

Building a serverless CDS Hook for executing CQL query using Amazon Healthlake

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Who am I?

- Mithun Mallick
- Principal Solutions Architect, AWS



- Over 20 years of industry experience
- Worked with both providers and payors building interoperability solutions
- Published multiple articles, workshops on FHIR
- 5th time at DevDays!

Learning Objectives

- Understanding serverless options on AWS for building FHIR based solutions
 - Amazon API Gateway : Serverless API Management for FHIR
 - AWS Lambda : Serverless compute offering function as service
 - Amazon Healthlake : Serverless FHIR repository
 - Amazon Comprehend Medical : NLP engine for clinical analysis
- Building a serverless CDS service using API Gateway and AWS Lambda
- Perform SNOMED CT code analysis using Comprehend Medical
- Query Amazon Healthlake for FHIR resources
- Execute a CQL query on AWS Lambda

Background

- COVID-19 has shown that pandemics have cascading effects
- Front line workers are most risk in such situations
- Planning of resources is a key factor for keeping employees safe
- Using AI and technology can help with resource planning

How a COVID-19 Outbreak Could Affect Workplaces

Similar to influenza viruses, SARS-CoV-2, the virus that causes COVID-19, has the potential to cause extensive outbreaks. Under conditions associated with widespread person-to-person spread, multiple areas of the United States and other countries may see impacts at the same time. In the absence of a vaccine, an outbreak may also be an extended event. As a result, workplaces may experience:

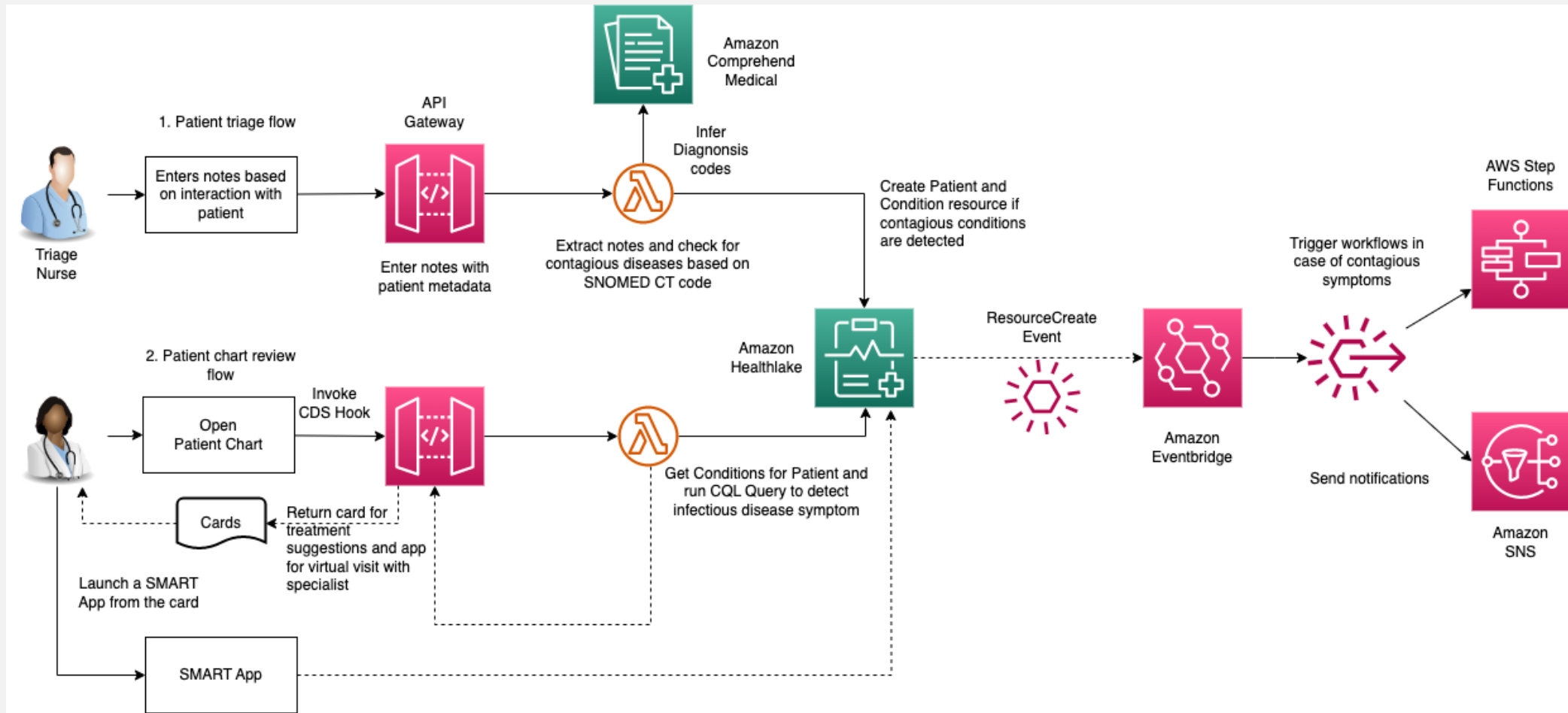
- **Absenteeism.** Workers could be absent because they are sick; are caregivers for sick family members; are caregivers for children if schools or day care centers are closed; have at-risk people at home, such as immunocompromised family members; or are afraid to come to work because of fear of possible exposure.
- **Change in patterns of commerce.** Consumer demand for items related to infection prevention (e.g., respirators) is likely to increase significantly, while consumer interest in other goods may decline. Consumers may also change shopping patterns because of a COVID-19 outbreak. Consumers may try to shop at off-peak hours to reduce contact with other people, show increased interest in home delivery services, or prefer other options, such as drive-through service, to reduce person-to-person contact.
- **Interrupted supply/delivery.** Shipments of items from geographic areas severely affected by COVID-19 may be delayed or cancelled with or without notification.

Source: <https://www.osha.gov/sites/default/files/publications/OSHA3990.pdf>

Using AI and NLP to trigger event driven workflows

- Capturing pandemic symptoms at first point of contact
- Triggering workflows to alert employees and plan resources
- Support clinical decision by using CQL
- Augment provider's resources with SMART apps
- Provide seamless experience to patients while keeping everyone safe

Proposed Solution



Tutorial Steps

- Setup environment and download code
- Deploy AWS Lambda functions
- Trigger API to create patient data with conditions
- Integrate the CDS API service with the CDS Hooks sandbox
- Launch SMART app from the cards returned from service

What did you learn?

- Using Amazon Comprehend Medical to detect Conditions
- Using Amazon Healthlake as the FHIR repository
- Using AWS Lambda for FHIR based compute
- Using Amazon Eventbridge to build event driven workflows on FHIR resources

Using serverless to enable feature driven development

Workshop instructions



<https://catalog.us-east-1.prod.workshops.aws/workshops/f4058d53-bda2-4717-baa9-a08775c2bf09/en-US/build-cds-hook-with-healthlake>

Contact

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Q&A

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