Lab 4: Screenshots

```
PS C:\Users\Mahammad Anis\lab4> minikube start
W0206 17:05:11.922442    18312 main.go:291] Unable to resolve the current Docker CLI context "default": context "default"
: context not found: open C:\Users\Mahammad Anis\.docker\contexts\meta\37a8eec1ce19687d132fe29051dca629d164e2c4958ba141d
5f4133a33f0688f\meta.json: The system cannot find the path specified.
* minikube v1.32.0 on Microsoft Windows 11 Home Single Language 10.0.22621.3007 Build 22621.3007
* Using the docker driver based on existing profile
* Starting control plane node minikube in cluster minikube
* Pulling base image ...
* Updating the running docker "minikube" container ...
* Preparing Kubernetes v1.28.3 on Docker 24.0.7 ...
* Configuring bridge CNI (Container Networking Interface) ...
* Verifying Kubernetes components...
  - Using image gcr.io/k8s-minikube/storage-provisioner:v5
  - Using image docker.io/kubernetesui/metrics-scraper:v1.0.8
  - Using image docker.io/kubernetesui/dashboard:v2.7.0
* Some dashboard features require the metrics-server addon. To enable all features please run:

        minikube addons enable metrics-server


* Enabled addons: storage-provisioner, default-storageclass, dashboard
* Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
PS C:\Users\Mahammad Anis\lab4>
```

```
PS C:\Users\Mahammad Anis\lab4> kompose convert
INFO Kubernetes file "dapp-service.yaml" created
INFO Kubernetes file "ganache-service.yaml" created
INFO Kubernetes file "react-service.yaml" created
INFO Kubernetes file "dapp-deployment.yaml" created
INFO Kubernetes file "ganache-deployment.yaml" created
INFO Kubernetes file "react-deployment.yaml" created
```

```
space by default
PS C:\Users\Mahammad Anis\lab4> kubectl apply -f ganache-deployment.yaml
deployment.apps/ganache created
PS C:\Users\Mahammad Anis\lab4> kubectl apply -f ganache-service.yaml
service/ganache created
PS C:\Users\Mahammad Anis\lab4> kubectl apply -f dapp-deployment.yaml
deployment.apps/dapp created
PS C:\Users\Mahammad Anis\lab4> kubectl apply -f dapp-service.yaml
service/dapp created
PS C:\Users\Mahammad Anis\lab4> kubectl apply -f react-deployment.yaml
deployment.apps/react created
PS C:\Users\Mahammad Anis\lab4> kubectl apply -f react-service.yaml
service/react created
PS C:\Users\Mahammad Anis\lab4>
```

```
PS C:\Users\Mahammad Anis\lab4> kubectl get pods
NAME                                                  READY   STATUS             RESTARTS         AGE
dapp-7dbc4b9bb5-gd62m                                 0/1     ContainerCreating  0                5m2s
ganache-68fcbf4785-64qks                              1/1     Running            0                5m21s
grafana-7f58874548-dgw67                              1/1     Running            3 (9m4s ago)     7h43m
mongo-express-deployment-b88f6d45f-xnf8p              1/1     Running            3 (9m3s ago)     9h
mongodb-stateful-set-0                                1/1     Running            3 (9m3s ago)     9h
mongodb-stateful-set-1                                1/1     Running            3 (9m3s ago)     9h
nginx-bhf6g                                           1/1     Running            3 (9m3s ago)     9h
nginx-deployment-584fbb974d-gtjbv                     1/1     Running            4 (9m4s ago)     9h
nginx-deployment-584fbb974d-jm9jc                     1/1     Running            4 (9m4s ago)     9h
nginx-deployment-584fbb974d-k6cd8                     1/1     Running            3 (9m3s ago)     9h
note-deployment-74cc946cd8-g94qf                      1/1     Running            9 (5m52s ago)    9h
note-deployment-74cc946cd8-kxmtb                      1/1     Running            7 (6m9s ago)     8h
note-server-deployment-6fb5fcb67f-l84tj               1/1     Running            3 (8m54s ago)    9h
note-server-deployment-6fb5fcb67f-xnfvp               1/1     Running            4 (8m54s ago)    8h
prometheus-alertmanager-0                             1/1     Running            6                7h58m
prometheus-kube-state-metrics-745b475957-hzlbm        1/1     Running            6 (9m4s ago)     7h58m
prometheus-prometheus-node-exporter-4bznw             1/1     Running            4 (9m3s ago)     7h58m
prometheus-prometheus-pushgateway-6ccd698d79-5klmg    1/1     Running            3 (9m4s ago)     7h58m
prometheus-server-5c99dfc547-76j6c                    2/2     Running            7 (9m3s ago)     7h58m
react-78495dbb48-znn2q                                0/1     ContainerCreating  0                4m51s
web-0                                                 0/1     Pending            0                9h
```

```
PS C:\Users\Mahammad Anis\lab4> kubectl get services
NAME                                   TYPE           CLUSTER-IP       EXTERNAL-IP   PORT(S)          AGE
dapp                                   ClusterIP      10.110.35.233    <none>        4000/TCP         5m44s
ganache                                ClusterIP      10.100.239.124   <none>        8545/TCP         5m59s
grafana                                ClusterIP      10.108.252.41    <none>        80/TCP           7h44m
grafana-ext                            NodePort       10.99.101.234    <none>        80:31390/TCP     7h32m
kubernetes                             ClusterIP      10.96.0.1        <none>        443/TCP          13h
mongo-express-service                  LoadBalancer   10.98.80.203     <pending>     8081:32326/TCP   9h
mongodb-service                        ClusterIP      10.111.220.1     <none>        27017/TCP        9h
nginx                                  ClusterIP      None             <none>        80/TCP           9h
note-server-service                    ClusterIP      10.96.213.1      <none>        5000/TCP         9h
note-service                           LoadBalancer   10.107.198.232   <pending>     3000:30719/TCP   9h
prometheus-alertmanager                ClusterIP      10.107.30.10     <none>        9093/TCP         7h59m
prometheus-alertmanager-headless       ClusterIP      None             <none>        9093/TCP         7h59m
prometheus-kube-state-metrics          ClusterIP      10.104.32.166    <none>        8080/TCP         7h59m
prometheus-prometheus-node-exporter    ClusterIP      10.100.118.33    <none>        9100/TCP         7h59m
prometheus-prometheus-pushgateway      ClusterIP      10.96.75.33      <none>        9091/TCP         7h59m
prometheus-server                      ClusterIP      10.106.223.33    <none>        80/TCP           7h59m
prometheus-server-ext                  NodePort       10.99.250.180    <none>        80:30588/TCP     7h45m
react                                  ClusterIP      10.105.93.109    <none>        3000/TCP         5m29s
```

```
PS C:\Users\Mahammad Anis\lab4> kubectl describe deployment dapp
Name:                   dapp
Namespace:              default
CreationTimestamp:      Tue, 06 Feb 2024 17:09:23 -0500
Labels:                 io.kompose.service=dapp
Annotations:            deployment.kubernetes.io/revision: 1
                        kompose.cmd: C:\ProgramData\chocolatey\lib\kubernetes-kompose\tools\kompose.exe convert
                        kompose.version: 1.32.0 (765fde254)
Selector:               io.kompose.service=dapp
Replicas:               1 desired | 1 updated | 1 total | 1 available | 0 unavailable
StrategyType:           RollingUpdate
MinReadySeconds:        0
RollingUpdateStrategy:  25% max unavailable, 25% max surge
Pod Template:
  Labels:       io.kompose.network/lab4-default=true
                io.kompose.service=dapp
  Annotations:  kompose.cmd: C:\ProgramData\chocolatey\lib\kubernetes-kompose\tools\kompose.exe convert
                kompose.version: 1.32.0 (765fde254)
  Containers:
   dapp:
    Image:        schadokar/eth-server:1.0.0
    Port:         4000/TCP
    Host Port:    4000/TCP
    Environment:  <none>
    Mounts:       <none>
  Volumes:        <none>
Conditions:
  Type           Status  Reason
  ----           ------  ------
  Available      True    MinimumReplicasAvailable
  Progressing    True    NewReplicaSetAvailable
OldReplicaSets:  <none>
NewReplicaSet:   dapp-7dbc4b9bb5 (1/1 replicas created)
Events:
  Type    Reason             Age   From                   Message
  ----    ------             ----  ----                   -------
  Normal  ScalingReplicaSet  25m   deployment-controller  Scaled up replica set dapp-7dbc4b9bb5 to 1
PS C:\Users\Mahammad Anis\lab4>
```

```
PS C:\Users\Mahammad Anis\lab4> minikube service dapp
W0206 17:40:55.347486   12276 main.go:291] Unable to resolve the current Docker CLI context "default": context "default": context not found: open C:\Users\M
ahammad Anis\.docker\contexts\meta\37a8eec1ce19687d132fe29051dca629d164e2c4958ba141d5f4133a33f0688f\meta.json: The system cannot find the path specified.
|-----------|------|-------------|--------------|
| NAMESPACE | NAME | TARGET PORT |     URL      |
|-----------|------|-------------|--------------|
| default   | dapp |             | No node port |
|-----------|------|-------------|--------------|
* service default/dapp has no node port
* Starting tunnel for service dapp.
|-----------|------|-------------|------------------------|
| NAMESPACE | NAME | TARGET PORT |          URL           |
|-----------|------|-------------|------------------------|
| default   | dapp |             | http://127.0.0.1:57131 |
|-----------|------|-------------|------------------------|
* Opening service default/dapp in default browser...
! Because you are using a Docker driver on windows, the terminal needs to be open to run it.
* Stopping tunnel for service dapp.
PS C:\Users\Mahammad Anis\lab4> kubectl port-forward service/dapp 4000:9090
error: Service dapp does not have a service port 9090
PS C:\Users\Mahammad Anis\lab4> kubectl port-forward service/dapp 4000:4000
Forwarding from 127.0.0.1:4000 -> 4000
Forwarding from [::1]:4000 -> 4000
Handling connection for 4000
Handling connection for 4000
```

```
* Stopping tunnel for service dapp.
PS C:\Users\Mahammad Anis\lab4> minikube service react
W0206 17:45:50.542229    9584 main.go:291] Unable to resolve the current Docker CLI context "default": context "default": context not found: open C:\Users\M
ahammad Anis\.docker\contexts\meta\37a8eec1ce19687d132fe29051dca629d164e2c4958ba141d5f4133a33f0688f\meta.json: The system cannot find the path specified.
|-----------|-------|-------------|--------------|
| NAMESPACE | NAME  | TARGET PORT |     URL      |
|-----------|-------|-------------|--------------|
| default   | react |             | No node port |
|-----------|-------|-------------|--------------|
* service default/react has no node port
* Starting tunnel for service react.
|-----------|-------|-------------|------------------------|
| NAMESPACE | NAME  | TARGET PORT |          URL           |
|-----------|-------|-------------|------------------------|
| default   | react |             | http://127.0.0.1:58434 |
|-----------|-------|-------------|------------------------|
* Opening service default/react in default browser...
! Because you are using a Docker driver on windows, the terminal needs to be open to run it.
```
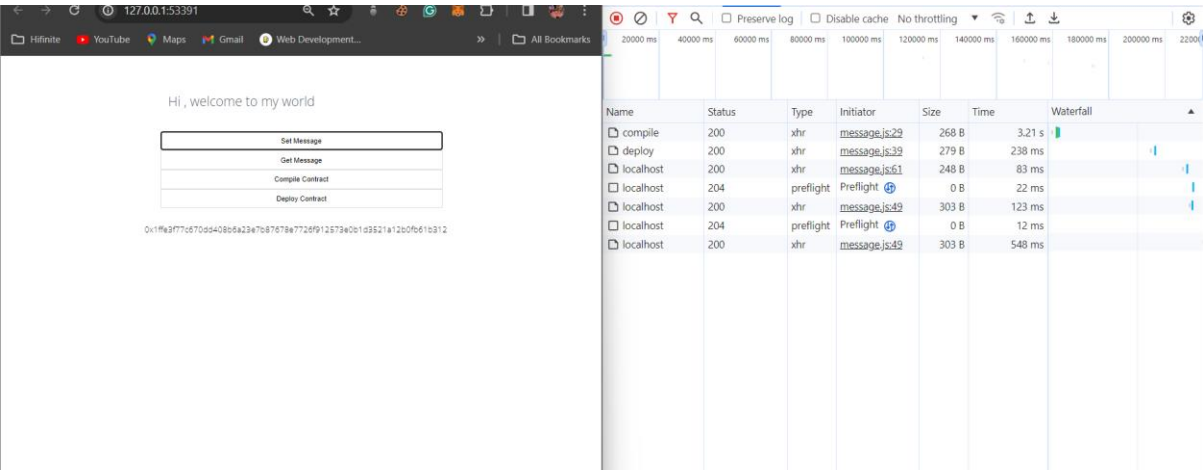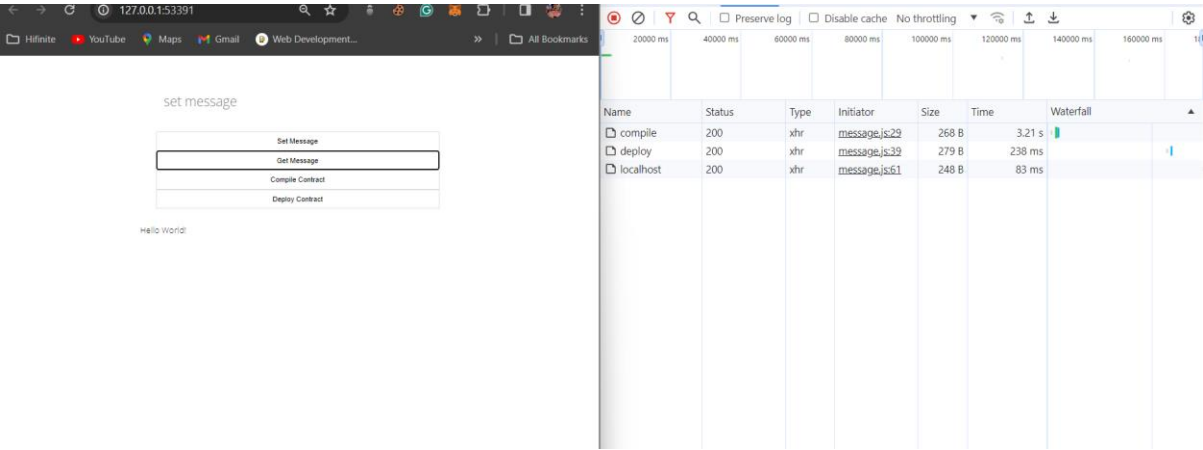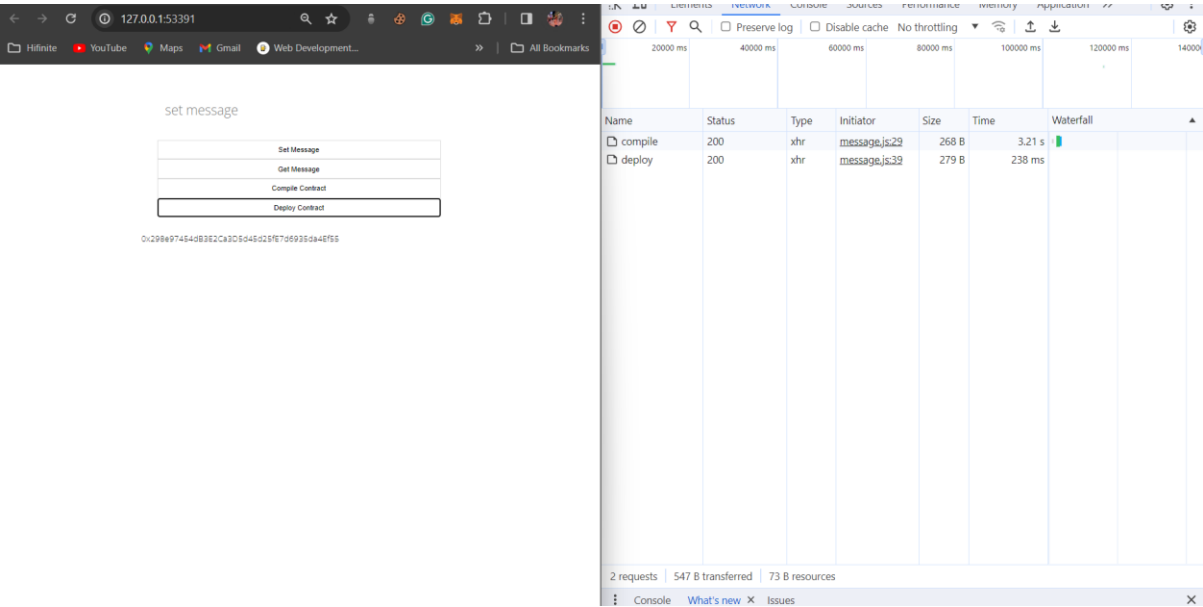
➔ **Deployment – Replica sets**

```
PS C:\Users\Mahammad Anis\lab4> kubectl delete pod dapp-6db8996c45-p8f54
pod "dapp-6db8996c45-p8f54" deleted
PS C:\Users\Mahammad Anis\lab4> kubectl get pods
NAME                                                READY   STATUS    RESTARTS      AGE
dapp-6db8996c45-2x5xx                               1/1     Running   0             5s
ganache-69fb769d49-gmrnj                            1/1     Running   2 (27m ago)   49m
grafana-7f588874548-n5h5l                           1/1     Running   2 (27m ago)   56m
mongo-express-deployment-b88f6d45f-r25nt            1/1     Running   2 (27m ago)   56m
mongodb-stateful-set-0                              1/1     Running   2 (27m ago)   56m
mongodb-stateful-set-1                              1/1     Running   2 (27m ago)   55m
nginx-deployment-584fbb974d-6hl2m                   1/1     Running   2 (27m ago)   56m
nginx-deployment-584fbb974d-skjvx                   1/1     Running   2 (27m ago)   56m
nginx-deployment-584fbb974d-stjrp                   1/1     Running   2 (27m ago)   56m
nginx-s7lbb                                         1/1     Running   2 (27m ago)   56m
note-deployment-74cc946cd8-w88rl                    1/1     Running   3 (11m ago)   56m
note-deployment-74cc946cd8-wh8qp                    1/1     Running   3 (11m ago)   56m
note-server-deployment-6fb5fcb67f-cp579             1/1     Running   2 (12m ago)   56m
note-server-deployment-6fb5fcb67f-g7dh2             1/1     Running   2 (12m ago)   56m
prometheus-alertmanager-0                           1/1     Running   2 (27m ago)   56m
prometheus-kube-state-metrics-745b475957-n759n      1/1     Running   3 (11m ago)   56m
prometheus-prometheus-node-exporter-swqc8           1/1     Running   2 (27m ago)   56m
prometheus-prometheus-pushgateway-6ccd698d79-hws64  1/1     Running   2 (27m ago)   56m
prometheus-server-5c99dfc547-pvxf4                  2/2     Running   4 (27m ago)   56m
react-584865cc5b-h2f6f                              1/1     Running   2 (27m ago)   47m
web-0                                               0/1     Pending   0             56m
PS C:\Users\Mahammad Anis\lab4>
```

➔ **Env Variables:**

```
PS C:\Users\Mahammad Anis\lab4> kubectl exec dapp-6db8996c45-2x5xx -- env
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin
HOSTNAME=dapp-6db8996c45-2x5xx
MONGO_EXPRESS_SERVICE_PORT_8081_TCP_PORT=8081
MONGO_EXPRESS_SERVICE_PORT_8081_TCP_ADDR=10.98.80.203
MONGODB_SERVICE_PORT_27017_TCP_PORT=27017
REACT_PORT_3000_TCP=tcp://10.106.149.216:3000
DAPP_SERVICE_PORT_4000=4000
DAPP_SERVICE_HOST=10.106.212.196
DAPP_PORT_4000_TCP=tcp://10.106.212.196:4000
PROMETHEUS_PROMETHEUS_PUSHGATEWAY_PORT_9091_TCP_PROTO=tcp
PROMETHEUS_SERVER_EXT_SERVICE_HOST=10.99.250.180
PROMETHEUS_SERVER_EXT_PORT_80_TCP=tcp://10.99.250.180:80
GRAFANA_SERVICE_PORT=80
GRAFANA_PORT_80_TCP_PORT=80
GANACHE_PORT_8545_TCP=tcp://10.103.105.111:8545
GRAFANA_EXT_SERVICE_PORT=80
PROMETHEUS_PROMETHEUS_NODE_EXPORTER_PORT_9100_TCP_ADDR=10.100.118.33
GRAFANA_SERVICE_PORT_SERVICE=80
GRAFANA_PORT_80_TCP_ADDR=10.108.252.41
REACT_PORT_3000_TCP_ADDR=10.106.149.216
PROMETHEUS_PROMETHEUS_PUSHGATEWAY_PORT_9091_TCP_PORT=9091
REACT_SERVICE_PORT=3000
GANACHE_SERVICE_PORT=8545
PROMETHEUS_KUBE_STATE_METRICS_PORT_8080_TCP_ADDR=10.104.32.166
GRAFANA_EXT_PORT_80_TCP=tcp://10.99.101.234:80
GRAFANA_PORT_80_TCP=tcp://10.108.252.41:80
GRAFANA_PORT_80_TCP_PROTO=tcp
DAPP_PORT_4000_TCP_ADDR=10.106.212.196
NOTE_SERVICE_PORT_3000_TCP_PROTO=tcp
PROMETHEUS_ALERTMANAGER_PORT_9093_TCP_PORT=9093
NOTE_SERVER_SERVICE_PORT_5000_TCP_PORT=5000
KUBERNETES_SERVICE_PORT_HTTPS=443
MONGO_EXPRESS_SERVICE_PORT=tcp://10.98.80.203:8081
PROMETHEUS_ALERTMANAGER_PORT_9093_TCP=tcp://10.107.30.10:9093
PROMETHEUS_ALERTMANAGER_PORT_9093_TCP_ADDR=10.107.30.10
GANACHE_PORT_8545_TCP_PROTO=tcp
PROMETHEUS_SERVER_PORT_80_TCP_PROTO=tcp
NOTE_SERVER_SERVICE_PORT_5000_TCP_PROTO=tcp
PROMETHEUS_SERVER_EXT_PORT=tcp://10.99.250.180:80
PROMETHEUS_KUBE_STATE_METRICS_PORT_8080_TCP=tcp://10.104.32.166:8080
PROMETHEUS_PROMETHEUS_NODE_EXPORTER_PORT_9100_TCP_PROTO=tcp
PROMETHEUS_PROMETHEUS_NODE_EXPORTER_PORT_9100_TCP_PORT=9100
PROMETHEUS_PROMETHEUS_PUSHGATEWAY_PORT_9091_TCP_ADDR=10.96.75.33
MONGO_EXPRESS_SERVICE_PORT_8081_TCP_PROTO=tcp
PROMETHEUS_KUBE_STATE_METRICS_PORT_8080_TCP_PROTO=tcp
GRAFANA_EXT_PORT=tcp://10.99.101.234:80
NOTE_SERVICE_SERVICE_PORT=3000
GANACHE_SERVICE_HOST=10.103.105.111
```

```
DAPP_SERVICE_PORT=4000
GANACHE_PORT_8545_TCP_PORT=8545
GRAFANA_EXT_PORT_80_TCP_PORT=80
NOTE_SERVICE_PORT_3000_TCP=tcp://10.107.198.232:3000
PROMETHEUS_ALERTMANAGER_SERVICE_HOST=10.107.30.10
GRAFANA_SERVICE_HOST=10.108.252.41
GRAFANA_PORT=tcp://10.108.252.41:80
PROMETHEUS_SERVER_SERVICE_PORT=80
GRAFANA_EXT_PORT_80_TCP_PROTO=tcp
MONGODB_SERVICE_SERVICE_HOST=10.111.220.1
GANACHE_SERVICE_PORT_8545=8545
PROMETHEUS_PROMETHEUS_NODE_EXPORTER_SERVICE_PORT=9100
KUBERNETES_PORT_443_TCP_PORT=443
PROMETHEUS_KUBE_STATE_METRICS_SERVICE_PORT=8080
PROMETHEUS_KUBE_STATE_METRICS_PORT_8080_TCP_PORT=8080
NOTE_SERVER_SERVICE_PORT_5000_TCP=tcp://10.96.213.1:5000
PROMETHEUS_PROMETHEUS_NODE_EXPORTER_SERVICE_PORT_METRICS=9100
PROMETHEUS_PROMETHEUS_NODE_EXPORTER_PORT=tcp://10.100.118.33:9100
PROMETHEUS_SERVER_EXT_PORT_80_TCP_PROTO=tcp
PROMETHEUS_SERVER_SERVICE_HOST=10.106.223.33
GRAFANA_EXT_PORT_80_TCP_ADDR=10.99.101.234
MONGODB_SERVICE_PORT_27017_TCP_PROTO=tcp
PROMETHEUS_ALERTMANAGER_PORT_9093_TCP_PROTO=tcp
PROMETHEUS_PROMETHEUS_PUSHGATEWAY_PORT=tcp://10.96.75.33:9091
PROMETHEUS_SERVER_PORT=tcp://10.106.223.33:80
PROMETHEUS_SERVER_PORT_80_TCP_ADDR=10.106.223.33
PROMETHEUS_KUBE_STATE_METRICS_SERVICE_PORT_HTTP=8080
PROMETHEUS_PROMETHEUS_PUSHGATEWAY_SERVICE_PORT=9091
MONGO_EXPRESS_SERVICE_SERVICE_HOST=10.98.80.203
REACT_SERVICE_HOST=10.106.149.216
PROMETHEUS_PROMETHEUS_PUSHGATEWAY_SERVICE_PORT_HTTP=9091
REACT_PORT=tcp://10.106.149.216:3000
NOTE_SERVER_SERVICE_SERVICE_PORT=5000
NOTE_SERVICE_PORT_3000_TCP_ADDR=10.107.198.232
PROMETHEUS_ALERTMANAGER_PORT=tcp://10.107.30.10:9093
GANACHE_PORT_8545_TCP_ADDR=10.103.105.111
PROMETHEUS_SERVER_EXT_PORT_80_TCP_ADDR=10.99.250.180
MONGODB_SERVICE_PORT=tcp://10.111.220.1:27017
REACT_PORT_3000_TCP_PROTO=tcp
PROMETHEUS_SERVER_PORT_80_TCP_PORT=80
NOTE_SERVER_SERVICE_SERVICE_HOST=10.96.213.1
PROMETHEUS_PROMETHEUS_NODE_EXPORTER_SERVICE_HOST=10.100.118.33
GRAFANA_EXT_SERVICE_HOST=10.99.101.234
REACT_SERVICE_PORT_3000=3000
GANACHE_PORT=tcp://10.103.105.111:8545
NOTE_SERVER_SERVICE_PORT_5000_TCP_ADDR=10.96.213.1
DAPP_PORT=tcp://10.106.212.196:4000
DAPP_PORT_4000_TCP_PROTO=tcp
PROMETHEUS_SERVER_SERVICE_PORT_HTTP=80
KUBERNETES_SERVICE_PORT=443
KUBERNETES_PORT=tcp://10.96.0.1:443
PROMETHEUS_KUBE_STATE_METRICS_SERVICE_HOST=10.104.32.166
MONGODB_SERVICE_PORT_27017_TCP_ADDR=10.111.220.1
DAPP_PORT_4000_TCP_PORT=4000
PROMETHEUS_PROMETHEUS_PUSHGATEWAY_SERVICE_HOST=10.96.75.33
PROMETHEUS_ALERTMANAGER_SERVICE_PORT=9093
PROMETHEUS_SERVER_PORT_80_TCP=tcp://10.106.223.33:80
PROMETHEUS_PROMETHEUS_PUSHGATEWAY_PORT_9091_TCP=tcp://10.96.75.33:9091
KUBERNETES_PORT_443_TCP_ADDR=10.96.0.1
PROMETHEUS_SERVER_EXT_SERVICE_PORT=80
PROMETHEUS_PROMETHEUS_NODE_EXPORTER_PORT_9100_TCP=tcp://10.100.118.33:9100
KUBERNETES_SERVICE_HOST=10.96.0.1
KUBERNETES_PORT_443_TCP=tcp://10.96.0.1:443
PROMETHEUS_SERVER_EXT_PORT_80_TCP_PORT=80
```

```yaml
react-service.yaml
1   apiVersion: v1
2   kind: Service
3   metadata:
4     annotations:
5       kompose.cmd: C:\ProgramData\chocolatey\lib\kubernetes-kompose\tools\kompose.exe convert -f docker-compose.yml
6       kompose.version: 1.32.0 (765fde254)
7     labels:
8       io.kompose.service: react
9     name: react
10  spec:
11    ports:
12    type : LoadBalancer
13      - name: "3000"
14        port: 3000
15        targetPort: 80
16    selector:
17      io.kompose.service: react
18
```

Horizontal Scaling

```yaml
dpp-hpa.yaml
1    apiVersion: autoscaling/v1
2    kind: HorizontalPodAutoscaler
3    metadata:
4      name: frontend-hpa
5    spec:
6      scaleTargetRef:
7        apiVersion: apps/v1
8        kind: Deployment
9        name: react
10     minReplicas: 1
11     maxReplicas: 5
12     targetCPUUtilizationPercentage: 50
13
```

```
PS C:\Users\Mahammad Anis\lab4> kubectl apply -f dapp-hpa.yaml
horizontalpodautoscaler.autoscaling/frontend-hpa configured
PS C:\Users\Mahammad Anis\lab4> kubectl apply -f react-hpa.yaml
horizontalpodautoscaler.autoscaling/react-hpa created
PS C:\Users\Mahammad Anis\lab4> kubectl get hpa
NAME            REFERENCE           TARGETS         MINPODS  MAXPODS  REPLICAS  AGE
dapp-hpa        Deployment/dapp     <unknown>/50%   1        5        1         108m
frontend-hpa    Deployment/react    <unknown>/50%   1        5        1         108m
react-hpa       Deployment/react    <unknown>/50%   1        5        1         19s
PS C:\Users\Mahammad Anis\lab4>
```