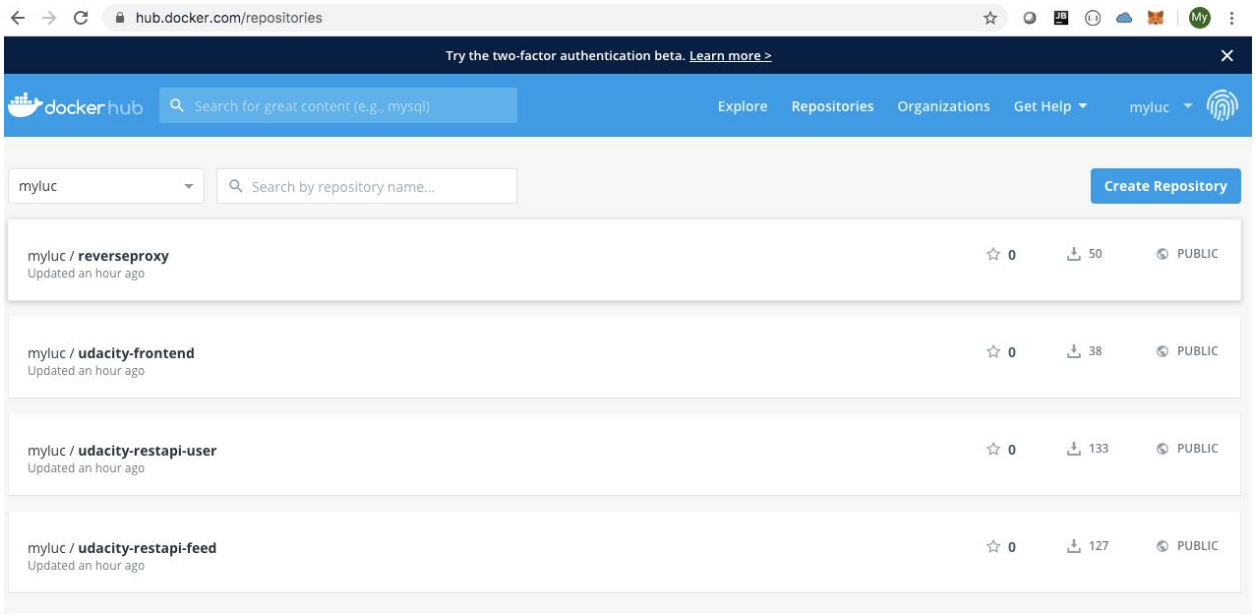
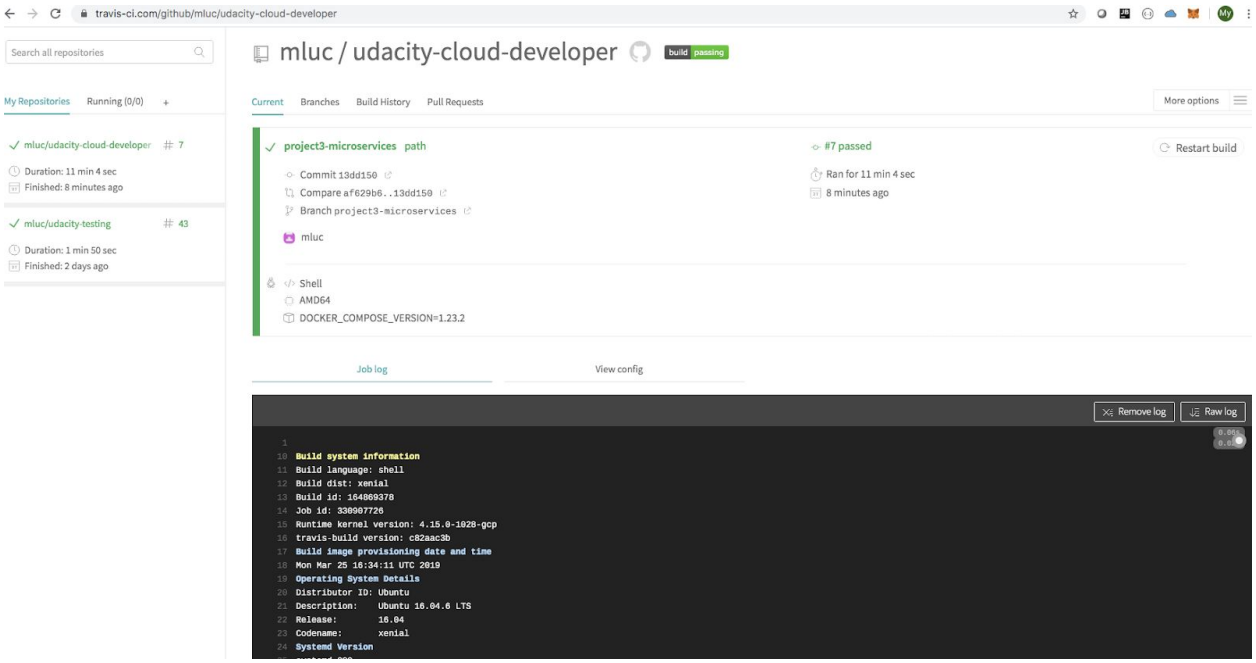
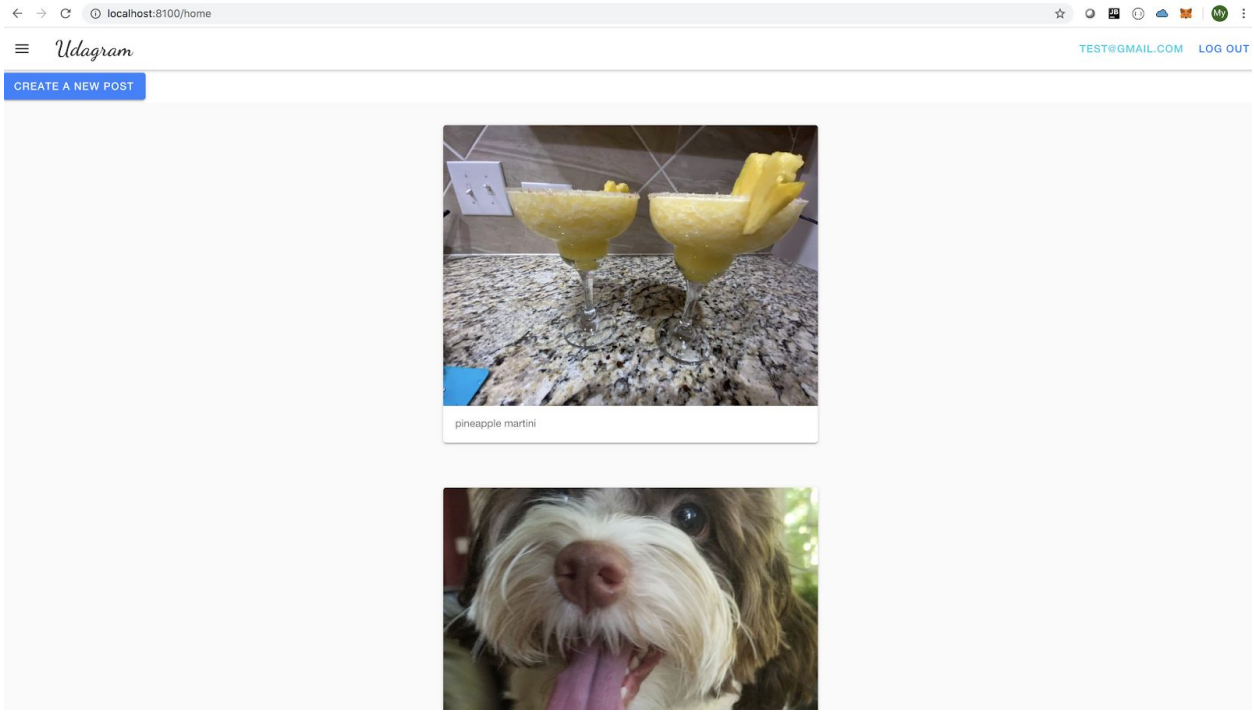
- Dockerhub:

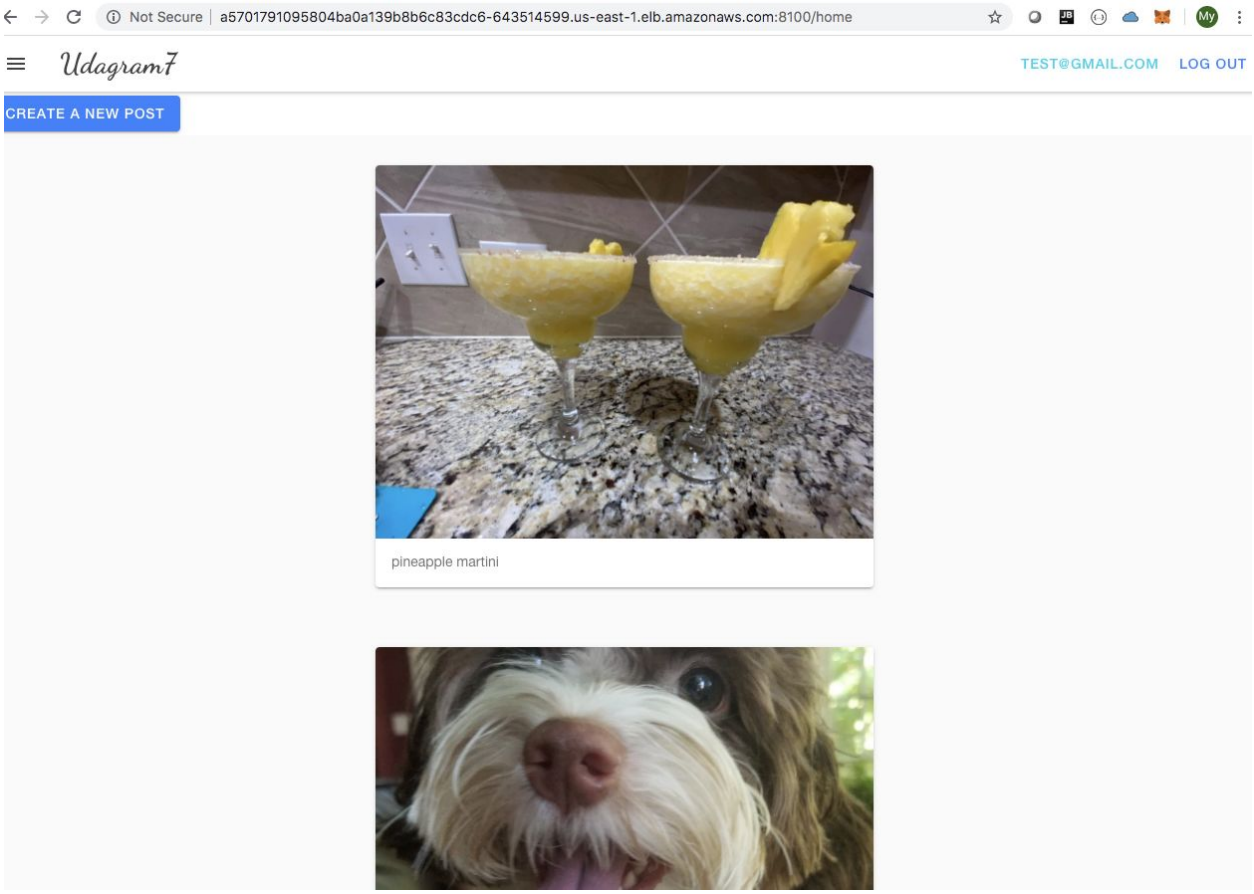


- Travis-ci: (see https://api.travis-ci.com/v3/job/330907726/log.txt for detail)



- Application





- Rolling update without downtime:

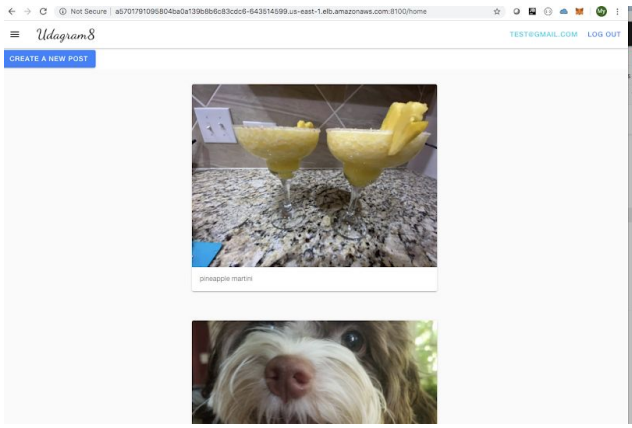
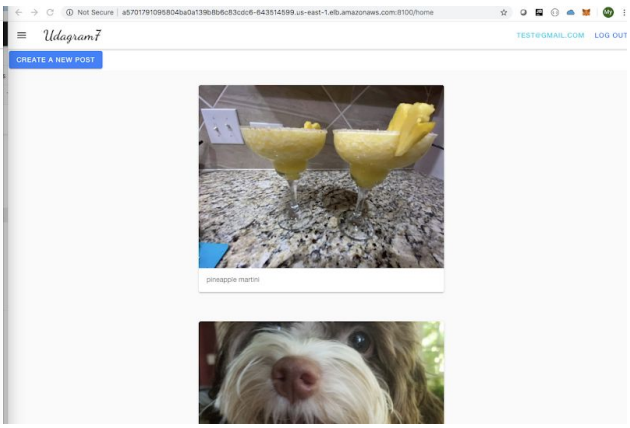
```
Roberts-MBP:k8s myluc$ kubectl get pods
NAME                              READY   STATUS              RESTARTS   AGE
backend-feed-5d8854ddd6-2rvq4     0/1     ContainerCreating   0          14s
backend-feed-5d8854ddd6-v9952     1/1     Running             0          21s
backend-feed-6994cf777b-mfkcp     1/1     Running             0          57m
backend-user-6968469794-jlxw6     0/1     ContainerCreating   0          0s
backend-user-6968469794-mx5nt     1/1     Running             0          9s
backend-user-857559f868-qhtt5     1/1     Running             0          57m
backend-user-857559f868-rvcpg     1/1     Terminating         0          57m
frontend-679db64ffc-c9qrk         1/1     Running             0          42m
frontend-679db64ffc-zv69n         1/1     Running             0          42m
reverseproxy-557c7c7d56-49w4f     1/1     Running             0          57m
reverseproxy-557c7c7d56-l2zkt     1/1     Running             0          57m
Roberts-MBP:k8s myluc$ kubectl get pods
NAME                              READY   STATUS              RESTARTS   AGE
backend-feed-5d8854ddd6-2rvq4     1/1     Running             0          16s
backend-feed-5d8854ddd6-v9952     1/1     Running             0          23s
backend-feed-6994cf777b-mfkcp     0/1     Terminating         0          57m
backend-user-6968469794-jlxw6     0/1     ContainerCreating   0          2s
backend-user-6968469794-mx5nt     1/1     Running             0          11s
backend-user-857559f868-qhtt5     1/1     Running             0          57m
backend-user-857559f868-rvcpg     0/1     Terminating         0          57m
frontend-5cc8cd695-46cbg          0/1     ContainerCreating   0          0s
frontend-679db64ffc-c9qrk         1/1     Running             0          42m
frontend-679db64ffc-zv69n         1/1     Running             0          42m
reverseproxy-557c7c7d56-49w4f     1/1     Running             0          57m
reverseproxy-557c7c7d56-l2zkt     1/1     Running             0          57m
Roberts-MBP:k8s myluc$ kubectl get pods
NAME                              READY   STATUS              RESTARTS   AGE
backend-feed-5d8854ddd6-2rvq4     1/1     Running             0          17s
backend-feed-5d8854ddd6-v9952     1/1     Running             0          24s
backend-user-6968469794-jlxw6     0/1     ContainerCreating   0          3s
backend-user-6968469794-mx5nt     1/1     Running             0          12s
backend-user-857559f868-qhtt5     1/1     Running             0          57m
backend-user-857559f868-rvcpg     0/1     Terminating         0          57m
frontend-5cc8cd695-46cbg          0/1     ContainerCreating   0          1s
frontend-679db64ffc-c9qrk         1/1     Running             0          42m
frontend-679db64ffc-zv69n         1/1     Running             0          42m
reverseproxy-557c7c7d56-49w4f     1/1     Running             0          57m
reverseproxy-557c7c7d56-l2zkt     1/1     Running             0          57m
```

```
Roberts-MBP:k8s myluc$ kubectl get all
NAME                                READY   STATUS    RESTARTS   AGE
pod/backend-feed-5d8854ddd6-2rvq4   1/1     Running   0          3m49s
pod/backend-feed-5d8854ddd6-v9952   1/1     Running   0          3m56s
pod/backend-user-6968469794-jlxw6   1/1     Running   0          3m35s
pod/backend-user-6968469794-mx5nt   1/1     Running   0          3m44s
pod/frontend-5cc8cd695-46cbg        1/1     Running   0          3m33s
pod/frontend-5cc8cd695-6ndlh        1/1     Running   0          3m29s
pod/reverseproxy-85dbfb5998-7zd2z   1/1     Running   0          3m22s
pod/reverseproxy-85dbfb5998-vbmxx   1/1     Running   0          3m20s

NAME                    TYPE           CLUSTER-IP       EXTERNAL-IP                                                                PORT(S)          AGE
service/backend-feed    ClusterIP      10.100.149.169   <none>                                                                     8080/TCP         4h55m
service/backend-user    ClusterIP      10.100.69.28     <none>                                                                     8080/TCP         4h55m
service/frontend        LoadBalancer   10.100.178.26    a5701791095804ba0a139b8b6c83cdc6-643514599.us-east-1.elb.amazonaws.com     8100:30451/TCP   46m
service/kubernetes      ClusterIP      10.100.0.1       <none>                                                                     443/TCP          6h16m
service/reverseproxy    LoadBalancer   10.100.35.214    a727e8f85a7a143229a165c4f855a717-1857238864.us-east-1.elb.amazonaws.com   8080:30036/TCP   4h55m

NAME                           READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/backend-feed   2/2     2            2           4h55m
deployment.apps/backend-user   2/2     2            2           4h55m
deployment.apps/frontend       2/2     2            2           46m
deployment.apps/reverseproxy   2/2     2            2           4h55m

NAME                                      DESIRED   CURRENT   READY   AGE
replicaset.apps/backend-feed-5d8854ddd6   2         2         2       3m56s
replicaset.apps/backend-feed-6994cf777b   0         0         0       61m
replicaset.apps/backend-feed-7746b9d645   0         0         0       4h55m
replicaset.apps/backend-user-6865ddb6cf   0         0         0       4h55m
replicaset.apps/backend-user-6968469794   2         2         2       3m44s
replicaset.apps/backend-user-857559f868   0         0         0       61m
replicaset.apps/frontend-5cc8cd695        2         2         2       3m33s
replicaset.apps/frontend-679db64ffc       0         0         0       46m
replicaset.apps/reverseproxy-557c7c7d56   0         0         0       60m
replicaset.apps/reverseproxy-7558457cb7   0         0         0       4h55m
replicaset.apps/reverseproxy-85dbfb5998   2         2         2       3m22s
Roberts-MBP:k8s myluc$
```

- A/B deployment: (use canary deployment) two versions of the same application run simultaneously

```
Roberts-MBP:k8s myluc$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
backend-feed-5d8854ddd6-2rvq4       1/1     Running   0          52m
backend-feed-5d8854ddd6-v9952       1/1     Running   0          52m
backend-user-6968469794-jlxw6       1/1     Running   0          52m
backend-user-6968469794-mx5nt       1/1     Running   0          52m
frontend-795c6dc949-wdf6d           1/1     Running   0          7m47s
frontend-795c6dc949-zkh8n           1/1     Running   0          7m50s
frontend-canary-9889ccdfc-7vxrt     1/1     Running   0          49s
frontend-canary-9889ccdfc-j5h86     1/1     Running   0          49s
reverseproxy-85dbfb5998-7zd2z       1/1     Running   0          52m
reverseproxy-85dbfb5998-vbmxx       1/1     Running   0          52m
```

-

```
Roberts-MBP:~ myluc$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
backend-feed-5d8854ddd6-2rvq4       1/1     Running   0          56m
backend-feed-5d8854ddd6-v99S2       1/1     Running   0          56m
backend-user-6968469794-jlxw6       1/1     Running   0          56m
backend-user-6968469794-mx5nt       1/1     Running   0          56m
frontend-795c6dc949-wdf6d           1/1     Running   0          11m
frontend-795c6dc949-zkh8n           1/1     Running   0          11m
frontend-canary-9889ccdfc-7vxrt     1/1     Running   0          4m23s
frontend-canary-9889ccdfc-j5h86     1/1     Running   0          4m23s
reverseproxy-85dbfb5998-7zd2z       1/1     Running   0          55m
reverseproxy-85dbfb5998-vbmxx       1/1     Running   0          55m
Roberts-MBP:~ myluc$ kubectl describe pod/frontend-795c6dc949-wdf6d
Name:           frontend-795c6dc949-wdf6d
Namespace:      default
Priority:       0
Node:           ip-192-168-22-156.ec2.internal/192.168.22.156
Start Time:     Sat, 09 May 2020 00:15:28 -0500
Labels:         api=external
                pod-template-hash=795c6dc949
                service=frontend
                track=stable
Annotations:    kubernetes.io/psp: eks.privileged
Status:         Running
IP:             192.168.24.84
IPs:            <none>
Controlled By:  ReplicaSet/frontend-795c6dc949
Containers:
  frontend:
    Container ID:   docker://0fd0c8e53bc67ef3f00ca5db7951b5539e5495c7536641e8f58155f35dca2c0e
    Image:          myluc/udacity-frontend:V7
    Image ID:       docker-pullable://myluc/udacity-frontend@sha256:beb1e6307df2d59962195fff536c4d876ecf33eb990314b4ef7e647505097e66
    Port:           80/TCP
    Host Port:      0/TCP
    State:          Running
      Started:      Sat, 09 May 2020 00:15:30 -0500
    Ready:          True
    Restart Count:  0
    Limits:
      cpu:      500m
```

```
Last login: Sat May  9 00:24:12 on ttys009
Roberts-MBP:~ myluc$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
backend-feed-5d8854ddd6-2rvq4       1/1     Running   0          56m
backend-feed-5d8854ddd6-v99S2       1/1     Running   0          57m
backend-user-6968469794-jlxw6       1/1     Running   0          56m
backend-user-6968469794-mx5nt       1/1     Running   0          56m
frontend-795c6dc949-wdf6d           1/1     Running   0          11m
frontend-795c6dc949-zkh8n           1/1     Running   0          12m
frontend-canary-9889ccdfc-7vxrt     1/1     Running   0          4m59s
frontend-canary-9889ccdfc-j5h86     1/1     Running   0          4m59s
reverseproxy-85dbfb5998-7zd2z       1/1     Running   0          56m
reverseproxy-85dbfb5998-vbmxx       1/1     Running   0          56m
Roberts-MBP:~ myluc$ kubectl describe pod/frontend-canary-9889ccdfc-7vxrt
Name:           frontend-canary-9889ccdfc-7vxrt
Namespace:      default
Priority:       0
Node:           ip-192-168-61-21.ec2.internal/192.168.61.21
Start Time:     Sat, 09 May 2020 00:22:26 -0500
Labels:         api=external
                pod-template-hash=9889ccdfc
                service=frontend
                track=canary
Annotations:    kubernetes.io/psp: eks.privileged
Status:         Running
IP:             192.168.62.24
IPs:            <none>
Controlled By:  ReplicaSet/frontend-canary-9889ccdfc
Containers:
  frontend:
    Container ID:   docker://157cbfff2e06b8f46ee302edbd7d54bc84956bed47fa174605a065f48a26ab90
    Image:          myluc/udacity-frontend:V8
    Image ID:       docker-pullable://myluc/udacity-frontend@sha256:8ae4697c7ad1d42c89f557b08c691c2c19e2f7df0d2e3a1240a56821da10f86e
    Port:           80/TCP
    Host Port:      0/TCP
    State:          Running
      Started:      Sat, 09 May 2020 00:22:28 -0500
    Ready:          True
    Restart Count:  0
    Limits:
```