



49°

Lab - AWS re/Start

**Actividad: Trabajo con AWS
Lambda**





Interactuando con AWS Lambda

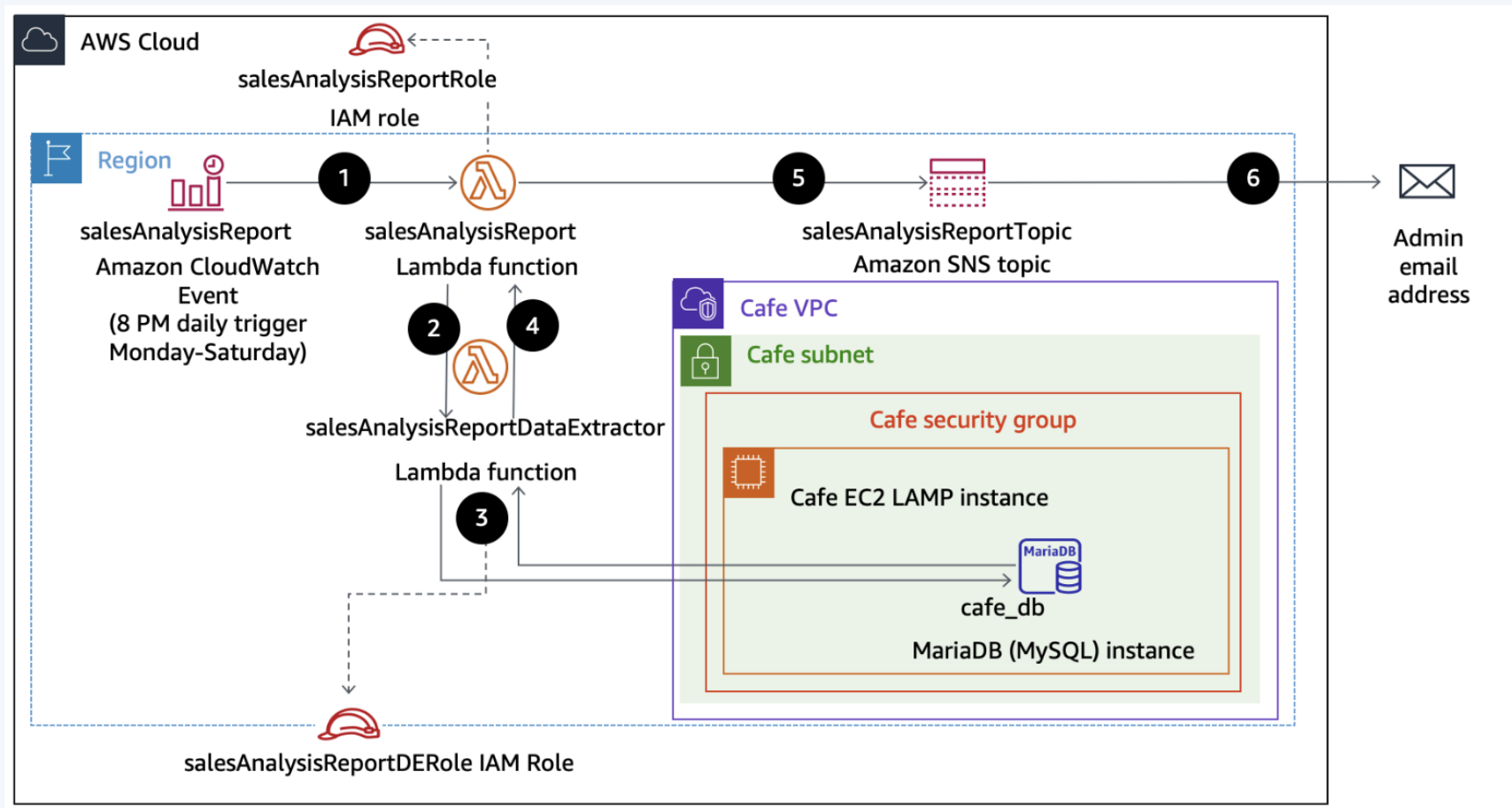
Los objetivos son:

- Reconocer los permisos de política de AWS IAM necesarios para facilitar una función de Lambda a otros recursos de AWS.
- Crear una capa de Lambda para satisfacer una dependencia de biblioteca externa.
- Crear funciones de Lambda que extraigan datos de la base de datos y envíen informes al usuario.
- Implementar y probar una función de Lambda que se inicie en función de una programación y que invoque a otra función.
- Utilizar los registros de CloudWatch para solucionar cualquier problema de ejecución de una función de Lambda.

Tarea 01



Esta es la arquitectura a desarrollar:



Y esta es la secuencia de procesos:

1. Un evento de Amazon CloudWatch llama a la función Lambda salesAnalysisReport a las 20:00 todos los días de lunes a sábado.
2. La función Lambda salesAnalysisReport invoca otra función Lambda, salesAnalysisReportDataExtractor, para recuperar los datos del informe.
3. La función salesAnalysisReportDataExtractor ejecuta una consulta analítica en la base de datos de la cafetería (cafe_db).
4. El resultado de la consulta se devuelve a la función salesAnalysisReport.
5. La función salesAnalysisReport formatea el informe en un mensaje y lo publica en el tema salesAnalysisReportTopic de Amazon SNS.
6. El tema SNS salesAnalysisReportTopic envía el mensaje por correo electrónico al administrador.

Tarea 01



Empezaremos observando los roles de IAM creados:

IAM > Roles

Roles (17) Info

An IAM role is an identity you can create that has specific permissions with credentials that are valid for short durations. Roles can be assumed by entities that you trust.

Q sales

X

2 matches

<

1

>

⚙

<input type="checkbox"/>	Role name	Trusted entities	Last activity
<input type="checkbox"/>	salesAnalysisReportDERole	AWS Service: lambda	-
<input type="checkbox"/>	salesAnalysisReportRole	AWS Service: lambda	-

Donde sus políticas de permisos son:

Permissions policies (2) Info

salesAnalysisReportDERole

Q

Search

Filter by Type

All types

<

1

>

⚙

<input type="checkbox"/>	Policy name	Type	Attached entities
<input type="checkbox"/>	<input checked="" type="checkbox"/> AWSLambdaBasicRunRole	Customer inline	0
<input type="checkbox"/>	<input checked="" type="checkbox"/> AWSLambdaVPCAccessRunRole	Customer inline	0

Permissions policies (4) Info

salesAnalysisReportRole

Q

Search

Filter by Type

All types

<

1

>

⚙

<input type="checkbox"/>	Policy name	Type	Attached entities
<input type="checkbox"/>	<input checked="" type="checkbox"/> AmazonSNSFullAccess	Customer inline	0
<input type="checkbox"/>	<input checked="" type="checkbox"/> AmazonSSMReadOnlyAccess	Customer inline	0
<input type="checkbox"/>	<input checked="" type="checkbox"/> AWSLambdaBasicRunRole	Customer inline	0
<input type="checkbox"/>	<input checked="" type="checkbox"/> AWSLambdaRole	Customer inline	0

Ahora, procedemos a crear una capa de Lambda, para poder importar las bibliotecas / librerías

Tarea 01



Estas son las configuraciones de las capa creada:

Lambda > Layers > Create layer

Create layer

Layer configuration

Name
pymysqlLibrary

Description - optional
pymysqlLibrary

☒ Upload a .zip file
☐ Upload a file from Amazon S3

[Upload](#)

pymysql-v3.zip
105.45 KB

For files larger than 10 MB, consider uploading using Amazon S3.

Compatible architectures - optional [Info](#)
Choose the compatible instruction set architectures for your layer.

☐ x86_64
☐ arm64

Compatible runtimes - optional [Info](#)
Choose up to 15 runtimes.

Runtimes

Python 3.9

Luego creamos la función para la extracción de la data

☒ 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

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 [Info](#)
Choose the language to use to write your function. Note that the console code editor supports only Node.js, Python, and Ruby.
Python 3.9

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.
salesAnalysisReportDERole

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

Tarea 01



Y adjuntamos la capa recién creada a la función

Lambda > Layers > Add layer

Add layer

Function runtime settings

Runtime Python 3.9	Architecture x86_64
-----------------------	------------------------

Choose a layer

Layer source [Info](#)
Choose from layers with a compatible runtime and instruction set architecture or specify the Amazon Resource Name (ARN) of a layer version. You can also [create a new layer](#).

☐ **AWS layers**
Choose a layer from a list of layers provided by AWS.

☒ **Custom layers**
Choose a layer from a list of layers created by your AWS account or organization.

☐ **Specify an ARN**
Specify a layer by providing the ARN.

Custom layers
Layers created by your AWS account or organization that are compatible with your function's runtime.

pymysqlLibrary

Version
1

Y cargamos el código de la función

```
import boto3
import pymysql
import sys

def lambda_handler(event, context):

    # Retrieve the database connection information from the event input parameter.

    dbUrl = event['dbUrl']
    dbName = event['dbName']
    dbUser = event['dbUser']
    dbPassword = event['dbPassword']

    # Establish a connection to the Cafe database, and set the cursor to return results as a Python dictionary.

    try:
        conn = pymysql.connect(host=dbUrl, user=dbUser, passwd=dbPassword, db=dbName, cursorclass=pymysql.cursors.DictCursor)

    except pymysql.Error as e:
        print('ERROR: Failed to connect to the Cafe database.')
        print('Error Details: %d %s' % (e.args[0], e.args[1]))
        sys.exit()

    # Execute the query to generate the daily sales analysis result set.

    with conn.cursor() as cur:
        cur.execute("SELECT c.product_group_number, c.product_group_name, a.product_id, b.product_name, CAST(sum(a.quantity) AS int) as quantity FROM order_item a, product b")
        result = cur.fetchall()

    # Close the connection.

    conn.close()

    # Return the result set.

    return {'statusCode': 200, 'body': result}
```

Tarea 01



Después, debemos configurar las conexiones de redes

VPC Info

Choose a VPC for your function to access.

vpc-00a8e987577d6e4ec (10.200.0.0/20)

☐ 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-0d7f0a6bc56f105ff (10.200.0.0/24)

us-west-2a

aws:cloudformation:logical-id: PublicSubnet1

aws:cloudformation:stack-id: arn:aws:cloudformation:us-west-2:211125579541:stack/c98436a224050116054108t1w211125579541/54f732a0-dbc9-11ee-8235-067d99d4a53d

aws:cloudformation:stack-name: c98436a224050116054108t1w211125579541

cloudlab: c98436a224050116054108t1w211125579541 Name: Cafe Public Subnet 1

We recommend that you choose at least 2 subnets for Lambda to run your functions in high availability mode.

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-05dbb75204306e23d (c98436a224050116054108t1w211125579541-CafeSecurityGroup-zKs41zME2MQg)

Security group for the Cafe instance

aws:cloudformation:logical-id: CafeSecurityGroup

aws:cloudformation:stack-id: arn:aws:cloudformation:us-west-2:211125579541:stack/c98436a224050116054108t1w211125579541/54f732a0-dbc9-11ee-8235-067d99d4a53d

aws:cloudformation:stack-name: c98436a224050116054108t1w211125579541

cloudlab: c98436a224050116054108t1w211125579541 Name: CafeSecurityGroup

Ahora, es momento de testear la función. La configuración

Code

Test

Monitor

Configuration

Aliases

Versions

Test event Info

Delete

Save

Test

To invoke your function without saving an event, modify the event, then choose Test. Lambda uses the modified event to invoke your function, but does not overwrite the original event until you choose Save changes.

Test event action

Create new event

Edit saved event

Event name

SARDETestEvent

Event JSON

Format JSON

1 {

2 "dbUrl": "ec2-18-246-233-144.us-west-2.compute.amazonaws.com",

3 "dbName": "cafe_db",

4 "dbUser": "root",

5 "dbPassword": "Re:Start!9"

6 }

Pero falló: **Task timed out after 3.01 seconds**

Tarea 01



Entonces, procedamos a corregirlo. Fijémonos en las reglas de entrada del grupo de seguridad.

Inbound rules										
Inbound rules (3)										
<input type="text" value="Search"/>										
<input type="checkbox"/>	Name	Security group rule...	IP version	Type	Protocol	Port range	Source	Description		
<input type="checkbox"/>	-	sgr-0dec2c62b935d42...	IPv4	HTTP	TCP	80	0.0.0.0/0	-		
<input type="checkbox"/>	-	sgr-04944075492ba8...	IPv4	MYSQL/Aurora	TCP	3306	0.0.0.0/0	-		
<input type="checkbox"/>	-	sgr-006c4092e2dc9024c	IPv4	SSH	TCP	22	0.0.0.0/0	-		

Después de abrir el puerto 3306 para la conexió con la bd:

✓

Executing function: succeeded ([logs](#))

▼ Details

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

```
{
  "statusCode": 200,
  "body": []
}
```

Añadamos algunos registros de pedidos, para testear que se guardan en la bd

✓

Executing function: succeeded ([logs](#))

▼ Details

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

```
{
  "statusCode": 200,
  "body": [
    {
      "product_group_number": 1,
      "product_group_name": "Pastries",
      "product_id": 1,
      "product_name": "Croissant",
      "quantity": 2
    }
  ],
}
```

✓

Executing function: succeeded ([logs](#))

▼ Details

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

```
},
{
  "product_group_number": 2,
  "product_group_name": "Drinks",
  "product_id": 9,
  "product_name": "Latte",
  "quantity": 1
}
]
```


Tarea 01



Ahora, procedemos a configurar las notificaciones, empezamos creando el t3pico de SNS

Amazon SNS > Topics > Create topic

Create topic

Details

Type [Info](#)
Topic type cannot be modified after topic is created

☐ FIFO (first-in, first-out)

- Strictly-preserved message ordering
- Exactly-once message delivery
- High throughput, up to 300 publishes/second
- Subscription protocols: SQS

☒ Standard

- Best-effort message ordering
- At-least once message delivery
- Highest throughput in publishes/second
- Subscription protocols: SQS, Lambda, HTTP, SMS, email, mobile application endpoints

Name

salesAnalysisReportTopic

Maximum 256 characters. Can include alphanumeric characters, hyphens (-) and underscores (_).

Display name - optional [Info](#)

To use this topic with SMS subscriptions, enter a display name. Only the first 10 characters are displayed in an SMS message.

SARTopic

Maximum 100 characters.

Junto a esto, necesitamos asignar nuestro suscriptor, quien recibir3 el e-mail

Amazon SNS > Subscriptions > Create subscription

Create subscription

Details

Topic ARN

arn:aws:sns:us-west-2:211125579541:salesAnalysisReportTopic

Protocol

The type of endpoint to subscribe

Email

Endpoint

An email address that can receive notifications from Amazon SNS.

millonesmam@gmail.com

[Info](#)

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

Tarea 01



Ahora, creamos la función `salesAnalysisReport` que maneja el flujo de reporte del análisis, mediante la CLI de AWS:

- Recupera la información de conexión a la base de datos desde Parameter Store.
- Invoca la función Lambda `salesAnalysisReportDataExtractor`, que recupera los datos del informe de la base de datos..
- Formatea y publica un mensaje con los datos del informe en el tema SNS.