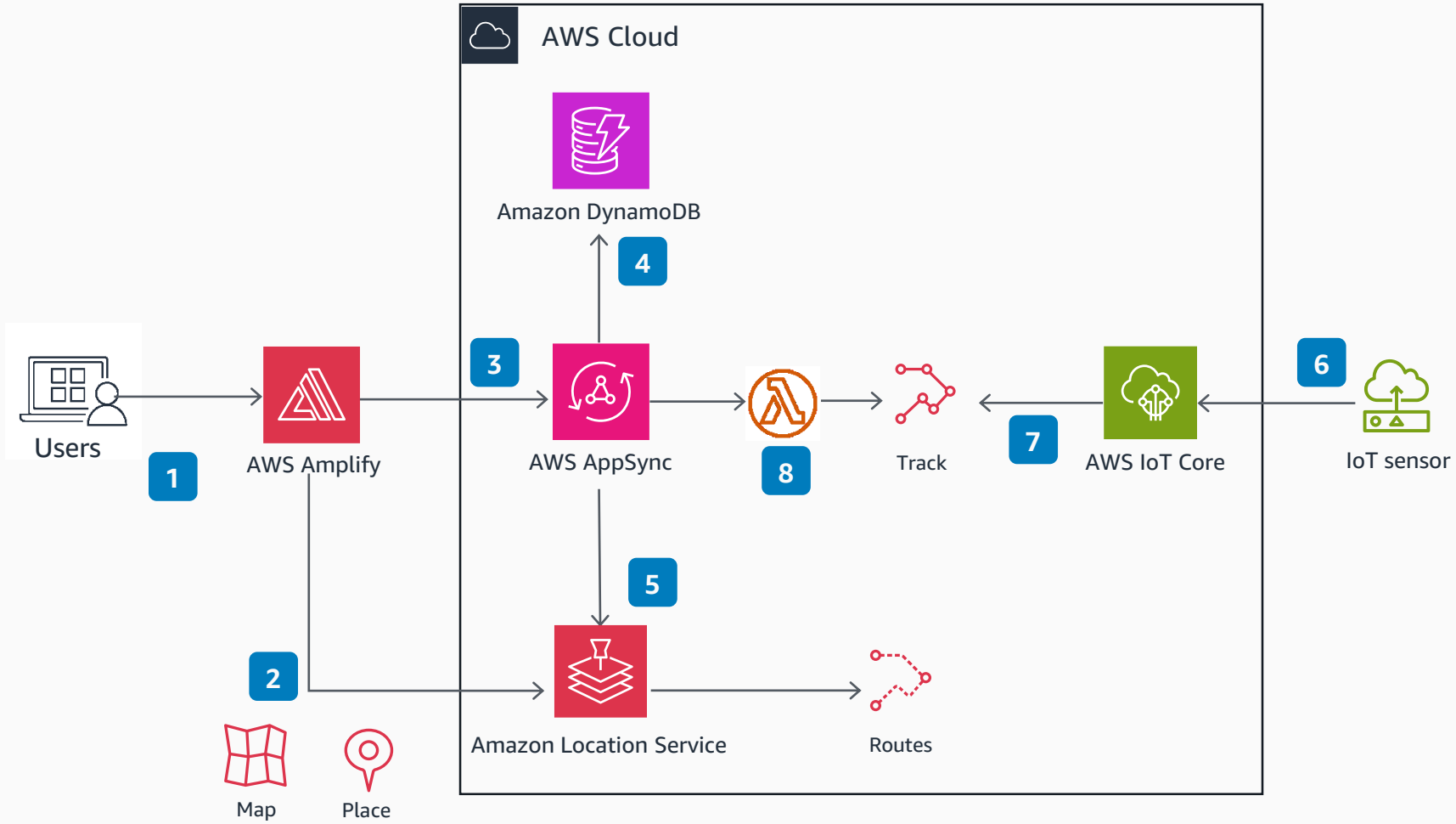
Guidance for Intelligent Route Optimization on AWS

This architecture diagram demonstrates how to implement route optimization and tracking for companies with fleet and delivery operations in high density environments.



1. Users access the application through a web-based UI that uses **AWS Amplify** libraries to connect to AWS.
2. **Amplify** allows the application to display interactive maps, autocomplete addresses, and place markers by connecting with **Amazon Location Service**.
3. The application connects to the AWS Cloud through **AWS AppSync**, which acts as a central hub to interact with other AWS resources.
4. Itineraries are stored in **Amazon DynamoDB**, where the application can query and update them with single-digit millisecond performance.
5. Itineraries are optimized using **Amazon Location** Route Matrix API. This API returns a matrix with the distance between each pair of points of the itinerary. The matrix is then used to optimize the route based on the shortest distance between each pair of waypoints.
6. Once an itinerary starts, an asset outfitted with an Internet of Things (IoT) sensor sends position updates to **AWS IoT Core** using the message queuing telemetry transport (MQTT) protocol.
7. **AWS IoT Core** routes the messages to a **Location Service** Tracker, which stores the position updates for up to 30 days.
8. Users of the application can track the assets on the map in near real-time. This is achieved by polling the updates from the **Amazon Location** tracker through an **AWS Lambda** custom **AWS AppSync** resolver.

Reviewed for technical accuracy September 6, 2023

AWS Reference Architecture