

Project title:  
CKA : Accessing Software Application in a Cluster

Name : Khaled Mofdhi Alshammri  
Email :i5irh.a@gmail.com

Resources to Refer for completing the project :

- Docker image
- K8 cluster setup
- Yaml file

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### **Step 1 :**

Create directory for Project

```
$ mkdir project2-s5 && cd project2-s5
```

Init master & worker 1,2

```
$ sudo kubeadm reset  
$ sudo kubeadm init  
$ mkdir -p $HOME/.kube && sudo cp -i /etc/kubernetes/admin.conf $HOME/.kube/config  
$ sudo chown $(id -u):$(id -g) $HOME/.kube/config  
$ sudo kubectl get nodes  
$ kubectl get nodes
```

Create yaml file and check pod ,nodes :

```
$ touch project_pods.yaml && nano project_pods.yaml  
$ kubectl get pods  
$ kubectl get nodes  
$ kubectl create -f project_pods.yaml
```

---

```
master ● worker1 ● worker2 ●  
  
labsuser@ip-172-31-35-240:~/project2-s5$ kubectl get pods  
No resources found in default namespace.  
labsuser@ip-172-31-35-240:~/project2-s5$ kubectl get nodes  
NAME                STATUS    ROLES    AGE   VERSION  
ip-172-31-35-240    NotReady master   10m   v1.19.4  
ip-172-31-42-72     NotReady <none>   2m41s v1.19.4  
ip-172-31-43-133    NotReady <none>   3m10s v1.19.4  
labsuser@ip-172-31-35-240:~/project2-s5$ kubectl create -f proj_pods.yaml  
deployment.apps/accessment2 created  
labsuser@ip-172-31-35-240:~/project2-s5$ kubectl get pods  
NAME                READY    STATUS    RESTARTS   AGE  
accessment2-7d44d75dbf-8x9tr    0/2      Pending   0           6s  
accessment2-7d44d75dbf-blgh6    0/2      Pending   0           6s  
labsuser@ip-172-31-35-240:~/project2-s5$ kubectl get deploy | grep -i access  
accessment2    0/2      2           0           16s  
labsuser@ip-172-31-35-240:~/project2-s5$
```

```
master ● worker1 ● worker2 ● Used 8.6 of 50 hours in Jun, 2021 ▶ Start Lab ■ End Lab ⓘ Details ✕

labuser@ip-172-31-35-240:~/project2-s5$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
accessment2-7d44d75dbf-bv9tr        2/2     Running   0           7m34s
accessment2-7d44d75dbf-bjgh6        2/2     Running   0           7m34s
labuser@ip-172-31-35-240:~/project2-s5$ kubectl get nodes
NAME                                STATUS   ROLES    AGE   VERSION
ip-172-31-35-240                    Ready    master   18m   v1.19.4
ip-172-31-42-72                     Ready    <none>   18m   v1.19.4
ip-172-31-43-133                    Ready    <none>   11m   v1.19.4
labuser@ip-172-31-35-240:~/project2-s5$ kubectl get deploy | grep -i access
accessment2 2/2 2 7m54s
labuser@ip-172-31-35-240:~/project2-s5$ kubectl describe deploy accessment2
Name:         accessment2
Namespace:    default
CreationTimestamp: Wed, 30 Jun 2021 14:43:59 +0000
Labels:       <none>
Annotations:  deployment.kubernetes.io/revision: 1
Selector:     type=submit-project2
Replicas:    2 desired | 2 updated | 2 total | 2 available | 0 unavailable
StrategyType: RollingUpdate
MinReadySeconds: 0
RollingUpdateStrategy: 25% max unavailable, 25% max surge
Pod Template:
  Labels:  type=submit-project2
  Containers:
    cont1:
      Image:        nginx
      Port:         80/TCP
      Host Port:    0/TCP
      Environment:  <none>
      Mounts:
        /usr/share/nginx/html/ from accessment2-volume (rw)
    cont2:
      Image:        centos
      Port:         <none>
      Host Port:    <none>
      Command:
        sh
        -c
        while true; do echo 'date' >> /udrive/index.html; echo 'date'; sleep 2; done;
      Environment:  <none>
      Mounts:
        /udrive from accessment2-volume (rw)
  Volumes:
    accessment2-volume:
      Type:      EmptyDir (a temporary directory that shares a pod's lifetime)
      Medium:
      SizeLimit: <unset>
  Conditions:
    Type      Status  Reason
labuser@ip-172-31-35-240:~/project2-s5$
```

```
master ● worker1 ● worker2 ● Used 8.6 of 50 hours in Jun, 2021 ▶ Start Lab ■ End Lab ⓘ Details ✕

accessment2 2/2 2 7m54s
labuser@ip-172-31-35-240:~/project2-s5$ kubectl describe deploy accessment2
Name:         accessment2
Namespace:    default
CreationTimestamp: Wed, 30 Jun 2021 14:43:59 +0000
Labels:       <none>
Annotations:  deployment.kubernetes.io/revision: 1
Selector:     type=submit-project2
Replicas:    2 desired | 2 updated | 2 total | 2 available | 0 unavailable
StrategyType: RollingUpdate
MinReadySeconds: 0
RollingUpdateStrategy: 25% max unavailable, 25% max surge
Pod Template:
  Labels:  type=submit-project2
  Containers:
    cont1:
      Image:        nginx
      Port:         80/TCP
      Host Port:    0/TCP
      Environment:  <none>
      Mounts:
        /usr/share/nginx/html/ from accessment2-volume (rw)
    cont2:
      Image:        centos
      Port:         <none>
      Host Port:    <none>
      Command:
        sh
        -c
        while true; do echo 'date' >> /udrive/index.html; echo 'date'; sleep 2; done;
      Environment:  <none>
      Mounts:
        /udrive from accessment2-volume (rw)
  Volumes:
    accessment2-volume:
      Type:      EmptyDir (a temporary directory that shares a pod's lifetime)
      Medium:
      SizeLimit: <unset>
  Conditions:
    Type      Status  Reason
    ----      -
    Available  True    MinimumReplicasAvailable
    Progressing True    NewReplicaSetAvailable
    OldReplicaSets: <none>
    NewReplicaSet:  accessment2-7d44d75dbf (2/2 replicas created)
  Events:
    Type      Reason      Age    From      Message
    ----      -
    Normal    ScalingReplicaSet  8m1s  deployment-controller  Scaled up replica set accessment2-7d44d75dbf to 2
labuser@ip-172-31-35-240:~/project2-s5$
```

### Step 2 :

Create project svc yaml and check service :

```
$ touch proj_svc.yaml && nano proj_svc.yaml
```

```
$ kubectl create -f proj_svc.yaml
```

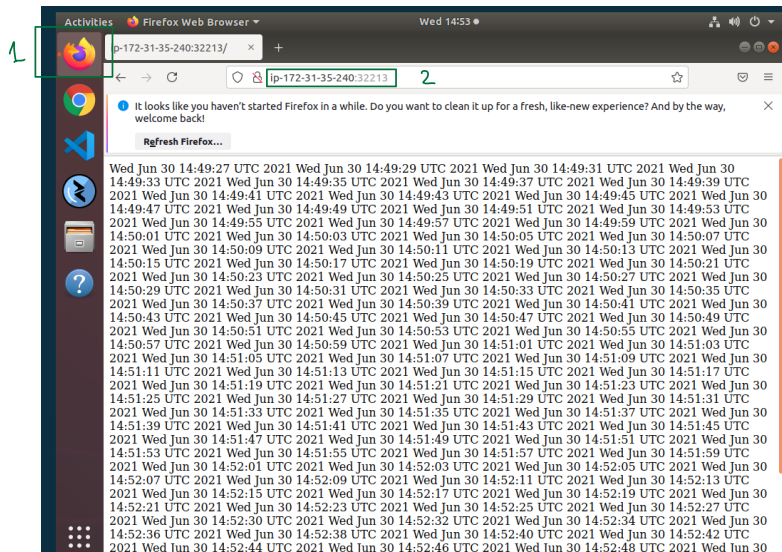
```
$ kubectl get services
```

```
labuser@ip-172-31-35-240:~/project2-s5$ ls
proj_pods.yaml  proj_svc.yaml
labuser@ip-172-31-35-240:~/project2-s5$ kubectl create -f proj_svc.yaml
service/project-svc created
labuser@ip-172-31-35-240:~/project2-s5$ kubectl get services
NAME         TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)          AGE
kubernetes   ClusterIP   10.96.0.1     <none>        443/TCP          19m
project-svc   NodePort    10.108.22.145 <none>        80:32213/TCP     7s
```

### Step 3 :

Open Desktop > browser > put the master hostname : port ( ip-172.31.35.240:32213 )

```
NAME         TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)          AGE
kubernetes   ClusterIP   10.96.0.1     <none>        443/TCP          19m
project-svc   NodePort    10.108.22.145 <none>        80:32213/TCP     7s
labuser@ip-172-31-35-240:~/project2-s5$
```



#### **Step 4 :**

- Describe the running pod to check its health
- Debug the individual containers for more detailed information

```
master ● worker1 ● worker2 ●

labsuser@ip-172-31-35-240:~/project2-s5$ kubectl describe pod accessment2
Name:         accessment2-7d44d75dbf-8x9tr
Namespace:    default
Priority:      0
Node:         ip-172-31-42-72/172.31.42.72
Start Time:   Wed, 30 Jun 2021 14:48:51 +0000
Labels:       pod-template-hash=7d44d75dbf
              type=submit-project2
Annotations:  cn1.projectcalico.org/podIP: 192.168.232.68/32
              cn1.projectcalico.org/podIPs: 192.168.232.68/32
Status:       Running
IP:           192.168.232.68
IPs:          192.168.232.68
Controlled By: ReplicaSet/accessment2-7d44d75dbf
Containers:
  cont1:
    Container ID:  docker://f080650d52d974100ddb83ccc921912aa05852c92a55fbed3ed4cf91c477ab
    Image:         nginx
    Image ID:      docker-pullable://nginx@sha256:47ae43cdfc7064d28800bc42e79a429540c7c80168e8c8952778c0d5af1c09db
    Port:          80/TCP
    Host Port:     0/TCP
    State:         Running
      Started:     Wed, 30 Jun 2021 14:49:18 +0000
    Ready:         True
    Restart Count:  0
    Environment:   <none>
    Mounts:
      /usr/share/nginx/html/ from accessment2-volume (rw)
      /var/run/secrets/kubernetes.io/serviceaccount from default-token-bjp18 (ro)
  cont2:
    Container ID:  docker://05e8ec93b6417cf1d00eb6997d8d7454144b632993829c3a2f61330bdd5513bd
    Image:         centos
    Image ID:      docker-pullable://centos@sha256:5528e8b1b1719d34604c87e11dcd1c0a20bedf46e83b5632cdeac91b8c04efc1
    Port:          <none>
    Host Port:     <none>
    Command:
      sh
      -c
      while true; do echo `date` >> /udrive/index.html; echo `date`; sleep 2; done;
    State:         Running
      Started:     Wed, 30 Jun 2021 14:49:27 +0000
    Ready:         True
    Restart Count:  0
    Environment:   <none>
    Mounts:
      /udrive from accessment2-volume (rw)
      /var/run/secrets/kubernetes.io/serviceaccount from default-token-bjp18 (ro)
Conditions:
  Type            Status
```

master ● worker1 ● worker2 ●

```
Normal    Started          7m21s          kubelet          Started container cont2
Name:      assessment2-7d44d75dbf-b1gh6
Namespace: default
Priority:   0
Node:      ip-172-31-42-72/172.31.42.72
Start Time: Wed, 30 Jun 2021 14:48:51 +0000
Labels:    pod-template-hash=7d44d75dbf
Annotations: cn1.projectcalico.org/podIP: 192.168.232.65/32
              cn1.projectcalico.org/podIPs: 192.168.232.65/32
Status:    Running
IP:        192.168.232.65
IPs:       IP: 192.168.232.65
Controlled By: ReplicaSet/assessment2-7d44d75dbf
Containers:
  cont1:
    Container ID:  docker://f77297fd9139f56bb5ef1a969fb90fa6a9ea1ea20a260f75b15b3ef3b80f500a
    Image:          nginx
    Image ID:       docker-pullable://nginx@sha256:47ae43cdfc7064d28800bc42e79a429540c7c80168e8c8952778c0d5af1c09db
    Port:          80/TCP
    Host Port:     0/TCP
    State:         Running
      Started:     Wed, 30 Jun 2021 14:49:15 +0000
      Ready:       True
      Restart Count: 0
    Environment:   <none>
    Mounts:
      /usr/share/nginx/html/ from assessment2-volume (rw)
      /var/run/secrets/kubernetes.io/serviceaccount from default-token-bjpl8 (ro)
  cont2:
    Container ID:  docker://35f6dcd92f8a5ffbb8be8cbb782e1a97547d99ead2897168930da90225ac7339
    Image:          centos
    Image ID:       docker-pullable://centos@sha256:5528e8b1b1719d34604c87e11dc1c0a20bedf46e83b5632cdeac91b8c04efc1
    Port:          <none>
    Host Port:     <none>
    Command:
      sh
      -c
      while true; do echo `date` >> /udrive/index.html; echo `date`; sleep 2; done;
    State:         Running
      Started:     Wed, 30 Jun 2021 14:49:27 +0000
      Ready:       True
      Restart Count: 0
    Environment:   <none>
    Mounts:
      /udrive from assessment2-volume (rw)
      /var/run/secrets/kubernetes.io/serviceaccount from default-token-bjpl8 (ro)
Conditions:
```

Kubernetes Admin      **Kubernetes New**      This Lab will get reset on 15th July 2021, 5:21 PM

master ● worker1 ● worker2 ●

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```
Conditions:
  Type              Status
  Initialized        True
  Ready              True
  ContainersReady    True
  PodScheduled       True

Volumes:
  assessment2-volume:
    Type:            EmptyDir (a temporary directory that shares a pod's lifetime)
    Medium:
    SizeLimit:        <unset>
  default-token-bjpl8:
    Type:            Secret (a volume populated by a Secret)
    SecretName:      default-token-bjpl8
    Optional:        false
    BestEffort
QoS Class:          <none>
Node-Selectors:     <none>
Tolerations:        node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                    node.kubernetes.io/unreachable:NoExecute op=Exists for 300s

Events:
  Type      Reason      Age      From      Message
  ----      -
  Warning   FailedScheduling      8m47s (x5 over 12s)    default-scheduler      0/3 nodes are available: 1 node(s) had taint (node-role.kubernetes.io/master: ), that the pod didn't tolerate, 2 node(s) had taint (node.kubernetes.io/not-ready: ), t
  hat the pod didn't tolerate.
  Normal    Scheduled    7m57s    default-scheduler      Successfully assigned default/assessment2-7d44d75dbf-b1gh6 to ip-172-31-42-72
  Warning   FailedCreatePodSandbox 7m56s    kubelet                Failed to create pod sandbox: rpc error: code = Unknown desc = failed to set up sandbox container "945296100902b3b18b45773cf221a82d4d56d197891c122597ba65ae4ef059" n
  etwork for pod "assessment2-7d44d75dbf-b1gh6": networkPlugin cni failed to set up pod "assessment2-7d44d75dbf-b1gh6_default" network: stat /var/lib/calico/node/name: no such file or directory: check that the calico/node container is running and
  has mounted /var/lib/calico/
  Warning   FailedCreatePodSandbox 7m52s    kubelet                Failed to create pod sandbox: rpc error: code = Unknown desc = failed to set up sandbox container "d82627808324c263c0ffa44e46cfc1cc397b99279c60b9750f99c40d5068562c" n
  etwork for pod "assessment2-7d44d75dbf-b1gh6": networkPlugin cni failed to set up pod "assessment2-7d44d75dbf-b1gh6_default" network: stat /var/lib/calico/node/name: no such file or directory: check that the calico/node container is running and
  has mounted /var/lib/calico/
  Warning   FailedCreatePodSandbox 7m50s    kubelet                Failed to create pod sandbox: rpc error: code = Unknown desc = failed to set up sandbox container "bc0995974a229e9f2f1278cawf13cd0cde52e8979114509c-f09b79fa7b0d74dad" n
  etwork for pod "assessment2-7d44d75dbf-b1gh6": networkPlugin cni failed to set up pod "assessment2-7d44d75dbf-b1gh6_default" network: stat /var/lib/calico/node/name: no such file or directory: check that the calico/node container is running and
  has mounted /var/lib/calico/
  Warning   FailedCreatePodSandbox 7m47s    kubelet                Failed to create pod sandbox: rpc error: code = Unknown desc = failed to set up sandbox container "2988f3589072b79a1c767040f886c0a186914787244534c347e4150c84e50f9" n
  etwork for pod "assessment2-7d44d75dbf-b1gh6": networkPlugin cni failed to set up pod "assessment2-7d44d75dbf-b1gh6_default" network: stat /var/lib/calico/node/name: no such file or directory: check that the calico/node container is running and
  has mounted /var/lib/calico/
  Warning   FailedCreatePodSandbox 7m44s    kubelet                Failed to create pod sandbox: rpc error: code = Unknown desc = failed to set up sandbox container "637a2075df7137888a32e13291e839f5b69ac6aadb39eb4f854520f2c0f12f8" n
  etwork for pod "assessment2-7d44d75dbf-b1gh6": networkPlugin cni failed to set up pod "assessment2-7d44d75dbf-b1gh6_default" network: stat /var/lib/calico/node/name: no such file or directory: check that the calico/node container is running and
  has mounted /var/lib/calico/
  Warning   FailedCreatePodSandbox 7m42s    kubelet                Failed to create pod sandbox: rpc error: code = Unknown desc = failed to set up sandbox container "48787af1ab641051e3ad438539da0e1b2d3936772c81b0bb0cafe98da78989" n
  etwork for pod "assessment2-7d44d75dbf-b1gh6": networkPlugin cni failed to set up pod "assessment2-7d44d75dbf-b1gh6_default" network: stat /var/lib/calico/node/name: no such file or directory: check that the calico/node container is running and
  has mounted /var/lib/calico/
  Normal    SandboxChanged 7m41s (x6 over 7m54s) kubelet                Pod sandbox changed, it will be killed and re-created.
  Normal    Pulling        7m40s    kubelet                Pulling image "nginx"
  Normal    Pulled         7m34s    kubelet                Successfully pulled image "nginx" in 5.624717906s
  Normal    Created        7m33s    kubelet                Created container cont1
  Normal    Started        7m32s    kubelet                Started container cont1
  Normal    Pulling        7m32s    kubelet                Pulling image "centos"
  Normal    Pulled         7m24s    kubelet                Successfully pulled image "centos" in 8.604573376s
```

```

Error from server (NotFound): pods "accessment2" not found
labsuser@ip-172-31-35-240:~/project2-s5$ kubectl logs accessment2-7d44d75dbf-blgh6 -c cont1
/docker-entrypoint.sh: /docker-entrypoint.d/ is not empty, will attempt to perform configuration
/docker-entrypoint.sh: Looking for shell scripts in /docker-entrypoint.d/
/docker-entrypoint.sh: Launching /docker-entrypoint.d/10-listen-on-ipv6-by-default.sh
10-listen-on-ipv6-by-default.sh: info: Getting the checksum of /etc/nginx/conf.d/default.conf
10-listen-on-ipv6-by-default.sh: info: Enabled listen on IPv6 in /etc/nginx/conf.d/default.conf
/docker-entrypoint.sh: Launching /docker-entrypoint.d/20-envsubst-on-templates.sh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/30-tune-worker-processes.sh
/docker-entrypoint.sh: Configuration complete; ready for start up
2021/06/30 14:49:16 [notice] 1#1: using the "epoll" event method
2021/06/30 14:49:16 [notice] 1#1: nginx/1.21.0
2021/06/30 14:49:16 [notice] 1#1: built by gcc 8.3.0 (Debian 8.3.0-6)
2021/06/30 14:49:16 [notice] 1#1: OS: Linux 5.3.0-1030-aws
2021/06/30 14:49:16 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1048576:1048576
2021/06/30 14:49:16 [notice] 1#1: start worker processes
2021/06/30 14:49:16 [notice] 1#1: start worker process 30
2021/06/30 14:49:16 [notice] 1#1: start worker process 31
labsuser@ip-172-31-35-240:~/project2-s5$ █

```

Yaml files :

#### ----- Project\_pods.yaml -----

```

kind: Deployment
apiVersion: apps/v1
metadata:
  name: accessment2
spec:
  replicas: 2
  selector:
    matchLabels:
      type: sumit-project2
  template:
    metadata:
      labels:
        type: sumit-project2
    spec:
      volumes:
        - name: accessment2-volume
          emptyDir: {}
      containers:
        - name: cont1
          image: nginx
          ports:
            - name: http
              containerPort: 80
          volumeMounts:
            - name: accessment2-volume
              mountPath: /usr/share/nginx/html/
        - name: cont2
          image: centos
          command: ["sh", "-c", "while true; do echo date >> /udrive/index.html; echo date; sleep 2; done;"]
          volumeMounts:
            - name: accessment2-volume
              mountPath: /udrive

```

-----  
**Project\_svc.yaml**  
-----

```
apiVersion: v1
kind: Service
metadata:
  name: project-svc
spec:
  ports:
  -
    port: 80
    targetPort: 80
  selector:
    type: sumit-project2
  type: NodePort
```