PES1UG21CS596

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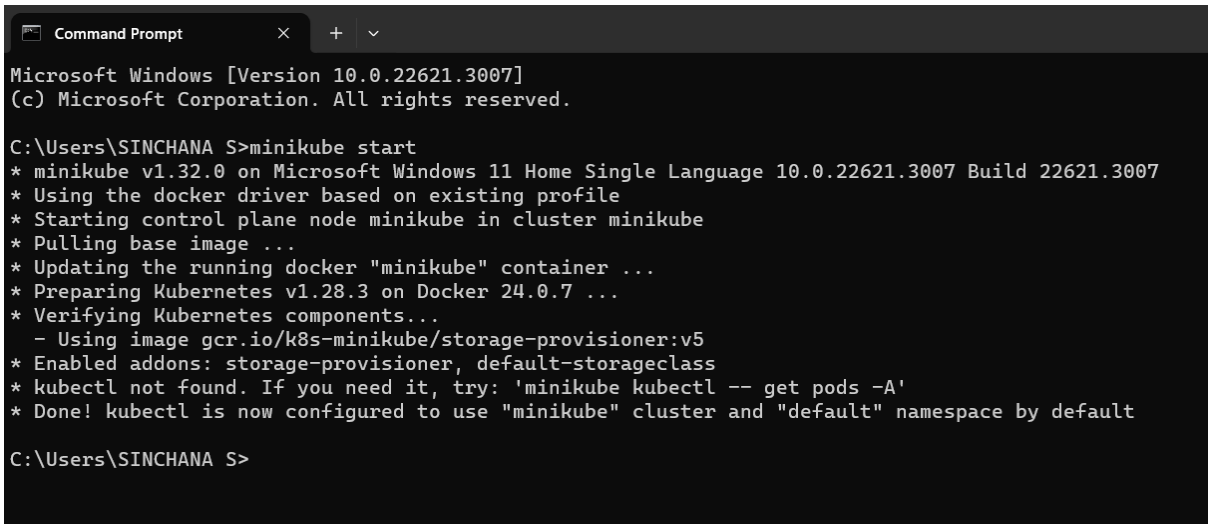
CC LAB

Task-1: After installation of both kubectl and minikube.

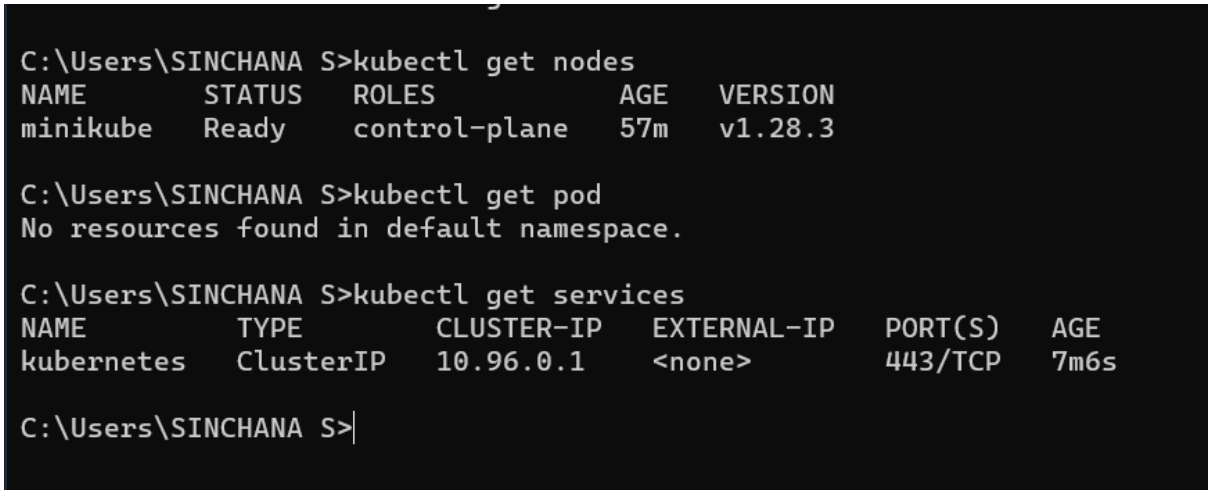
SCREENSHOT 1a: Minikube running successfully.



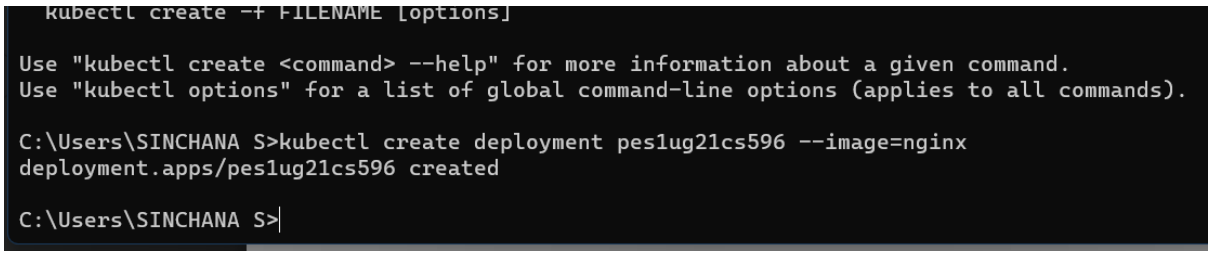
Task-2: Creating pods and deployments, editing them and

observing Rollback.

✓ SCREENSHOT 2a: Get nodes, pods, services.



SCREENSHOT 2b: Deployment Created (with SRN)



SCREENSHOT 2c: Get deployment and pod.

SCREENSHOT 2d: Editing ‘-image:nginx’

```
      maxUnavailable: 25%
    type: RollingUpdate
  template:
    metadata:
      creationTimestamp: null
      labels:
        app: pes1ug21cs596
    spec:
      containers:
      - image: nginx:1.16
        imagePullPolicy: Always
        name: nginx
        resources: {}
        terminationMessagePath: /dev/termination-log
        terminationMessagePolicy: File
      dnsPolicy: ClusterFirst
      restartPolicy: Always
      schedulerName: default-scheduler
      securityContext: {}
      terminationGracePeriodSeconds: 30
status:
```

SCREENSHOT 2e: Showing edited deployment.

```
C:\Users\SINCHANA S>kubectl edit deployment pes1ug21cs596
deployment.apps/pes1ug21cs596 edited

C:\Users\SINCHANA S>
```

SCREENSHOT 2f: Deployment rolled back.

```
C:\Users\SINCHANA S>kubectl rollout undo deployment pes1ug21cs596
deployment.apps/pes1ug21cs596 rolled back

C:\Users\SINCHANA S>
```

SCREENSHOT 2g: Changes after rolling back to original.

```
        app: pes1ug21cs596
    spec:
      containers:
      - image: nginx
        imagePullPolicy: Always
        name: nginx
        resources: {}
        terminationMessagePath: /dev/termination-log
        terminationMessagePolicy: File
      dnsPolicy: ClusterFirst
      restartPolicy: Always
      schedulerName: default-scheduler
      securityContext: {}
      terminationGracePeriodSeconds: 30
status:
  conditions:
  - lastTransitionTime: "2024-02-13T09:17:19Z"
```

Task-3: Debugging Pods.

✓ SCREENSHOT 3a: Kubectl logs displayed

```
C:\Users\SINCHANA S>kubectl get pod
NAME                            READY   STATUS    RESTARTS   AGE
pes1ug21cs596-8547cd7f65-5cv6k   1/1     Running   0          27s

C:\Users\SINCHANA S>kubectl logs pes1ug21cs596-8547cd7f65-5cv6k
/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: Sourcing /docker-entrypoint.d/15-local-resolvers.envsh
/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
2024/02/13 09:49:11 [notice] 1#1: using the "epoll" event method
2024/02/13 09:49:11 [notice] 1#1: nginx/1.25.3
2024/02/13 09:49:11 [notice] 1#1: built by gcc 12.2.0 (Debian 12.2.0-14)
2024/02/13 09:49:11 [notice] 1#1: OS: Linux 5.15.133.1-microsoft-standard-WSL2
2024/02/13 09:49:11 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1048576:1048576
2024/02/13 09:49:11 [notice] 1#1: start worker processes
2024/02/13 09:49:11 [notice] 1#1: start worker process 29
2024/02/13 09:49:11 [notice] 1#1: start worker process 30
2024/02/13 09:49:11 [notice] 1#1: start worker process 31
2024/02/13 09:49:11 [notice] 1#1: start worker process 32
2024/02/13 09:49:11 [notice] 1#1: start worker process 33
2024/02/13 09:49:11 [notice] 1#1: start worker process 34
2024/02/13 09:49:11 [notice] 1#1: start worker process 35
2024/02/13 09:49:11 [notice] 1#1: start worker process 36

C:\Users\SINCHANA S>
```

SCREENSHOT 3b: Kubectl ‘describe pod’ command – Screenshot of “events” section.

```
    Environment:    <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-xtnzf (ro)
Conditions:
  Type              Status
  Initialized       True
  Ready             True
  ContainersReady   True
  PodScheduled      True
Volumes:
  kube-api-access-xtnzf:
    Type:                    Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds:  3607
    ConfigMapName:           kube-root-ca.crt
    ConfigMapOptional:       <nil>
    DownwardAPI:             true
QoS Class:                   BestEffort
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
  ----    ------     ----   ----               -------
  Normal  Scheduled  2m12s  default-scheduler  Successfully assigned default/pes1ug21cs596-8547cd7f65-5cv6k to minikube
  Normal  Pulling    2m10s  kubelet            Pulling image "nginx"
  Normal  Pulled     2m4s   kubelet            Successfully pulled image "nginx" in 6.291s (6.292s including waiting)
  Normal  Created    2m3s   kubelet            Created container nginx
  Normal  Started    2m3s   kubelet            Started container nginx

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```

SCREENSHOT 3c: Creating mongo deployment

```
C:\Users\SINCHANA S>kubectl create deployment pes1ug21cs596-mongo --image=mongo
deployment.apps/pes1ug21cs596-mongo created

C:\Users\SINCHANA S>
```

SCREENSHOT 3d: Deleting both requirements.

```
C:\Users\SINCHANA S>kubectl delete deployment pes1ug21cs596
deployment.apps "pes1ug21cs596" deleted

C:\Users\SINCHANA S>kubectl delete deployment pes1ug21cs596-mongo
deployment.apps "pes1ug21cs596-mongo" deleted

C:\Users\SINCHANA S>
```

Task-4: Applying configuration files.

SCREENSHOT 4a: Kubectl apply command on yaml file.

```
C:\Users\SINCHANA S>kubectl apply -f nginx-deployment.yaml
deployment.apps/nginx-deployment-pes1ug21cs596 created

C:\Users\SINCHANA S>kubectl get pod
NAME                                              READY   STATUS    RESTARTS   AGE
nginx-deployment-pes1ug21cs596-67856bc4f5-9x9w8   1/1     Running   0          69s
nginx-deployment-pes1ug21cs596-67856bc4f5-thkdd   1/1     Running   0          69s

C:\Users\SINCHANA S>kubectl get deployment
NAME                            READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment-pes1ug21cs596   2/2     2            2           87s

C:\Users\SINCHANA S>kubectl get replicaset
NAME                                        DESIRED   CURRENT   READY   AGE
nginx-deployment-pes1ug21cs596-67856bc4f5   2         2         2       115s

C:\Users\SINCHANA S>
```

```
C:\Users\SINCHANA S>kubectl apply -f nginx-deployment.yaml
deployment.apps/nginx-deployment-pes1ug21cs596 configured

C:\Users\SINCHANA S>kubectl get pod
NAME                                              READY   STATUS              RESTARTS   AGE
nginx-deployment-pes1ug21cs596-67856bc4f5-9x9w8   1/1     Running             0          3m37s
nginx-deployment-pes1ug21cs596-67856bc4f5-spwmf   0/1     ContainerCreating   0          3s
nginx-deployment-pes1ug21cs596-67856bc4f5-thkdd   1/1     Running             0          3m37s

C:\Users\SINCHANA S>kubectl get deployment
NAME                            READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment-pes1ug21cs596   3/3     3            3           3m50s

C:\Users\SINCHANA S>kubectl get replicaset
NAME                                        DESIRED   CURRENT   READY   AGE
nginx-deployment-pes1ug21cs596-67856bc4f5   3         3         3       3m55s

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```

SCREENSHOT 4b: Kubectl get on yaml file.

```
        resources: {}
        terminationMessagePath: /dev/termination-log
        terminationMessagePolicy: File
      dnsPolicy: ClusterFirst
      restartPolicy: Always
      schedulerName: default-scheduler
      securityContext: {}
      terminationGracePeriodSeconds: 30
status:
  availableReplicas: 3
  conditions:
  - lastTransitionTime: "2024-02-13T11:15:30Z"
    lastUpdateTime: "2024-02-13T11:16:07Z"
    message: ReplicaSet "nginx-deployment-pes1ug21cs596-67856bc4f5" has successfully
      progressed.
    reason: NewReplicaSetAvailable
    status: "True"
    type: Progressing
  - lastTransitionTime: "2024-02-13T11:19:07Z"
    lastUpdateTime: "2024-02-13T11:19:07Z"
    message: Deployment has minimum availability.
    reason: MinimumReplicasAvailable
    status: "True"
    type: Available
  observedGeneration: 2
  readyReplicas: 3
  replicas: 3
  updatedReplicas: 3

C:\Users\SINCHANA S>
```

Task-5: Delete a pod to observe the self-healing feature.

✓ SCREENSHOT 5a: Delete pod.

```
C:\Users\SINCHANA S>kubectl get pod
NAME                                              READY   STATUS    RESTARTS   AGE
nginx-deployment-pes1ug21cs596-67856bc4f5-9x9w8   1/1     Running   0          5m23s
nginx-deployment-pes1ug21cs596-67856bc4f5-spwmf   1/1     Running   0          109s
nginx-deployment-pes1ug21cs596-67856bc4f5-thkdd   1/1     Running   0          5m23s

C:\Users\SINCHANA S>kubectl delete pod nginx-deployment-pes1ug21cs596-67856bc4f5-9x9w8
pod "nginx-deployment-pes1ug21cs596-67856bc4f5-9x9w8" deleted

C:\Users\SINCHANA S>kubectl delete pod nginx-deployment-pes1ug21cs596-67856bc4f5-spwmf
pod "nginx-deployment-pes1ug21cs596-67856bc4f5-spwmf" deleted

C:\Users\SINCHANA S>kubectl get pod
NAME                                              READY   STATUS    RESTARTS   AGE
nginx-deployment-pes1ug21cs596-67856bc4f5-5tcmq   1/1     Running   0          19s
nginx-deployment-pes1ug21cs596-67856bc4f5-pcpgz   1/1     Running   0          34s
nginx-deployment-pes1ug21cs596-67856bc4f5-thkdd   1/1     Running   0          6m25s

C:\Users\SINCHANA S>
```

SCREENSHOT 6a: Kubectl apply and get command.

```
C:\Users\SINCHANA S>kubectl apply -f nginx-service.yaml
service/nginx-service-pes1ug21cs596 created

C:\Users\SINCHANA S>kubectl get service
NAME                          TYPE        CLUSTER-IP      EXTERNAL-IP   PORT(S)    AGE
kubernetes                    ClusterIP   10.96.0.1       <none>        443/TCP    134m
nginx-service-pes1ug21cs596   ClusterIP   10.99.232.116   <none>        8080/TCP   11s

C:\Users\SINCHANA S>kubectl describe service nginx-service
Name:              nginx-service-pes1ug21cs596
Namespace:         default
Labels:            <none>
Annotations:       <none>
Selector:          app=nginx
Type:              ClusterIP
IP Family Policy:  SingleStack
IP Families:       IPv4
IP:                10.99.232.116
IPs:               10.99.232.116
Port:              <unset>  8080/TCP
TargetPort:        80/TCP
Endpoints:         10.244.0.11:80,10.244.0.12:80,10.244.0.9:80
Session Affinity:  None
Events:            <none>


C:\Users\SINCHANA S>
```

✓ SCREENSHOT 6b: kubectl get pod -o wide command.

```
C:\Users\SINCHANA S>kubectl get pod -o wide
NAME                                     READY   STATUS    RESTARTS   AGE     IP            NODE       NOMINATE
D NODE   READINESS GATES
nginx-deployment-pes1ug21cs596-67856bc4f5-5tcmq   1/1     Running   0          3m37s   10.244.0.12   minikube   <none>
         <none>
nginx-deployment-pes1ug21cs596-67856bc4f5-pcpgz   1/1     Running   0          3m52s   10.244.0.11   minikube   <none>
         <none>
nginx-deployment-pes1ug21cs596-67856bc4f5-thkdd   1/1     Running   0          9m43s   10.244.0.9    minikube   <none>
         <none>

C:\Users\SINCHANA S>
```

Task-7: Port Forwarding.

SCREENSHOT 7a: Kubectl port-forward command .

```
C:\Users\SINCHANA S>kubectl port-forward service/nginx-service-pes1ug21cs596 8080:8080
Forwarding from 127.0.0.1:8080 -> 80
Forwarding from [::1]:8080 -> 80
Handling connection for 8080
Handling connection for 8080
```

SCREENSHOT 7b: Display welcome to nginx on web page.

Task-8: Deleting service/deployment and Cleanup.

✓ SCREENSHOT 8a: Delete nginx deployments.

```
C:\Users\SINCHANA S>kubectl delete deployment nginx-deployment-pes1ug21cs596
deployment.apps "nginx-deployment-pes1ug21cs596" deleted

C:\Users\SINCHANA S>kubectl delete service nginx-service-pes1ug21cs596
service "nginx-service-pes1ug21cs596" deleted

C:\Users\SINCHANA S>
```

SCREENSHOT 8b: Minikube stop

```
C:\Users\SINCHANA S>minikube stop
* Stopping node "minikube"  ...
* Powering off "minikube" via SSH ...
* 1 node stopped.

C:\Users\SINCHANA S>
```

Task-9: Expose an external IP address to access an Application in a cluster (To be done by the student).

SCREENSHOT 9a: The command which exposes specifies the type of service (NodePort/LoadBalancer)

```
C:\Users\SINCHANA S>kubectl create deployment nginx-pes1ug21cs596 --image=nginx
deployment.apps/nginx-pes1ug21cs596 created

C:\Users\SINCHANA S>kubectl expose deployment nginx-pes1ug21cs596 --type=LoadBalancer --port=80 --target-port=80
service/nginx-pes1ug21cs596 exposed

C:\Users\SINCHANA S>
```

✓ SCREENSHOT 9b: kubectl get service command which displays the node port

```
C:\Users\SINCHANA S>kubectl get service nginx-pes1ug21cs596
NAME                  TYPE           CLUSTER-IP       EXTERNAL-IP   PORT(S)        AGE
nginx-pes1ug21cs596   LoadBalancer   10.103.237.156   <pending>     80:32109/TCP   8m10s

C:\Users\SINCHANA S>
```

SCREENSHOT 9c: minikube IP address

```
C:\Users\SINCHANA S>minikube ip
192.168.49.2

C:\Users\SINCHANA S>
```

SCREENSHOT 9d: the webpage with the IP Address visible. (If the IP Address is not visible in

the screenshot, you will lose significant portion of marks w.r.t. Section 9)

```
C:\Users\SINCHANA S>minikube tunnel
* Tunnel successfully started

* NOTE: Please do not close this terminal as this process must stay alive for the tunnel to be accessible ...

! Access to ports below 1024 may fail on Windows with OpenSSH clients older than v8.1. For more information, see: https:
//minikube.sigs.k8s.io/docs/handbook/accessing/#access-to-ports-1024-on-windows-requires-root-permission
* Starting tunnel for service nginx-pes1ug21cs596.
```

```
Microsoft Windows [Version 10.0.22621.3007]
(c) Microsoft Corporation. All rights reserved.

C:\Users\SINCHANA S>kubectl get service nginx-pes1ug21cs596
NAME                    TYPE           CLUSTER-IP       EXTERNAL-IP   PORT(S)        AGE
nginx-pes1ug21cs596   LoadBalancer   10.103.237.156   127.0.0.1     80:32109/TCP   11m

C:\Users\SINCHANA S>
```