Home Assignment

1. Introduction

In this assignment you will perform 2 exercises, one practical exercise and one research exercise.

You will be required to create a few components and make them work together as well as research a few new topics and understand how they work. The components will run on AWS (free tier) and don't require specific AWS knowledge in advance.

- To perform this exercise, you will be required to create an AWS account (credit card is required but all components are on the free tier level)

2. Practical Exercise Description

In this exercise you will create a serverless lambda function that will be able to send mails to subscribed users and will be available on the internet. This will be done in stages with increasing difficulty.

Important notes:

- You can write the lambda in any supported programming language.
- Please make sure that if you make architecture/configuration decision you will be able to explain why you chose them over other options.
- The infrastructure will need to be **built using IaC (Not necessarily Terraform)**. You can initially build it manually in the console, but you will be required to provide the IaC code for the project.

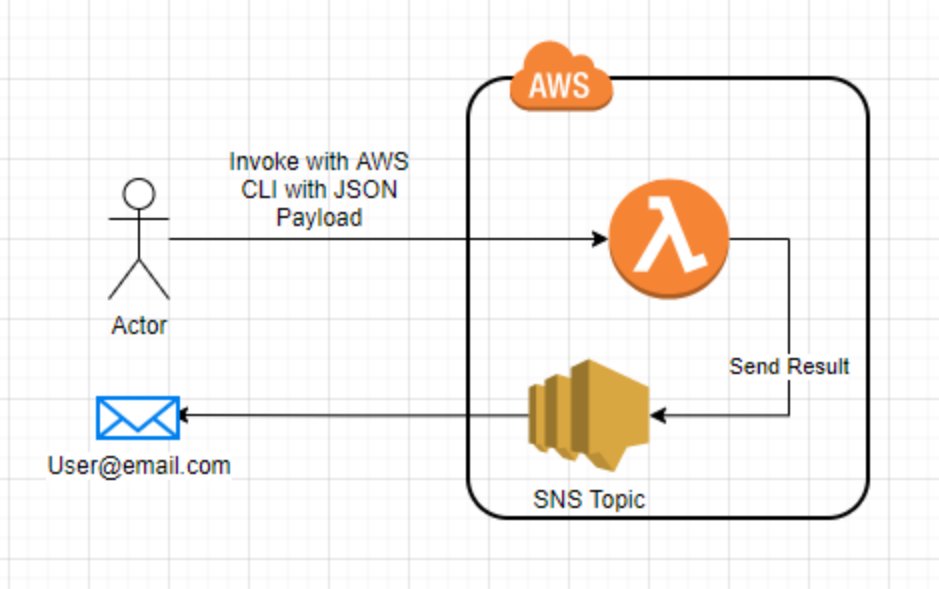
Stage 1:

You are required to create the following:

1) a Lambda function (serverless function) that will get 2 parameters(numbers) via JSON format and will calculate their sum.
2) Set up an AWS SNS Topic that the Lambda function can access.
3) Update the Lambda function to send the result to an AWS SNS topic (Component which allows to send messages to external interfaces: Email/Slack/etc..).
   This can be tested by subscribing to the topic with your personal mail and see it works.

To test the Lambda, you should be able to invoke it with AWS and JSON payload.

The solution should look as follows:

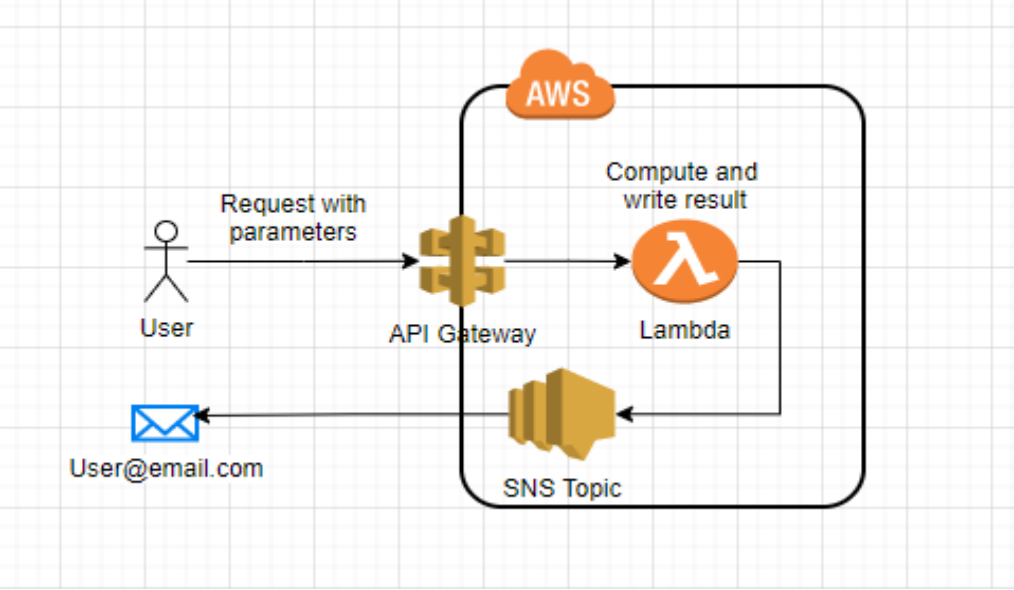


Stage 2:

You are required to perform the following:

- Create an AWS API Gateway that will integrate with the Lambda from stage 1 and allow access to it via http requests from the internet.
- Change the Lambda to print the sum result to the user's browser in addition to sending a mail via SNS.

The solution should look as follows:



Practical Exercise Deliverables

All deliverables should be in a **private git repository** which will be shared with the reviewer (details sent by us) and include the following:

- Lambda source code
- IaC source code
- Usage instructions - A way to activate the Lambda and test it via AWS CLI or internet access (for example: Curl Command/browser url/etc)
- **Please register the email address of the person reviewing the task** (will be given by us) to the SNS topic when done to allow full testing of the process.

3. Research Exercise

In this exercise you will research new concepts and technologies, learn how they work and compare different implementations for them as well as their pros and cons.

You should be able to explain what the different options are and in what scenarios you will recommend each one and why.

Important notes:

- You don't need to learn technical commands or instructions.
- You only need to refer to technologies and solutions in **AWS.**
- You should focus on the "How" and "Why" things work like they are described, what were they meant to solve, etc.
- The research part should not take more than 1 hour per stage and the deliverables for each stage should take approx. 15 minutes.

Stage 1:

In the last exercise you used an API Gateway to access the Lambda you created.

There are several ways to expose a web application to the internet, review the following ways:

- API Gateway Rest/HTTP
- Load Balancer Application/Network
- Function URL

Provide a use-case/example for a web application in which you will choose one of the above. Please elaborate why you have chosen the specific solution and not the others.

Stage 2:

You were requested to provide **secured** terminal(bash) access to EC2 **linux** servers in a private subnet in AWS from personal computers.

- What would you consider?
- What solutions are available **(provide at least 2)**?
- When will you use each one and why?
- How do the proposed solutions work?

Research Exercise Deliverables

For each stage, please provide the following:
1) Short description of the issue or technological challenge.

2) What are the proposed solutions/technologies

3) A comparison between the possible solutions/technologies. Focus on the main advantages/disadvantages of each technology or demonstrate why you will choose a solution for a specific scenario.

Feel free to contact us if you have any questions or things are unclear.
Following the completion of the task we will schedule a short review of the solution.