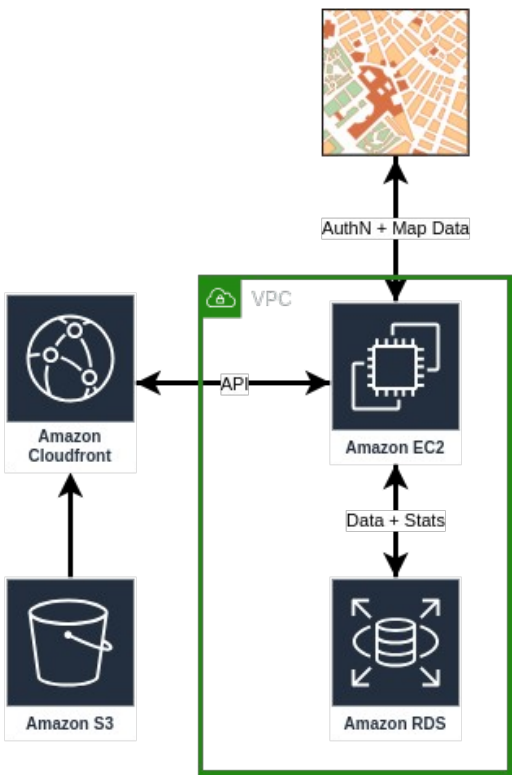
- Static frontend app - S3 + Cloudfront
- Backend - auto-scaled EC2 instances
- Database - RDS PostgreSQL
- AuthN via OpenStreetMap

Current Architecture (contd)



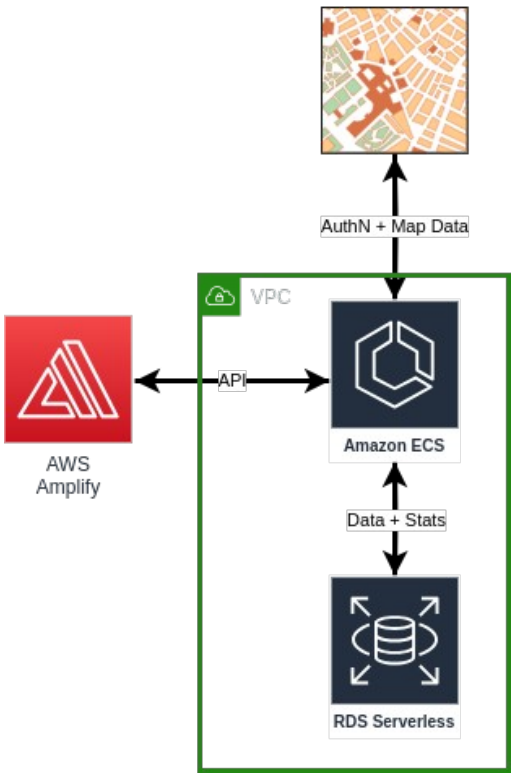
- APM - New Relic
- Traces – Sentry
- Logs - CloudWatch Logs
- Deployments via Cloudformation
  - Via CircleCI
    - Triggered by Github push
- Scripted database backups

Challenges



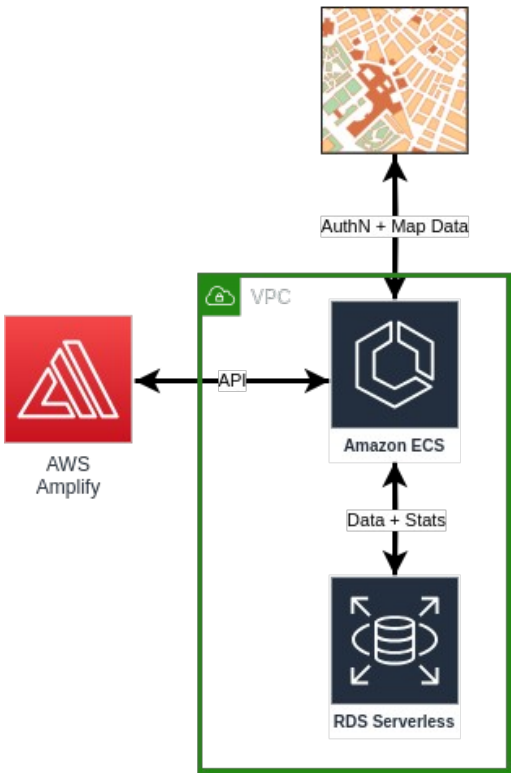
- Expensive and rigid capacity planning
- Legacy / deprecated architecture and AWS services
- Slow deployments and bootstrapping
- Infra changes are not easy (or fast)
- Security and patching woes

Planned Architecture



- Best-effort “*serverless*” architecture
- Frontend deployment via AWS Amplify
- Backend on AWS ECS
- Database on Aurora Serverless
- Tooling for security
- Monitoring sidecars
- Better VPC architecture

Improvements



- Embracing “*serverless*” services
- Faster service scaling
- Better networking, service isolation
- Easier patching (Debian FTW!!!)
- DevEx – self-service ephemeral environments

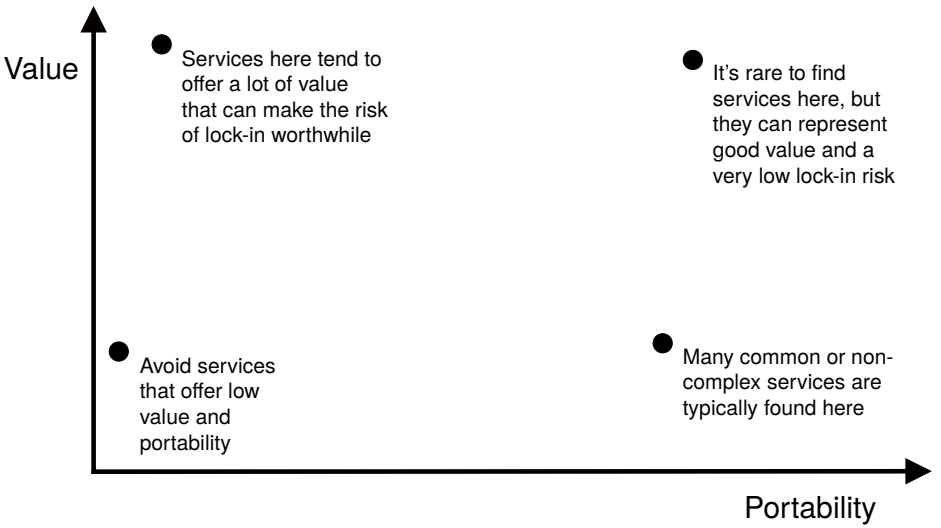
Developer Experience

- Better SLI / SLO and tighter error budgets
- Continuous integration (and deployment)
- Better thought-out observability metrics
- Reduced alert fatigues
- Easier community contributions

On vendor lock-in

- Grants tend to dry up quickly!
- Cost vs. performance vs. flexibility
- Multi-cloud deployment
- Cloud-agnostic IaC helpers

  (Terraform)



https://www.gov.uk/guidance/managing-technical-lock-in-in-the-cloud

Looking forward

- OpenTelemetry for Logs, Traces, and Metrics
- Infrastructure policy enforcement using OPA
- Container orchestration – k8s, etc.
- Blue / Green deployments
- Workload security using container scanning and hardening

Get Involved

- Review code, file bug reports, send pull requests on Github
- Participate in the Working Groups
- Connect on Slack

https://www.hotosm.org/get-involved

Acknowledgements

HOT STAFF

Ramya Ragupathy

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COMMUNITY CONTRIBUTORS

Taylor Smock

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KATHMANDU LIVING LABS

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https://github.com/hotosm/tasking-manager/graphs/contributors

Thank you!

https://github.com/hotosm/tasking-manager