

Efficient and Performant GraphQL Serverless APIs

Zach Lendon
Director, Application Development

Following Up:

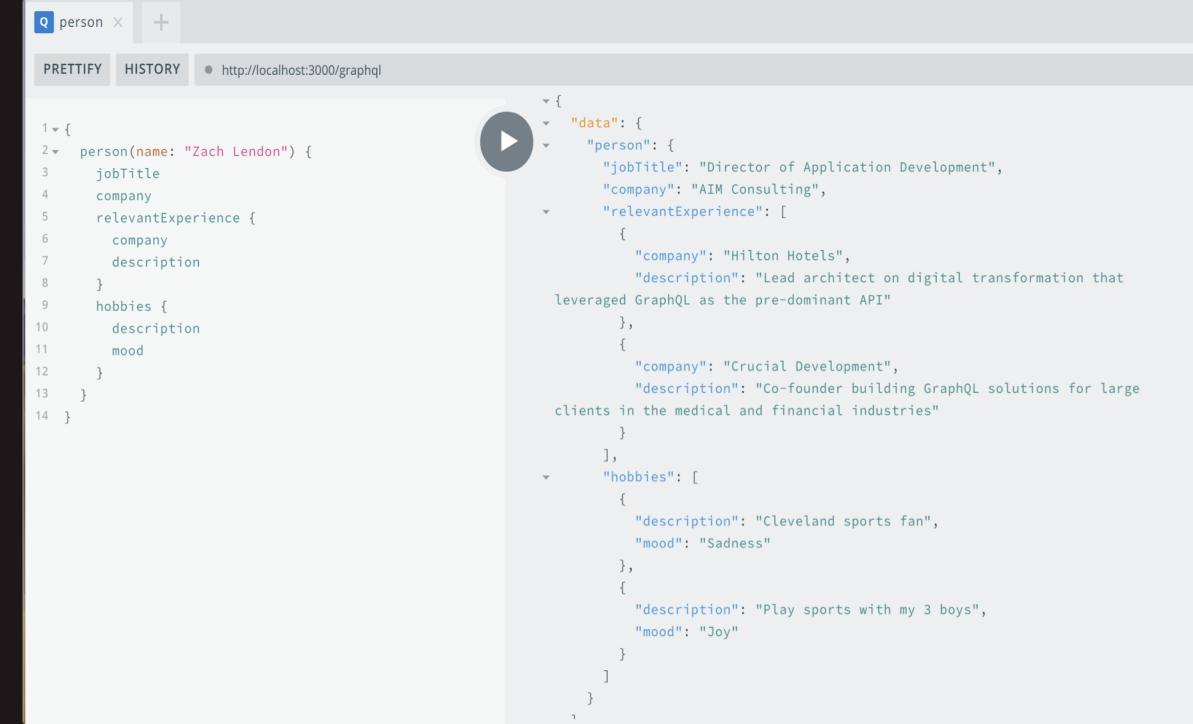
→ **Office Hours**

Thursday, February 13
9:30 am

→ **Repo**

[https://www.github.com/zachlendon
/developerweek2020](https://www.github.com/zachlendon/developerweek2020)

→ **Social**
@zachlendon



A screenshot of a GraphQL playground interface showing a query result. The query is:

```
1 ↴ {  
2   ↴ person(name: "Zach Lendon") {  
3     jobTitle  
4     company  
5     relevantExperience {  
6       company  
7       description  
8     }  
9     hobbies {  
10       description  
11       mood  
12     }  
13   }  
14 }
```

The resulting JSON data is:

```
→ {  
  → "data": {  
    → "person": {  
      "jobTitle": "Director of Application Development",  
      "company": "AIM Consulting",  
      "relevantExperience": [  
        {  
          "company": "Hilton Hotels",  
          "description": "Lead architect on digital transformation that leveraged GraphQL as the pre-dominant API"  
        },  
        {  
          "company": "Crucial Development",  
          "description": "Co-founder building GraphQL solutions for large clients in the medical and financial industries"  
        }  
      ],  
      "hobbies": [  
        {  
          "description": "Cleveland sports fan",  
          "mood": "Sadness"  
        },  
        {  
          "description": "Play sports with my 3 boys",  
          "mood": "Joy"  
        }  
      ]  
    }  
  }
```



React App



localhost:3000



Welcome to React

To get started, edit `src/App.js` and save to reload.

[tomyitav / create-graphql-app](#)

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Code Issues 3 Pull requests 20 Actions Projects 0 Wiki Security Insights

Cli tool for bootstrapping serverless GraphQL api <https://medium.com/@tomyitav/serverless>

graphql cli typescript apollo nodejs code-generation apollo-server schema-first serverless now-cli aws-lambda

515 commits 48 branches 0 packages 37 releases 2 contributors MIT

Branch: master New pull request Create new file Upload files Find file Clone or download

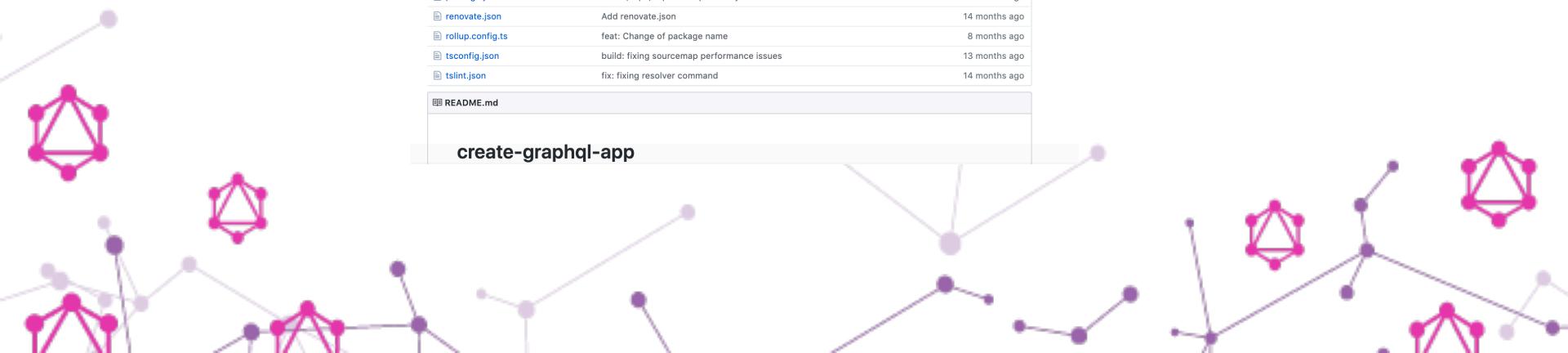
tomyitav Merge pull request #283 from tomyitav/renovate/tslint-5.x

Latest commit e3c2ace on Sep 15, 2019

File	Commit Message	Time Ago
src	fix: Fixing ci	6 months ago
test	fix: init test fix	12 months ago
tools	Initial commit	15 months ago
.editorconfig	Initial commit	15 months ago
.gitignore	fix(build): added output dir to project	14 months ago
.prettierignore	test: adding test for resolver output	14 months ago
.travis.yml	fix: removing build of version 6	14 months ago
CONTRIBUTING.md	chore: resolver command basic layout	14 months ago
LICENSE	Initial commit	15 months ago
README.md	fix: updated dependencies	6 months ago
code-of-conduct.md	Initial commit	15 months ago
init-demo.gif	gif addition to readme	11 months ago
package-lock.json	chore(deps): update dependency tslint to v6.20.0	5 months ago
package.json	chore(deps): update dependency tslint to v6.20.0	5 months ago
renovate.json	Add renovate.json	14 months ago
rollup.config.ts	feat: Change of package name	8 months ago
tsconfig.json	build: fixing sourcemap performance issues	13 months ago
tslint.json	fix: fixing resolver command	14 months ago

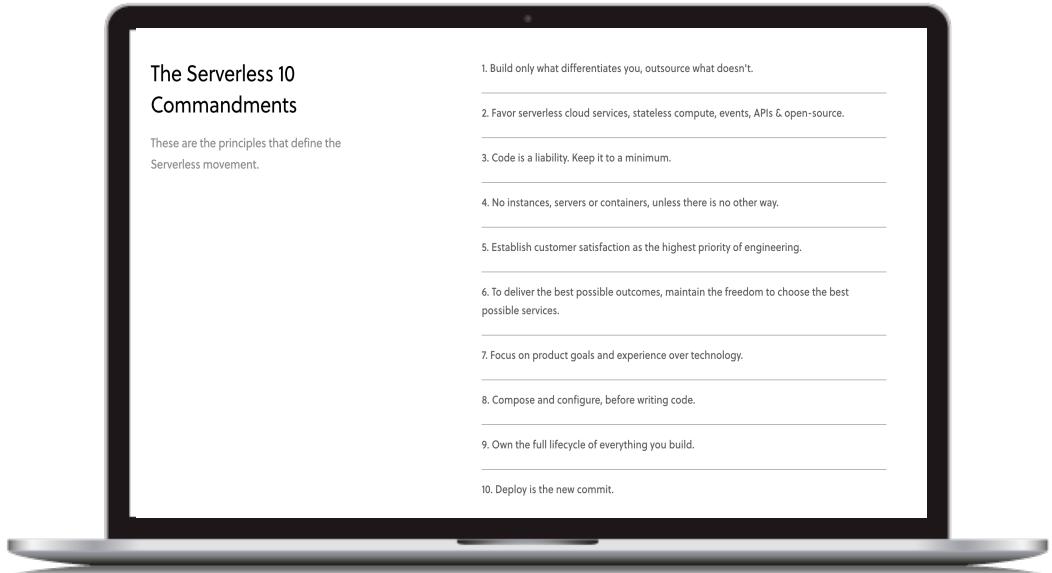
README.md

create-graphql-app



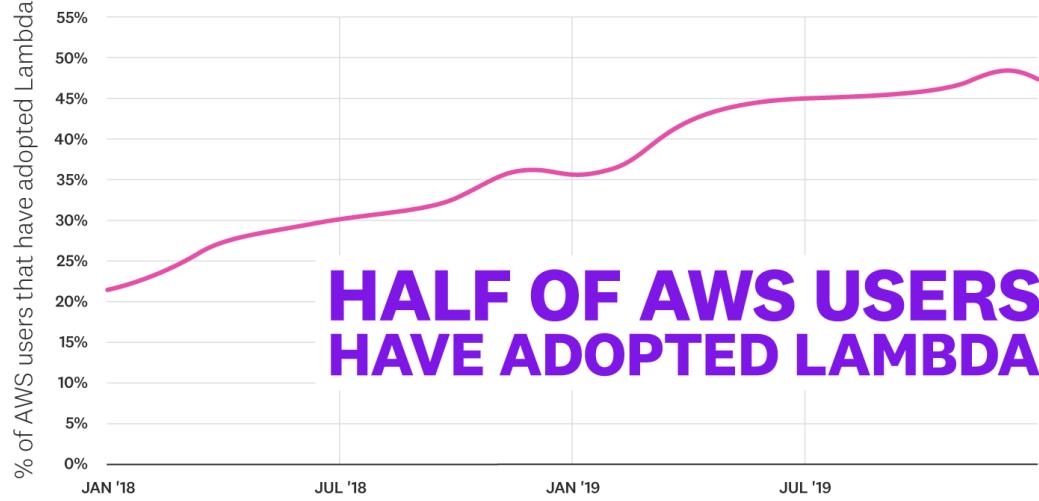
Why use GraphQL and Serverless?

- Efficient querying for data
- Efficient Runtime
- Performance
- Organizational Agility
- Ease of use



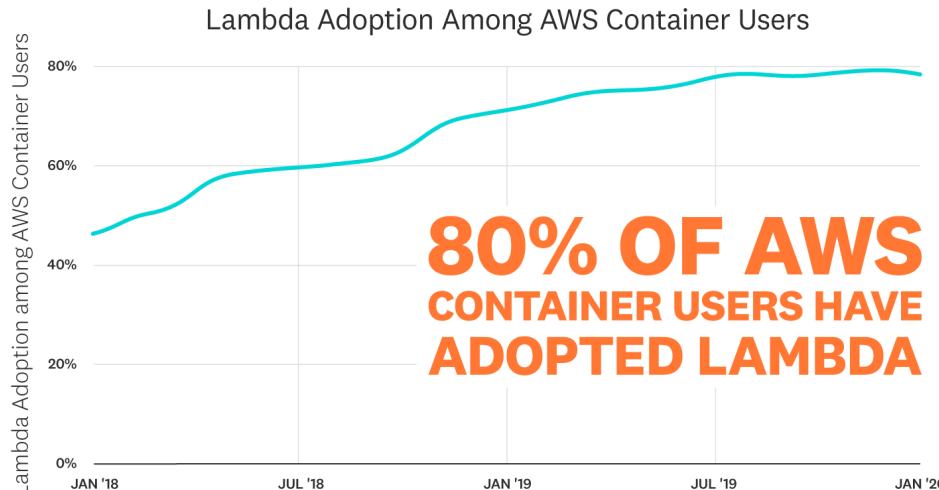
Serverless Adoption

Lambda Adoption Among AWS Users



Source: Datadog

Serverless Adoption



GraphQL Adoption (2018)



priceline



Autodesk

splunk>

airbnb



Atlassian

Zillow®



coursera

GitHub



American Airlines



NETFLIX

The New York Times

OpenTable®

stripe

NORDSTROM

intuit.

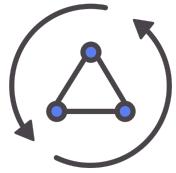


PayPal™

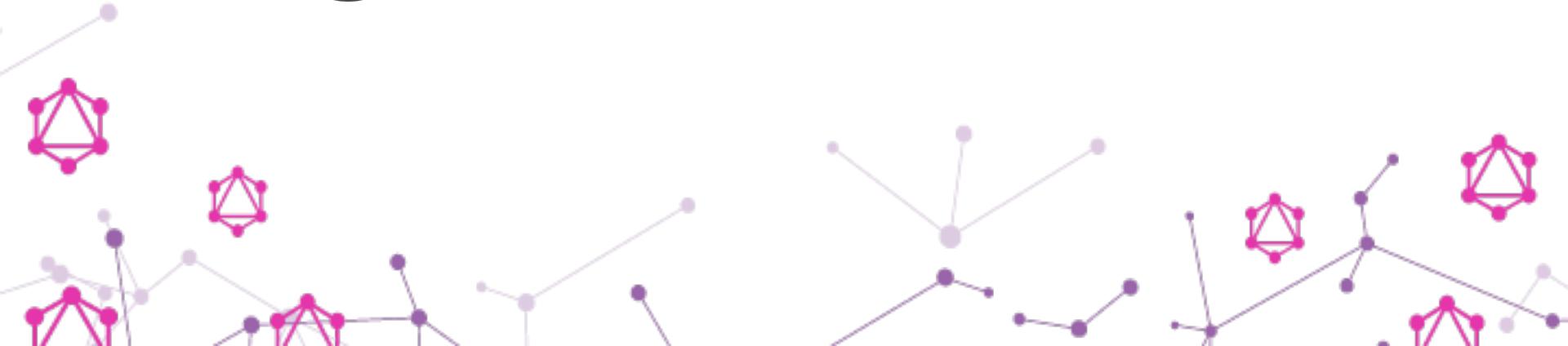
AMERICAN
EXPRESS



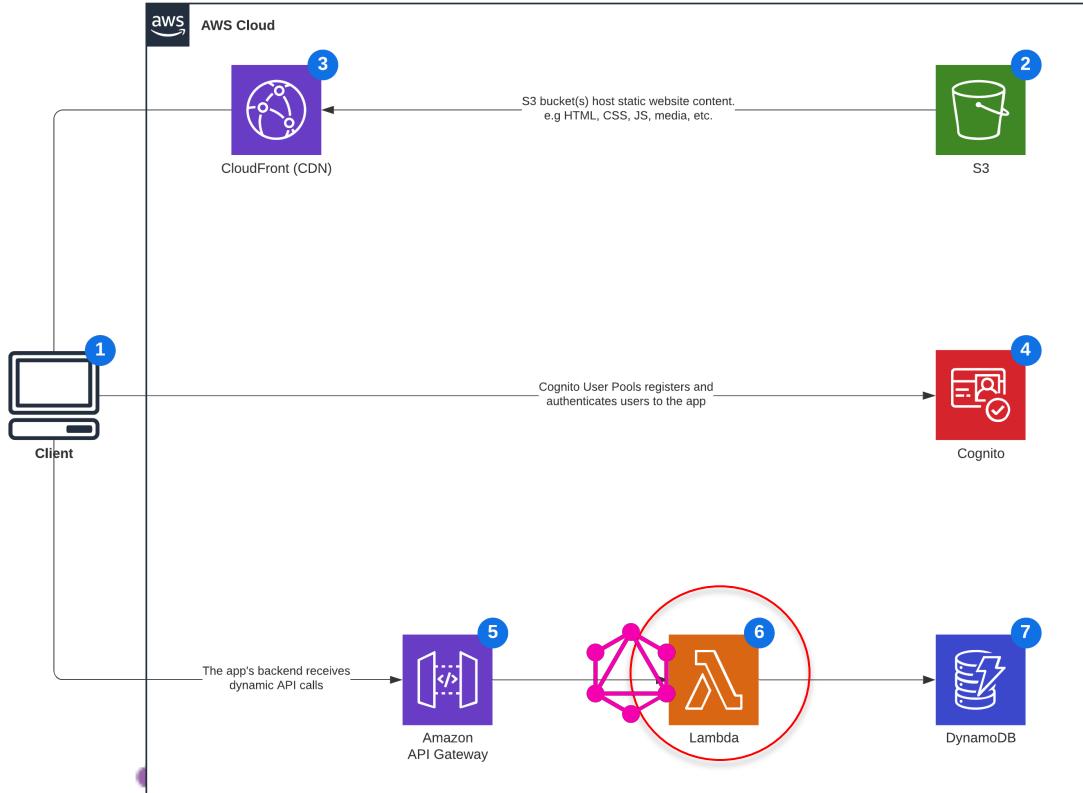
Prisma



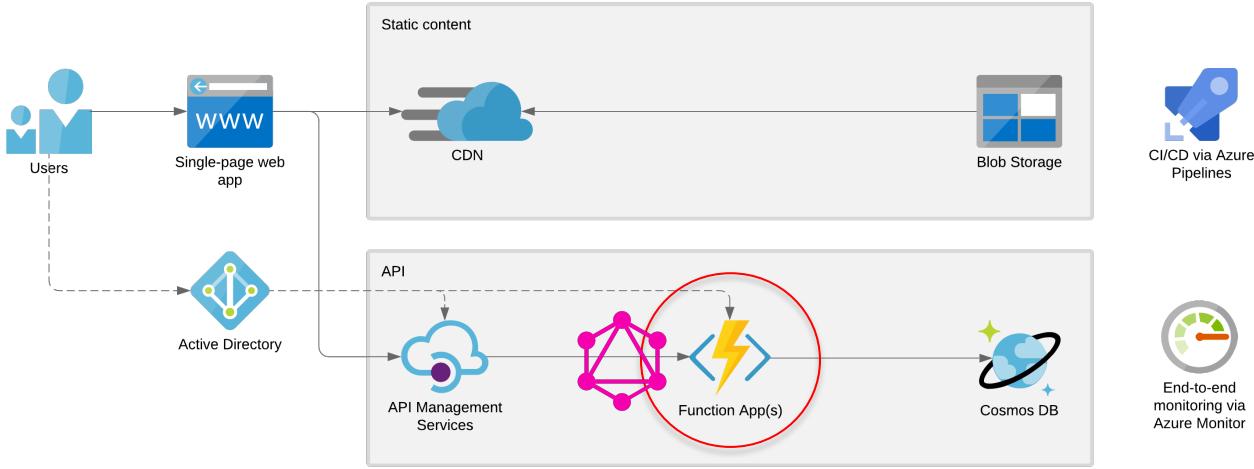
AWS AppSync



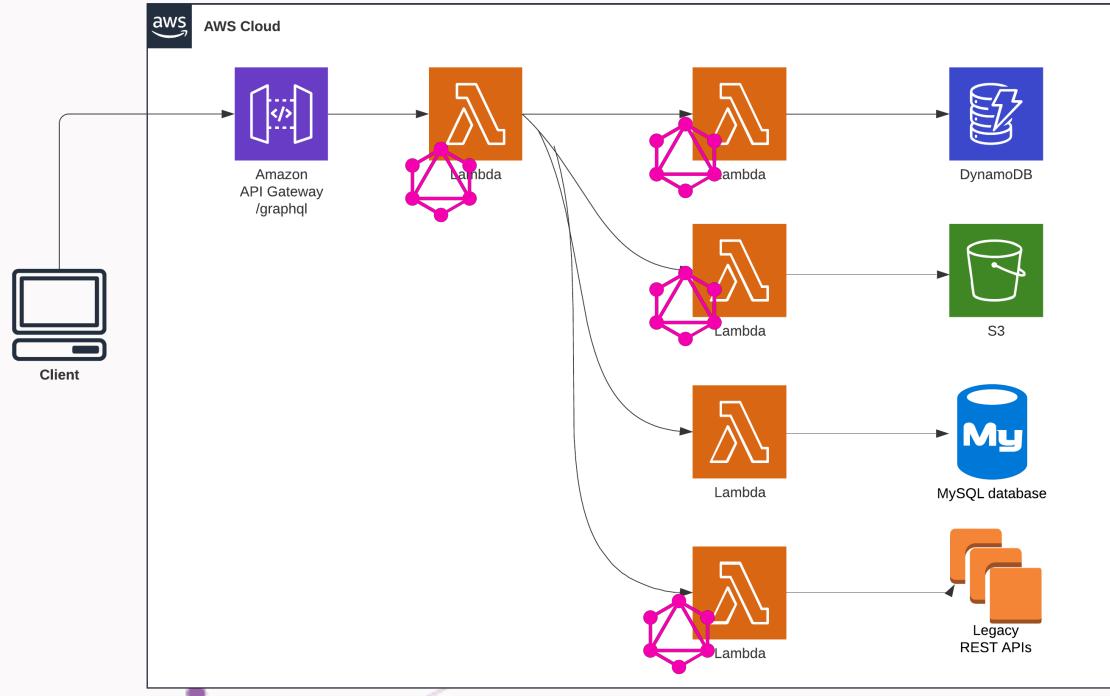
Serverless Architectures



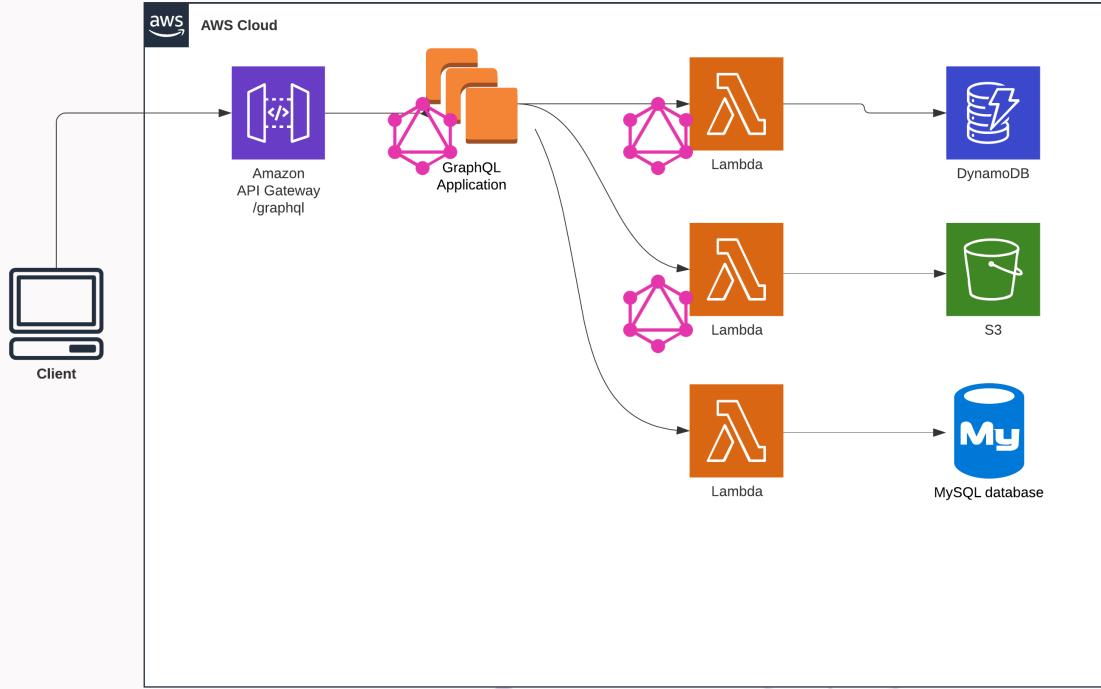
Serverless Architectures



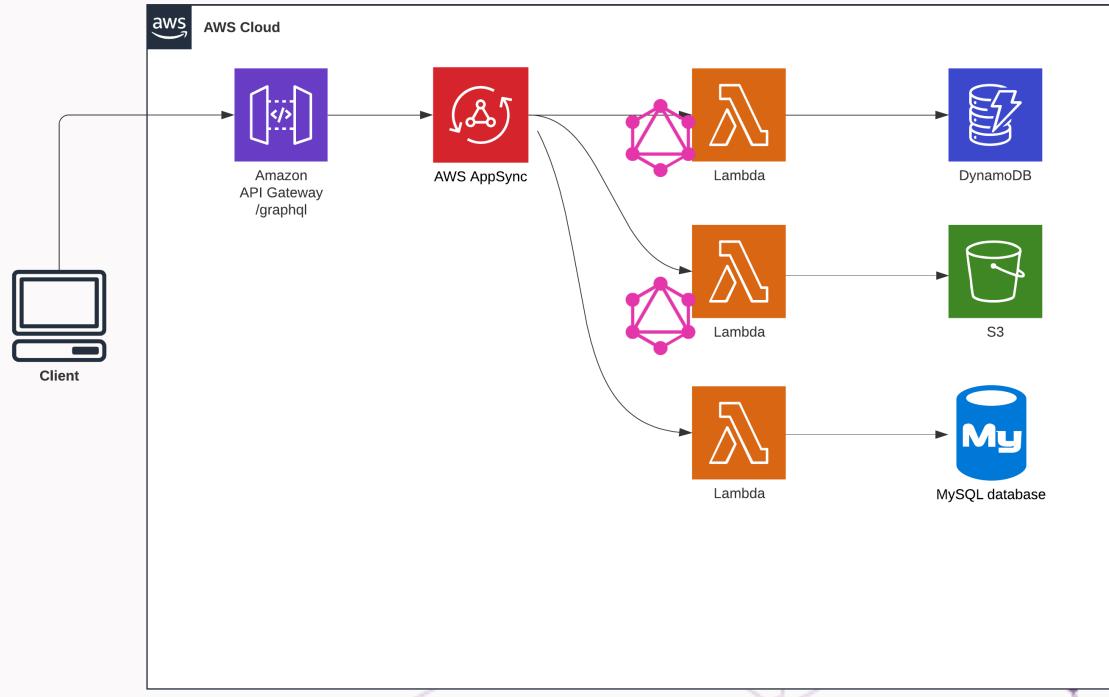
GraphQL + Serverless



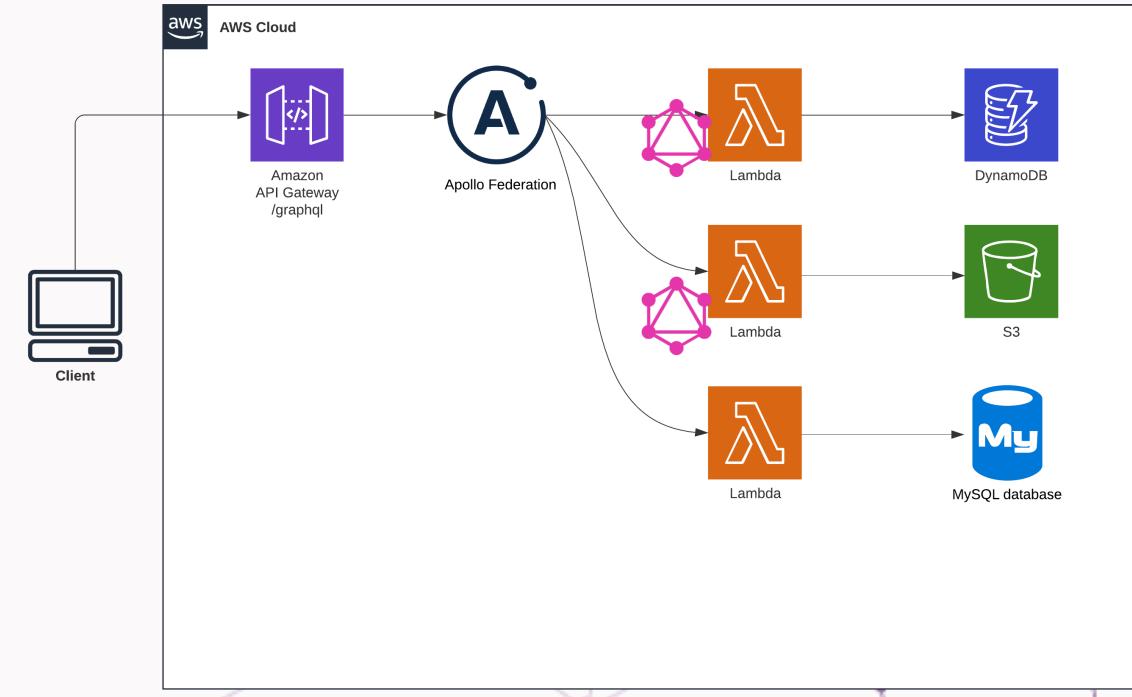
Container and Serverless + Serverless



AppSync GraphQL + Serverless



Apollo Federated GraphQL + Serverless



What are some base Serverless GraphQL technologies that Javascript-first teams can embrace?

Serverless
Framework

TypeScript

Apollo

Technical Excellence Maturity

- Ease of getting running quickly
- Architectural Flexibility
- Typing Support
- Reduce Errors
- Local Development Support
- Ease of adding functionality

Setup

- **Install Node, NPM/Yarn, and Serverless Framework**
- **Create-GraphQL-App**

<https://github.com/tomyitav/create-graphql-app>

- typescript
- apollo-server 2
- serverless-offline
- graphql-code-generator
- merge-graphql-schemas
- injection-js

Resulting App

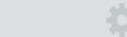
<https://github.com/tomyitav/apollo-typed-lambda>

Q car X



PRETTYIFY HISTORY

http://localhost:3000/graphqL



COPY CURL

```
1 <| [ {  
2   car {  
3     name  
4   }  
5 }]
```

▶ {
 "data": {
 "car": [
 {
 "name": "sampleCar1"
 },
 {
 "name": "sampleCar2"
 }
]
 }
}

DOCS

SCHEMA

Performance and Efficiency Challenges

- You get standard GraphQL challenges for free!
- Cold Starts
- Logic Between Requests
- Language Performance
- Schema Stitching

Performance and Efficiency Strategies

- Same non-serverless solutions apply too!
 - Use tools like GraphQL X-Ray Resolvers to identify issues
 - Similar to Apollo Federated Tracers
 - Load testing (Blueprints, Serverless Artillery)
 - Follow FaaS best practice guidelines
 - Be flexible with your architecture
- Not everything has to be GraphQL/Serverless
- Different Programming Language?
 - Schema Stitching Challenges / Opportunities

GraphQL Checklist

The screenshot shows the main interface of the GraphQL Checklist application. At the top, there's a navigation bar with links like 'Articles', 'RN', 'Internal sites', 'Your projects', 'Benefits', 'Medtech', 'High Tech', 'CI/CD', 'Open Source', 'Heart Failure', 'Feedly', 'FAQ', 'Recipes', 'Moving', and 'DeveloperWeek'. Below the navigation is the title 'The GraphQL Checklist' and a subtitle: 'The GraphQL Checklist Application is perfect for meticulous GraphQL engineers!'. There are social sharing buttons for 'Tweet' and 'Star 0'. A large red 'F' grade is prominently displayed. The main form area includes fields for 'Project Name', 'Page title or URL', 'Developer's name or team', and a 'Start new checklist' button. To the right of these fields are six categories: 'AUTHORING', 'BEFORE', 'MANAGEMENT', 'PRACTICES', 'SECURITY', and 'SERVERLESS', each with a corresponding icon. A legend indicates priority levels: '0/3 ✓ high priority' (red), '0/7 ✓ medium priority' (orange), and '0/4 ✓ low priority' (green). Below the form is a green button labeled 'Generate report'. An advertisement for 'Sustain #23' is visible, followed by a 'Filter by tags' section with buttons for 'ALL' (highlighted in red), 'TOOLS', 'IDE', 'MEDIUM', 'HIGH', 'SECURITY', 'TEAM', 'MANAGEMENT', 'DOCKER', 'LOW', 'SERVERLESS', 'CODE GENERATOR', and 'TESTING'. Under the 'AUTHORING' section, there's a progress bar at 0% and a note: 'Authoring items are ✓'. A list item 'Essential GraphQL tools: Install these to work faster locally' is shown with tags 'TOOLS | MEDIUM'. The 'BEFORE' section has a similar layout with a 0% progress bar and a note: 'Before items are ✓'.

Summary

- **GraphQL and Serverless are a compelling architectural tandem for modern systems**
- **There are open-source alternatives for building serverless GraphQL applications**
 - Create-GraphQL-App is a compelling entrant
- **The architecture itself is all about performance**
- **When problem arise, studying what is happening in your serverless GraphQL application is key in making it more performant**

Links

Topic	Link
GraphQL Checklist	https://www.graphqlchecklist.com
State of Serverless	https://www.datadoghq.com/state-of-serverless/
Create-GraphQL-App	https://github.com/tomyitav/create-graphql-app
GraphQL Resolver Tracing	https://medium.com/lifeomic/introducing-graphql-resolver-tracing-in-aws-x-ray-aec890a992e7
AWS Lambda Function Best Practices	https://docs.aws.amazon.com/lambda/latest/dg/best-practices.html
Awesome-GraphQL List	https://github.com/chentsulin/awesome-graphql
Apollo Gateway + Apollo-server-lambda	https://github.com/apollographql/apollo-server/issues/3190

Thank You!

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Thursday, February 13
11:00 am

→ **AIM Consulting**

aimconsulting.com

→ **Repo**

<https://www.github.com/zachlendon/developerweek2020>

→ **Social**

@zachlendon