AWS re:Invent

NOV. 29 – DEC. 3, 2021 | LAS VEGAS, NV

FWM204

Building the re:Invent app with Amazon Location Service

Fernando Rocha Silva
Sr. Specialist Solutions Architect, Front-end and Mobile
Amazon Web Services

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Location-based services: The hard way

- √ Location service provider
- √ Procurement/sourcing
- √ Price negotiation
- √ Security assessment
- √ Infrastructure setup
- √ Integration
- √ Deployment
- √ Testing
- Not good enough?



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

What is Amazon Location Service?



Location-based service

Fully managed

Serverless

Global coverage

aws

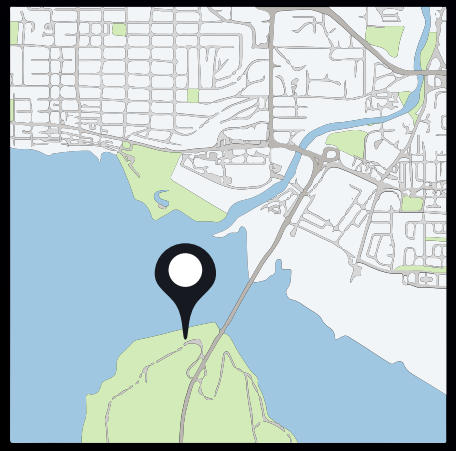
© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Features

Easy access to geospatial features



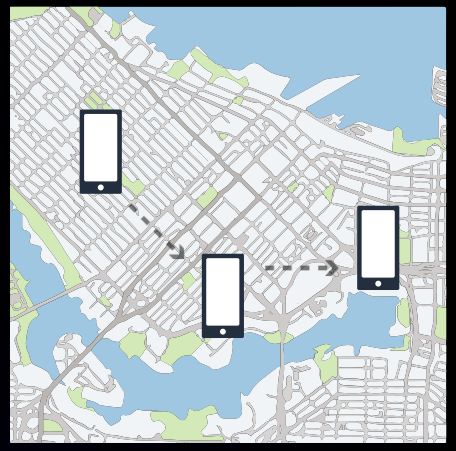
Maps



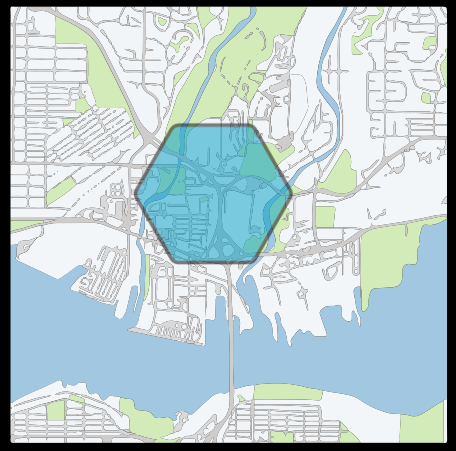
Places



Routes



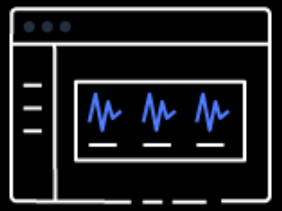
Trackers



Geofences

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

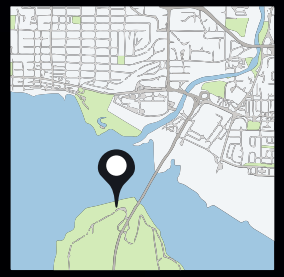
Data providers



Your application



Maps



Places



Routes

esri THE SCIENCE OF WHERE®

here

AWS Partners

Global coverage

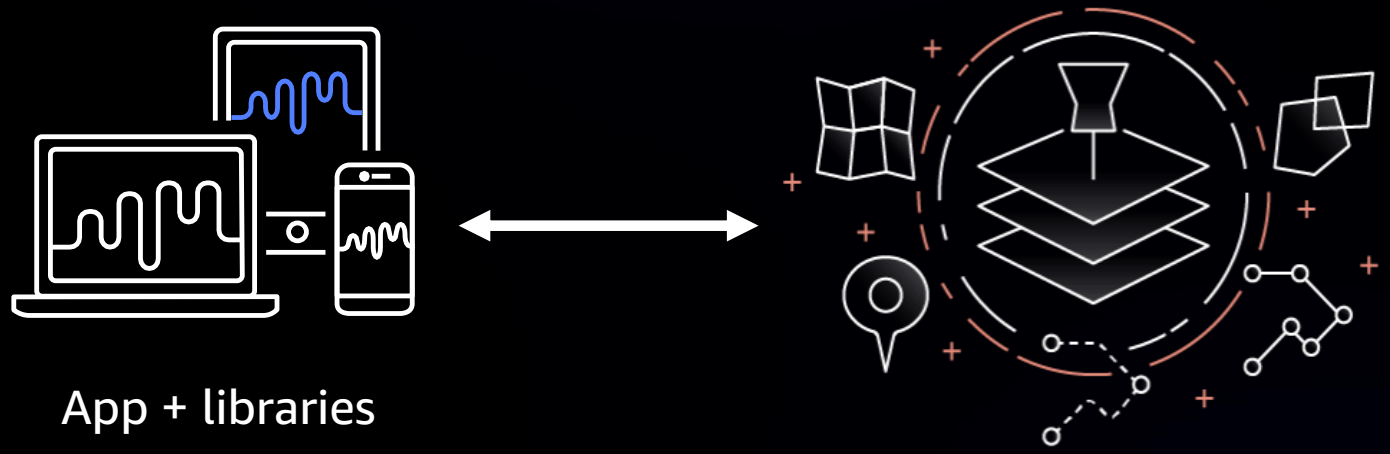
One API

One price

aws

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Location-based services: The easy way



No need for new credentials

No vendor onboarding

Simplified global coverage

Simple integrations

Lower cost of experimentation

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

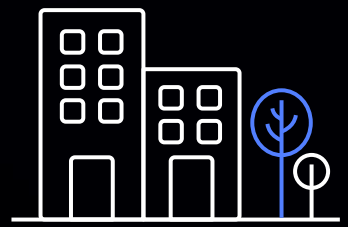
re:Invent mobile app

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

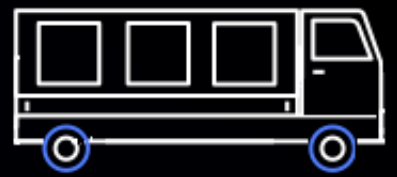
re:Invent 2021 in numbers



20K attendees



4 venues



125 shuttles



25 routes

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

How is the app helping you?

How do I get to my session?

How do I get to my hotel?

When is the next shuttle arriving?

What is the shuttle’s current location?

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Amazon Location: Maps

Visualize location information

7 different styles

Vector and raster format

Support for popular rendering libraries like MapBox, MapLibre, and Tangram



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Amazon Location: Routes

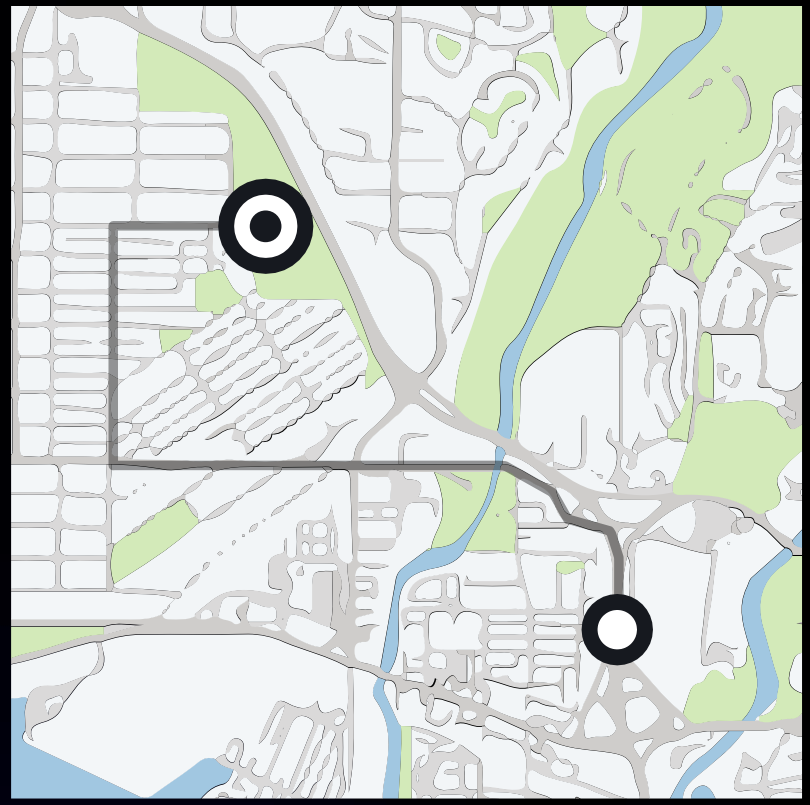
Calculate time and distance between 2 points

Ability to add 23 stops in your route

Routes calculated for cars, trucks, and walking

Detailed routes for each leg of the trip

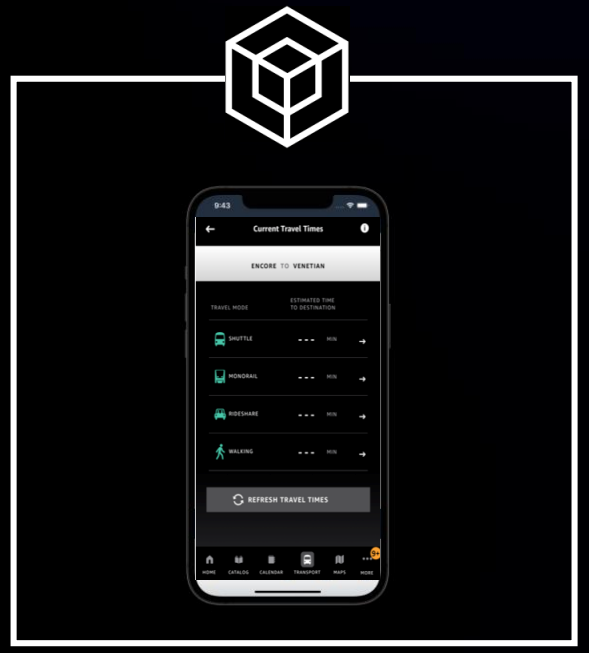
Provides a polyline for easy visualization



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

How do I get to my session?

Amazon
Location SDK



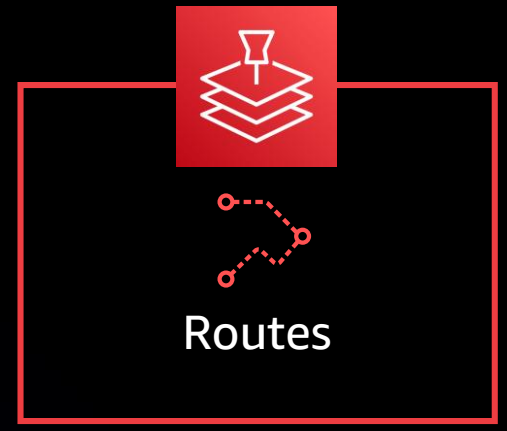
calculate route

```
request: {
   Departure time: now,
   Departure position: attendee position,
   Destination position: venue/hotel position,
   Distance unit: "Kilometers | Miles",
   Travel mode: "Walking”
}
```

```
response: {
   Distance: distance in km or miles,
   Duration: duration in seconds,
   Polyline: [positions]
}
```

Positions are in `[longitude, latitude]`

Amazon
Location Service



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

How is the app helping you?

How do I get to my session?

How do I get to my hotel?

When is the next shuttle arriving?

What is the shuttle’s current location?

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Amazon Location: Trackers

Store location updates for devices and assets

Query for current and historical locations

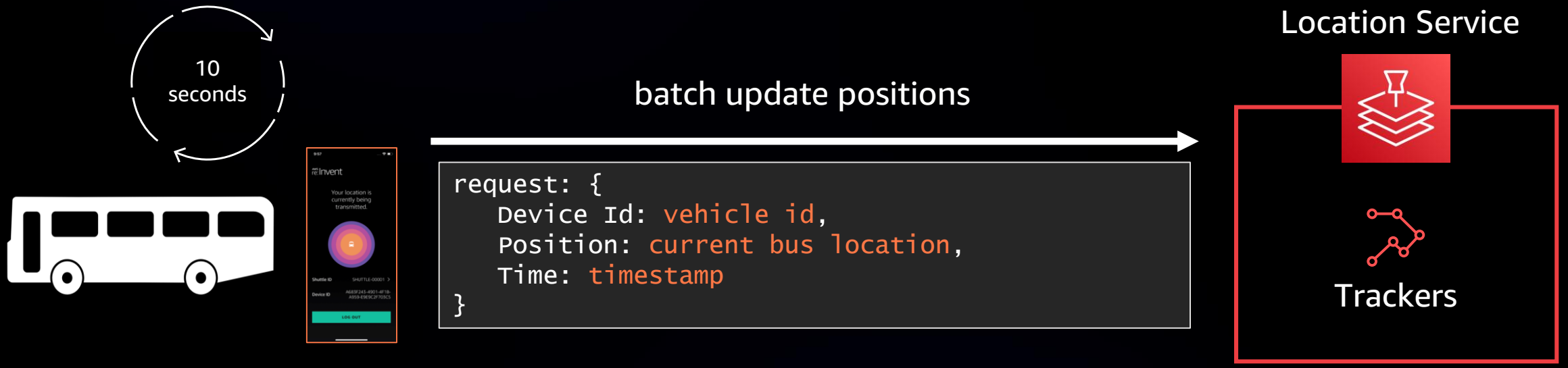
Location data is stored for 30 days

Distance-based filters enabled to save costs



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Shuttle position update



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Privacy is a big deal

51%

of US marketers expect the budget allocation for location-based services to increase

71%

of consumers are less willing to share physical location to mobile apps compared to other forms of personal data, such as a mobile phone number or responses to a survey

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Security and privacy

Tracking and geofencing information stays in your AWS account

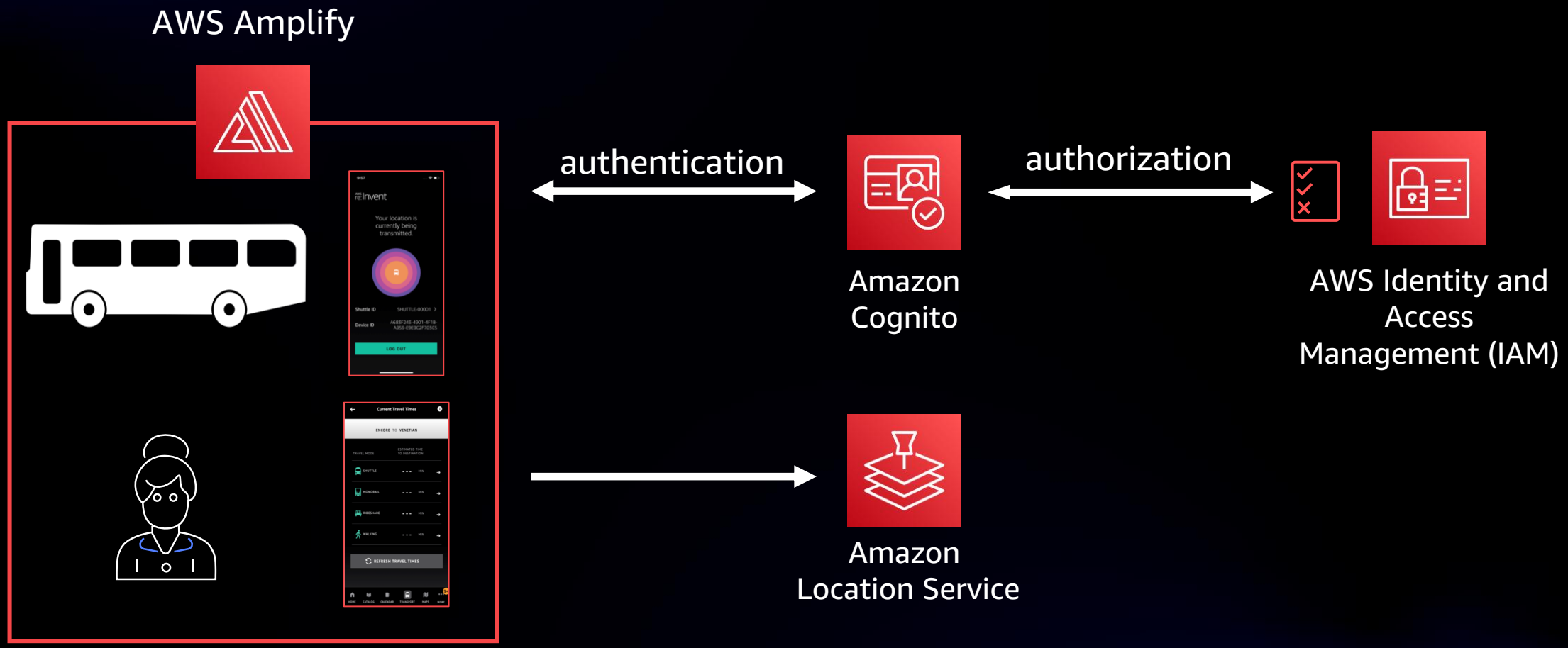
Requests for maps, places, and routes are anonymized

Amazon Location Service licensing terms do not grant Amazon or third parties rights to sell your data or use it for advertising

Use customer managed keys to encrypt tracking and geofencing data

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Authentication and authorization



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Shuttle administration

AWS
Amplify



list device positions

```
response: {
  [
    {
        Device Id: vehicle id,
        Position: position,
        Time: timestamp
    }
  ]
}
```

Amazon
Location Service

Trackers

Maps

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

How far away is my shuttle?

Amazon Location SDK



get shuttle position

```
request: {
   Shuttle id: shuttle id
}
```

calculate route

```
request: {
   Departure time: now,
   Departure position: current bus location,
   Destination position: bus stop position,
   Distance unit: "Kilometers | Miles",
   Travel mode: "Car”
}
```

```
response: {
   Duration: duration in seconds
}
```

Amazon Location Service

Routes

Trackers

Positions are in [longitude, latitude]

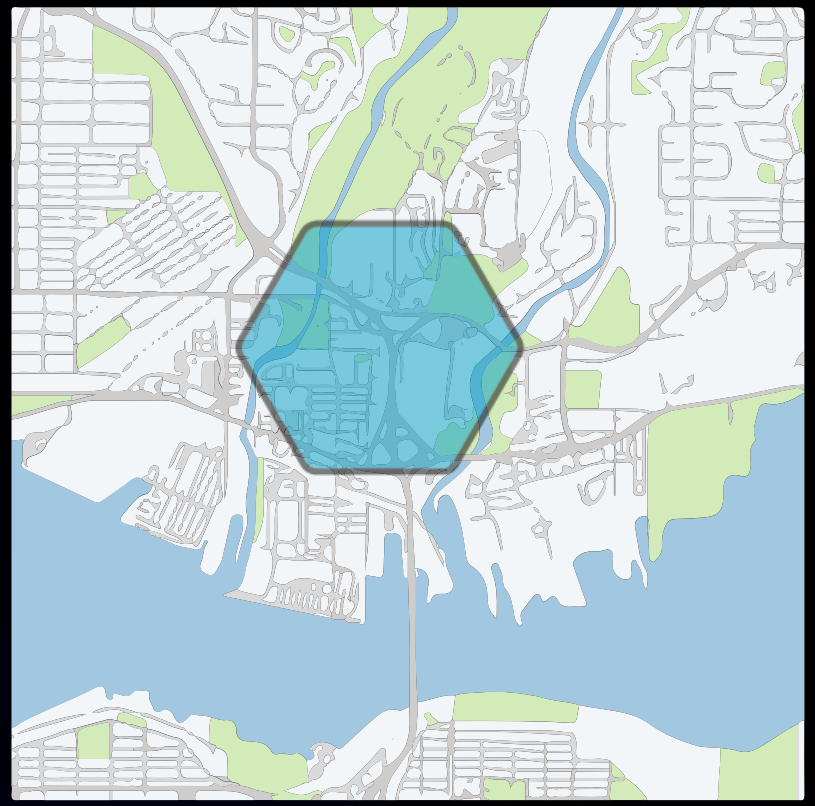
© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Amazon Location: Geofence collections

Create virtual boundaries that represent locations

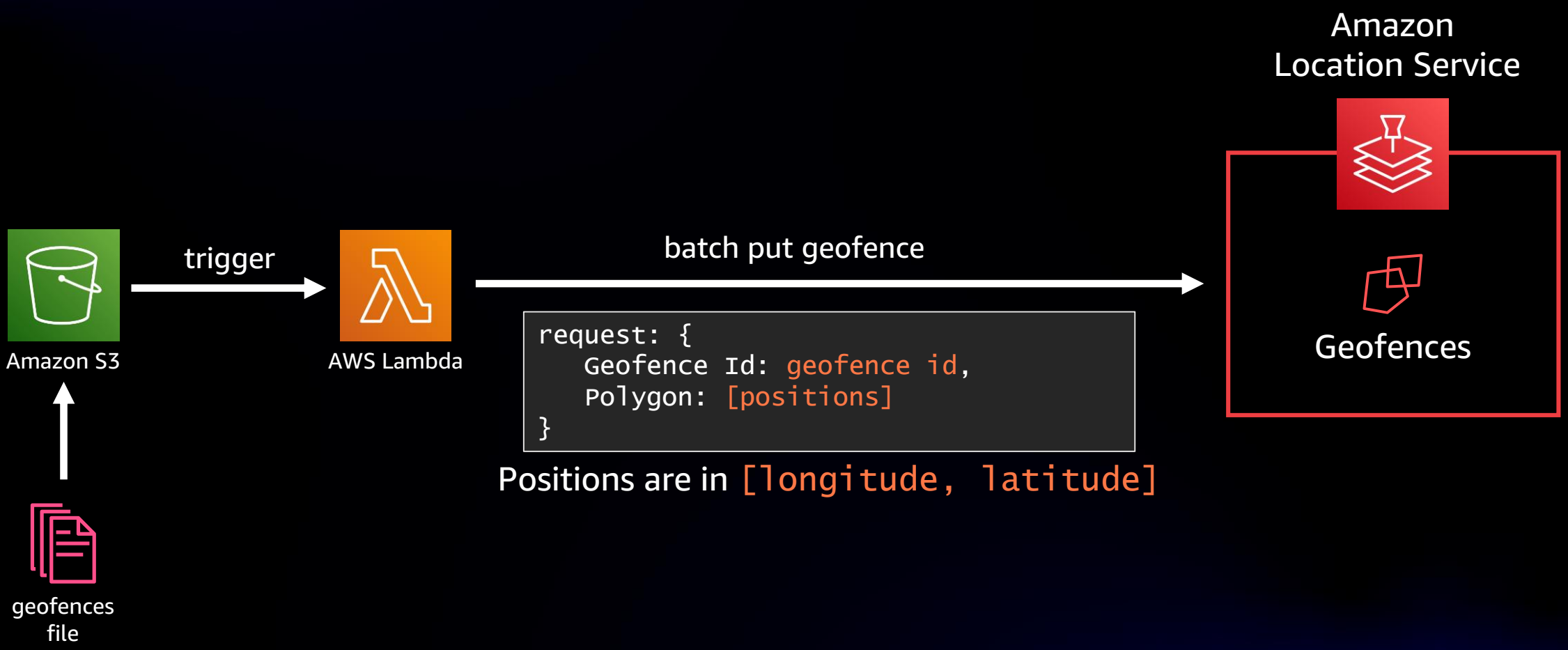
Evaluate device positions against geofences to generate ENTER and EXIT events

Link collections to trackers to send geofencing events automatically to Amazon EventBridge



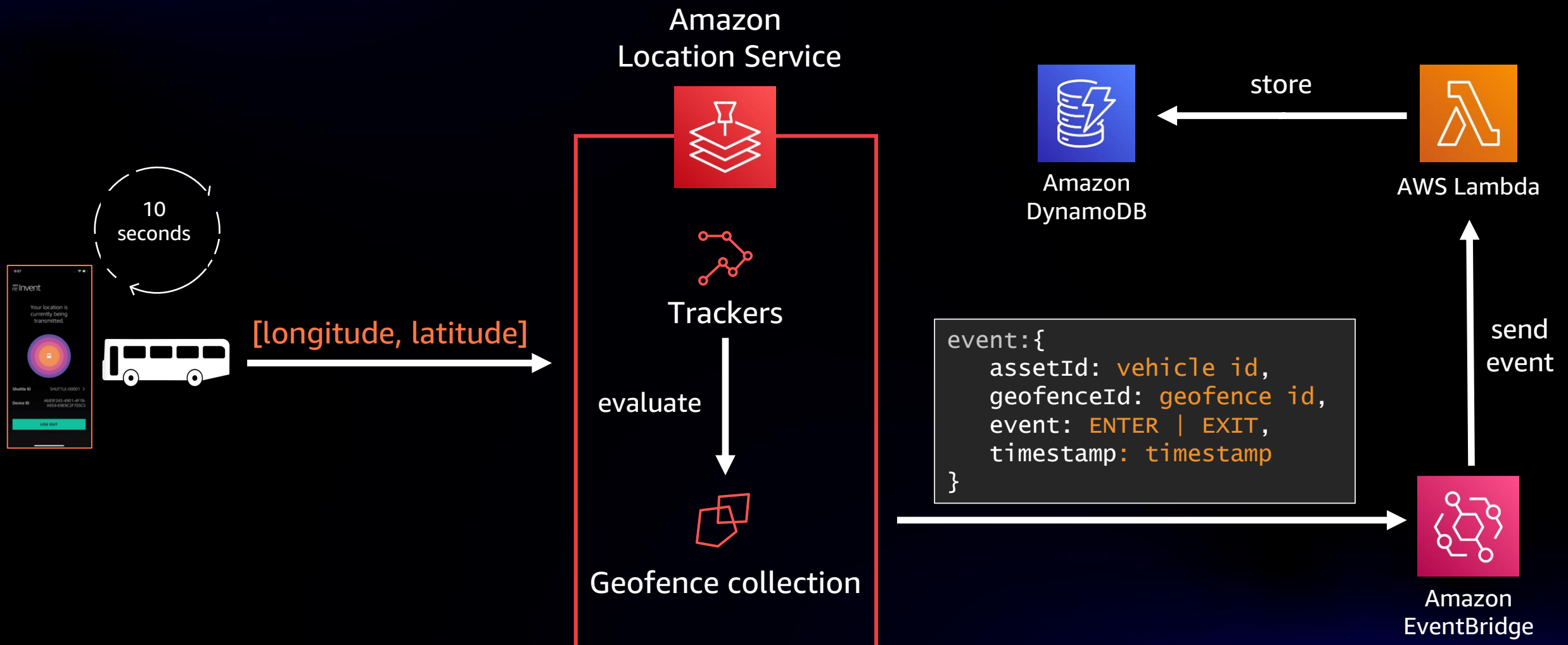
© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Creating geofences



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Shuttle arrival



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Multiple geofences



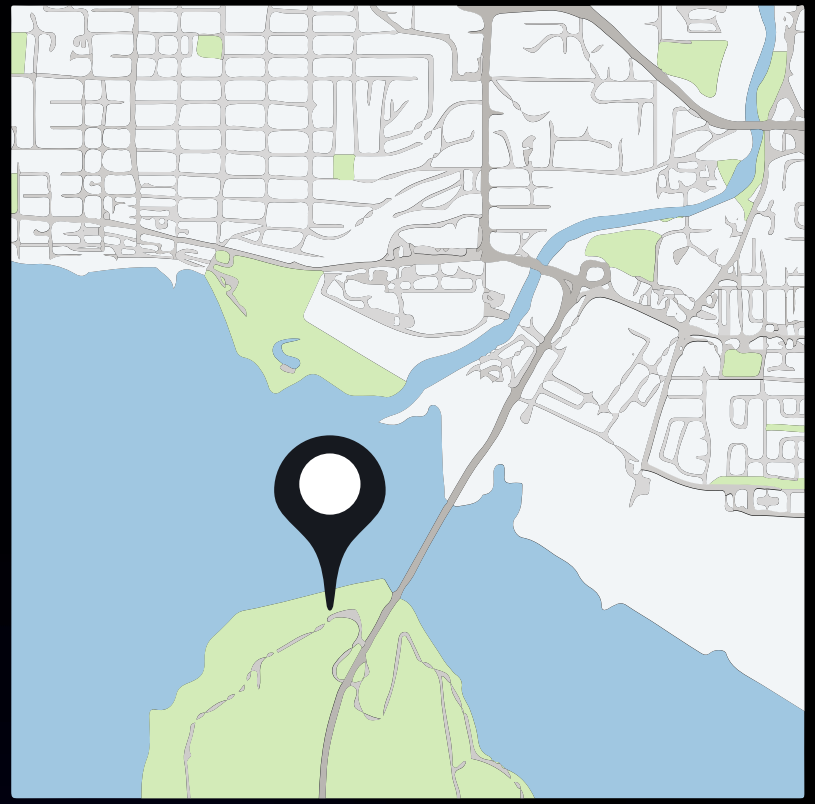
© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Amazon Location: Places

Search for points of interest

Geocode and reverse-geocode addresses

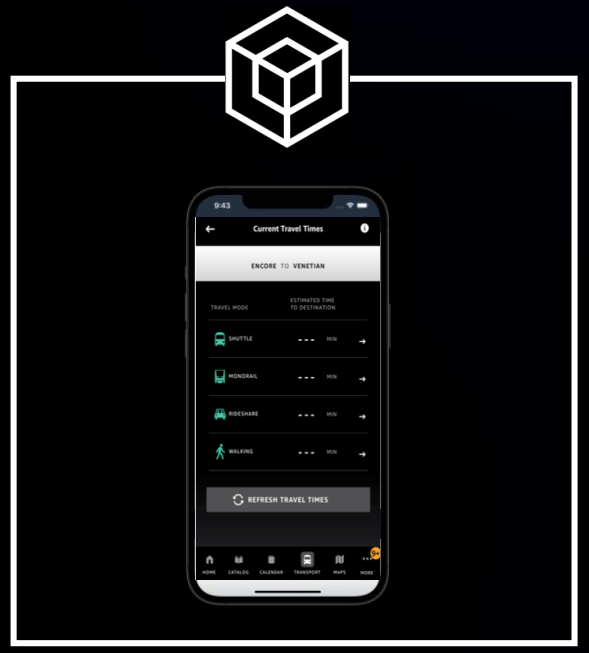
Data ownership: storing of places results is permitted



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Where is that place?

Amazon
Location SDK



geocode

```
request: {
   text: ”Tour Eiffel”
}
```

```
Place: [{
   AddressNumber: "5",
   Country: "FRA”,
   Label: "Tour Eiffel, 5 Avenue Anatole France,
75007 Paris, France",
   Municipality: "Paris",
   Neighborhood: "7e Arrondissement",
   PostalCode: "75007",
   Region: "Île-de-France",
   Street: "Avenue Anatole France",
   SubRegion: "Paris",
   Point: [position]
}]
```

Positions are in [longitude, latitude]

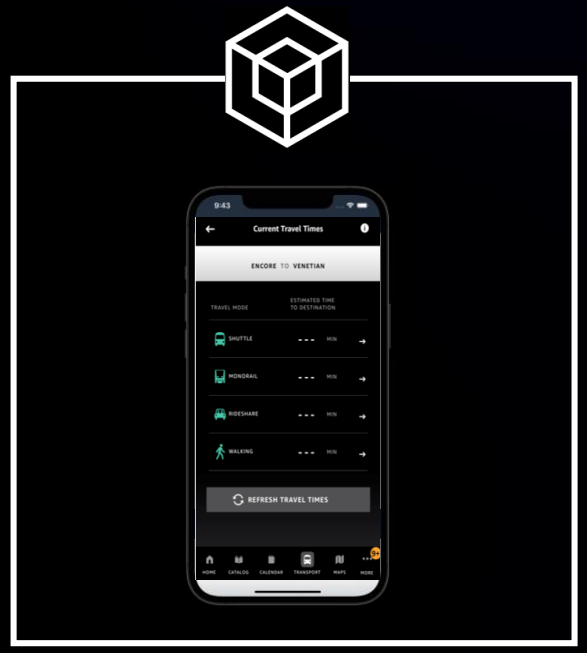
Amazon
Location Service

Places

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

What is this place?

Amazon
Location SDK



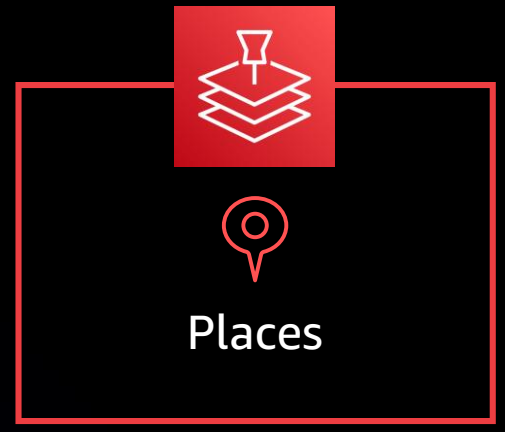
reverse-geocode

```
request: {
   location: [position]
}
```

```
Place: [{
   AddressNumber: "5",
   Country: "FRA”,
   Label: "Tour Eiffel, 5 Avenue Anatole France,
75007 Paris, France",
   Municipality: "Paris",
   Neighborhood: "7e Arrondissement",
   PostalCode: "75007",
   Region: "Île-de-France",
   Street: "Avenue Anatole France",
   SubRegion: "Paris",
   Point: [position]
}]
```

Positions are in [longitude, latitude]

Amazon
Location Service



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

How to get started

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Tech stack

Front-end SDKs for Android, iOS, JavaScript

Backend SDKs for C++, Go, Java, JavaScript, .NET, Node.js, PHP, Python, and Ruby

Create resources using the AWS Console, AWS CLI, or the service's APIs

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

AWS Amplify

AMPLIFY

Develop



Configure AWS backends fast



Seamlessly connect front ends



CLI

Admin UI



Libraries & UI components

Feature categories

- Authentication
- DataStore
- Storage
- API (GraphQL & REST)
- Functions
- Analytics
- Pubsub
- Predictions
- Interactions
- Notifications
- Geo **NEW**

Powered by AWS services such as AWS AppSync (GraphQL API) and Amazon Cognito (authentication)

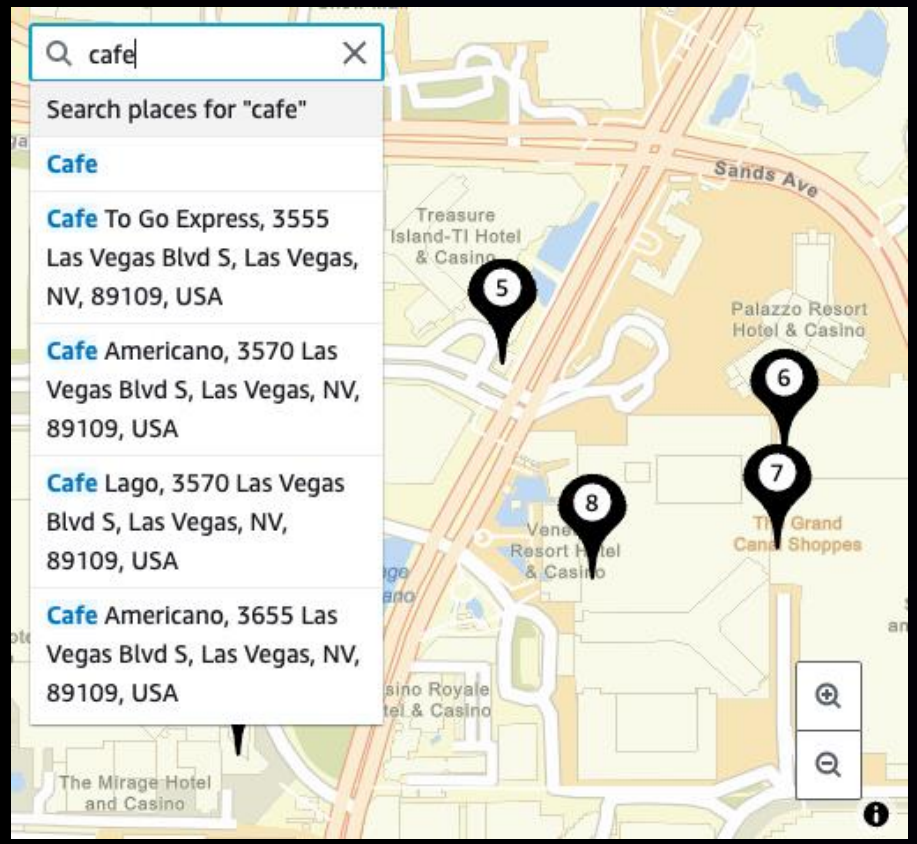
aws

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Amplify Geo

AMPLIFY

Front-end developers can quickly add mapping and location features to web and mobile apps, powered by Amazon Location Service



Reduce time-to–market with easy resource provisioning via Amplify CLI, and intuitive location-based APIs

Build quick PoCs with ready-to-use UI components

Library support for web (General Availability) and native Android & iOS (Developer Preview)

Reduce latency and improve user experience by deploying close to your customers – available in 9 AWS Regions today

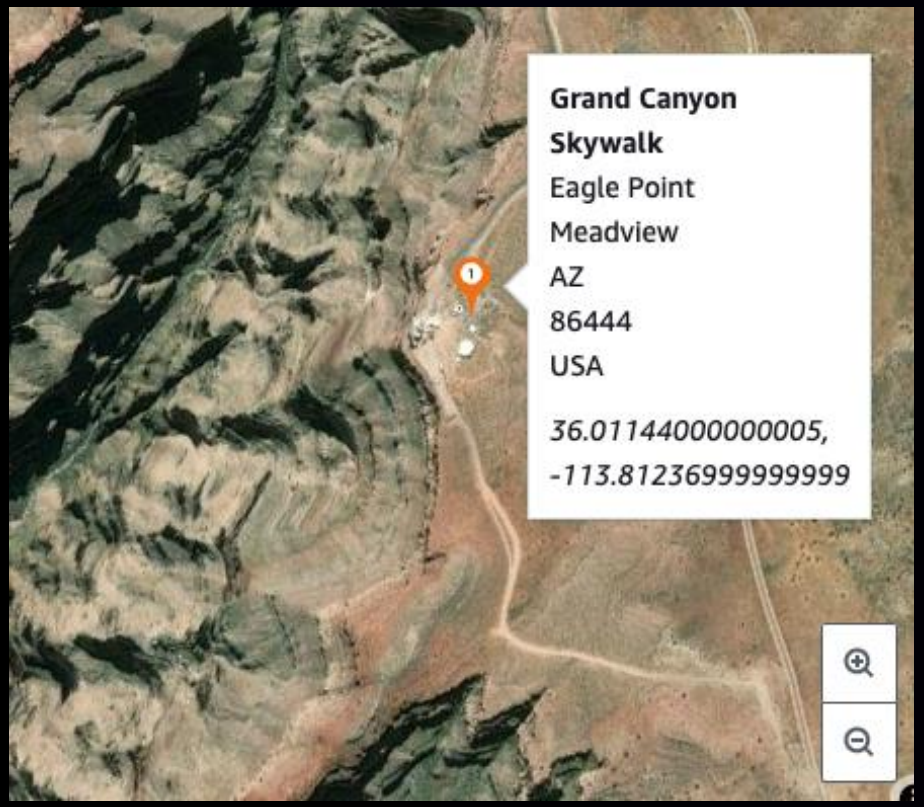
aws

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Amplify Geo

AMPLIFY

Fast time-to-market for new building scalable, low-cost, privacy-respecting map-enabled web and mobile apps



Maps and location search can be added to apps with a few lines of code

```
const map = await AmplifyMapLibre.createMap({
  container: "map", // The ID of a DOM element
  center: [-123.1187, 49.2819],
  zoom: 11,
  region: "us-west-2",
})
```

Display predefined markers and search results on a map

aws

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Get started now!



amplify.aws



a.co/location

aws

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Thank you!

Fernando Rocha Silva

LinkedIn /in/fernandorochas
Twitter @rochatron
GitHub rochabr



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.