Modernising Tasking Manager Infrastructure
Yogesh Girikumar
DevOps Architect

Humanitarian
OpenStreetMap
Team
International non-profit NGO

dedicated to humanitarian action

focused on open mapping

community development

contributions go to OpenStreetMap
HOT Impact Report

https://www.hotosm.org/annual-reports/2022-2023-impact-report/
MAP FOR PEOPLE IN NEED

Join a global community that is mapping the places most vulnerable to disaster and poverty in order to support humanitarian aid and sustainable development across the world.

Start mapping  Join the community

“Solving the problems of a thousand people...
..with the help of a thousand people”
The impact!

2.2M
BUILDINGS

84K
KM ROADS

Over 9000!
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)

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
DK Benjamin

COMMUNITY CONTRIBUTORS
Taylor Smock
Sam Woodcock

KATHMANDU LIVING LABS
Hel Nershing Thapa
Aadesh Baral
Ichcha Moktan

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

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