Name: Amit Goswami
Cloud Developer Nano Degree
Project : Refactor Udagram app to microservices

Refactor Udagram app to Micro-services

Overview of the Project Tasks : *You have to start with the "Udagram - photo sharing" Monolith application and divide the application into smaller (micro)services. Each microservice must run in a separate Docker container. These containers (and ReplicaSets) have to be managed by using the Kubernetes cluster. You have to demonstrate the ability to independently scale-up, release, and deploy the project using Kubernetes, and TravisCI.*

A. Steps to Follow

- Divide the application into smaller services
- Containerize the application, create the Kubernetes resource, and deploy it to Kubernetes cluster.
- Implement automatic continuous integration (CI) and continuous delivery (CD) using Travis CI.
- Extend the application with deployments and be able to do rolling-updates and rollbacks

B. Dependencies

Cloud Services

- Amazon Web Services - Relational Database Services - PostgreSQL
- Amazon Web Services S3 - Resource hosting and deployments
- Amazon Web Services - IAM account [applicable only if you host your project on the cloud

The following cloud services are optional to use:

- AWS CloudFront - CDN for SPA
- AWS EKS - Backend API
- AWS DynamoDB - Persistent Datastore
- AWS Cognito - User Authentication
- AWS CloudWatch - Performance and Health checks

Please submit your project with the following:

- Screenshot of TravisCI which shows the successful build and deploy steps
- The public GitHub repo and the docker hub images
- Screenshot of kubectl get pod which shows all running containers
- Screenshot of the application

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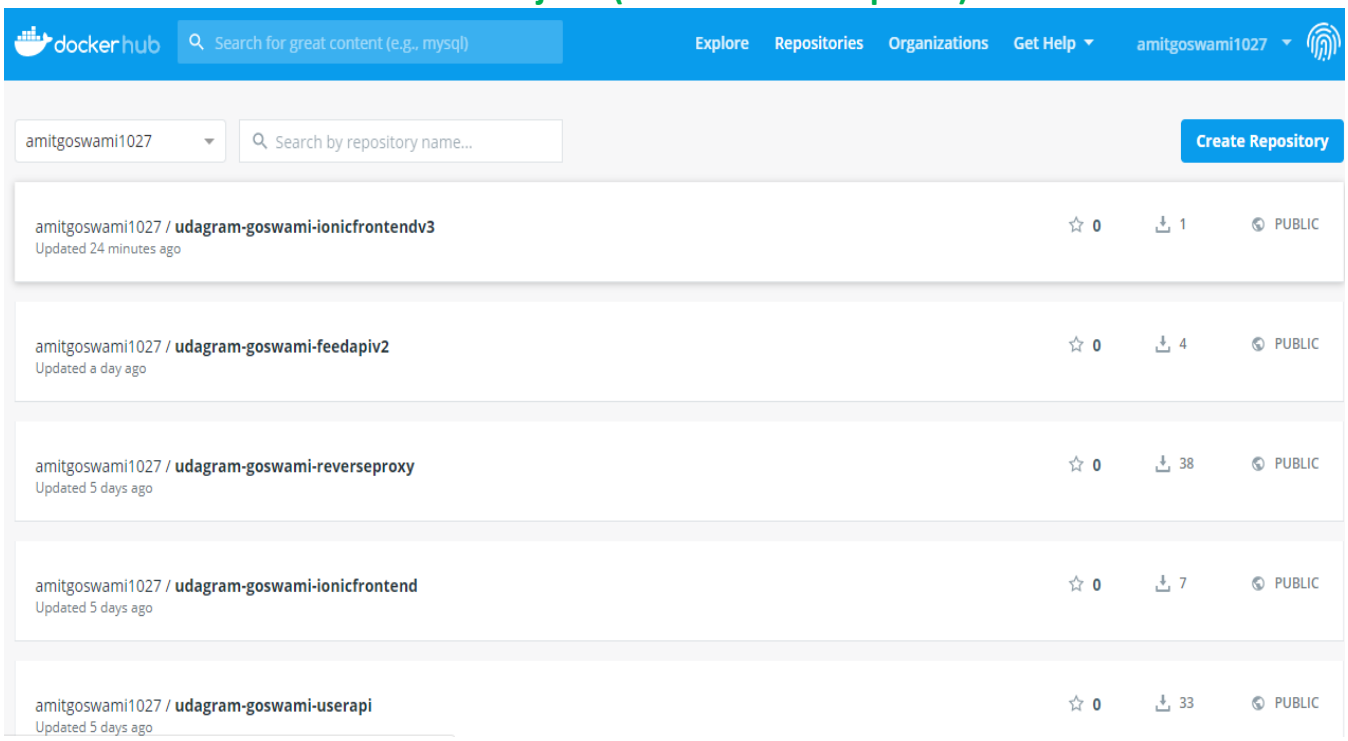
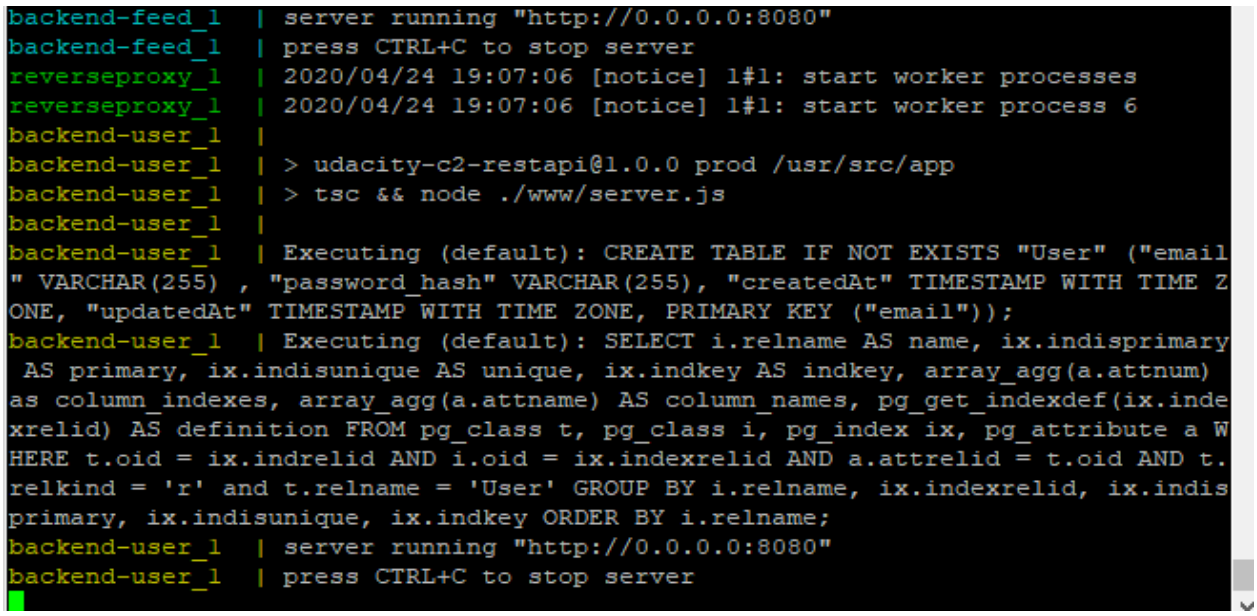
1. DOCKER IMAGES for the Project. (Docker Hub Snapshot)



2. Screenshot of all the services running



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3. KOBS Kubernetes cluster Details:

```
exit
[ec2-user@ip-10-0-1-208 docker]$ kops validate cluster
Validating cluster udagram-kops-goswami-store.k8s.local

INSTANCE GROUPS
NAME                    ROLE    MACHINETYPE     MIN     MAX     SUBNETS
master-us-east-1a       Master  m3.medium       1       1       us-east-1a
nodes                   Node    t2.medium       2       2       us-east-1a

NODE STATUS
NAME                            ROLE    READY
ip-172-20-36-10.ec2.internal    node    True
ip-172-20-41-252.ec2.internal   master  True
ip-172-20-53-161.ec2.internal   node    True

Your cluster udagram-kops-goswami-store.k8s.local is ready
[ec2-user@ip-10-0-1-208 docker]$
```

4. kubectl get secrets

```
[ec2-user@ip-10-0-1-208 k8s]$ kubectl apply -f env-secret.yaml
secret/env-secret created
[ec2-user@ip-10-0-1-208 k8s]$ kubectl get secrets
NAME                  TYPE                                  DATA   AGE
aws-secret            Opaque                                2      2m49s
default-token-pnjqj   kubernetes.io/service-account-token   3      113m
env-secret            Opaque                                2      93s
[ec2-user@ip-10-0-1-208 k8s]$
```

5. kubectl get pods

```
[ec2-user@ip-10-0-1-208 k8s]$ kubectl get pods
NAME                               READY   STATUS    RESTARTS   AGE
backend-feed-66d8f64f66-n294x      1/1     Running   0          96s
backend-feed-66d8f64f66-ws4lb      1/1     Running   0          96s
backend-user-c8687cb9d-ffzd9       1/1     Running   0          70s
backend-user-c8687cb9d-wqtng       1/1     Running   0          70s
frontend-b55df45b7-h7z48           1/1     Running   0          50s
reverseproxy-7c9d65b857-nsw27      1/1     Running   0          34s
[ec2-user@ip-10-0-1-208 k8s]$
```

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6. kubectl get services

```
[ec2-user@ip-10-0-1-208 k8s]$ kubectl get services
NAME           TYPE        CLUSTER-IP       EXTERNAL-IP   PORT(S)    AGE
backend-feed   ClusterIP   100.65.108.177   <none>        8080/TCP   15m
backend-user   ClusterIP   100.64.242.143   <none>        8080/TCP   15m
frontend       ClusterIP   100.66.229.141   <none>        8100/TCP   14m
kubernetes     ClusterIP   100.64.0.1       <none>        443/TCP    131m
reverseproxy   ClusterIP   100.69.117.222   <none>        8080/TCP   14m
[ec2-user@ip-10-0-1-208 k8s]$
```

7. kubectl get deployments

```
[ec2-user@ip-10-0-1-208 k8s]$ kubectl get deployment
NAME           READY   UP-TO-DATE   AVAILABLE   AGE
backend-feed   2/2     2            2           19m
backend-user   0/2     2            0           19m
frontend       1/1     1            1           18m
reverseproxy   1/1     1            1           18m
[ec2-user@ip-10-0-1-208 k8s]$
```

8. Kubectl get deployments (Scaling it to three pods)

```
[ec2-user@ip-10-0-1-208 k8s]$ kubectl scale deployment/backend-user --replicas=3

deployment.apps/backend-user scaled
[ec2-user@ip-10-0-1-208 k8s]$ kubectl get deployment
NAME           READY   UP-TO-DATE   AVAILABLE   AGE
backend-feed   3/3     3            3           59m
backend-user   1/3     3            1           59m
frontend       1/1     1            1           58m
reverseproxy   1/1     1            1           58m
[ec2-user@ip-10-0-1-208 k8s]$
```

9. Kubectl get pods

```
[ec2-user@ip-10-0-1-208 k8s]$ kubectl get pods
NAME                            READY   STATUS        RESTARTS   AGE
backend-feed-66d8f64f66-dkvrg   1/1     Running       2          3m48s
backend-feed-66d8f64f66-j5lfv   1/1     Running       2          3m48s
backend-feed-66d8f64f66-sgl4x   1/1     Running       2          3m48s
backend-user-c8687cb9d-ffzd9    0/1     Terminating   13         61m
backend-user-c8687cb9d-g27s2    0/1     Error         1          2m41s
frontend-b55df45b7-h7z48        1/1     Running       0          61m
reverseproxy-7c9d65b857-nsw27   1/1     Running       0          61m
[ec2-user@ip-10-0-1-208 k8s]$
```

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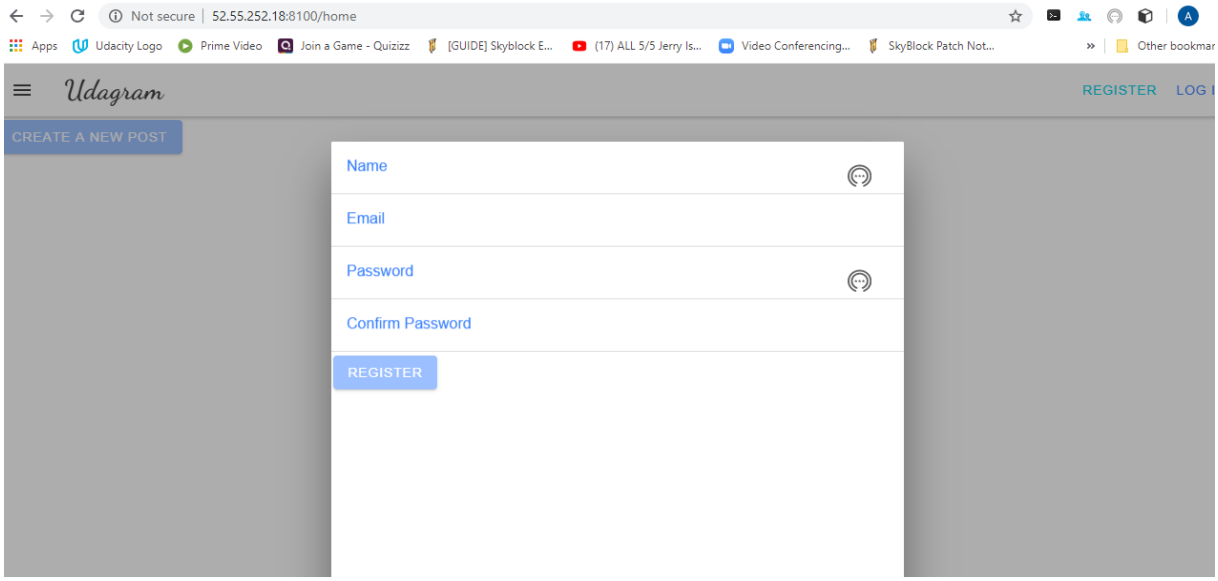
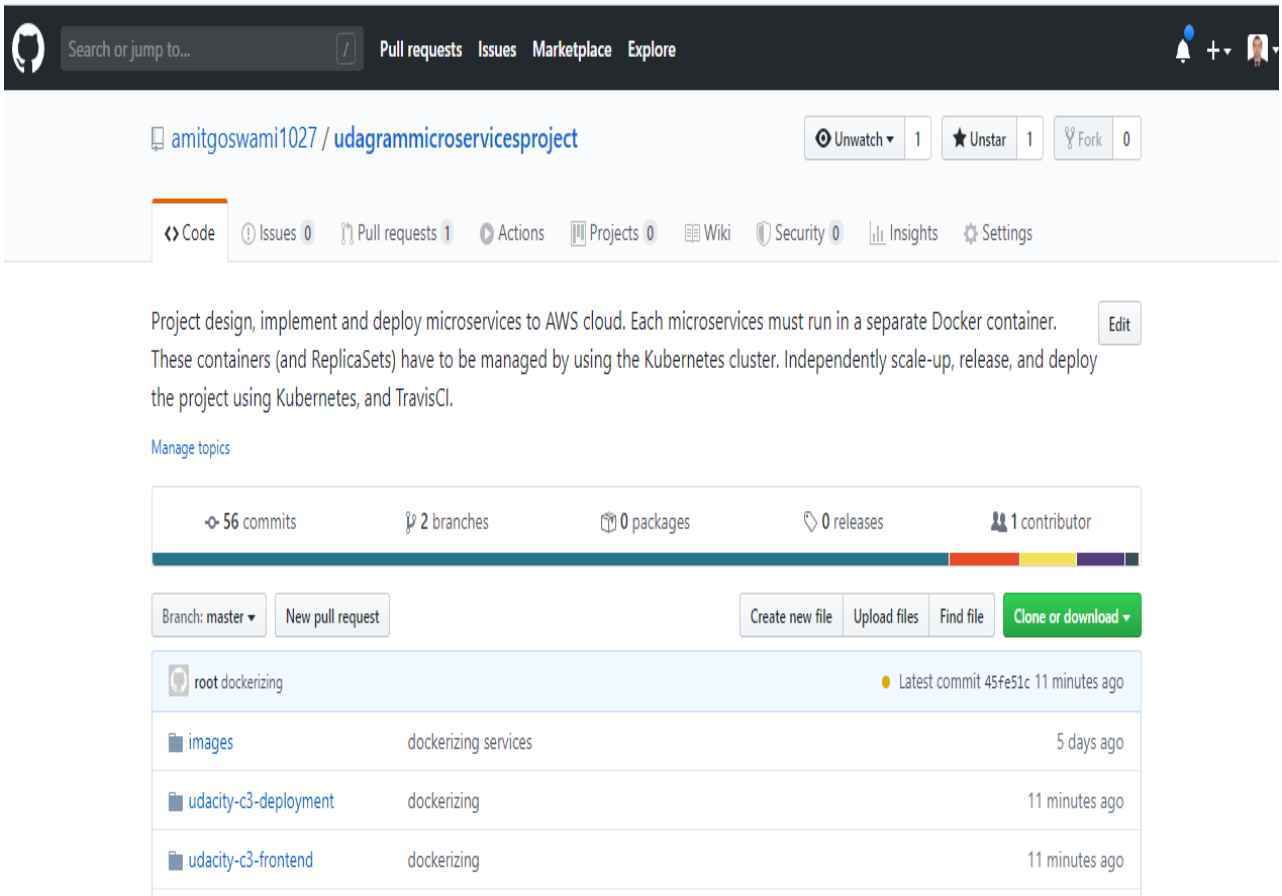
Screenshot of the application



Screenshot of github



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Screenshot of the travis UI