

moonpig

Scaling Moonpig's Serverless Backend: Event-Driven Federation at Scale

By Alexis Lowe

About me

Alexis Lowe aka Chimbosonic

Principal Engineer at Moonpig

Ex-Cyber Security Engineer

Open-source Maintainer:

- Keyoxide Project 
- `wkd.dp42.dev` a diagnostic tool for OpenPGP WKD protocol



Keyoxide Profile

Who are Moonpig?

17 Tech Teams

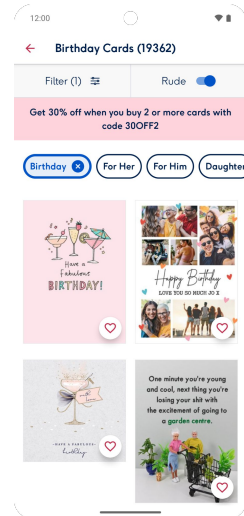
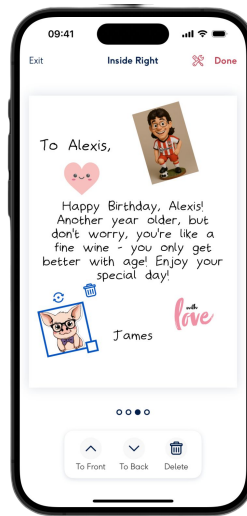
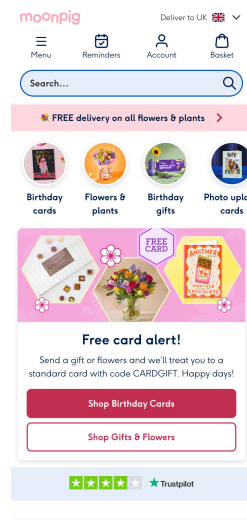
2 Brands – Greetz and Moonpig

3 Clients – Native iOS app, Native Android app
and a Next.js Website (5 web apps)

1 Supergraph

26 Micrographs – each represents a bounded
context

~60 releases a day



Moonpig is the UK's leading online gifting platform, making it easy to send personalised cards, gifts, and flowers straight to the door of the buyer or recipient.

What are we building?



1

Hyper-Scalable /
Multi-Region Active-Active



2

Built for Fast, Team-Based
Iteration



3

Serves all Clients

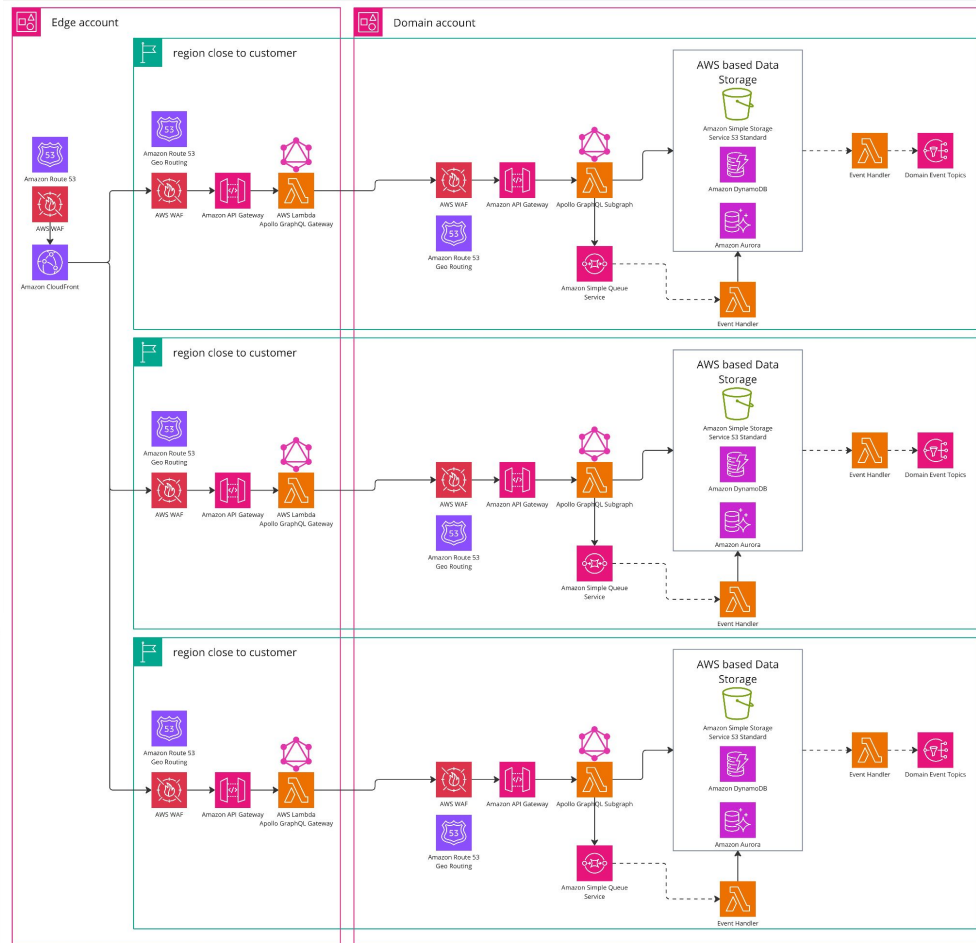
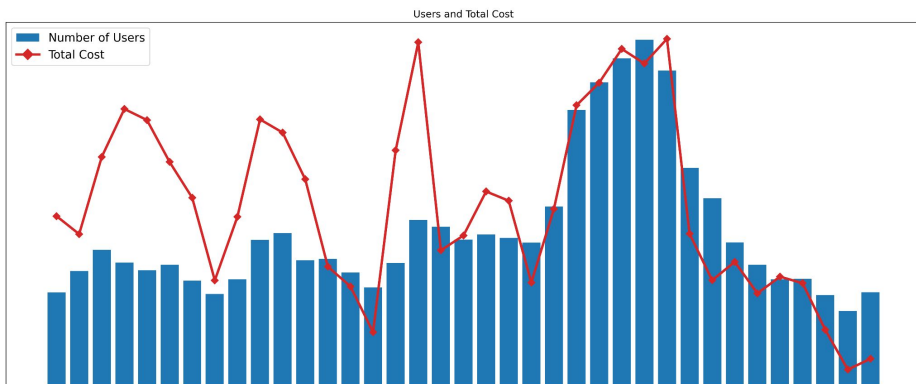


How are we building it?

Hyper-scalable / Multi-Region Active-Active

Entirely built on AWS:

- Compute: Lambda
- Events and Messaging: SNS, SQS and EventBridge
- Data Storage: DynamoDB, S3 and Aurora Serverless V2
- Geo-based Routing via Route53
- Cloudfront as our AWS edge



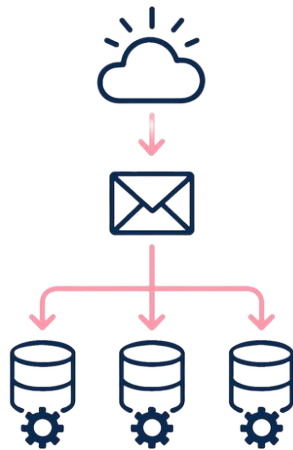
How are we building it?

Built for Fast, Team-Based Iteration

Buy vs Build

Event-Driven Architecture with Distributed Data

- “Domains” communicate between each other with events and commands
- Each “Domain” has its own projection of the data which is hydrated by events
- Eventual Consistency is preferred over synchronous coupling



How are we building it?

Single API for all clients

Federated GraphQL

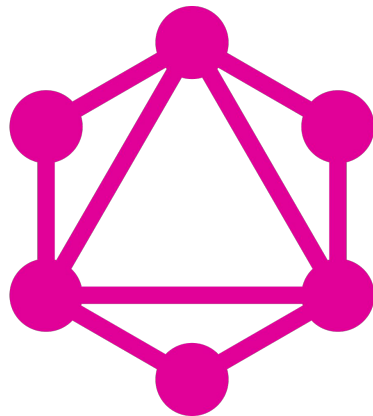
- Apollo Federation v2
- In-House schema stitching and schema deployment

Modified Apollo Gateway running AWS Lambda

- Custom Metrics into Cloudwatch
- Custom APQ Caching to leverage Cloudfront
- Many fixes to get around AWS idiosyncrasies (uri length limits, lambda response size limits, ...)

Micrographs running Apollo Subgraph on AWS Lambda

- Custom plugins for Metrics , Logging and tracing



How are we building it?

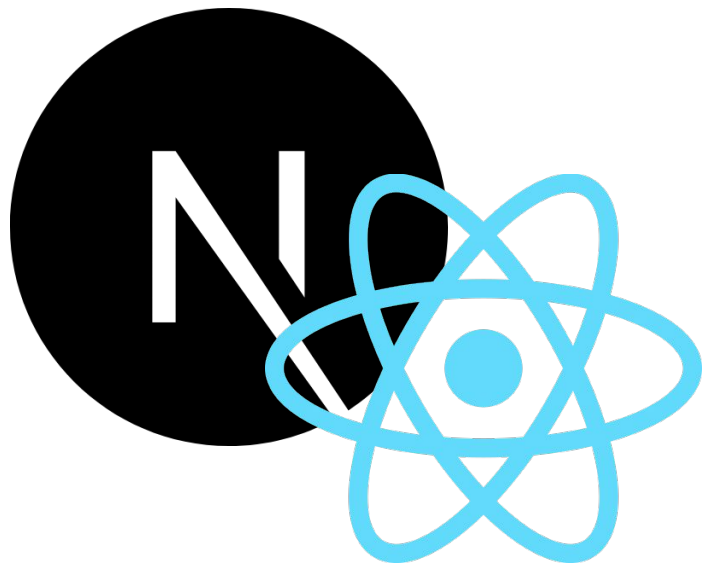
Serverless Website

5 web apps

- Split by domains
- Mixture of CSR and SSR
- Shared platform/infra code
- Cloudfront function for routing between apps

Next JS running on AWS Lambda

- Lambda layers:
 - aws-lambda-web-adapter: conversion of AWS Api Gateway events to HTTP
 - aws-otel-collector: automates converting otel traces to AWS X-ray



Key takeaways

Serverless allows focus and scale

Federation, Multi-apps, and event-driven architecture allows teams to build with a shared interfaces whilst enabling fast iteration



For more details check our blog posts!
- <https://medium.com/moonpigtech>



Moonpig Technology Podcast
Spotify

Thank you



Contact Me -
<https://chimbosonic.com>

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We are hiring! -
<https://moonpig.careers>