Lomba Kompetensi Siswa Sekolah Menengah Kejuruan Tingkat Provinsi Jawa Barat Tahun 2022

Modul 1 - Serverless Architecture

July 21, 2022

Bidang Lomba Cloud Computing

1 Overview

You have been tasked to deploy an API on AWS. The REST API is built using AWS serverless architecture. The data will be stored in DynamoDB. The solution requires to use a custom domain and an SSL.

2 General Rules

1. Failure to comply with the rules will result in immediate disqualification.
2. You have 3 hours to finish the tasks.
3. You may not open any website unless otherwise specified in section 6 and you may open the control panel of your domain provider to update the nameserver to Route 53.
4. You may use AWS Console and AWS CLI to deploy the solutions. You may not use SAM, CloudFormation or CDK.
5. Between and after the event, you may not access your account. Any activity on your AWS account during this period is not allowed.
6. During the event, multiple login is not permitted.
7. If you have any question, do not hesitate to ask.

3 Architecture

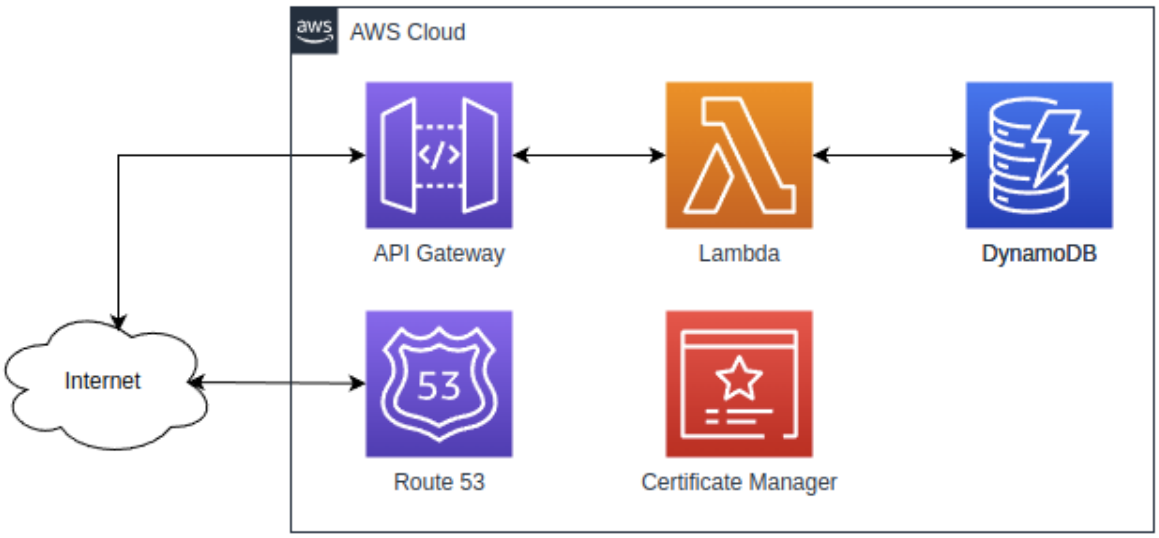

Figure 1: Architecture Diagram

4 Information

1. The repository URL for the lambda function is https://github.com/kensasongko/lksccjabar2022modul1_aplikasi
2. This solution must be deployed in **us-east-1 (N. Virginia) region**. Deploying in another region will result in a major point reduction.

5 Task

1. Create a DynamoDB table with the following conditions:
    - Table Name: modul1
    - Billing Mode: Pay per request
    - Partition Key: id
    - Capacity Mode: On-demand
    - Table Class: Standard
    - Encryption Key Management: Owned by DynamoDB
    - Tags: Key=LKS-ID, Value=MODUL1
2. Create and configure lambda from the repository with the following conditions:
    - Add environment variables as described in the README.md from the repository.
    - Execution time: 15 seconds
    - Enable X-Ray tracing
    - Tags: Key=LKS-ID, Value=MODUL1
    - Give lambda permission to read and write DynamoDB.
3. Create and configure API Gateway with the following conditions:
    - Protocol: REST API
    - Endpoint Type: Edge optimized
    - Tags: Key=LKS-ID, Value=MODUL1
4. Add lambda integration to the API Gateway with the following specifications:
    - Resources: /todos
    - Method: GET & POST
    - Set API Key Required to true on each method
5. Deploy the API with the following specifications:
    - Stage Name: prod
    - X-Ray tracing: enabled
6. Create a Usage Plan in API Gateway to limit request to the prod stage with the following specifications:
    - Rate: 5 requests per second
    - Burst: 10
    - Quota: 1000 request per day
7. Create a new API Key in API Gateway.
8. Apply the Usage Plan to the API Key.
9. Create a certificate in ACM with the following specifications:
    - Domain Name: modul1.[YOUR_DOMAIN]
    - Validation Method: DNS validation
    - Tags: Key=LKS-ID, Value=MODUL1
10. Configure the API in the API Gateway to use custom domain with the format modul1.[YOUR_DOMAIN]. The domain must be hosted in Route 53.

11. Using any REST-API-capable client (e.g., curl, Postman), ensure you can access the API using the API key you generated. Make sure the throttling works as expected.
    Example:

```
$ curl -X POST \
https://modul1.[YOUR_DOMAIN]/todos \
-H "x-api-key: [YOUR_API_KEY]" \
-d '{"title":"First Entry", "message":"This is the first todo entry."}'


$ curl -X GET \
https://modul1.[YOUR_DOMAIN]/todos \
-H "x-api-key: [YOUR_API_KEY]"
```

6 References

- DynamoDB documentation
- Lambda documentation
- API Gateway documentation
- Route 53 documentation
- Certificate Manager documentation
- Postman download
- Postman documentation
- curl download
- curl documentation

Good luck!