Quiz 1
10/26/20 6:15pm-7:45pm

This is an open book quiz. Once you complete the answer, you need to upload your answer file. You may scan or take pictures and/or type your answer and upload the file. The upload should be completed by 8:00pm EST.

A. Questions from Assignment 1 [25 Points]

1. What are three advantages to using Swagger?

2. When you call the API from your frontend application hosted at http://www.yourdomain.com, you get the following error in the developer console:

"No 'Access-Control-Allow-Origin' header is present on the requested resource. Origin 'http://www.yourdomain.com' is therefore not allowed access."

> What is the reason for this error? How do you resolve it? (describe every step)

3. You create a new Lambda function that returns the text "Hello world". You test it and it completes the execution in a few milliseconds. You then decide to use it to store a message in a DynamoDB table. You add code to do just that, on top of the original code. Upon testing the new version of the function, it times out after 3 seconds, over and over again.

>What might be the issue and how can you resolve it?

4. You have an SQS queue with 100,000 messages in it. How would you go about reading the messages on AWS? Please be descriptive in terms of the infrastructure and the permissions needed.

5. For the following questions, imagine you have the following resources on AWS: an API Gateway deployment, a Lambda function connected to one of the API Gateway methods that responds to each request, and a Lex bot called "Concierge". You create a new intent called HotelBookingIntent in Lex. You add a few utterances and build it. When you start testing it in the Lex test console, everything works as expected. You then write code to call your Lex bot from a Lambda function, but all the incoming messages are not understood by the Lex bot.

>What is the most likely reason for Lex failing to understood messages sent through the Lambda function, yet everything working correctly through the Lex test console?

B. Design Question [25]

Small Video Clips Sharing App

You are going to design an app using AWS platform and services to allow users to upload and share short videos, and allow users to search and view those videos. I want you to draw the architecture for such an app with appropriate AWS services to support the following functionalities:

1. User can upload short videos. While uploading, the user provides a metadata file that has uploaders name, a short description about the video.
2. User can search videos by uploaders name and/or video descriptions. The app should show the list of matching videos. Once clicked, it should stream the video to the user's mobile app.
3. Application also keeps history of the videos a user has watched in his/her profile. The app should recommend a list of videos when the user logs in.

What you need to provide:

1. You need to draw the supporting architecture
2. List of APIs
3. List of Lambda functions with input triggers and output
4. Appropriate data stores to facilitate these.
5. Describe the end-to-end path with the involved APIs, lambda functions, and database components for an user searching for video by categories. You may make assumptions about search categories.

   Your design should account for scalability, event driven system design. You may make assumptions about external APIs such as recommendation API for list of videos.

C. Questions from Papers [25]

C.1: [GFS]Specify three most important considerations/rationale behind Google to design GFS. Also specify what design choices were made to address these in GFS.

C.2: [GFS]Illustrate through examples what happens if a chunk server goes down in GFS, i.e., how the self-healing process takes place.

C.3 [BigTable] Explain Big Table structure through row key, column key with examples.

C.4 [Big Table] How is bloom filter utilized in Big Table?

C.5 [MR] Describe what happens if a task tracker fails while executing a map task – how job tracker detects it and what action it takes.

D. Lecture Notes [25]

D.1 What is live VM migration? Describe the process through “iterative copy” with an illustration? Why shared storage between source and destination VM is required for live migration?

D.2 What is the benefit of a private cloud? Provide three reasons why Enterprises are adopting this even though they need to invest in the infrastructure. How does Hybrid cloud help?

D.3 What is the key difference between Full and Para virtualization?

D.4 What is the benefit of serverless architecture? Why is it scalable?

D5. What is the role of a message queue system like Kafka/Kinesis/SQS in the overall design of a system?