

# Module 13 Challenge Lab - Implementing a Serverless Architecture for the Café

Name: Pham Do Tien Phong  
Student Id: 104189767

## Task 1: Downloading the source code

I did it and I will use it later

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

The screenshot shows the AWS Management Console interface for creating a new security group. The 'Basic details' section is filled out with 'LambdaSG' as the name and 'Allows SSH access to developers' as the description. The 'VPC' dropdown is set to 'vpc-09c8b64c3d9f02b0 (Lab VPC)'. The 'Inbound rules' section is currently empty, and the 'Outbound rules' section shows a default rule for 'All traffic'.

The first step is creating security group for Lambda (name: LambdaSG , VPC : LabVPC, Outbound rules : All traffic)

The screenshot shows the 'Edit inbound rules' page for a security group. It lists two inbound rules. The first rule is for 'MySQL/Aurora' with protocol 'TCP' and port range '3306'. The second rule is also for 'MySQL/Aurora' with protocol 'TCP' and port range '3306', but its source is set to 'Custom' with a value of 'sg-00b345a867013c3a2'. This second rule is circled in red.

Then , I add new inbound rule to DatabaseSG with Type: MySQL/Aurora and Source :LamdaSG I created above.

**AWS Lambda**

Dashboard  
Applications  
**Functions**

▼ Additional resources  
Code signing configurations  
Layers  
Replicas

▼ Related AWS resources  
Step Functions state machines

**Create function**

AWS Serverless Application Repository applications have moved to [Create application](#).

☒ Author from scratch  
Start with a simple Hello World example.
 ☐ Use a blueprint  
Build a Lambda application from sample code and configuration presets for common use cases.
 ☐ Container image  
Select a container image to deploy for your function.

**Basic information**

**Function name**  
Enter a name that describes the purpose of your function.  
salesAnalysisReportDataExtractor  
Use only letters, numbers, hyphens, or underscores with no spaces.

**Runtime**  
Choose the language to use to write your function. Note that the console code editor supports only Node.js, Python, and Ruby.  
Python 3.8

**Architecture**  
Choose the instruction set architecture you want for your function code.  
☒ x86\_64  
☐ arm64

**Permissions**  
By default, Lambda will create an execution role with permissions to upload logs to Amazon CloudWatch Logs. You can customize this default role later when adding triggers.

▼ **Change default execution role**

**Execution role**  
Choose a role that defines the permissions of your function. To create a custom role, go to the IAM console.

☐ Create a new role with basic Lambda permissions  
☒ Use an existing role  
☐ Create a new role from AWS policy templates

**Existing role**  
Choose an existing role that you've created to be used with this Lambda function. The role must have permission to upload logs to Amazon CloudWatch Logs.  
salesAnalysisReportDERole

**Enable VPC**  
Connect your function to a VPC to access private resources during invocation.

**VPC**  
Choose a VPC for your function to access.  
vpc-09c9b64c3d9f0220 [10.0.0.0/16]

☐ Allow IPv6 traffic for dual-stack subnets  
You can allow outbound IPv6 traffic to subnets that have both IPv4 and IPv6 CIDR blocks.

**Subnets**  
Select the VPC subnets for Lambda to use to set up your VPC configuration.  
Choose subnets  
subnet-0c6d87a82a60b0c7 [10.0.2.0/24] us-east-1b  
aws:cloudformation:logical-id: PrivateSubnet2 aws:cloudformation:stack-id: arn:aws:cloudformation:us-east-1:806945179556:stack:8332ba1775303525623311e06945179556 cloudat: c8332ba1775303525623311e06945179556 Name: Private Subnet 2  
subnet-04ba89c58f4c42e [10.0.1.0/24] us-east-1a  
aws:cloudformation:logical-id: PrivateSubnet1 aws:cloudformation:stack-id: arn:aws:cloudformation:us-east-1:806945179556:stack:8332ba1775303525623311e06945179556 cloudat: c8332ba1775303525623311e06945179556 Name: Private Subnet 1

**Security groups**  
Choose the VPC security groups for Lambda to use to set up your VPC configuration. The table below shows the inbound and outbound rules for the security groups that you choose.  
Choose security groups  
sg-00b345a867013e3a2 (LambdaSG) Allow Lambda function

**Inbound rules** | **Outbound rules**

Security group ID	Protocol	Ports	Destination
sg-00b345a867013e3a2	All	All	0.0.0.0/0

These images are the information of the new Lambda Function I created with name: salesAnalysisReportDataExtractor , Runtime: Python 3.8 , Role : salesAnalysisReportDERole, VPC: Lab VPC, Subnet: Private subnet1 & Private subnet2, SG: LambdaSG.

aws

Services

Search

[Alt+S]

VPC

EC2

S3

RDS

≡

Edit basic settings

Basic settings

Info

Description - optional

Lambda function to extract data from database

Memory

Info

Your function is allocated CPU proportional to the memory configured.

128

MB

Set memory to between 128 MB and 10240 MB

Ephemeral storage

Info

You can configure up to 10 GB of ephemeral storage (/tmp) for your function. [View pricing](#)

512

MB

Set ephemeral storage (/tmp) to between 512 MB and 10240 MB.

SnapStart

Info

Reduce startup time by having Lambda cache a snapshot of your function after the function has initialized. To evaluate whether your function code is resilient to snapshot operations, review the [SnapStart compatibility considerations](#).

None

Supported runtimes: Java 11, Java 17.

Timeout

0

min

30

sec

Execution role

Choose a role that defines the permissions of your function. To create a custom role, go to the [IAM console](#).

☒ Use an existing role

☐ Create a new role from AWS policy templates

Existing role

Choose an existing role that you've created to be used with this Lambda function. The role must have permission to upload logs to Amazon CloudWatch Logs.

salesAnalysisReportDERole

[View the salesAnalysisReportDERole role](#) on the IAM console.

Configure the DataExtractor Lambda

### Task 3: Creating the salesAnalysisReport Lambda function

aws Services [Alt+S]

VPC EC2 S3 RDS Lambda

Lambda > Functions > Create function

### Create function [info](#)

AWS Serverless Application Repository applications have moved to [Create application](#).

☒ Author from scratch  
Start with a simple Hello World example.

☐ Use a blueprint  
Build a Lambda application from sample code and configuration presets for common use cases.

☐ Container image  
Select a container image to deploy for your function.

#### Basic information

**Function name**  
Enter a name that describes the purpose of your function.  
  
Use only letters, numbers, hyphens, or underscores with no spaces.

**Runtime** [info](#)  
Choose the language to use to write your function. Note that the console code editor supports only Node.js, Python, and Ruby.  
 [↻](#)

**Architecture** [info](#)  
Choose the instruction set architecture you want for your function code.  
☒ x86\_64  
☐ arm64

**Permissions** [info](#)  
By default, Lambda will create an execution role with permissions to upload logs to Amazon CloudWatch logs. You can customize this default role later when adding triggers.

▼ **Change default execution role**

**Execution role**  
Choose a role that defines the permissions of your function. To create a custom role, go to the [IAM console](#).  
☐ Create a new role with basic Lambda permissions  
☒ Use an existing role  
☐ Create a new role from AWS policy templates

**Existing role**  
Choose an existing role that you've created to be used with this Lambda function. The role must have permission to upload logs to Amazon CloudWatch Logs.  
 [↻](#)

I create new Lambda function with name: saleAnalysisReport , Runtime: Python 3.8 and IAM Role: saleAnalysisReportRole.

aws

Services

Search

[Alt+S]

VPC

EC2

S3

RDS

Lambda

Lambda > Functions > salesAnalysisReport > Edit basic settings

Edit basic settings

Basic settings

Info

Description - optional

Lambda function to generate and send the daily sales report

Memory

Info

Your function is allocated CPU proportional to the memory configured.

128

MB

Set memory to between 128 MB and 10240 MB

Ephemeral storage

Info

You can configure up to 10 GB of ephemeral storage (/tmp) for your function. [View pricing](#)

512

MB

Set ephemeral storage (/tmp) to between 512 MB and 10240 MB.

SnapStart

Info

Reduce startup time by having Lambda cache a snapshot of your function after the function has initialized. To evaluate whether your function code is resilient to snapshot operations, review the [SnapStart compatibility considerations](#).

None

Supported runtimes: Java 11, Java 17.

Timeout

0

min

30

sec

Execution role

Choose a role that defines the permissions of your function. To create a custom role, go to the [IAM console](#).

☒ Use an existing role

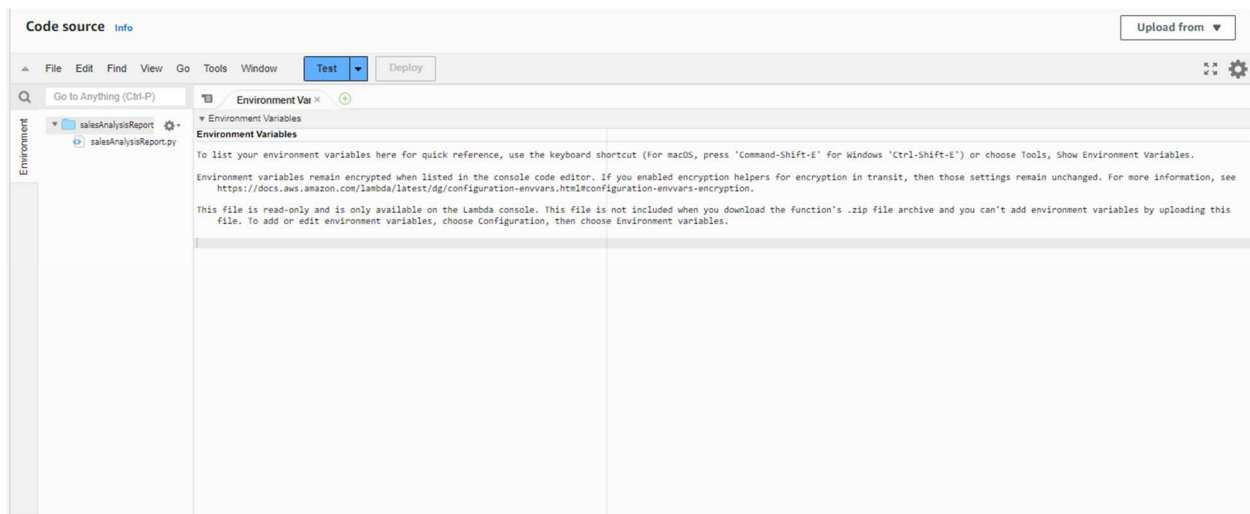
☐ Create a new role from AWS policy templates

Existing role

Choose an existing role that you've created to be used with this Lambda function. The role must have permission to upload logs to Amazon CloudWatch Logs.

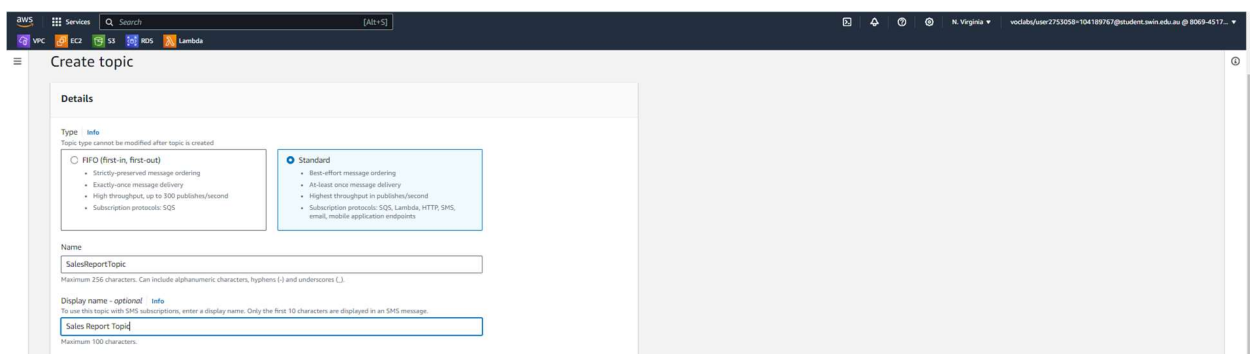
salesAnalysisReportRole

[View the salesAnalysisReportRole role](#) on the IAM console.

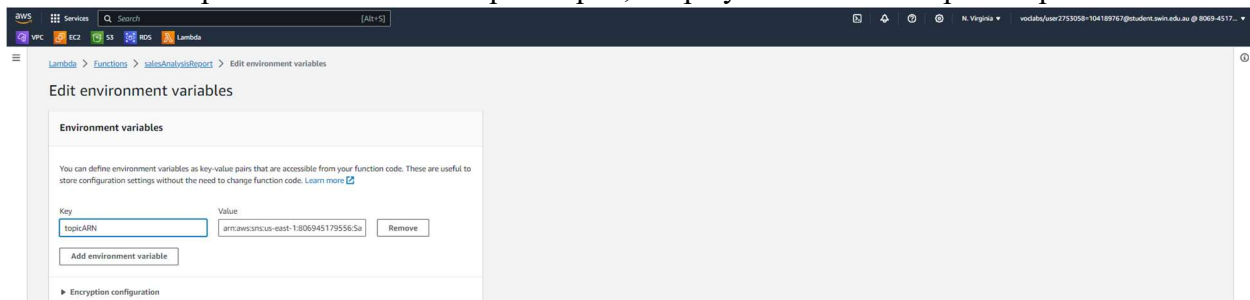


Configure the Lambda function above.

## Task 4: Creating an SNS topic



I create SNS topic with name: SaleReportTopic , Display name: Sales Report Topic.



I add new environment variables with key: topicARN and value is the ARN of the topic above.

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

aws Services Search [Alt+S]

Amazon SNS now supports in-place message archiving and replay for FIFO topics. [Learn more](#)

Amazon SNS > Subscriptions > Create subscription

### Create subscription

**Details**

Topic ARN

Protocol  
This type of endpoint to subscribe

Endpoint  
An email address that can receive notifications from Amazon SNS.

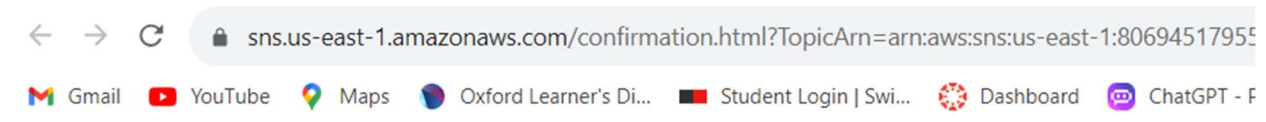
After your subscription is created, you must confirm it. [Info](#)

**Subscription filter policy - optional** [Info](#)  
This policy filters the messages that a subscriber receives.

**Redrive policy (dead-letter queue) - optional** [Info](#)  
Send undeliverable messages to a dead-letter queue.

Cancel Create subscription

I create subscription of the for SalesReportTopic and the endpoint is my private email.



Simple Notification Service

### Subscription confirmed!

You have successfully subscribed.

Your subscription's id is:

arn:aws:sns:us-east-1:806945179556:SalesReportTopic:804d0c9f-12b4-4a08-9e69-df9521c522f3

If it was not your intention to subscribe, [click here to unsubscribe](#).

I receive confirmed email.

## Task 6: Testing the salesAnalysisReport Lambda function

✓

Executing function: succeeded (logs)

▼ Details

The area below shows the last 4 KB of the execution log.

```
{
  "statusCode": 200,
  "body": "\"Sales Analysis Report sent.\""
}
```

Summary

Code SHA-256

aJkuHxZfG9ClxdxAQBK6haXsFCSX2up4DA6TpE2RXg=

Request ID

506abf9e-62cf-4816-9fb6-48e0af4fea92

Duration

1519.07 ms

Resources configured

128 MB

Log output

The section below shows the logging calls in your code. [Click here](#) to view the corresponding CloudWatch log group.

Execution time

2 seconds ago (November 15, 2023 at 12:55 AM GMT+8)

Function version

\$LATEST

Billed duration

1520 ms

Max memory used

76 MB

START RequestId: 506abf9e-62cf-4816-9fb6-48e0af4fea92 Version: \$LATEST

END RequestId: 506abf9e-62cf-4816-9fb6-48e0af4fea92

REPORT RequestId: 506abf9e-62cf-4816-9fb6-48e0af4fea92 Duration: 1519.07 ms Billed Duration: 1520 ms Memory Size: 128 MB Max Memory Used: 76 MB

I can test successfully

## Daily Sales Analysis Report Hộp thư đến x



**Sales Report Topic** <no-reply@sns.amazonaws.com>

đến tôi ▼

Sales Analysis Report

Date: 2023-11-14

Product Group: Pastries

Item Name	Quantity
*****	*****
Croissant	29
Donut	23
Chocolate Chip Cookie	18
Muffin	6
Strawberry Blueberry Tart	34
Strawberry Tart	33

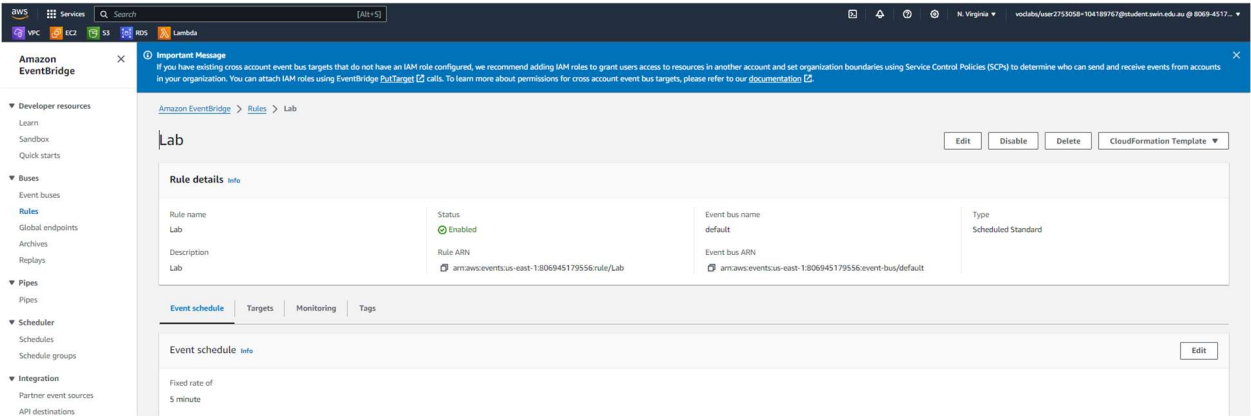
Product Group: Drinks

Item Name	Quantity
*****	*****
Coffee	33
Hot Chocolate	17
Latte	24



I can receive a new email

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



I create an Amazon EventBridge to trigger Lambda function



I receive email.