Lab - 4

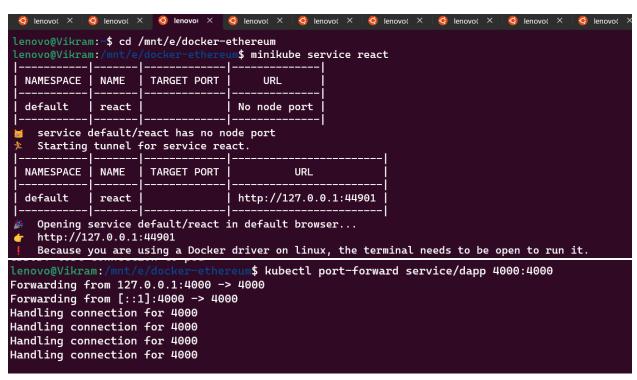
Name - Vikram singh (101501507)

kubernetes setup

```
lenovot X lenovo
```

```
lenovo@Vikram:/mnt/e/docker-ethereum$ kubectl apply -f .
deployment.apps/dapp created
service/dapp created
deployment.apps/ganache created
service/ganache created
deployment.apps/react created
service/react created
```

```
Lenovo@Vikram:/mnt/e/docker-ethereum$ kubectl get po
NAME
                                              READY
                                                       STATUS
                                                                           RESTARTS
                                                                                            AGE
dapp-9d994d54c-kvsw5
                                              1/1
                                                       Running
                                                                           1 (6m14s ago)
                                                                                            16m
dapp-bx844
                                              1/1
                                                       Running
                                                                                            2d23h
dapp-mhxrm
                                              1/1
                                                       Running
                                                                             (6m11s ago)
                                                                                            2d23h
                                                       ImagePullBackOff
ethereum-client-fmg6k
                                              0/1
                                                                                            5h51m
                                                                           e
ethereum-client-gbmbm
                                              0/1
                                                       ImagePullBackOff
                                                                                            5h51m
                                                       ImagePullBackOff
                                                                           0
ethereum-client-sjm5g
                                              0/1
                                                                                            5h51m
ethereum-node-0
                                              0/1
                                                       ImagePullBackOff
                                                                           0
                                                                                            5h51m
ganache-0
                                              1/1
                                                       Running
                                                                             (6m15s ago)
                                                                                            2d23h
                                              1/1
                                                                             (6m22s ago)
                                                       Running
                                                                                            16m
mongo-express-deployment-b88f6d45f-8t8mj
                                              1/1
                                                                           51 (78s ago)
                                                       Running
                                                                                            24h
mongodb-stateful-set-0
                                              1/1
                                                       Running
                                                                             (6m18s ago)
                                                                                            24h
mongodb-stateful-set-1
                                              1/1
                                                       Running
                                                                             (6m14s ago)
                                                                                            24h
my-typescript-app-bc58865cc-qv46j
                                              1/1
                                                       Running
                                                                                            2d23h
note-deployment-74cc946cd8-mt8lf
note-deployment-74cc946cd8-zpxmp
                                              1/1
                                                                             (4m22s ago)
                                                       Running
                                                                           2
                                                                                            24h
                                                                           2 (4m10s ago)
                                              1/1
                                                       Running
                                                                                            24h
note-server-deployment-6fb5fcb67f-s748d
                                              1/1
                                                       Running
                                                                           59 (52s ago)
                                                                                            24h
note-server-deployment-6fb5fcb67f-sgkkq
                                              1/1
                                                                           59 (56s ago)
                                                                                            24h
                                                       Running
                                                                           1 (6m ago)
                                              1/1
                                                       Running
                                                                                            16m
react-frontend-h7lt6
                                              1/1
                                                       Running
                                                                             (5m59s ago)
                                                                                            2d23h
react-frontend-sw4hr
                                              1/1
                                                                                            2d23h
                                                       Running
lenovo@Vikram:/mnt/e/docker-ethereum$ kubectl get deployments
                             READY
                                                   AVAILABLE
NAME
                                     UP-TO-DATE
                                                                AGF
                             1/1
                                     1
                                                   1
                                                                21m
                             1/1
                                      1
                                                                21m
mongo-express-deployment
                             1/1
                                      1
                                                                24h
                                                   1
my-typescript-app
                             1/1
                                                   1
                                                                2d23h
                                      1
                                      2
                                                   2
note-deployment
                             2/2
                                                                24h
note-server-deployment
                                      2
                                                   0
                                                                24h
                             0/2
                             1/1
                                                                21m
```





set message

Set Message	
Get Message	
Compile Contract	
Deploy Contract	

Contract compiled successfully!



set message

Set Message	
Get Message	
Compile Contract	
Deploy Contract	

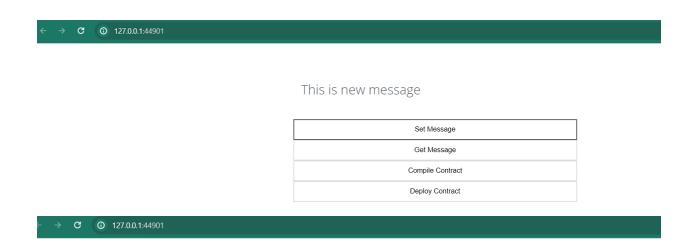
0x5a340f367B41dac53756EdF993aBc43f716adABF



set message

Set Message
Get Message
Compile Contract
Deploy Contract

Hello World!

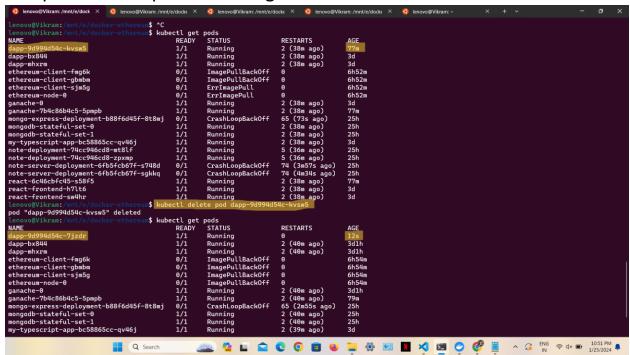


This is new message



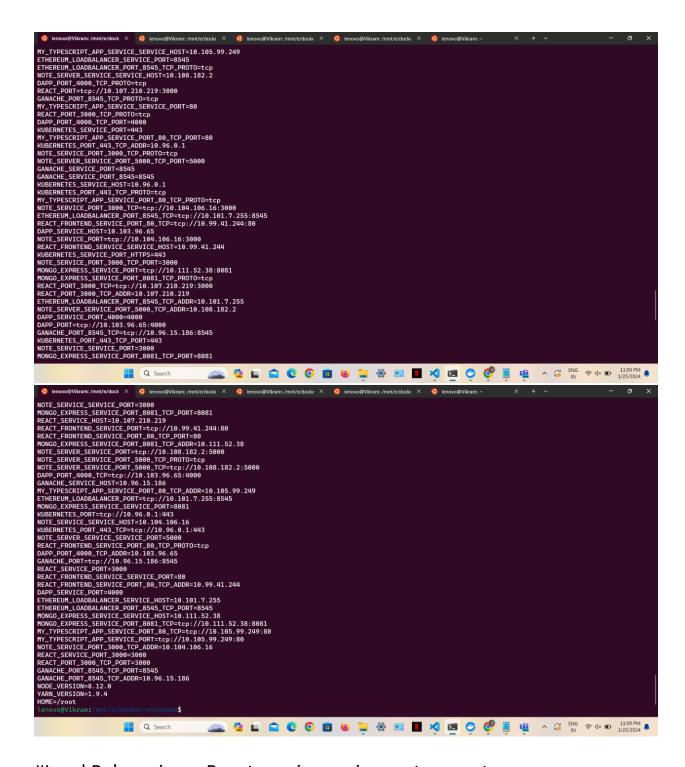
This is new message

Replicaset - replicaset configured as 1



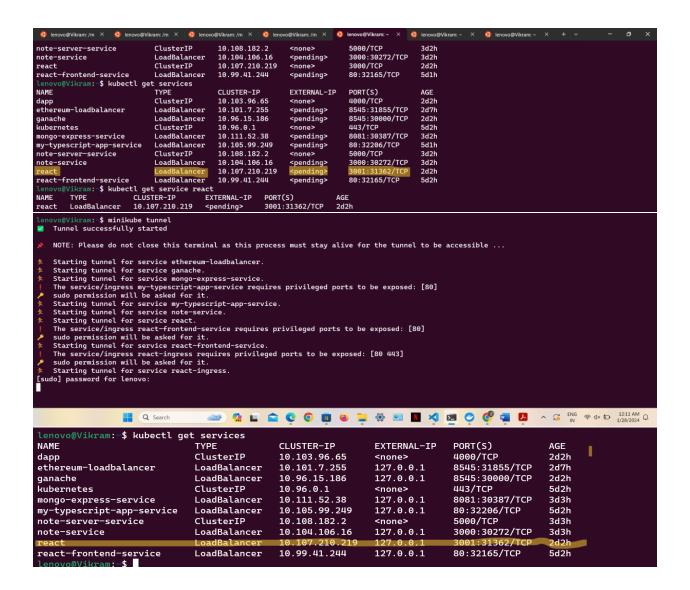
Secret - configmap

```
m$ kubectl apply -f configMap.yaml
configmap/node-app-config created
lenovo@Vikram:/mnt/e/docker-ethereum$ kubectl apply -f dapp.deployment.yaml
error: the path "dapp.deployment.yaml" does not exist
lenovo@Vikram:/mnt/e/docker-ethereum$ kubectl apply -f dapp-deployment.yaml
deployment.apps/dapp configured
                                           $ kubectl get pods
                                                   READY
                                                             STATUS
                                                                                                         AGE
                                                    1/1
                                                             Running
                                                                                                         16s
dapp-bx844
                                                                                       (55m ago)
                                                                                                         3d1h
                                                             Running
dapp-mhxrm
                                                    1/1
                                                             Running
ImagePullBackOff
                                                                                       (56m ago)
                                                                                                         3d1h
                                                    0/1
ethereum-client-fmg6k
                                                                                                         7h10m
                                                   0/1
0/1
0/1
1/1
ethereum-client-gbmbm
                                                             {\bf ImagePullBackOff}
                                                                                                         7h10m
ethereum-client-sjm5g
                                                             ImagePullBackOff
                                                                                                         7h10m
                                                             ImagePullBackOff
ethereum-node-0
                                                                                                         7h10m
                                                             Running
                                                                                    2 (56m ago)
2 (56m ago)
68 (5m29s ago)
ganache-0
                                                                                                         3d1h
ganache-7b4c86b4c5-5pmpb
                                                                                                         95m
                                                             Running
mongo-express-deployment-b88f6d45f-8t8mj
                                                    1/1
                                                                                                         26h
                                                             Running
                                                    1/1
1/1
1/1
                                                                                    2 (56m ago)
2 (56m ago)
mongodb-stateful-set-0
                                                                                                         26h
                                                             Running
mongodb-stateful-set-1
                                                                                                         26h
                                                             Running
                                                                                    2 (55m ago)
5 (54m ago)
5 (54m ago)
my-typescript-app-bc58865cc-qv46j
                                                             Running
                                                                                                         3d1h
                                                   1/1
1/1
note-deployment-74cc946cd8-mt8lf
                                                             Running
                                                                                                         26h
note-deployment-74cc946cd8-zpxmp
note-server-deployment-6fb5fcb67f-s748d
note-server-deployment-6fb5fcb67f-sgkkq
                                                             Running
                                                                                                         26h
                                                                                    77 (4m32s ago)
77 (5m1s ago)
                                                    0/1
                                                             CrashLoopBackOff
                                                                                                         26h
                                                   0/1
                                                             CrashLoopBackOff
                                                                                                         26h
                                                                                    2 (55m ago)
2 (56m ago)
2 (56m ago)
react-6c46cbfc45-s58f5
                                                    1/1
                                                             Running
                                                                                                         95m
                                                    1/1
1/1
                                                             Running
react-frontend-h7lt6
                                                                                                         3d1h
react-frontend-sw4hr
                                                             Running
                                                                                                         3d1h
                         /docker-ethereum$
                                                     🗻 😘 🖬 😭 🥲 🧿 🖺 🔌 🥝 🥝
                               Q Search
                                            um$ kubectl exec dapp-5f85856bf7-bd2jq -- env
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin
HOSTNAME=dapp-5f85856bf7-bd2jq
NODE_PORT=8080
MY_TYPESCRIPT_APP_SERVICE_SERVICE_HOST=10.105.99.249
ETHEREUM_LOADBALANCER_SERVICE_PORT=8545
ETHEREUM_LOADBALANCER_PORT_8545_TCP_PROTO=tcp
                                                        🗻 🤼 🗆 😭 C 🔘 📵 🔘 📮 🧖 🖭 🔳 🖒 🗅
                                Q Search
```



#Load Balanceing - React app is running on two port http://127.0.0.1:37347(default), http://127.0.0.1:3001(nordport)

```
lenovo@Vikram:/mnt/e/docker-ethereum$ kubectl apply -f react-service.yaml
service/react configured
lenovo@Vikram:/mnt/e/docker-ethereum$
```



IAMESPACE	NAME	TARGET PORT	URL	
efault	react	 http/3001	 http://192.168.58.2:31362	
Starting	tunnel	for service rea	 act.	1
NAMESPACE	NAME	TARGET PORT	URL	
default	react	 	http://127.0.0.1:37347	
http://12	27.0.0.1	: 37347	in default browser driver on linux, the termi	nal needs to be open to run it.

set message



Contract compiled successfully!

Scaling - HPA scaling

lenovo@Vikram:/mnt/e/docker-ethereum\$ kubectl autoscale deployment react --cpu-percent=50 --min=1 --max=10 horizontalpodautoscaler.autoscaling/react autoscaled

```
um$ kubectl get hpa
TARGETS
NAME
                                                                                       REPLICAS
                     REFERENCE
                                                                  MINPODS
                                                                             MAXPODS
                                                                                                   AGE
ethereum-node-hpa
                     Deployment/ethereum-node
                                                                                                   6h41m
                                                 <unknown>/50%
                                                                             10
                     Deployment/react
                                                 0%/50%
                                                                                                   126m
react
                                      $ kubectl get hpa react
                                                 MAXPODS
NAME
        REFERENCE
                            TARGETS
                                       MINPODS
                                                            REPLICAS
                            0%/50%
                                                                        149m
react
        Deployment/react
```

 Generate Load on react app for testing react app hpa frirst install - sudo apt-get install apache2-utils

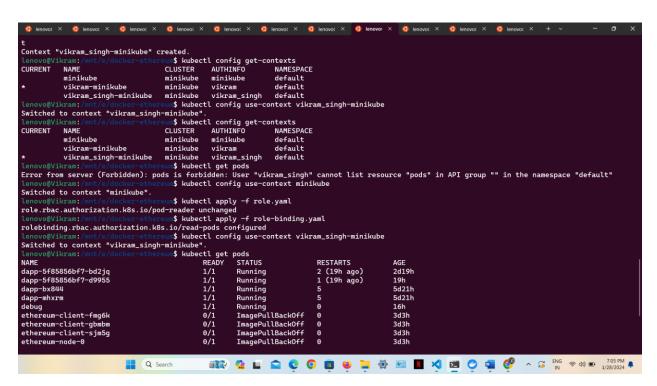
```
lenovo@Vikram:~$ ab -n 1000 -c 10 http://127.0.0.1:41117/
This is ApacheBench, Version 2.3 <$Revision: 1879490 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
Licensed to The Apache Software Foundation, http://www.apache.org/
Benchmarking 127.0.0.1 (be patient)
Completed 100 requests
Completed 200 requests
Completed 300 requests
Completed 400 requests
Completed 500 requests
Completed 600 requests
Completed 700 requests
Completed 800 requests
Completed 900 requests
Completed 1000 requests
Finished 1000 requests
Server Software:
                        nginx/1.21.6
Server Hostname:
                        127.0.0.1
Server Port:
                        41117
Document Path:
Document Length:
                        2148 bytes
Concurrency Level:
                        10
Time taken for tests:
                        1.412 seconds
Complete requests:
                        1000
Failed requests:
Total transferred:
                        2382000 bytes
                        2148000 bytes
HTML transferred:
Requests per second:
                        708.39 [#/sec] (mean)
                        14.116 [ms] (mean)
Time per request:
```

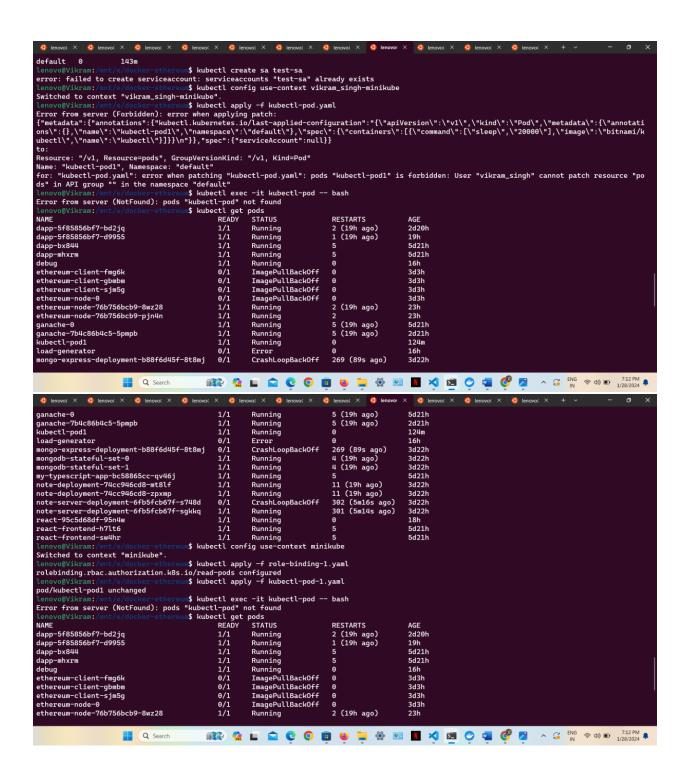
```
lenovo@Vikram:/mnt/e/docker-ethereum$
                                       kubectl
                                                get hpa react
NAME
        REFERENCE
                           TARGETS
                                      MINPODS
                                                MAXPODS
                                                          REPLICAS
                                                                      AGE
react
        Deployment/react
                           61%/50%
                                                10
                                                          2
                                                                      20h
lenovo@Vikram:/mnt/e/docker-ethereum$
```

```
lenovo@Vikram:/mnt/e/docker-ethereum$ kubectl get hpa react
NAME
                                      MINPODS
        REFERENCE
                            TARGETS
                                                 MAXPODS
                                                           REPLICAS
                                                                       AGE
react
        Deployment/react
                            87%/50%
                                                 10
                                                           2
                                                                       20h
                                      1
lenovo@Vikram:/mnt/e/docker-ethereum$ kubectl get hpa react
NAME
        REFERENCE
                            TARGETS
                                      MINPODS
                                                 MAXPODS
                                                           REPLICAS
                                                                       AGE
                                                 10
        Deployment/react
                            1%/50%
                                                           2
                                                                       20h
react
                                      1
```

Role Binding
User – vikram_singh

```
    Q lenovo( X | Q lenov
                                                                                                                                                                         $ ^C
$ kubectl delete pod load-generator
   pod "load-generator" deleted
                                                                                                                                                                        skubectl delete pod load-generator
   pod "load-generator" deleted
                                                                                                                                                                         $ kubectl delete pod load-generator
  pod "load-generator" deleted
                                                                                                                                                                        s kubectl delete pod load-generator
                                                                                                                                                              eum$ nano ~/.kube/config
eum$ openssl genrsa -out vikram_singh.key 2048
eum$ openssl req -new -key vikram_singh.key -out vikram_singh.csr -subj "/CN=vikram_singh/0=dev/0=example.org"
eum$ ls
   pod "load-generator" deleted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    vikram singh.kev
                                                                                                                                                                                                                     ganache-deployment.yaml
ganache-service.yaml
kompose
ganache-deployment.yaml
react-deployment.yaml
                                                                                              configMap.yaml
dapp-deployment.yaml
                                                                                                                                                                                                                       kubectl-pod-1.yaml
                                                                                                                                                                                                                                                                                                                                                                                                                                                       traffic-generator.vaml
                                                                                             dapp-service.yaml
docker-compose.ym
                                                                                                                                                                       yml kubectl-pod.yaml role-binding-1.yaml vikram_singh.csr
$ openssl x509 -req -CA ~/.minikube/ca.crt -CAkey ~/.minikube/ca.key -CAcreateserial -days 730 -in vikram_si
lenovo@Vikram:/mnt/e/docker-ethereur.pupens
ngh.csr -out vikram_singh.crt
Certificate request self-signature ok
subject=Cn = vikram_singh, 0 = dev, 0 = example.org
subject=Cn = vikram_singh, 0 = dev, 0 = example.org
subject=Cn = vikram_singh, 0 = dev, 0 = example.org
subject=Cn = vikram_singh.crt --client-key=vikram_singh
subject=Cn = vikram_singh.crt --client-key=vikram_singh
subject=Cn = vikram_singh.crt --client-key=vikram_singh.crt --client-key=vik
        enovo@Vikram:/mnt/e
 h.key
User "vikram_singh" set.
  Context "vikram_singh-minikube" created.
                                                                                                                                                              reaceu.
eum$ kubectl config get-contexts
CLUSTER AUTHINFO NAMESPACE
minikube minikube default
minikube vikram default
                                              NAME
   CURRENT
                                                minikube
vikram-minikube
                                                 vikram-minikube miniku
vikram_singh-minikube miniku
vikram_singh-minikube miniku
                                                                                                                                                                                                                Q Search
```





```
ethereum-node-76b756bcb9-pjn4n
                                                                                                                                                                                                                                                                                                                     Running
Running
Running
Running
                                                                                                                                                                                                                                                                    2
5 (19h ago)
5 (19h ago)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         23h
5d21h
2d21h
125m
16h
3d22h
3d22h
5d21h
3d22h
3d22h
3d22h
3d22h
3d22h
3d22h
3d21h
5d21h
5d21h
5d21h
ethereum-node-76b756bcb9-pjn4n
ganache-0
ganache-7b4c86b4c5-5pmpb
kubectl-pod1
load-generator
mongo-express-deployment-b88f6d45f-8t8mj
mongodb-stateful-set-0
mongodb-stateful-set-1
                                                                                                                                                                                                                                                                                                                       Error
CrashLoopBackOff
                                                                                                                                                                                                                                                                                                                                                                                                                                           269 (2m25s ago)
4 (19h ago)
4 (19h ago)
                                                                                                                                                                                                                                                                                                                       Running
Running
                                                                                                                                                                                                                                                                                                                                                                                                                                         5
11 (19h ago)
11 (19h ago)
303 (19s ago)
301 (24s ago)
mongoob state at set when the set of the set
                                                                                                                                                                                                                                                                                                                       Running
Running
                                                                                                                                                                                                                                                                                                                        Running
CrashLoopBackOff
CrashLoopBackOff
note-server-deployment-6fb5fcb67f-sgkkq
react-95c5d68df-95ndw
react-frontend-h7lt6
react-frontend-sw4hr
                                                                                                                                                                                                                            | 1/1 | Running 0
| 1/1 | Running 0
| 1/1 | Running 5
| 1/1 | Running 5
| kubectl config use-context minikube
                                                                                                                                                                                                                      m$ kubectl config use-context vikram_singh-minikube
minikube".
m$ kubectl auth can-i create pods
                                                                                                                                                                                                                            $
                                                                                                                                                                                                                                                       Q Search
```