DevOps Technical Assessment

Goal:

Ability to demonstrate architecting and implementing high availability, fault tolerance and production ready infrastructure using Kubernetes as the container orchestration platform.

Use Case:

A company called 'Max Weather' wants to build a platform that forecasts the weather. They decided to build that application on AWS cloud infrastructure, and they also want to leverage the below capabilities.

Key Requirements.

1. Application should be running 24/7 with high availability
2. There will be high traffic to the application during the day, especially in the morning where people tend to check the weather forecast, so that application should be scalable based on the traffic
3. They want to expose weather forecast functionalities as APIs, so that their frontend developers can build the frontend applications
4. They recommend using the oAuth2 authorization protocol to protect the APIs
5. They are also interested in implementing CI/CD pipeline process, to deploy the application incrementally into the production environment after it is successfully tested in the staging environment
6. For better troubleshooting purposes, they would like to send application logs into the AWS CloudWatch logs
7. All the infrastructure setup should be created using terraform scripts and parameterized so that the application can be set up in another cloud environment with minimal effort.

Implementation Assumptions:

1. You are not required to implement the back-end of the application. You can connect to any public APIs (e.g. Google location APIs) for this assessment
2. For the API authorization, you can use custom lambda authorizer
3. You are not required to create API resources in the AWS API gateway, proxy implementation is sufficient
4. It is not necessary to create an API gateway using the terraform scripts, you can create APIs manually using the AWS console if it is easier
5. You must do API authorization as part of this assignment.

NOTE: You can provision an AWS environment for free on a 30-day trial.

Deliverables:

1. Infrastructure architecture diagram which shows all the infrastructure components required to deploy this application with logical connections between components
2. Terraform scripts to create all the infrastructure components (The Terraform code must be modularised. CloudWatch services and scaling code must be tested prior to submission)
3. The below Kubernetes artifacts that are required to deploy the application:
   a. Deployment Yamal
   b. Service Yamal
   c. Nginx Ingress Controller
   d. Nginx ingress.
4. Jenkins pipeline script to deploy application(s) into the Kubernetes cluster
5. Application API deployed into AWS API gateway
6. Working postman script to demonstrate the API with proper authentication.

Send your submission by the due date and time, and any links to you code repositories to the following:
a. anurudda@101digital.io
b. rajiv@101digital.io.