ACA Module 13 – Challenge Lab: Implementing a Serverless Architecture for the Cafe

Student name: Duy Hung D Student ID: 104182779

Tutorial session: Monday 1:00PM

1. INTRODUCTION

Implementing a serverless architecture for a cafe involves leveraging cloud services to streamline operations and enhance scalability. The frontend, hosted on platforms like AWS S3 or Netlify, showcases the cafe's menu and promotions. User authentication is handled by serverless services such as Amazon Cognito or Auth0. Order processing, payment handling, and inventory management are managed through serverless backends using AWS Lambda or Azure Functions, coupled with NoSQL databases. Payment processing is offloaded to serverless gateways like Stripe or Square, ensuring security compliance. Notifications, analytics, and monitoring utilize serverless services such as AWS SNS, Lambda, and CloudWatch. A serverless API Gateway exposes APIs for the frontend and integrations with external services like delivery partners. The architecture promotes automatic scaling, reduced infrastructure management, and cost efficiency, allowing the cafe to focus on delivering an optimized customer experience.

1. Main

**Task 1: Downloading the source code**

Firstly, downloading 2 zip file included python code. Extract them and examine the contents

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*Figure 1 Downloaded python file*

Return to aws academy browser, choose the Details tab and show the access the multiple choice questions link. Copy it and paste to another web browser, answer the question 1. When I extract 2 zip files above, I see Python packages in a folder and it can be used for source code in lambda function. So I can choose the answer easily.

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*Figure 2 Module 13 Challenge Lab Questions*

**Task 2: Creating the DataExtractor Lambda function in the VPC**

When you want to create the DataExtractor Lambda function, you have to set security group for it. To allow the Lambda function to access the RDS database instance, it is necessary to modify the database security group by adding a rule that permits connections from the Lambda function. In order to establish this communication, a security group will be created for the Lambda function and added as an inbound rule to the security group of the RDS instance.

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*Figure 3 Create security group for lambda function*

Set the security group name is LambdaSG and connect with LabVPC. Type of outbound rules is all traffic to all address.

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*Figure 4 Set outbound rules for LambdaSG*

After create LambdaSG, update inbound rules in DatabaseSG. Add more MySQL/Aurora allow LambdaSG.

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*Figure 5 Edit inbound rules in DatabaseSG*

Next, create Lambda function and set the name long below. Choose Python 3.8 as a runtime and salesAnalysisReportDERole existing role.

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*Figure 6 Lambda function settings*

Choose LabVPC and select 2 private subnet with LambdaSG.

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*Figure 7 Lambda function settings*

Wait for several minutes and and upload the DataExtractor file that you have downloaded before.

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*Figure 8 Upload zip file to code in lambda*

And then set a small description, 128MB memory size and 30 seconds timeout.

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*Figure 9 Basic settings in lambda*

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*Figure 10 Handler in runtime settings*

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*Figure 11 Answer the second questions after task 2*

**Task 3: Creating the salesAnalysisReport Lambda function**

You will be responsible for creating the Lambda function which will be used to generate and send out the daily sales analysis report. Create a second Lamba function and set the same salsAnalysisReport with the same runtime and role. A screenshot of a computer

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*Figure 12 Second Lamba function*

Upload the salesAnalysisReport.zip file in this second lambda

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*Figure 13 Upload file in the second lambda*

As same as the first lambda function, set a small description, memory size and timeout.

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*Figure 14 Basic settings in second lambda function*

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*Figure 15 runtime settings in second lambda function*

**Task 4: Creating an SNS topic**

The report for sales analysis is sent to email subscribers through an SNS topic. Your task is to create a new SNS topic and update the environment variables of the salesAnalysisReport Lambda function to include the Amazon Resource Name (ARN) of the topic. Create a SNS topic that salesReportTopic as a name and display name with spaces.

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*Figure 16 Details in SNS topic*

After that, update salesAnalysisReport Lambda by adding topic key and value

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*Figure 17 Edit environment variables*

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*Figure 18 Answer question 3 after task 4*

**Task 5: Creating an email subscription to the SNS topic**

In order to obtain the sales report via email, it is necessary to establish an email subscription for the topic that was previously created. Use your personal email as endpoint to receive an email subscription and confirmation

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*Figure 19 Create subscription*

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*Figure 20 Answer question 4 after task 5*

**Task 6: Testing the salesAnalysisReport Lambda function**

Create a configure test event for salesAnalysisReport Lambda function.

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*Figure 21 Configure test event*

**Task 7: Setting up an Amazon EventBridge event to trigger the Lambda function each day**

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*Figure 22 EventBridge Scheduler console*

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*Figure 23 Add trigger in lambda function*

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*Figure 24 Answer question 4 and 5 after all task*