Exam CKA

Certified Kubernetes Administrator (CKA) Program

Version: 7.0

[Total Questions: 67]

1. Score: 4%

Set configuration context:

```
[student@node-1] $ kube
ctl config use-context k
8s
```

Context

You have been asked to create a new ClusterRole for a deployment pipeline and bind it to a specific ServiceAccount scoped to a specific namespace.

Task

Create a new ClusterRole named deployment-clusterrole, which only allows to create the following resource types:

• Deployment

• StatefulSet

• DaemonSet

Create a new ServiceAccount named cicd-token in the existing namespace app-team1.

Bind the new ClusterRole deployment-clusterrole lo the new ServiceAccount cicd-token , limited to the namespace app-team1.

Answer:

See the solution below.

Explanation:

Solution:

Task should be complete on node k8s -1 master, 2 worker for this connect use command

[student@node-1] > ssh k8s

kubectl create clusterrole deployment-clusterrole --verb=create

--resource=deployments,statefulsets,daemonsets

kubectl create serviceaccount cicd-token --namespace=app-team1

kubectl create rolebinding deployment-clusterrole --clusterrole=deployment-clusterrole

--serviceaccount=default:cicd-token --namespace=app-team1

2. Configure the kubelet systemd- managed service, on the node labelled with name=wk8s-node-1, to launch a pod containing a single container of Image httpd named webtool automatically. Any spec files required should be placed in the /etc/kubernetes/manifests directory on the node.

You can ssh to the appropriate node using:

[student@node-1] $ ssh wk8s-node-1

You can assume elevated privileges on the node with the following command:

[student@wk8s-node-1] $ | sudo –i

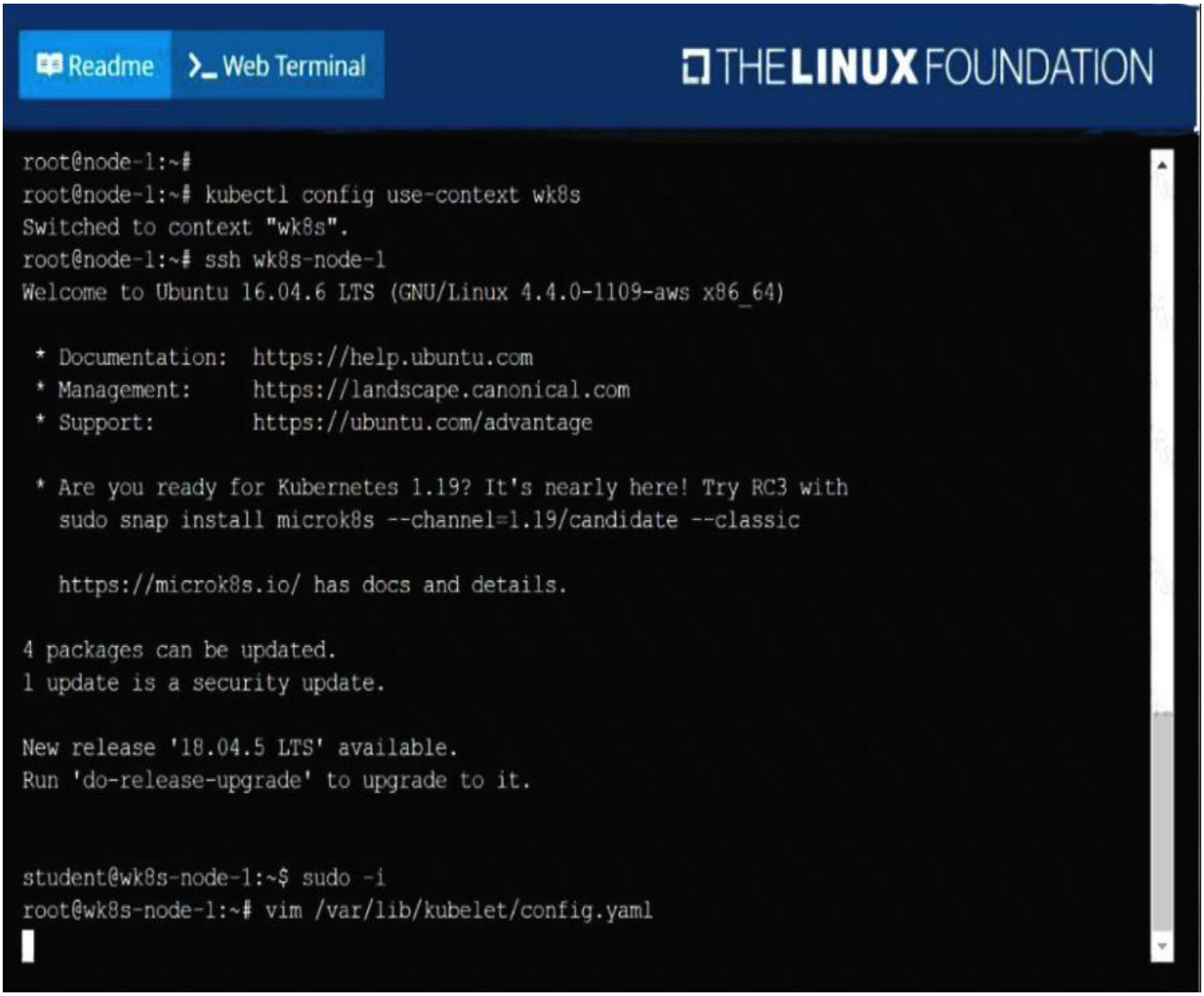
Answer:

See the solution below.

Explanation:

solution

F:\Work\Data Entry Work\Data Entry\20200827\CKA\21 C.JPG



F:\Work\Data Entry Work\Data Entry\20200827\CKA\21 D.JPG

Readme | Web Terminal | THE LINUX FOUNDATION

```
    clientCAFile: /etc/kubernetes/pki/ca.crt
authorization:
  mode: Webhook
  webhook:
    cacheAuthorizedTTL: 0s
    cacheUnauthorizedTTL: 0s
clusterDNS:
- 10.96.0.10
clusterDomain: cluster.local
cpuManagerReconcilePeriod: 0s
evictionPressureTransitionPeriod: 0s
fileCheckFrequency: 0s
healthzBindAddress: 127.0.0.1
healthzPort: 10248
httpCheckFrequency: 0s
imageMinimumGCAge: 0s
kind: KubeletConfiguration
nodeStatusReportFrequency: 0s
nodeStatusUpdateFrequency: 0s
rotateCertificates: true
runtimeRequestTimeout: 0s
staticPodPath: /etc/kubernetes/manifests
streamingConnectionIdleTimeout: 0s
syncFrequency: 0s
:wq
```

F:\Work\Data Entry Work\Data Entry\20200827\CKA\21 E.JPG

Readme | Web Terminal

THE LINUX FOUNDATION

```
root@node-1:~# ssh wk8s-node-1
Welcome to Ubuntu 16.04.6 LTS (GNU/Linux 4.4.0-1109-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

 * Are you ready for Kubernetes 1.19? It's nearly here! Try RC3 with
   sudo snap install microk8s --channel=1.19/candidate --classic

   https://microk8s.io/ has docs and details.

4 packages can be updated.
1 update is a security update.

New release '18.04.5 LTS' available.
Run 'do-release-upgrade' to upgrade to it.


student@wk8s-node-1:~$ sudo -i
root@wk8s-node-1:~# vim /var/lib/kubelet/config.yaml
root@wk8s-node-1:~# cd /etc/kubernetes/manifests
root@wk8s-node-1:/etc/kubernetes/manifests#
root@wk8s-node-1:/etc/kubernetes/manifests# vim pod.yaml
```

F:\Work\Data Entry Work\Data Entry\20200827\CKA\21 F.JPG

Readme Web Terminal THE LINUX FOUNDATION

```
apiVersion: v1
kind: Pod
metadata:
  name: webtool
spec:
  containers:
  - name: webtool
    image: httpd
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
:w
```

F:\Work\Data Entry Work\Data Entry\20200827\CKA\21 G.JPG

Readme | Web Terminal

THE LINUX FOUNDATION

```
https://microk8s.io/ has docs and details.

4 packages can be updated.
1 update is a security update.

New release '18.04.5 LTS' available.
Run 'do-release-upgrade' to upgrade to it.


student@wk8s-node-1:~$ sudo -i
root@wk8s-node-1:~# vim /var/lib/kubelet/config.yaml
root@wk8s-node-1:~# cd /etc/kubernetes/manifests
root@wk8s-node-1:/etc/kubernetes/manifests#
root@wk8s-node-1:/etc/kubernetes/manifests# vim pod.yaml
root@wk8s-node-1:/etc/kubernetes/manifests# systemctl  restart kubelet
root@wk8s-node-1:/etc/kubernetes/manifests# systemctl  enable kubelet
root@wk8s-node-1:/etc/kubernetes/manifests# exit
logout
student@wk8s-node-1:~$ exit
logout
Connection to 10.250.5.39 closed.
root@node-1:~# k get po
NAME                 READY   STATUS    RESTARTS   AGE
webtool-wk8s-node-1  1/1     Running   0          11s
root@node-1:~#
```

3. Score: 7%

Set configuration context:

```
[student@node-1] $ kube
ctl config use-context h
k8s
```

Task

Create a new NetworkPolicy named allow-port-from-namespace in the existing namespace echo. Ensure that the new NetworkPolicy allows Pods in namespace my-app to connect to port 9000 of Pods in namespace echo.

Further ensure that the new NetworkPolicy:

• does not allow access to Pods, which don't listen on port 9000

• does not allow access from Pods, which are not in namespace my-app

Answer:

See the solution below.

Explanation:

Solution:

#network.yaml

apiVersion: networking.k8s.io/v1 kind: NetworkPolicy

metadata:

name: allow-port-from-namespace namespace: internal

spec: podSelector: matchLabels: {

}

policyTypes:

- Ingress ingress:

- from:

- podSelector: {

}

ports:

- protocol: TCP port: 8080

#spec.podSelector namespace pod kubectl create -f network.yaml

4. Score:7%

Set configuration context:

```
[student@node-1] $ kube
ctl config use-context o
k8s
```

Task

Create a new PersistentVolumeClaim

• Name: pv-volume

• Class: csi-hostpath-sc

• Capacity: 10Mi

Create a new Pod which mounts the PersistentVolumeClaim as a volume:

• Name: web-server

• Image: nginx

• Mount path: /usr/share/nginx/html

Configure the new Pod to have ReadWriteOnce access on the volume.

Finally, using kubectl edit or kubectl patch expand the PersistentVolumeClaim to a capacity of 70Mi and record that change.

Answer:

See the solution below.

Explanation:

Solution:

vi pvc.yaml storageclass pvc apiVersion: v1

kind: PersistentVolumeClaim metadata:

name: pv-volume spec: accessModes:

- ReadWriteOnce volumeMode: Filesystem resources:

requests: storage: 10Mi

storageClassName: csi-hostpath-sc

vi pod-pvc.yaml apiVersion: v1 kind: Pod metadata:

name: web-server spec:

containers:

- name: web-server image: nginx volumeMounts:

- mountPath: "/usr/share/nginx/html"

name: my-volume volumes:

- name: my-volume persistentVolumeClaim: claimName: pv-volume

craete

kubectl create -f pod-pvc.yaml

#edit

kubectl edit pvc pv-volume --record

5. Create a snapshot of the etcd instance running at https://127.0.0.1:2379, saving the snapshot to the file path /srv/data/etcd-snapshot.db.

The following TLS certificates/key are supplied for connecting to the server with etcdctl:

- CA certificate: /opt/KUCM00302/ca.crt
- Client certificate: /opt/KUCM00302/etcd-client.crt
- Client key: Topt/KUCM00302/etcd-client.key

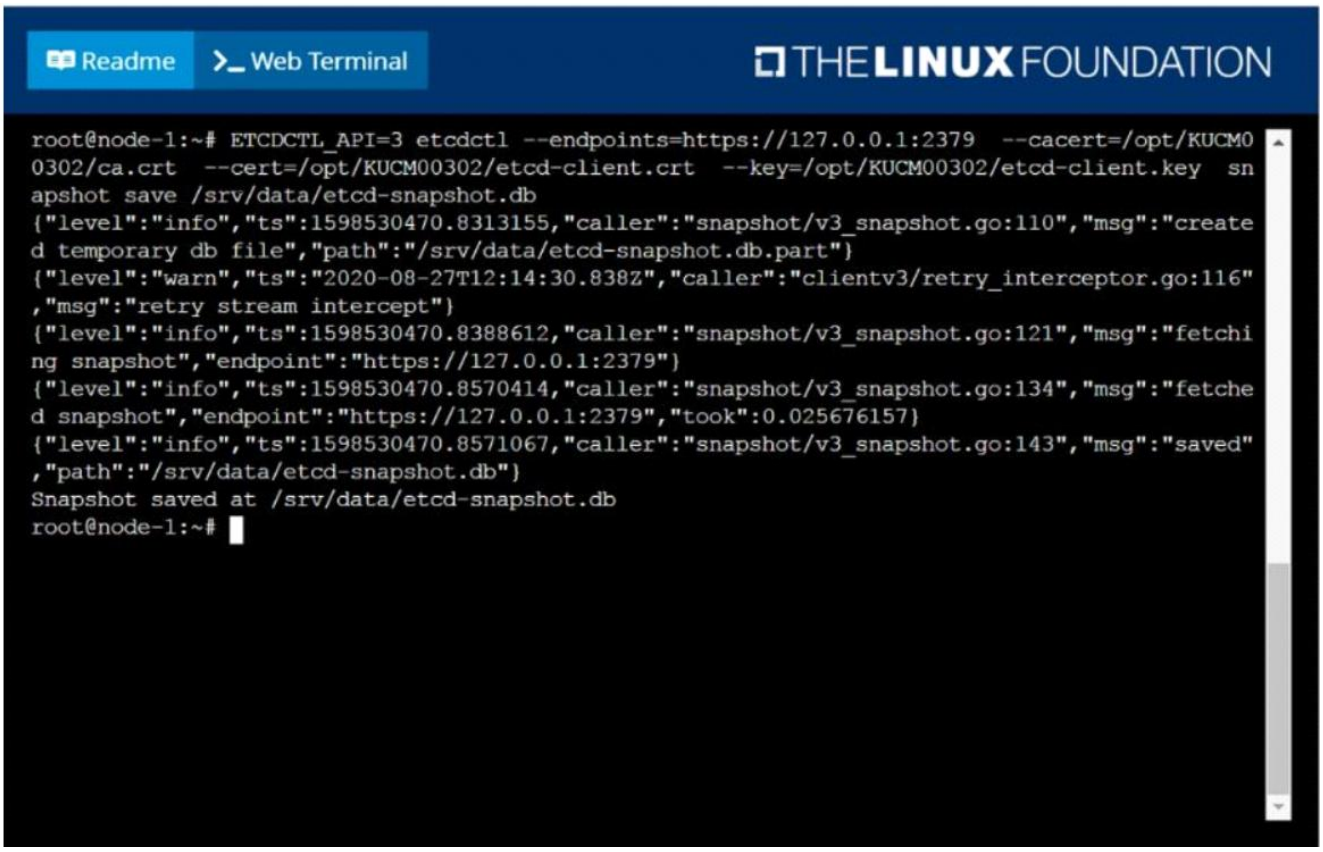
Answer:

See the solution below.

Explanation:

solution

F:\Work\Data Entry Work\Data Entry\20200827\CKA\18 C.JPG



6. List “nginx-dev” and “nginx-prod” pod and delete those pods

Answer:

See the solution below.

Explanation:

kubect1 get pods -o wide

kubectl delete po “nginx-dev”kubectl delete po “nginx-prod”

7. Create a nginx pod with label env=test in engineering namespace

Answer:

See the solution below.

Explanation:

kubectl run nginx --image=nginx --restart=Never --labels=env=test --namespace=engineering --dry-run -o yaml > nginx-pod.yaml

kubectl run nginx --image=nginx --restart=Never --labels=env=test --namespace=engineering --dry-run -o yaml | kubectl create -n engineering -f –

YAML File: apiVersion: v1 kind: Pod metadata: name: nginx

namespace: engineering labels:

env: test spec: containers:

- name: nginx image: nginx

imagePullPolicy: IfNotPresent restartPolicy: Never

kubectl create -f nginx-pod.yaml

8. Given a partially-functioning Kubernetes cluster, identify symptoms of failure on the cluster.

Determine the node, the failing service, and take actions to bring up the failed service and restore the health of the cluster. Ensure that any changes are made permanently.

You can ssh to the relevant I nodes (bk8s-master-0 or bk8s-node-0) using:

[student@node-1] $ ssh <nodename>

You can assume elevated privileges on any node in the cluster with the following command:

[student@nodename] $ | sudo –i

Answer:

See the solution below.

Explanation:

solution

F:\Work\Data Entry Work\Data Entry\20200827\CKA\23 C.JPG

Readme | Web Terminal | THE LINUX FOUNDATION

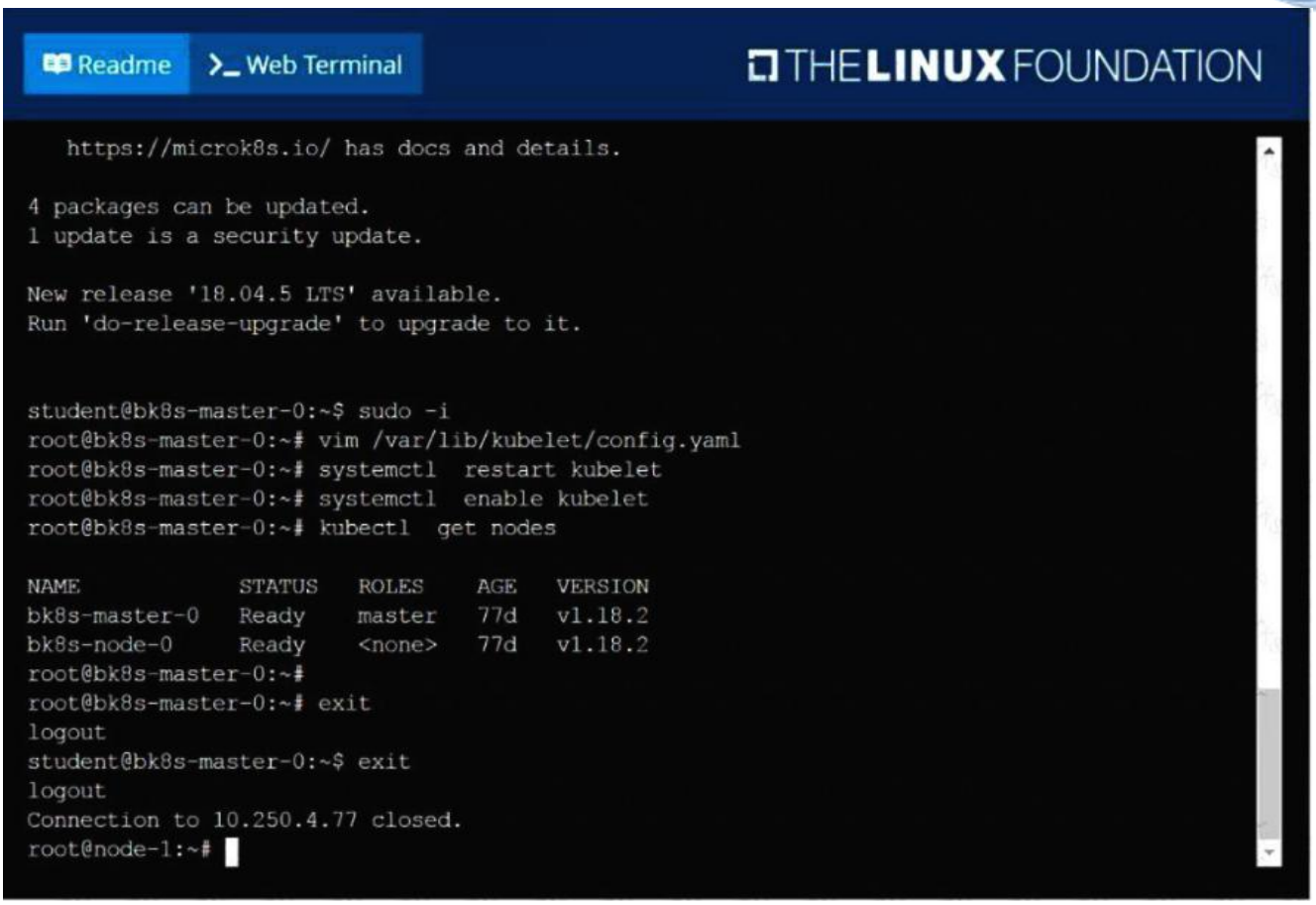
```
root@node-1:~#
root@node-1:~# kubectl config use-context bk8s
Switched to context "bk8s".
root@node-1:~# ssh bk8s-master-0
Welcome to Ubuntu 16.04.6 LTS (GNU/Linux 4.4.0-1109-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

 * Are you ready for Kubernetes 1.19? It's nearly here! Try RC3 with
   sudo snap install microk8s --channel=1.19/candidate --classic

   https://microk8s.io/ has docs and details.

4 packages can be updated.
1 update is a security update.

New release '18.04.5 LTS' available.
Run 'do-release-upgrade' to upgrade to it.


student@bk8s-master-0:~$ sudo -i
root@bk8s-master-0:~# vim /var/lib/kubelet/config.yaml
```

F:\Work\Data Entry Work\Data Entry\20200827\CKA\23 D.JPG

Readme | Web Terminal | THE LINUX FOUNDATION

```
authorization:
  mode: Webhook
  webhook:
    cacheAuthorizedTTL: 0s
    cacheUnauthorizedTTL: 0s
clusterDNS:
- 10.96.0.10
clusterDomain: cluster.local
cpuManagerReconcilePeriod: 0s
evictionPressureTransitionPeriod: 0s
fileCheckFrequency: 0s
healthzBindAddress: 127.0.0.1
healthzPort: 10248
httpCheckFrequency: 0s
imageMinimumGCAge: 0s
kind: KubeletConfiguration
nodeStatusReportFrequency: 0s
nodeStatusUpdateFrequency: 0s
rotateCertificates: true
runtimeRequestTimeout: 0s
staticPodPath: /etc/kubernetes/manifests
streamingConnectionIdleTimeout: 0s
syncFrequency: 0s
volumeStatsAggPeriod: 0s
:wq
```

F:\Work\Data Entry Work\Data Entry\20200827\CKA\23 E.JPG



9. Create a pod with image nginx called nginx and allow traffic on port 80

Answer:

See the solution below.

Explanation:

kubectl run nginx --image=nginx --restart=Never --port=80

10. From the pod label name=cpu-utilizer, find pods running high CPU workloads and write the name of the pod consuming most CPU to the file /opt/KUTR00102/KUTR00102.txt (which already exists).

Answer:

See the solution below.

Explanation:

solution

F:\Work\Data Entry Work\Data Entry\20200827\CKA\16 B.JPG

Readme Web Terminal THE LINUX FOUNDATION

```
root@node-1:~# k top po -l name=cpu-utilizer
NAME                    CPU(cores)   MEMORY(bytes)
cpu-utilizer-98b9se     60m          7Mi
cpu-utilizer-ab2d3s     14m          7Mi
cpu-utilizer-kipb9a     45m          7Mi
root@node-1:~# vim /opt/KUTR00102/KUTR00102.txt
```

F:\Work\Data Entry Work\Data Entry\20200827\CKA\16 C.JPG

Readme Web Terminal THE LINUX FOUNDATION

```
cpu-utilizer-98b9se
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
:wq
```

11. List all the pods sorted by created timestamp

Answer:

See the solution below.

Explanation:

kubect1 get pods--sort-by=.metadata.creationTimestamp

12. Create a Kubernetes secret as follows:

- Name: super-secret
- password: bob

Create a pod named pod-secrets-via-file, using the redis Image, which mounts a secret named super-secret at /secrets.

Create a second pod named pod-secrets-via-env, using the redis Image, which exports password as CONFIDENTIAL

Answer:

See the solution below.

Explanation:

solution

F:\Work\Data Entry Work\Data Entry\20200827\CKA\12 B.JPG

Readme Web Terminal THE LINUX FOUNDATION

```
root@node-1:~#
root@node-1:~# k create secret generic super-secret --from-literal=password=bob
secret/super-secret created
root@node-1:~# vim secret.yaml
```

F:\Work\Data Entry Work\Data Entry\20200827\CKA\12 C.JPG

Readme Web Terminal THE LINUX FOUNDATION

```
apiVersion: v1
kind: Pod
metadata:
  name: pod-secrets-via-file
spec:
  containers:
  - name: redis
    image: redis
    volumeMounts:
    - name: foo
      mountPath: "/secrets"
  volumes:
  - name: foo
    secret:
      secretName: super-secret
~
~
~
~
~
~
~
~
~
:w
```

F:\Work\Data Entry Work\Data Entry\20200827\CKA\12 D.JPG

Readme | Web Terminal | THE LINUX FOUNDATION

```
root@node-1:~# k create -f secret.yaml
pod/pod-secrets-via-file created
root@node-1:~# vim secret1.yaml
root@node-1:~# k create -f secret1.yaml
pod/pod-secrets-via-env created
root@node-1:~# k get po
NAME                        READY   STATUS    RESTARTS   AGE
cpu-utilizer-98b9se         1/1     Running   0          6h25m
cpu-utilizer-ab2d3s         1/1     Running   0          6h25m
cpu-utilizer-kipb9a         1/1     Running   0          6h25m
ds-kusc00201-2r2k9          1/1     Running   0          40m
ds-kusc00201-hzm9q          1/1     Running   0          40m
foo                         1/1     Running   0          6h28m
front-end                   1/1     Running   0          6h27m
hungry-bear                 1/1     Running   0          36m
kucc8                       3/3     Running   0          34m
nginx-app-848cfcf495-9prjh  1/1     Running   0          19m
nginx-app-848cfcf495-gl2kh  1/1     Running   0          19m
nginx-app-848cfcf495-pg2c8  1/1     Running   0          19m
nginx-kusc00101             1/1     Running   0          26m
pod-secrets-via-env         1/1     Running   0          4s
pod-secrets-via-file        1/1     Running   0          106s
webserver-84c55967f4-qzjcv  1/1     Running   0          6h43m
webserver-84c55967f4-t4791  1/1     Running   0          6h43m
root@node-1:~#
```

13. Print pod name and start time to “/opt/pod-status” file

Answer:

See the solution below.

Explanation:

kubect1 get pods -o=jsonpath='{range items[*]}{.metadata.name}{"\t"}{.status.podIP}{"\n"}{end}'

14. Create a persistent volume with name app-data, of capacity 2Gi and access mode ReadWriteMany.

The type of volume is hostPath and its location is /srv/app-data.

Answer:

See the solution below.

Explanation:

solution

Persistent Volume

A persistent volume is a piece of storage in a Kubernetes cluster. PersistentVolumes are a cluster-level resource like nodes, which don't belong to any namespace. It is provisioned by the administrator and has a particular file size. This way, a developer deploying their app on Kubernetes need not know the underlying infrastructure. When the developer needs a certain amount of persistent storage for their application, the system administrator configures the cluster so that they consume the PersistentVolume provisioned in an easy way.

Creating Persistent Volume

kind: PersistentVolumeapiVersion: v1metadata: name:app-dataspec: capacity: # defines the capacity of PV we are creating storage: 2Gi #the amount of storage we are tying to claim accessModes: # defines the rights of the volume we are creating - ReadWriteMany hostPath: path: "/srv/app-data" # path to which we are creating the volume

Challenge

- Create a Persistent Volume named app-data, with access mode ReadWriteMany, storage classname shared, 2Gi of storage capacity and the host path /srv/app-data.

```
apiVersion: v1
kind: PersistentVolume
metadata:
  name: app-data
spec:
  capacity:
    storage: 2Gi
  accessModes:
    - ReadWriteMany
  hostPath:
      path: /srv/app-data
  storageClassName: shared
~
~
~
~
~
~
~
~
~
~
~
"app-data.yaml" 12L, 194C
```

* 2. Save the file and create the persistent volume. Image for post

```
njerry191@cloudshell:~ (extreme-clone-265411)$ kubectl create -f pv.yaml
persistentvolume/pv created
```

* 3. View the persistent volume.

```
njerry191@cloudshell:~ (extreme-clone-265411)$ kubectl get pv
NAME      CAPACITY   ACCESS MODES   RECLAIM POLICY   STATUS      CLAIM   STORAGECLASS   REASON   AGE
app-data  2Gi        RWX            Retain           Available           shared                  31s
```

> Our persistent volume status is available meaning it is available and it has not been mounted yet. This status will change when we mount the persistentVolume to a persistentVolumeClaim.

PersistentVolumeClaim

In a real ecosystem, a system admin will create the PersistentVolume then a developer will create a PersistentVolumeClaim which will be referenced in a pod. A PersistentVolumeClaim is created by specifying the minimum size and the access mode they require from the persistentVolume.

Challenge

> Create a Persistent Volume Claim that requests the Persistent Volume we had created above. The claim should request 2Gi. Ensure that the Persistent Volume Claim has the same storageClassName as the persistentVolume you had previously created.

kind: PersistentVolumeapiVersion: v1metadata: name:app-data spec:

accessModes: - ReadWriteMany resources:

requests: storage: 2Gi

storageClassName: shared

* 2. Save and create the pvc

njerry191@cloudshell:~ (extreme-clone-2654111)$ kubect1 create -f app-data.yaml

persistentvolumeclaim/app-data created

* 3. View the pvc Image for post

```
njerry191@cloudshell:~ (extreme-clone-265411)$ kubectl get pvc
NAME    STATUS    VOLUME    CAPACITY    ACCESS MODES    STORAGECLASS
pv      Bound     pv        512m        RWX             shared
```

* 4. Let's see what has changed in the pv we had initially created.

Image for post

```
njerry191@cloudshell:~ (extreme-clone-265411)$ kubectl get pv
NAME    CAPACITY    ACCESS MODES    RECLAIM POLICY    STATUS    CLAIM        STORAGECLASS    REASON    AGE
pv      512m        RWX             Retain            Bound     default/pv   shared          16m
```

Our status has now changed from available to bound.

* 5. Create a new pod named myapp with image nginx that will be used to Mount the Persistent Volume Claim with the path /var/app/config.

Mounting a Claim

apiVersion: v1kind: Podmetadata: creationTimestamp: null name: app-dataspec: volumes: - name:congigpvc persistenVolumeClaim: claimName: app-data containers: - image: nginx name: app volumeMounts: - mountPath: "/srv/app-data " name: configpvc

15. Create a busybox pod that runs the command "env" and save the output to "envpod" file

Answer:

See the solution below.

Explanation:

kubectl run busybox --image=busybox --restart=Never –-rm -it -- env > envpod.yaml

16. Create a busybox pod and add “sleep 3600” command

Answer:

See the solution below.

Explanation:

kubectl run busybox --image=busybox --restart=Never -- /bin/sh -c "sleep 3600"

17. Score: 4%

Set configuration context:

```
[student@node-1] $ kube
ctl config use-context k
8s
```

Task

Create a pod named kucc8 with a single app container for each of the following images running inside (there may be between 1 and 4 images specified): nginx + redis + memcached .

Answer:

See the solution below.

Explanation: Solution:

kubectl run kucc8 --image=nginx --dry-run -o yaml > kucc8.yaml

vi kucc8.yaml apiVersion: v1 kind: Pod metadata:

creationTimestamp: null name: kucc8

spec: containers:

- image: nginx name: nginx

- image: redis name: redis

- image: memcached

name: memcached

- image: consul name: consul

#

kubectl create -f kucc8.yaml

#12.07

18. Set the node named ek8s-node-1 as unavailable and reschedule all the pods running on it.

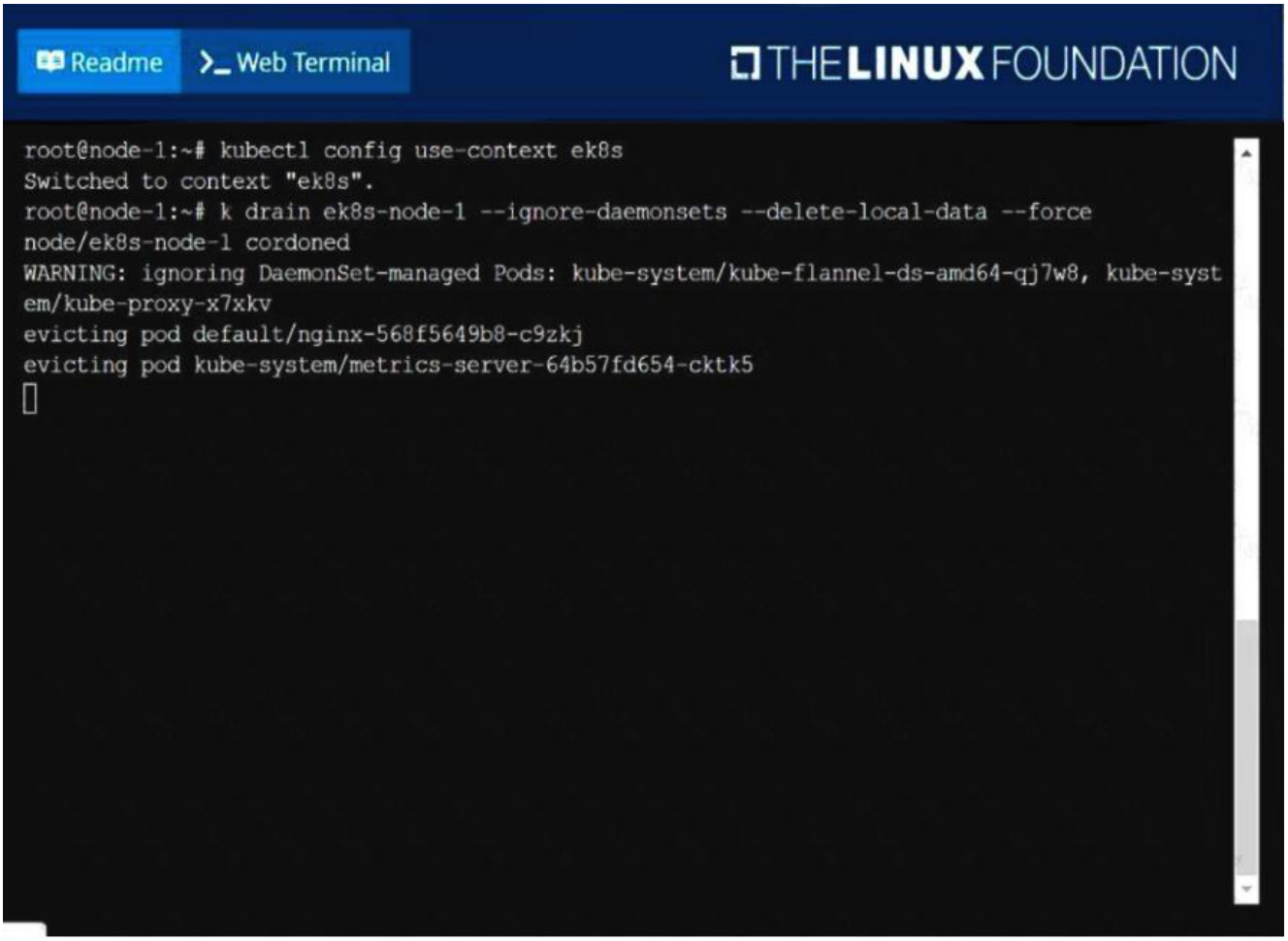
Answer:

See the solution below.

Explanation:

solution

F:\Work\Data Entry Work\Data Entry\20200827\CKA\19 B.JPG



19. Ensure a single instance of pod nginx is running on each node of the Kubernetes cluster where nginx also represents the Image name which has to be used. Do not override any taints currently in place.

Use DaemonSet to complete this task and use ds-kusc00201 as DaemonSet name.

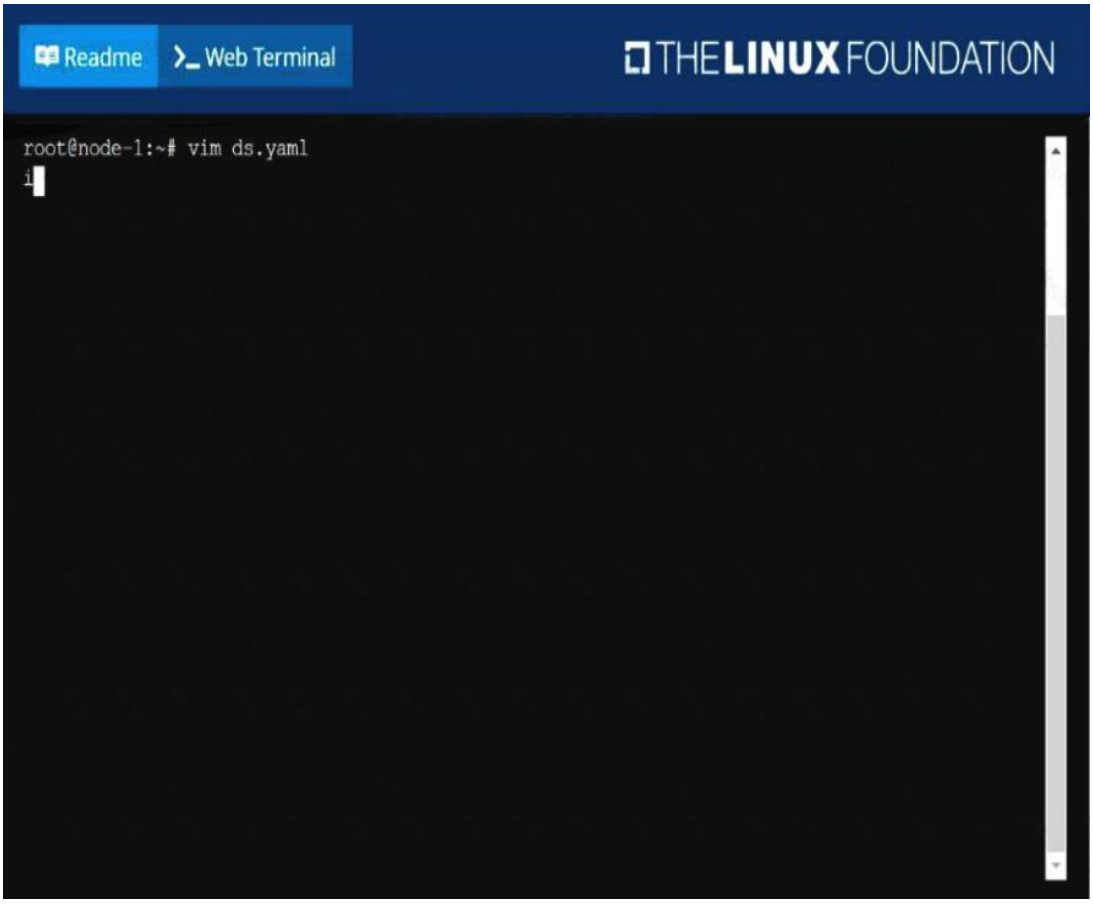
Answer:

See the solution below.

Explanation:

solution

F:\Work\Data Entry Work\Data Entry\20200827\CKA\3 B.JPG



F:\Work\Data Entry Work\Data Entry\20200827\CKA\3 C.JPG

Readme | Web Terminal — THE LINUX FOUNDATION

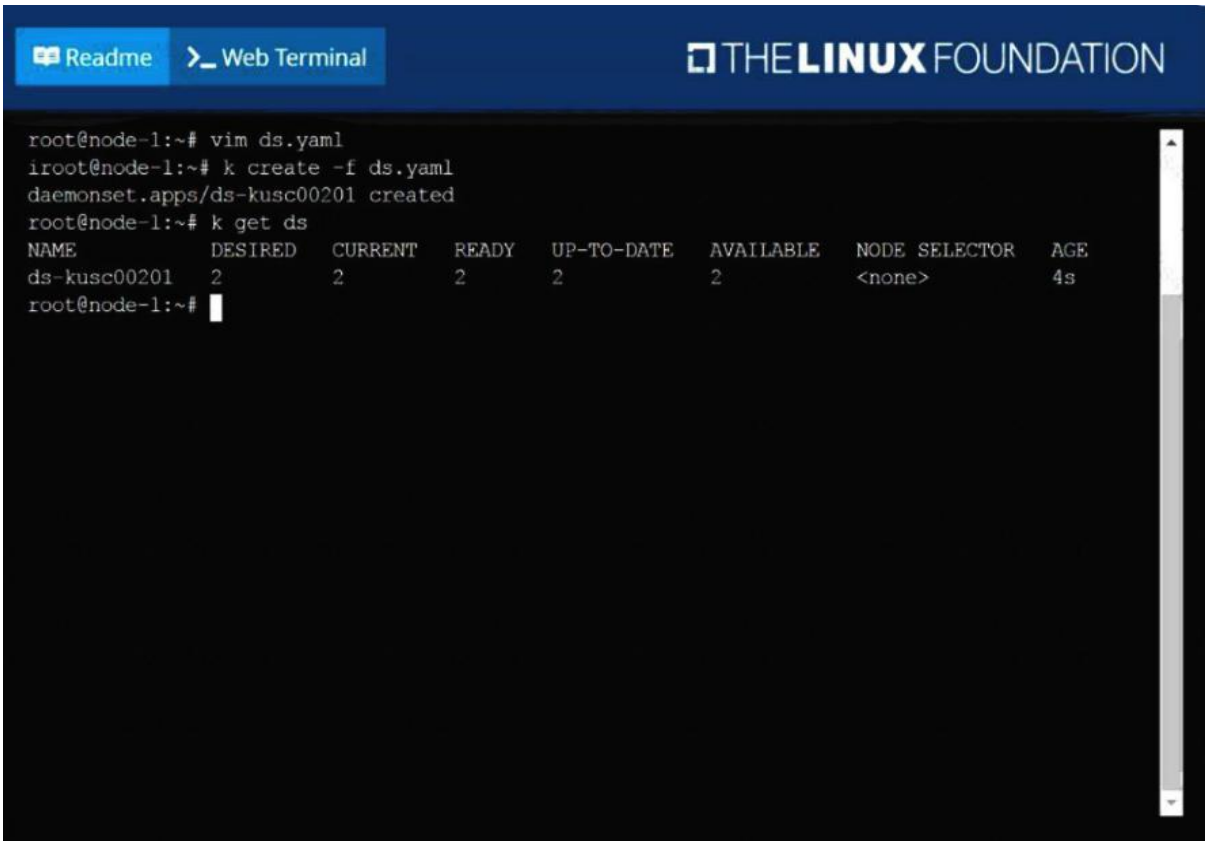
```
apiVersion: apps/v1
kind: DaemonSet
metadata:
  name: fluentd-elasticsearch
  namespace: kube-system
  labels:
    k8s-app: fluentd-logging
spec:
  selector:
    matchLabels:
      name: fluentd-elasticsearch
  template:
    metadata:
      labels:
        name: fluentd-elasticsearch
    spec:
      tolerations:
      # this toleration is to have the daemonset runnable on master nodes
      # remove it if your masters can't run pods
      - key: node-role.kubernetes.io/master
        effect: NoSchedule
      containers:
      - name: nginx
        image: nginx
-- INSERT --                                        17,19          All
```

F:\Work\Data Entry Work\Data Entry\20200827\CKA\3 D.JPG

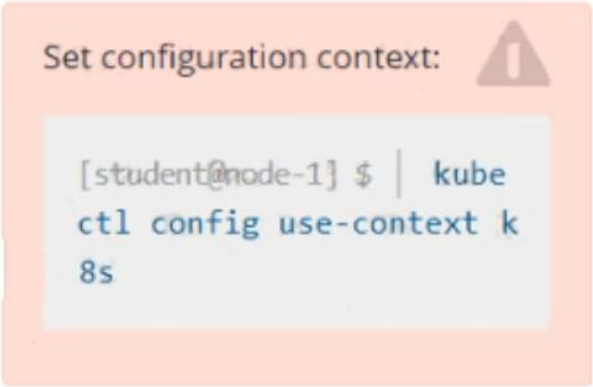
Readme | Web Terminal — THE LINUX FOUNDATION

```
apiVersion: apps/v1
kind: DaemonSet
metadata:
  name: ds-kusc00201
spec:
  selector:
    matchLabels:
      name: fluentd-elasticsearch
  template:
    metadata:
      labels:
        name: fluentd-elasticsearch
    spec:
      containers:
      - name: nginx
        image: nginx
~
~
~
~
~
~
~
~
:wq
```

F:\Work\Data Entry Work\Data Entry\20200827\CKA\3 E.JPG



20. Score: 7%



Task

Create a new nginx Ingress resource as follows:

• Name: ping

• Namespace: ing-internal

• Exposing service hi on path /hi using service port 5678

The availability of service hi can be checked using the following command, which should return hi :

```
[student@node-1] $ curl
-kL <INTERNAL_IP>/hi
```

Answer:

See the solution below.

Explanation:

Solution:

vi ingress.yaml

#

apiVersion: networking.k8s.io/v1 kind: Ingress

metadata: name: ping

namespace: ing-internal spec:

rules:

- http:

paths:

- path: /hi pathType: Prefix backend: service:

name: hi port:

number: 5678

#

kubectl create -f ingress.yaml

21. Scale the deployment webserver to 6 pods.

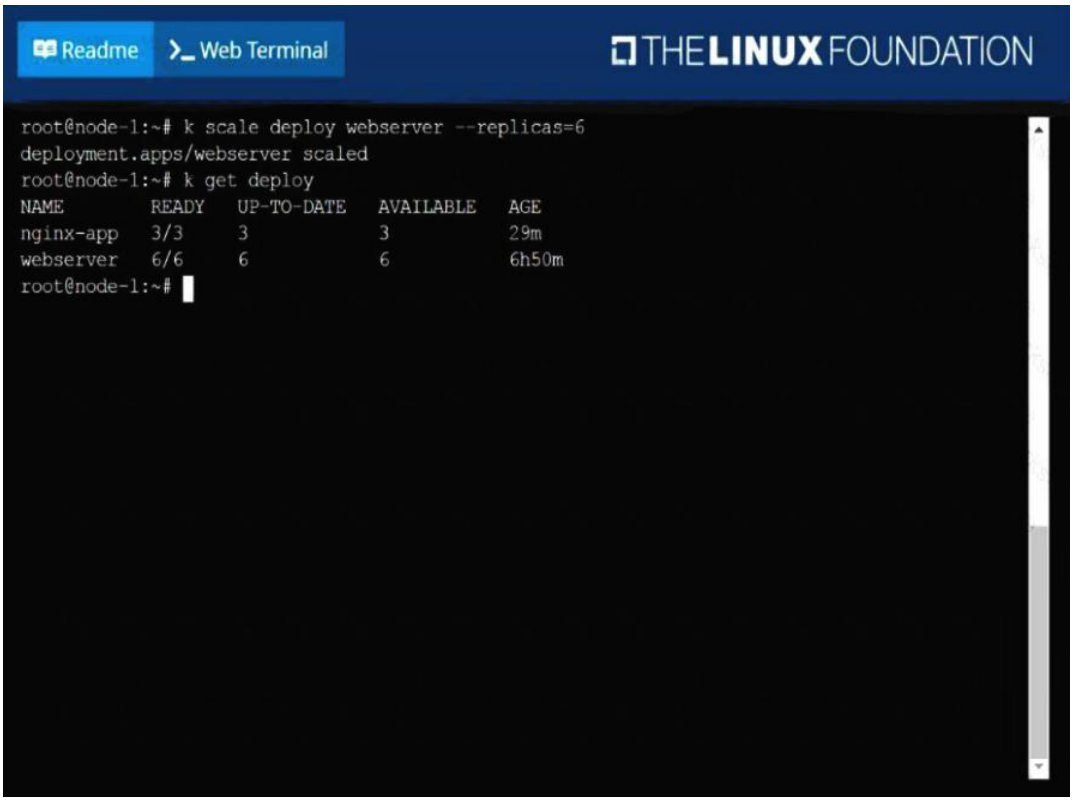
Answer:

See the solution below.

Explanation:

solution

F:\Work\Data Entry Work\Data Entry\20200827\CKA\14 B.JPG



22. Check the Image version of nginx-dev pod using jsonpath

Answer:

See the solution below.

Explanation:

kubect1 get po nginx-dev -o jsonpath='{.spec.containers[].image}{"\n"}'

23. Create a deployment as follows:

- Name: nginx-random
- Exposed via a service nginx-random
- Ensure that the service & pod are accessible via their respective DNS records
- The container(s) within any pod(s) running as a part of this deployment should use the nginx Image

Next, use the utility nslookup to look up the DNS records of the service & pod and write the output to /opt/KUNW00601/service.dns and /opt/KUNW00601/pod.dns respectively.

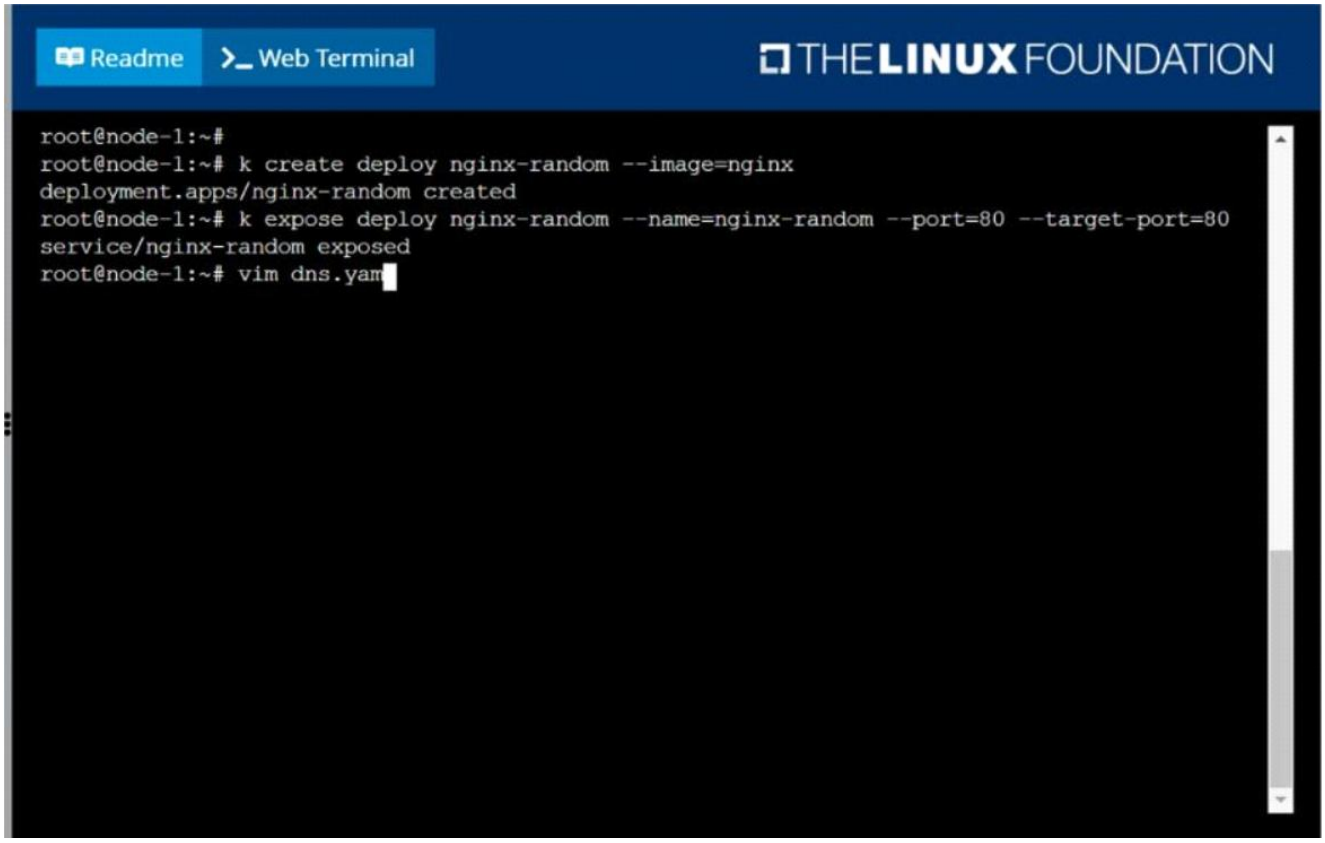
Answer:

See the solution below.

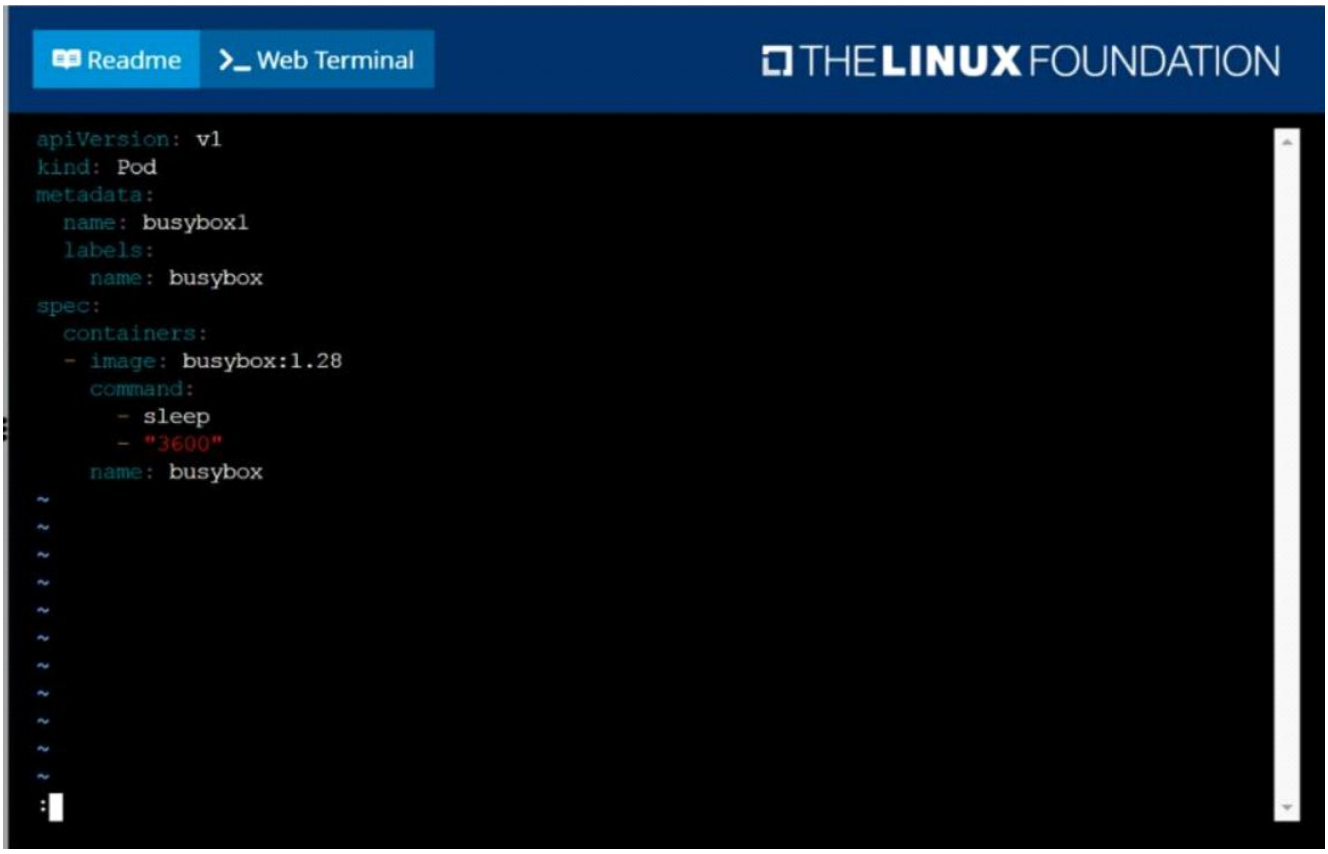
Explanation:

Solution:

F:\Work\Data Entry Work\Data Entry\20200827\CKA\17 C.JPG



F:\Work\Data Entry Work\Data Entry\20200827\CKA\17 D.JPG



F:\Work\Data Entry Work\Data Entry\20200827\CKA\17 E.JPG

Readme | Web Terminal | THE LINUX FOUNDATION

```
root@node-1:~# k create deploy nginx-random --image=nginx
deployment.apps/nginx-random created
root@node-1:~# k expose deploy nginx-random --name=nginx-random --port=80 --target-port=80
service/nginx-random exposed
root@node-1:~# vim dns.yaml
root@node-1:~# k create -f dns.yaml
pod/busybox1 created
root@node-1:~# k get po -o wide | grep nginx-random
nginx-random-6d5766bbdc-ptzv2   1/1     Running   0          103s    10.244.2.16   k8s-node-
1   <none>           <none>
root@node-1:~# k exec -it busybox1 -- nslookup nginx-random
Server:    10.96.0.10
Address 1: 10.96.0.10 kube-dns.kube-system.svc.cluster.local

Name:      nginx-random
Address 1: 10.111.37.132 nginx-random.default.svc.cluster.local
root@node-1:~# k exec -it busybox1 -- nslookup nginx-random  > /opt/KUNW00601/service.dns
root@node-1:~# k exec -it busybox1 -- nslookup 10-244-2-16.default.pod
Server:    10.96.0.10
Address 1: 10.96.0.10 kube-dns.kube-system.svc.cluster.local

Name:      10-244-2-16.default.pod
Address 1: 10.244.2.16 10-244-2-16.nginx-random.default.svc.cluster.local
root@node-1:~# k exec -it busybox1 -- nslookup 10-244-2-16.default.pod  > /opt/KUNW00601/pod
.dns
```

24. Task Weight: 4%

Set configuration context:

```
[student@node-1] $ kubectl config
use-context k8s
```

Task

Scale the deployment webserver to 3 pods.

Answer:

See the solution below.

Explanation:

Solution:

```
student@node-1:~$ kubectl  scale  deploy webserver  --replicas=3
deployment.apps/webserver scaled
student@node-1:~$ kubectl  scale  deploy webserver  --replicas=3
```

25. List all the pods sorted by name

Answer:

See the solution below.

Explanation:

kubect1 get pods --sort-by=.metadata.name

26. Create a pod named kucc8 with a single app container for each of the following images running inside (there may be between 1 and 4 images specified): nginx + redis + memcached.

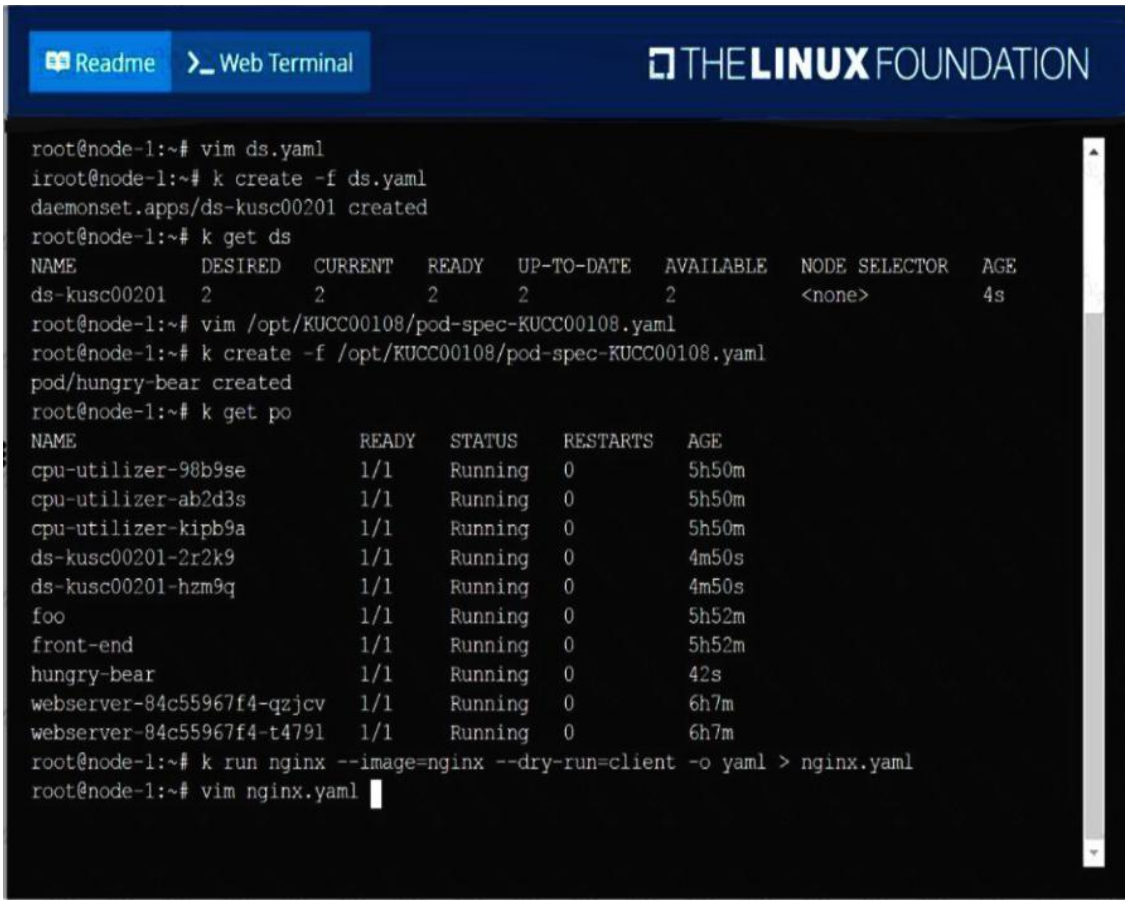
Answer:

See the solution below.

Explanation:

solution

F:\Work\Data Entry Work\Data Entry\20200827\CKA\5 B.JPG



F:\Work\Data Entry Work\Data Entry\20200827\CKA\5 C.JPG

Readme Web Terminal THE LINUX FOUNDATION

```
apiVersion: v1
kind: Pod
metadata:
  name: kucc8
spec:
  containers:
  - image: nginx
    name: nginx
  - image: redis
    name: redis
  - image: memcached
    name: memcached
~
~
~
~
~
~
~
~
~
~
~
~
:w
```

F:\Work\Data Entry Work\Data Entry\20200827\CKA\5 D.JPG

Readme Web Terminal THE LINUX FOUNDATION

```
cpu-utilizer-98b9se          1/1     Running             0          5h51m
cpu-utilizer-ab2d3s          1/1     Running             0          5h51m
cpu-utilizer-kipb9a          1/1     Running             0          5h51m
ds-kusc00201-2r2k9           1/1     Running             0          6m12s
ds-kusc00201-hzm9q           1/1     Running             0          6m12s
foo                          1/1     Running             0          5h54m
front-end                    1/1     Running             0          5h53m
hungry-bear                  1/1     Running             0          2m4s
kucc8                        0/3     ContainerCreating   0          4s
webserver-84c55967f4-qzjcv   1/1     Running             0          6h9m
webserver-84c55967f4-t4791   1/1     Running             0          6h9m
root@node-1:~# k get po
NAME                         READY   STATUS    RESTARTS   AGE
cpu-utilizer-98b9se          1/1     Running   0          5h52m
cpu-utilizer-ab2d3s          1/1     Running   0          5h52m
cpu-utilizer-kipb9a          1/1     Running   0          5h52m
ds-kusc00201-2r2k9           1/1     Running   0          6m31s
ds-kusc00201-hzm9q           1/1     Running   0          6m31s
foo                          1/1     Running   0          5h54m
front-end                    1/1     Running   0          5h54m
hungry-bear                  1/1     Running   0          2m23s
kucc8                        3/3     Running   0          23s
webserver-84c55967f4-qzjcv   1/1     Running   0          6h9m
webserver-84c55967f4-t4791   1/1     Running   0          6h9m
root@node-1:~#
```

27. Create 2 nginx image pods in which one of them is labelled with env=prod and another one labelled with env=dev and verify the same.

Answer:

See the solution below.

Explanation:

kubectl run --generator=run-pod/v1 --image=nginx -- labels=env=prod nginx-prod --dry-run -o yaml > nginx-prodpod.yaml Now, edit nginx-prod-pod.yaml file and remove entries like “creationTimestamp: null” “dnsPolicy: ClusterFirst”

vim nginx-prod-pod.yaml

apiVersion: v1 kind: Pod metadata: labels:

env: prod

name: nginx-prod spec:

containers:

- image: nginx name: nginx-prod

restartPolicy: Always

kubectl create -f nginx-prod-pod.yaml

kubectl run --generator=run-pod/v1 --image=nginx -- labels=env=dev nginx-dev --dry-run -o yaml >

nginx-dev-pod.yaml apiVersion: v1

kind: Pod metadata: labels: env: dev

name: nginx-dev spec:

containers:

- image: nginx name: nginx-dev

restartPolicy: Always

kubectl create -f nginx-prod-dev.yaml

Verify :

kubectl get po --show-labels kubectl get po -l env=prod kubectl get po -l env=dev

28. Create a pod that echo “hello world” and then exists. Have the pod deleted automatically when it’s completed

Answer:

See the solution below.

Explanation:

kubectl run busybox --image=busybox -it --rm --restart=Never -

/bin/sh -c 'echo hello world'

kubectl get po # You shouldn't see pod with the name "busybox"

29. For this item, you will have to ssh to the nodes ik8s-master-0 and ik8s-node-0 and complete all tasks on these nodes. Ensure that you return to the base node (hostname: node-1) when you have completed this item.

Context

As an administrator of a small development team, you have been asked to set up a Kubernetes cluster to test the viability of a new application.

Task

You must use kubeadm to perform this task. Any kubeadm invocations will require the use of the --ignore-preflight-errors=all option.

- Configure the node ik8s-master-O as a master node. .
- Join the node ik8s-node-o to the cluster.

Answer:

See the solution below.

Explanation:

solution

You must use the kubeadm configuration file located at /etc/kubeadm.conf when initializingyour cluster.

You may use any CNI plugin to complete this task, but if you don't have your favourite CNI plugin's manifest URL at hand, Calico is one popular option: https://docs.projectcalico.org/v3.14/manifests/calico.yaml

Docker is already installed on both nodes and apt has been configured so that you can install the required tools.

30. Score: 13%

Set configuration context:

```
[student@node-1] $ kube
ctl config use-context w
k8s
```

Task

A Kubernetes worker node, named wk8s-node-0 is in state NotReady. Investigate why this is the case, and perform any appropriate steps to bring the node to a Ready state, ensuring that any changes are made permanent.

You can ssh to the failed node using:

```
[student@node-1] $ ssh wk8s-node-0
```

You can assume elevated privileges on the node with the following command:

```
[student@w8ks-node-0] $ sudo -i
```

Answer:

See the solution below.

Explanation:

Solution:

sudo -i

systemctl status kubelet systemctl start kubelet systemctl enable kubelet

31. Create a namespace called 'development' and a pod with image nginx called nginx on this namespace.

Answer:

See the solution below.

Explanation:

kubectl create namespace development

kubectl run nginx --image=nginx --restart=Never -n development

32. Create a pod with environment variables as var1=value1.Check the environment variable in pod

Answer:

See the solution below.

Explanation:

kubectl run nginx --image=nginx --restart=Never --env=var1=value1

then

kubectl exec -it nginx -- env

or

kubectl exec -it nginx -- sh -c 'echo $var1'

or

kubectl describe po nginx | grep value1

33. Create a pod as follows:

- Name: non-persistent-redis
- container Image: redis
- Volume with name: cache-control
- Mount path: /data/redis

The pod should launch in the staging namespace and the volume must not be persistent.

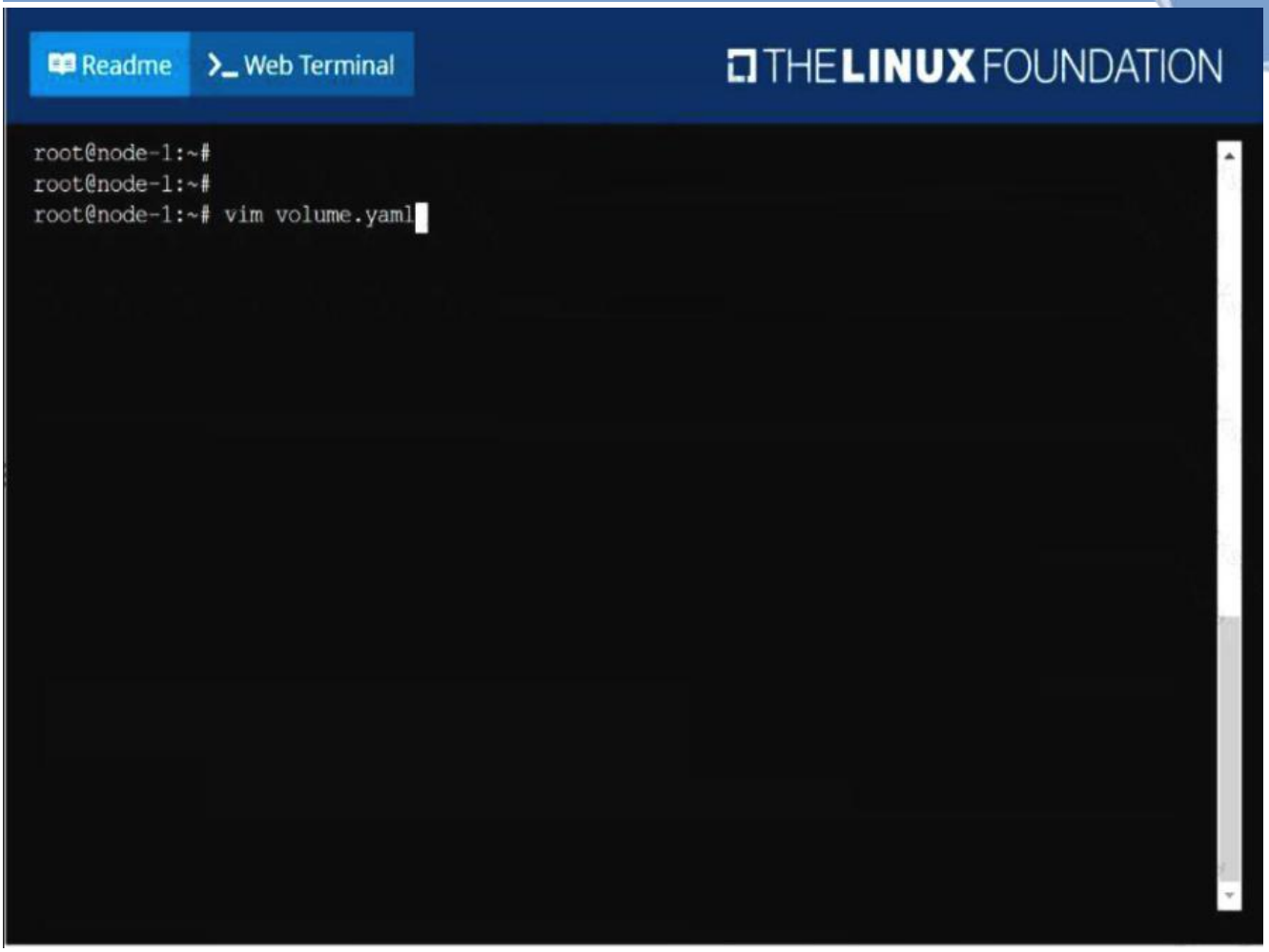
Answer:

See the solution below.

Explanation:

solution

F:\Work\Data Entry Work\Data Entry\20200827\CKA\13 B.JPG



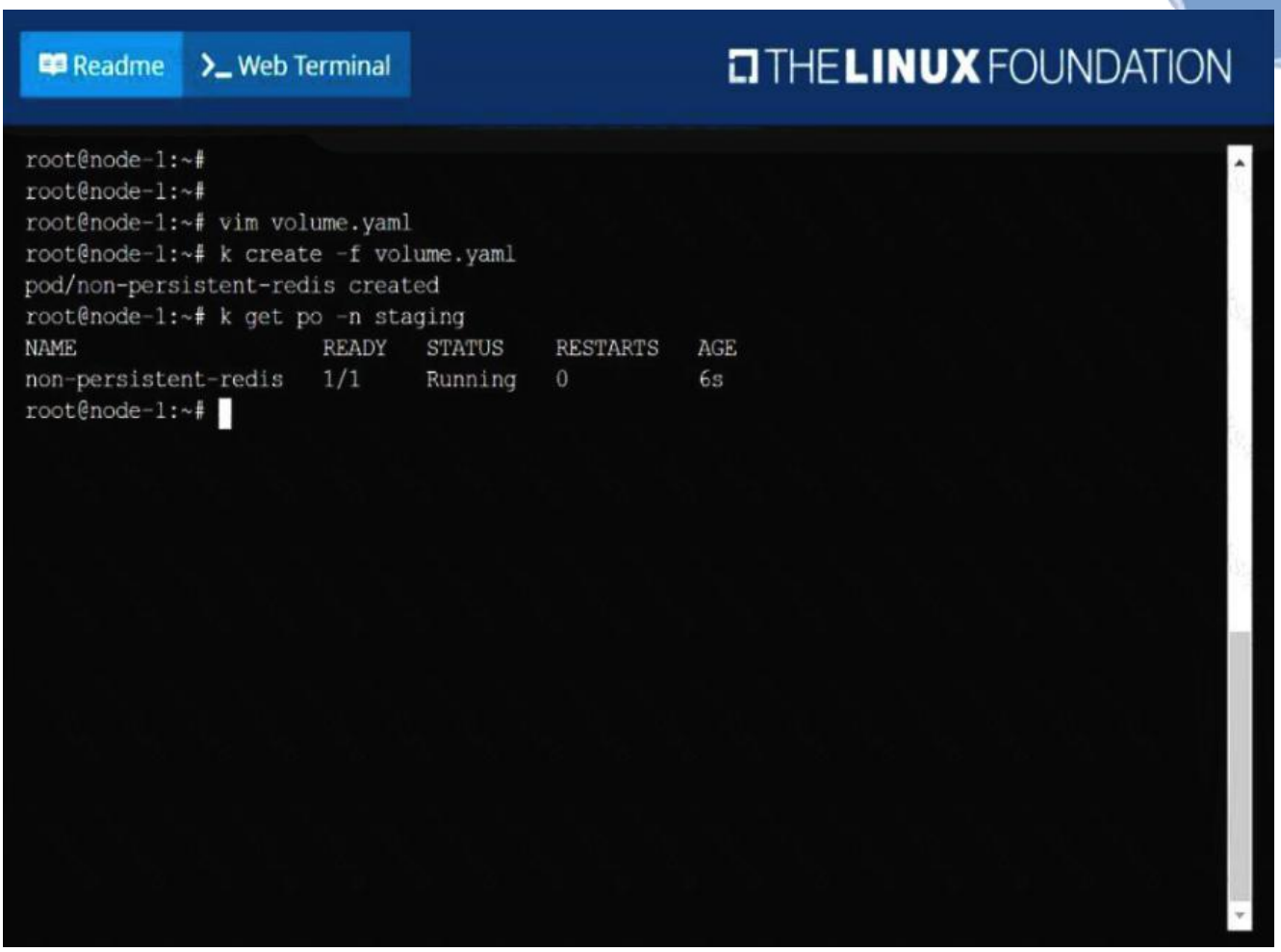
F:\Work\Data Entry Work\Data Entry\20200827\CKA\13 C.JPG

Readme | Web Terminal

THE LINUX FOUNDATION

```
apiVersion: v1
kind: Pod
metadata:
  name: non-persistent-redis
  namespace: staging
spec:
  containers:
  - name: redis
    image: redis
    volumeMounts:
    - name: cache-control
      mountPath: /data/redis
  volumes:
  - name: cache-control
    emptyDir: {}
~
~
~
~
~
~
~
~
~
:w
```

F:\Work\Data Entry Work\Data Entry\20200827\CKA\13 D.JPG



34. Get list of all the pods showing name and namespace with a jsonpath expression.

Answer:

See the solution below.

Explanation:

kubectl get pods -o=jsonpath="{.items[*]['metadata.name'

, 'metadata.namespace']}"

35. Check the image version in pod without the describe command

Answer:

See the solution below.

Explanation:

kubectl get po nginx -o jsonpath='{.spec.containers[].image}{"\n"}'

36. Score: 4%

Set configuration context:

```
[student@node-1] $ kube
ctl config use-context k
8s
```

Task

Schedule a pod as follows:

• Name: nginx-kusc00401

• Image: nginx

• Node selector: disk=ssd

Answer:

See the solution below.

Explanation:

Solution:

#yaml apiVersion: v1 kind: Pod metadata:

name: nginx-kusc00401 spec:

containers:

- name: nginx image: nginx

imagePullPolicy: IfNotPresent nodeSelector:

disk: spinning

#

kubectl create -f node-select.yaml

37. Create an nginx pod and list the pod with different levels of verbosity

Answer:

See the solution below.

Explanation:

// create a pod

kubectl run nginx --image=nginx --restart=Never --port=80

// List the pod with different verbosity kubectl get po nginx --v=7

kubectl get po nginx --v=8 kubectl get po nginx --v=9

38. Check to see how many worker nodes are ready (not including nodes tainted NoSchedule) and write the number to /opt/KUCC00104/kucc00104.txt.

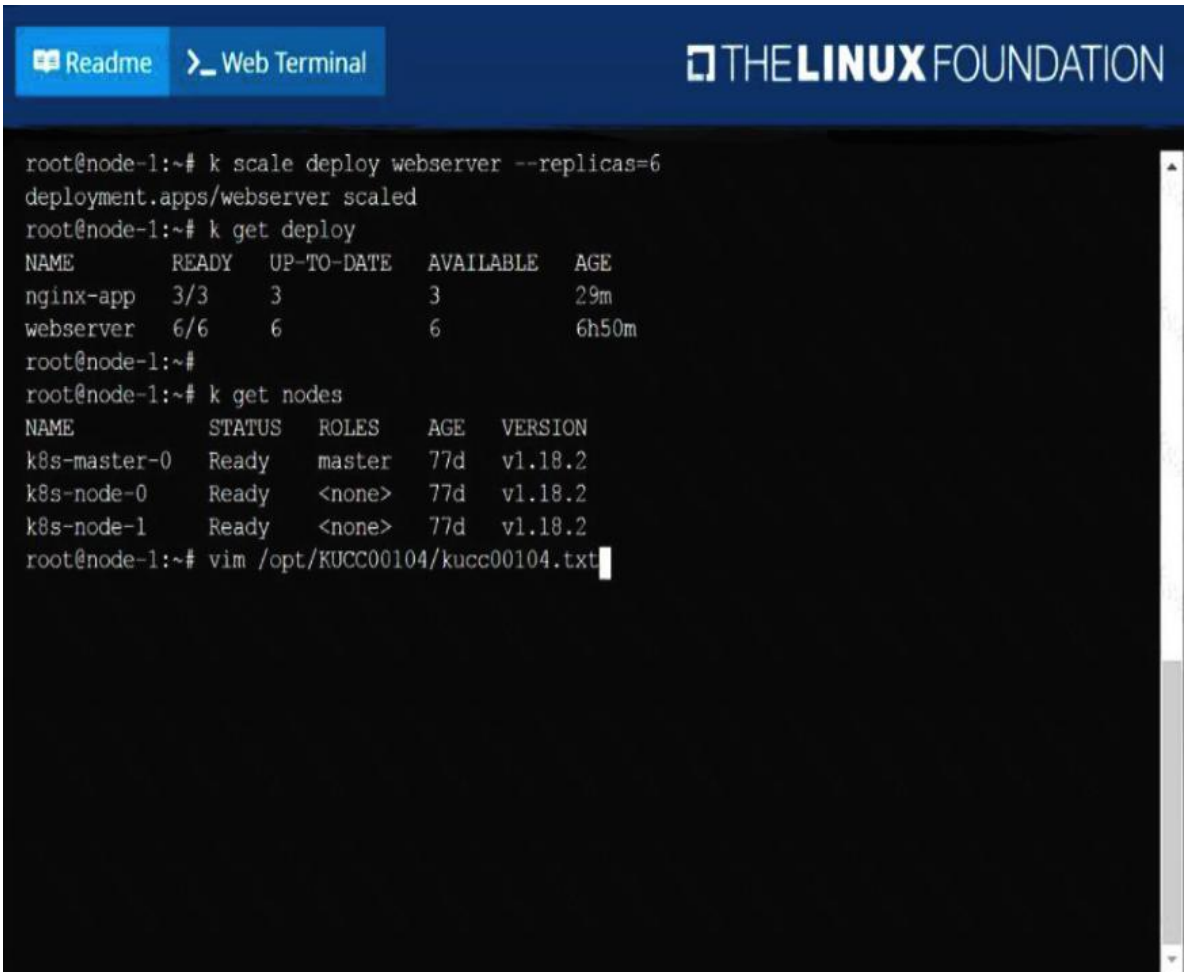
Answer:

See the solution below.

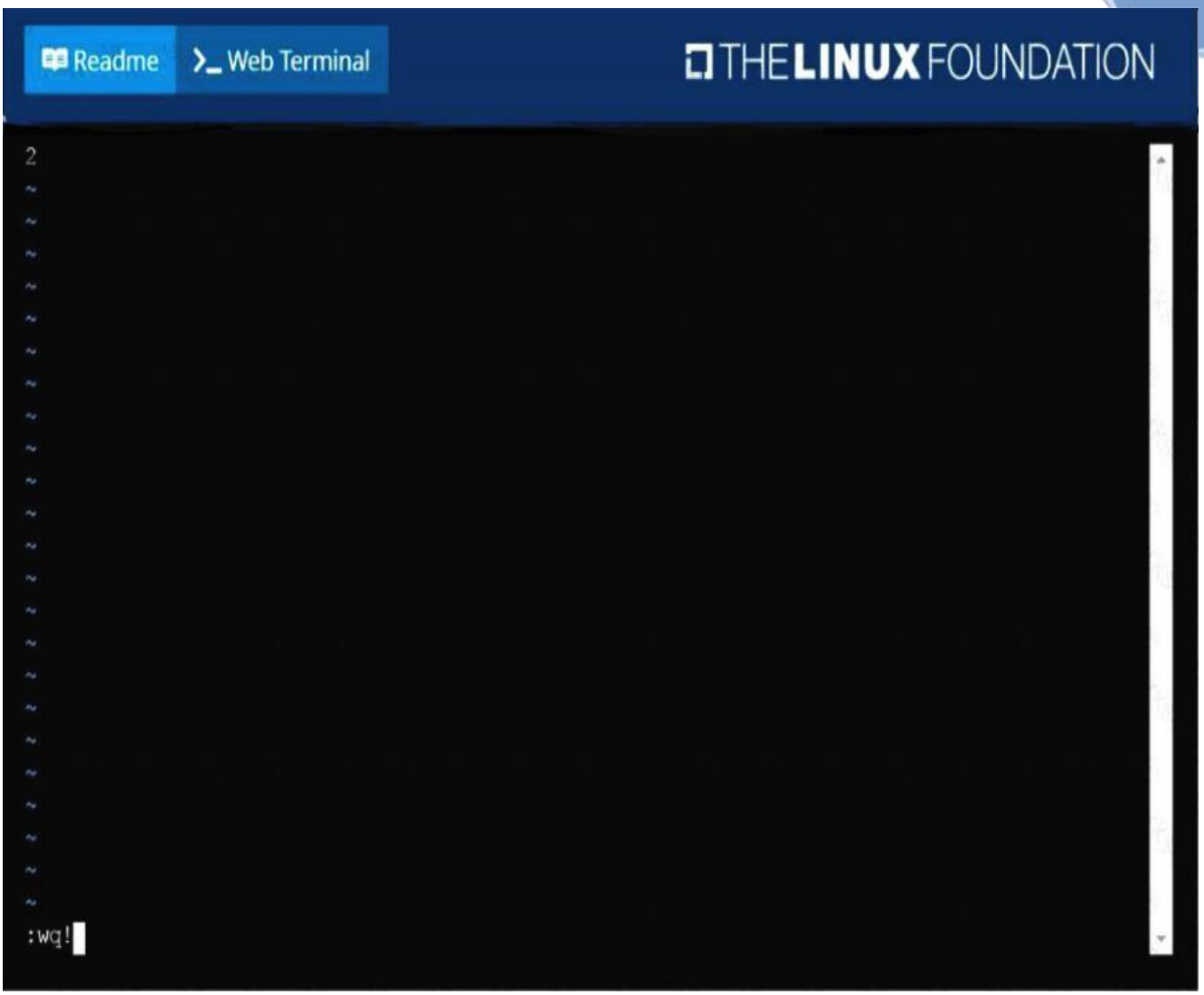
Explanation:

solution

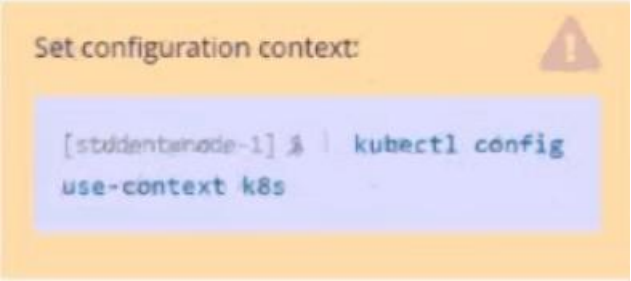
F:\Work\Data Entry Work\Data Entry\20200827\CKA\15 B.JPG



F:\Work\Data Entry Work\Data Entry\20200827\CKA\15 C.JPG



39. Task Weight: 4%



Task

Schedule a Pod as follows:

• Name: kucc1

• App Containers: 2

• Container Name/Images: o nginx

o consul

Answer:

See the solution below.

Explanation: Solution:

```
student@node-1:~$ kubectl config use-context k8s
Switched to context "k8s".
student@node-1:~$ kubectl run kucc1   --image=nginx --dry-run=client -o yaml > aa.y
```

Graphical user interface, text, application Description automatically generated

```
Readme   >_ Web Terminal                                THE LINUX FOUNDATION

apiVersion: v1
kind: Pod
metadata:
  labels:
    run: kucc1
  name: kucc1
spec:
  containers:
  - image: nginx
    name: nginx
  - image: consul
    name: consul
~
~
~
~
~
~
~
~
~
~
~
~
~
```

Text Description automatically generated

```
student@node-1:~$ kubectl config use-context k8s
Switched to context "k8s".
student@node-1:~$ kubectl run kucc1   --image=nginx --dry-run=client -o yaml > aa.yaml
student@node-1:~$ vim aa.yaml
student@node-1:~$ kubectl   create  -f aa.yaml
pod/kucc1 created
student@node-1:~$ kubectl get pods
NAME                      READY   STATUS              RESTARTS   AGE
11-factor-app             1/1     Running             0          6h34m
cpu-loader-98b9se         1/1     Running             0          6h33m
cpu-loader-ab2d3s         1/1     Running             0          6h33m
cpu-loader-kipb9a         1/1     Running             0          6h33m
foobar                    1/1     Running             0          6h34m
front-end-6bc87b9748-24rcm   1/1     Running             0          5m4s
front-end-6bc87b9748-hd5wp   1/1     Running             0          5m2s
kucc1                     0/2     ContainerCreating   0          3s
nginx-kusc00401           1/1     Running             0          2m28s
webserver-84c89dfd75-2dljn   1/1     Running             0          6h38m
webserver-84c89dfd75-8d8x2   1/1     Running             0          6h38m
webserver-84c89dfd75-z5zz4   1/1     Running             0          3m51s
student@node-1:~$
```

40. List the nginx pod with custom columns POD_NAME and POD_STATUS

Answer:

See the solution below.

Explanation:

kubectl get po -o=custom-columns="POD_NAME:.metadata.name,

POD_STATUS:.status.containerStatuses[].state"

41. Get IP address of the pod – “nginx-dev”

Answer:

See the solution below.

Explanation:

Kubect1 get po -o wide Using JsonPath

kubect1 get pods -o=jsonpath='{range items[*]}{.metadata.name}{"\t"}{.status.podIP}{"\n"}{end}'

42. Create a file:

/opt/KUCC00302/kucc00302.txt that lists all pods that implement service baz in namespace development.

The format of the file should be one pod name per line.

Answer:

See the solution below.

Explanation:

solution

F:\Work\Data Entry Work\Data Entry\20200827\CKA\11 B.JPG

Readme | Web Terminal — THE LINUX FOUNDATION

```
root@node-1:~#
root@node-1:~# k describe svc baz -n development
Name:              baz
Namespace:         development
Labels:            <none>
Annotations:       <none>
Selector:          name=foo
Type:              ClusterIP
IP:                10.104.252.175
Port:              <unset>  80/TCP
TargetPort:        9376/TCP
Endpoints:         10.244.1.5:9376,10.244.2.3:9376,10.244.2.6:9376
Session Affinity:  None
Events:            <none>
root@node-1:~# k get po -l name=foo -n development
NAME                    READY   STATUS    RESTARTS   AGE
pod-kucc00302-847878    1/1     Running   0          6h35m
pod-kucc00302-983457    1/1     Running   0          6h35m
pod-kucc00302-985953    1/1     Running   0          6h35m
root@node-1:~# k get po -l name=foo -n development  -o NAME
pod/pod-kucc00302-847878
pod/pod-kucc00302-983457
pod/pod-kucc00302-985953
root@node-1:~# k get po -l name=foo -n development  -o NAME  > /opt/KUCC00302/kucc00302.txt
root@node-1:~# vim /opt/KUCC00302/kucc00302.txt
```

F:\Work\Data Entry Work\Data Entry\20200827\CKA\11 C.JPG

Readme | Web Terminal — THE LINUX FOUNDATION

```
pod-kucc00302-847878
pod-kucc00302-983457
pod-kucc00302-985953
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
:wq
```

F:\Work\Data Entry Work\Data Entry\20200827\CKA\11 D.JPG

Readme | Web Terminal

THE LINUX FOUNDATION

```
Name:              baz
Namespace:         development
Labels:            <none>
Annotations:       <none>
Selector:          name=foo
Type:              ClusterIP
IP:                10.104.252.175
Port:              <unset>  80/TCP
TargetPort:        9376/TCP
Endpoints:         10.244.1.5:9376,10.244.2.3:9376,10.244.2.6:9376
Session Affinity:  None
Events:            <none>
root@node-1:~# k get po -l name=foo -n development
NAME                   READY   STATUS    RESTARTS   AGE
pod-kucc00302-847878   1/1     Running   0          6h35m
pod-kucc00302-983457   1/1     Running   0          6h35m
pod-kucc00302-985953   1/1     Running   0          6h35m
root@node-1:~# k get po -l name=foo -n development  -o NAME
pod/pod-kucc00302-847878
pod/pod-kucc00302-983457
pod/pod-kucc00302-985953
root@node-1:~# k get po -l name=foo -n development  -o NAME  > /opt/KUCC00302/kucc00302.txt
root@node-1:~# vim /opt/KUCC00302/kucc00302.txt
root@node-1:~# vim /opt/KUCC00302/kucc00302.txt
root@node-1:~#
```

43. Create a pod as follows:

- Name: mongo
- Using Image: mongo
- In a new Kubernetes namespace named: my-website

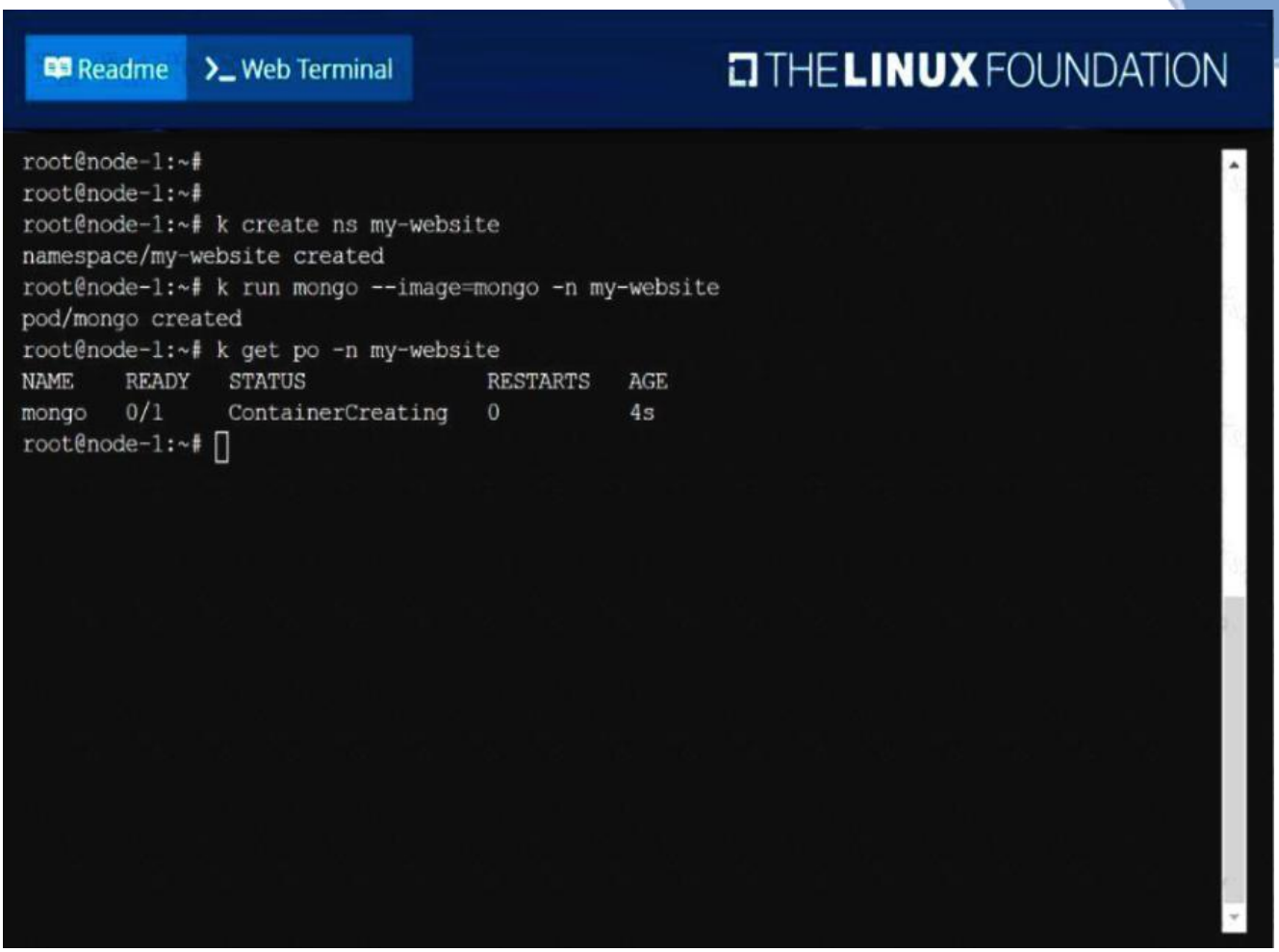
Answer:

See the solution below.

Explanation:

solution

F:\Work\Data Entry Work\Data Entry\20200827\CKA\9 B.JPG



44. Perform the following tasks:

- Add an init container to hungry-bear (which has been defined in spec file

/opt/KUCC00108/pod-spec-KUCC00108.yaml)

- The init container should create an empty file named/workdir/calm.txt
- If /workdir/calm.txt is not detected, the pod should exit
- Once the spec file has been updated with the init container definition, the pod should be created

Answer:

See the solution below.

Explanation:

solution

F:\Work\Data Entry Work\Data Entry\20200827\CKA\4 B.JPG

Readme Web Terminal THE LINUX FOUNDATION

```
root@node-1:~# vim ds.yaml
iroot@node-1:~# k create -f ds.yaml
daemonset.apps/ds-kusc00201 created
root@node-1:~# k get ds
NAME          DESIRED   CURRENT   READY   UP-TO-DATE   AVAILABLE   NODE SELECTOR   AGE
ds-kusc00201  2         2         2       2            2           <none>          4s
root@node-1:~# vim /opt/KUCC00108/pod-spec-KUCC00108.yaml
```

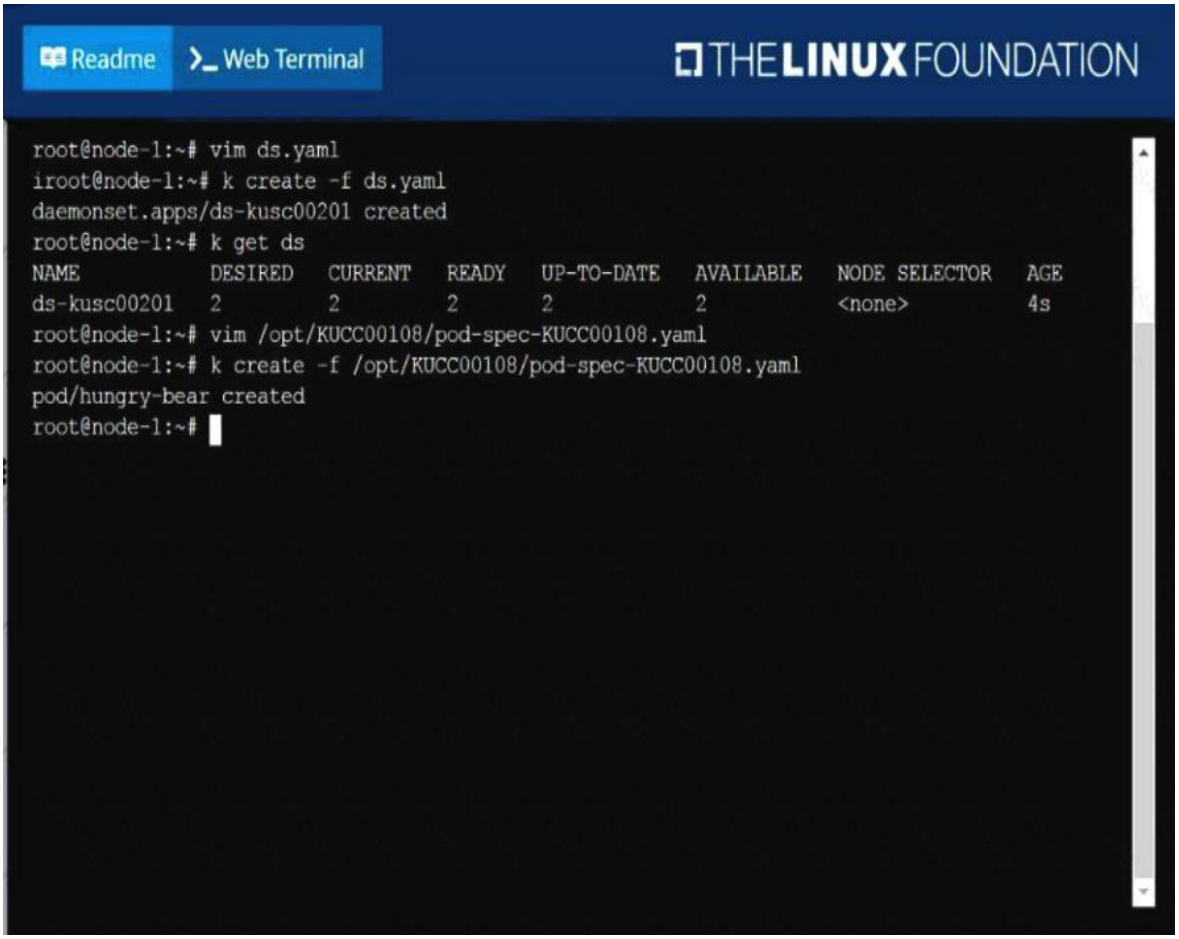
F:\Work\Data Entry Work\Data Entry\20200827\CKA\4 C.JPG

Readme | Web Terminal

THE LINUX FOUNDATION

```
apiVersion: v1
kind: Pod
metadata:
  name: hungry-bear
spec:
  volumes:
    - name: workdir
      emptyDir:
  containers:
  - name: checker
    image: alpine
    command: ["/bin/sh", "-c", "if [ -f /workdir/calm.txt ];
              then sleep 100000; else exit 1; fi"]
    volumeMounts:
    - name: workdir
      mountPath: /workdir
  initContainers:
  - name: create
    image: alpine
    command: ["/bin/sh", "-c", "touch /workdir/calm.txt"]
    volumeMounts:
    - name: workdir
      mountPath: /workdir
:wq
```

F:\Work\Data Entry Work\Data Entry\20200827\CKA\4 D.JPG



45. Create a deployment spec file that will:

- Launch 7 replicas of the nginx Image with the labelapp_runtime_stage=dev
- deployment name: kual00201

Save a copy of this spec file to /opt/KUAL00201/spec_deployment.yaml

(or /opt/KUAL00201/spec_deployment.json).

When you are done, clean up (delete) any new Kubernetes API object that you produced during this task.

Answer:

See the solution below.

Explanation:

solution

F:\Work\Data Entry Work\Data Entry\20200827\CKA\10 B.JPG

Readme Web Terminal THE LINUX FOUNDATION

```
root@node-1:~# k create deploy kual00201  --image=nginx --dry-run=client -o yaml > /opt/KUAL
00201/spec_deployment.yaml
root@node-1:~# vim /opt/KUAL00201/spec_deployment.yaml
```

F:\Work\Data Entry Work\Data Entry\20200827\CKA\10 C.JPG

Readme | Web Terminal

THE LINUX FOUNDATION

```
apiVersion: apps/v1
kind: Deployment
metadata:
  labels:
    app_runtime_stage: dev
  name: kual00201
spec:
  replicas: 7
  selector:
    matchLabels:
      app_runtime_stage: dev
  template:
    metadata:
      labels:
        app_runtime_stage: dev
    spec:
      containers:
      - image: nginx
        name: nginx
~
~
~
~
~
"/opt/KUAL00201/spec_deployment.yaml" 19L, 320C written
```

46. Score: 4%

Set configuration context:

```
[student@node-1] $ kube
ctl config use-context k
8s
```

Task

Scale the deployment presentation to 6 pods.

Answer:

See the solution below.

Explanation:

Solution:

kubectl get deployment

kubectl scale deployment.apps/presentation --replicas=6

47. Create a deployment as follows:

- Name: nginx-app
- Using container nginx with version 1.11.10-alpine
- The deployment should contain 3 replicas

Next, deploy the application with new version 1.11.13-alpine, by performing a rolling update.

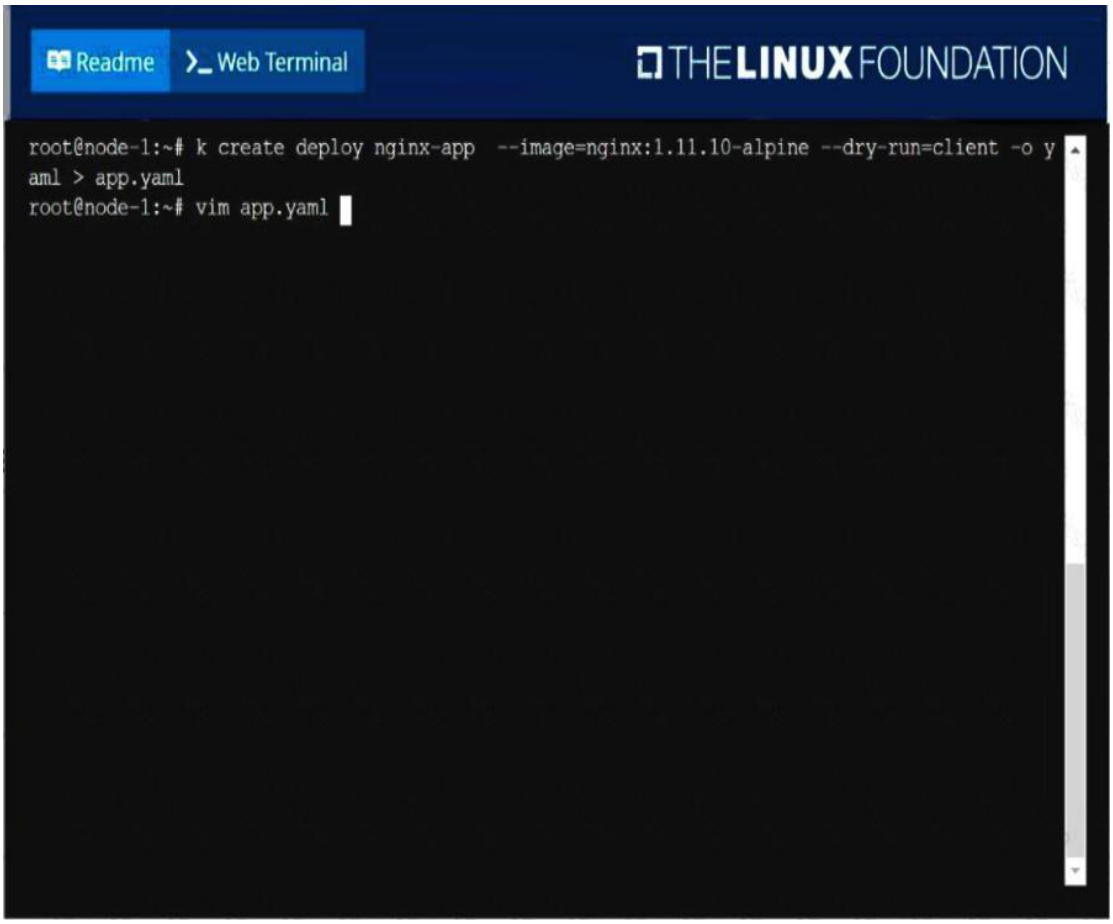
Finally, rollback that update to the previous version 1.11.10-alpine.

Answer:

See the solution below.

Explanation: solution

F:\Work\Data Entry Work\Data Entry\20200827\CKA\7 B.JPG



F:\Work\Data Entry Work\Data Entry\20200827\CKA\7 C.JPG

Readme | Web Terminal

THE LINUX FOUNDATION

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: nginx-app
spec:
  replicas: 3
  selector:
    matchLabels:
      app: nginx-app
  template:
    metadata:
      labels:
        app: nginx-app
    spec:
      containers:
      - image: nginx:1.11.10-alpine
        name: nginx
~
~
~
~
~
~
~
"app.yaml
```

F:\Work\Data Entry Work\Data Entry\20200827\CKA\7 D.JPG

Readme | Web Terminal | THE LINUX FOUNDATION

```
root@node-1:~# k create deploy nginx-app  --image=nginx:1.11.10-alpine --dry-run=client -o y
aml > app.yaml
root@node-1:~# vim app.yaml
root@node-1:~# k create -f app.yaml
deployment.apps/nginx-app created
root@node-1:~#
root@node-1:~#
root@node-1:~# k set image deploy nginx-app nginx=nginx:1.11.13-alpine  --record
deployment.apps/nginx-app image updated
root@node-1:~# k rollout undo deploy nginx-app
deployment.apps/nginx-app rolled back
root@node-1:~#
```

48. Monitor the logs of pod foo and:

- Extract log lines corresponding to error unable-to-access-website
- Write them to/opt/KULM00201/foo

Set configuration context:

```
[student@node-1] $ kube
ctl config use-context
k8s
```

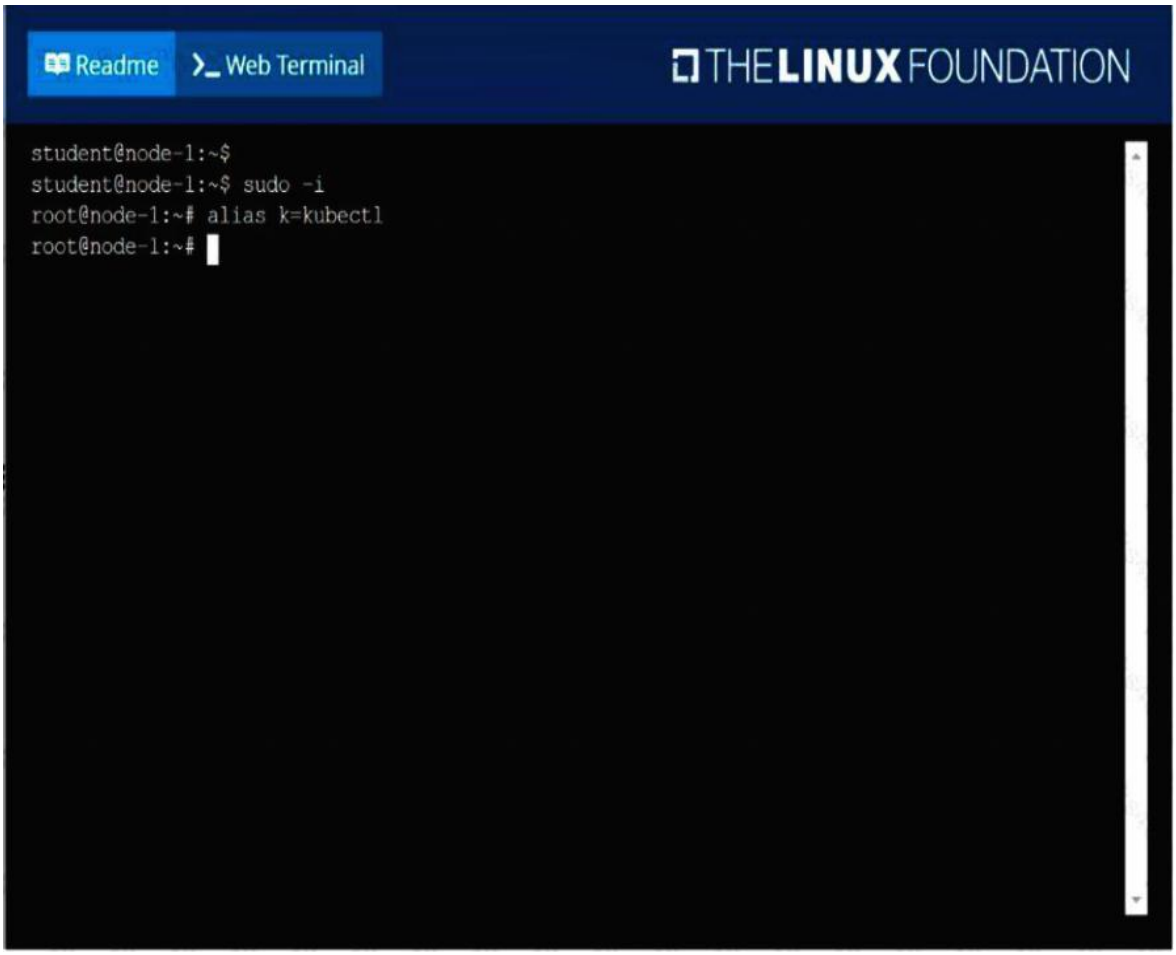
Answer:

See the solution below.

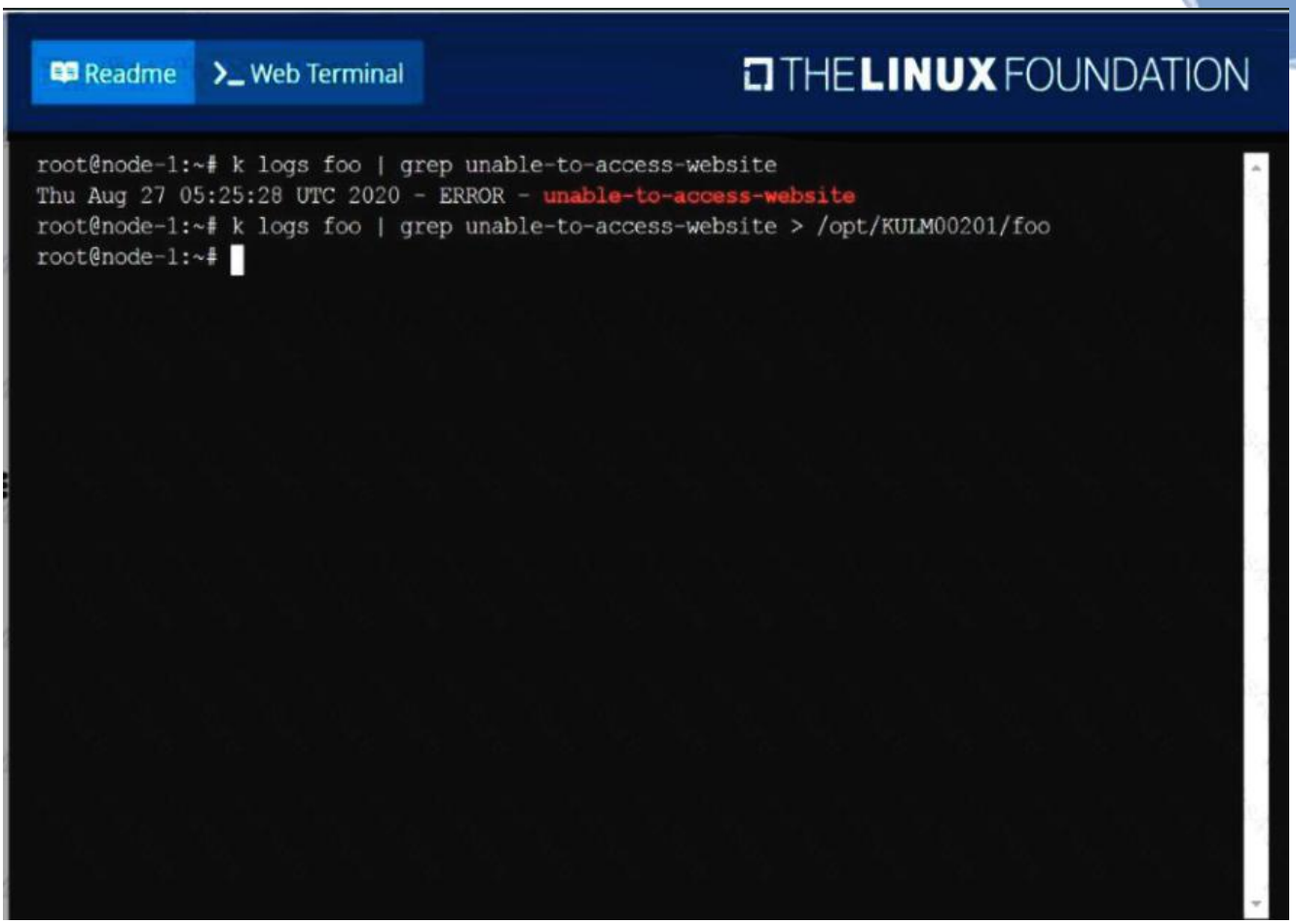
Explanation:

solution

F:\Work\Data Entry Work\Data Entry\20200827\CKA\1 B.JPG



F:\Work\Data Entry Work\Data Entry\20200827\CKA\1 C.JPG



49. Score: 5%

Task

From the pod label name=cpu-utilizer, find pods running high CPU workloads and write the name of the pod consuming most CPU to the file /opt/KUTR00401/KUTR00401.txt (which already exists).

Answer:

See the solution below.

Explanation:

Solution:

kubectl top -l name=cpu-user -A

echo 'pod name' >> /opt/KUT00401/KUT00401.txt

50. Score: 4%

Set configuration context:

```
[student@node-1] $ kube
ctl config use-context k
8s
```

Task

Check to see how many nodes are ready (not including nodes tainted NoSchedule) and write the number to /opt/KUSC00402/kusc00402.txt.

Answer:

See the solution below.

Explanation:

Solution:

kubectl describe nodes | grep ready|wc -l

kubectl describe nodes | grep -i taint | grep -i noschedule |wc -l echo 3 > /opt/KUSC00402/kusc00402.txt

#

kubectl get node | grep -i ready |wc -l

taintsnoSchedule

kubectl describe nodes | grep -i taints | grep -i noschedule |wc -l

#

echo 2 > /opt/KUSC00402/kusc00402.txt

51. List pod logs named “frontend” and search for the pattern “started” and write it to a file “/opt/error-logs”

Answer:

See the solution below.

Explanation:

Kubectl logs frontend | grep -i “started” > /opt/error-logs

52. List all the pods sorted by name

Answer:

See the solution below.

Explanation:

kubectl get pods --sort-by=.metadata.name

53. Score: 7%

No configuration context change required for this task.
Ensure, however, that you have returned to the base node before starting to work on this task:

```
[student@mk8s-master-0]
$
exit
```

Task

First, create a snapshot of the existing etcd instance running at https://127.0.0.1:2379, saving the snapshot to /srv/data/etcd-snapshot.db.

Creating a snapshot of the given instance is expected to complete in seconds.
If the operation seems to hang, something's likely wrong with your command. Use CTRL + C to cancel the operation and try again.

Next, restore an existing, previous snapshot located at /var/lib/backup/etcd-snapshot-previo us.db

The following TLS certificates/key are supplied for connecting to the server with etcdctl :

- CA certificate: /opt/KUIN00601/ca.crt
- Client certificate: /opt/KUIN00601/etcd-client.crt
- Client key: /opt/KUIN00601/etcd-client.key

Answer:

See the solution below.

Explanation:

Solution:

#backup

ETCDCTL_API=3 etcdctl --endpoints="https://127.0.0.1:2379" --cacert=/opt/KUIN000601/ca.crt

--cert=/opt/KUIN000601/etcd-client.crt --key=/opt/KUIN000601/etcd-client.key snapshot save

/etc/data/etcd-snapshot.db

#restore

ETCDCTL_API=3 etcdctl --endpoints="https://127.0.0.1:2379" --cacert=/opt/KUIN000601/ca.crt --cert=/opt/KUIN000601/etcd-client.crt --key=/opt/KUIN000601/etcd-client.key snapshot restore /var/lib/backup/etcd-snapshot-previoys.db

54. List the nginx pod with custom columns POD_NAME and POD_STATUS

Answer:

See the solution below.

Explanation:

kubectl get po -o=custom-columns="POD_NAME:.metadata.name, POD_STATUS:.status.containerStatuses[].state"

55. List all the pods showing name and namespace with a json path expression

Answer:

See the solution below.

Explanation:

kubectl get pods -o=jsonpath="{.items[*]['metadata.name', 'metadata.namespace']}"

56. Create a pod that having 3 containers in it? (Multi-Container)

Answer:

See the solution below.

Explanation:

image=nginx, image=redis, image=consul Name nginx container as “nginx-container” Name redis container as “redis-container” Name consul container as “consul-container”

Create a pod manifest file for a container and append container section for rest of the images

kubectl run multi-container --generator=run-pod/v1 --image=nginx -- dry-run -o yaml > multi-container.yaml

then

vim multi-container.yaml apiVersion: v1

kind: Pod metadata: labels:

run: multi-container name: multi-container spec:

containers:

- image: nginx

name: nginx-container

- image: redis

name: redis-container

- image: consul

name: consul-container restartPolicy: Always

57. Score: 4%

Set configuration context:

```
[student@node-1] $ kube
ctl config use-context e
k8s
```

Task

Set the node named ek8s-node-1 as unavailable and reschedule all the pods running on it.

Answer:

See the solution below.

Explanation:

SOLUTION:

[student@node-1] > ssh ek8s

kubectl cordon ek8s-node-1

kubectl drain ek8s-node-1 --delete-local-data --ignore-daemonsets --force

58. Schedule a pod as follows:

- Name: nginx-kusc00101
- Image: nginx
- Node selector: disk=ssd

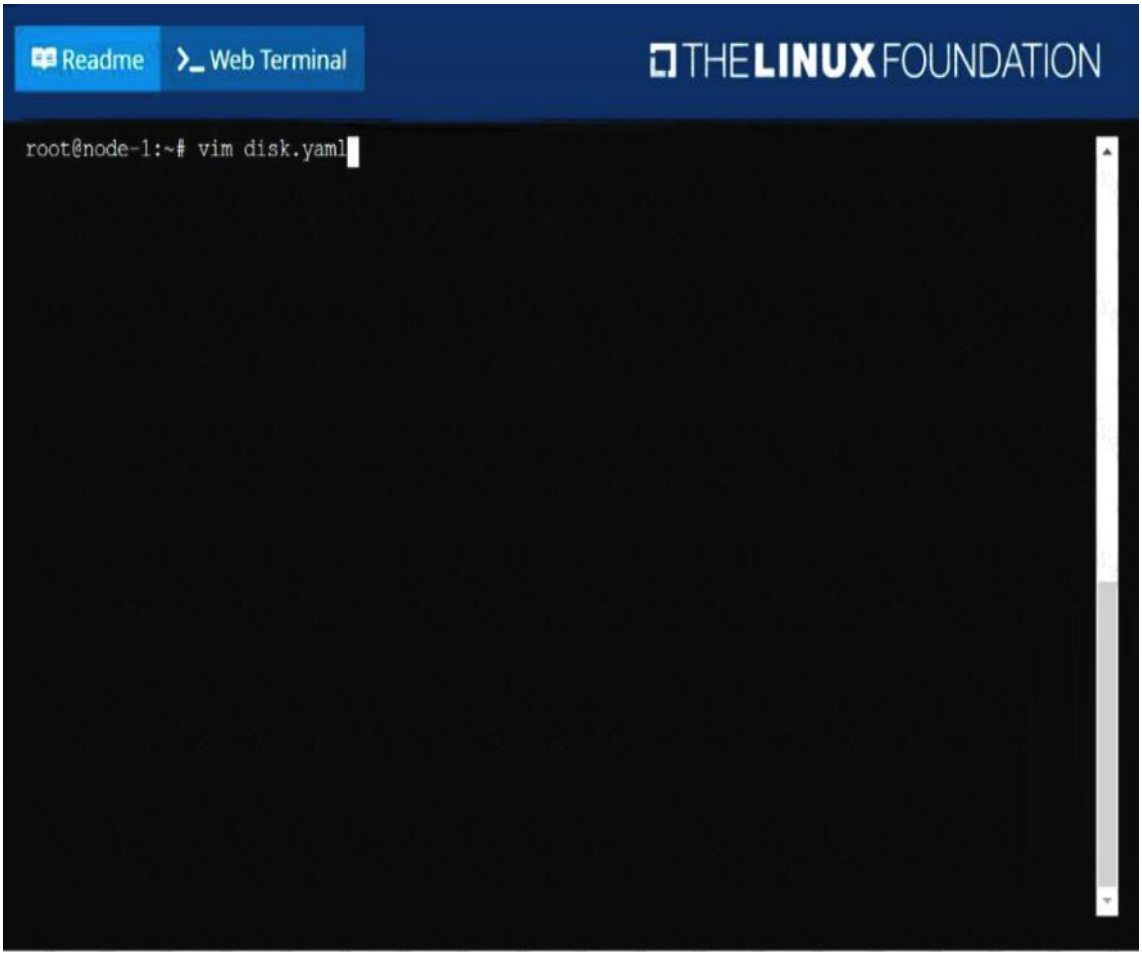
Answer:

See the solution below.

Explanation:

solution

F:\Work\Data Entry Work\Data Entry\20200827\CKA\6 B.JPG



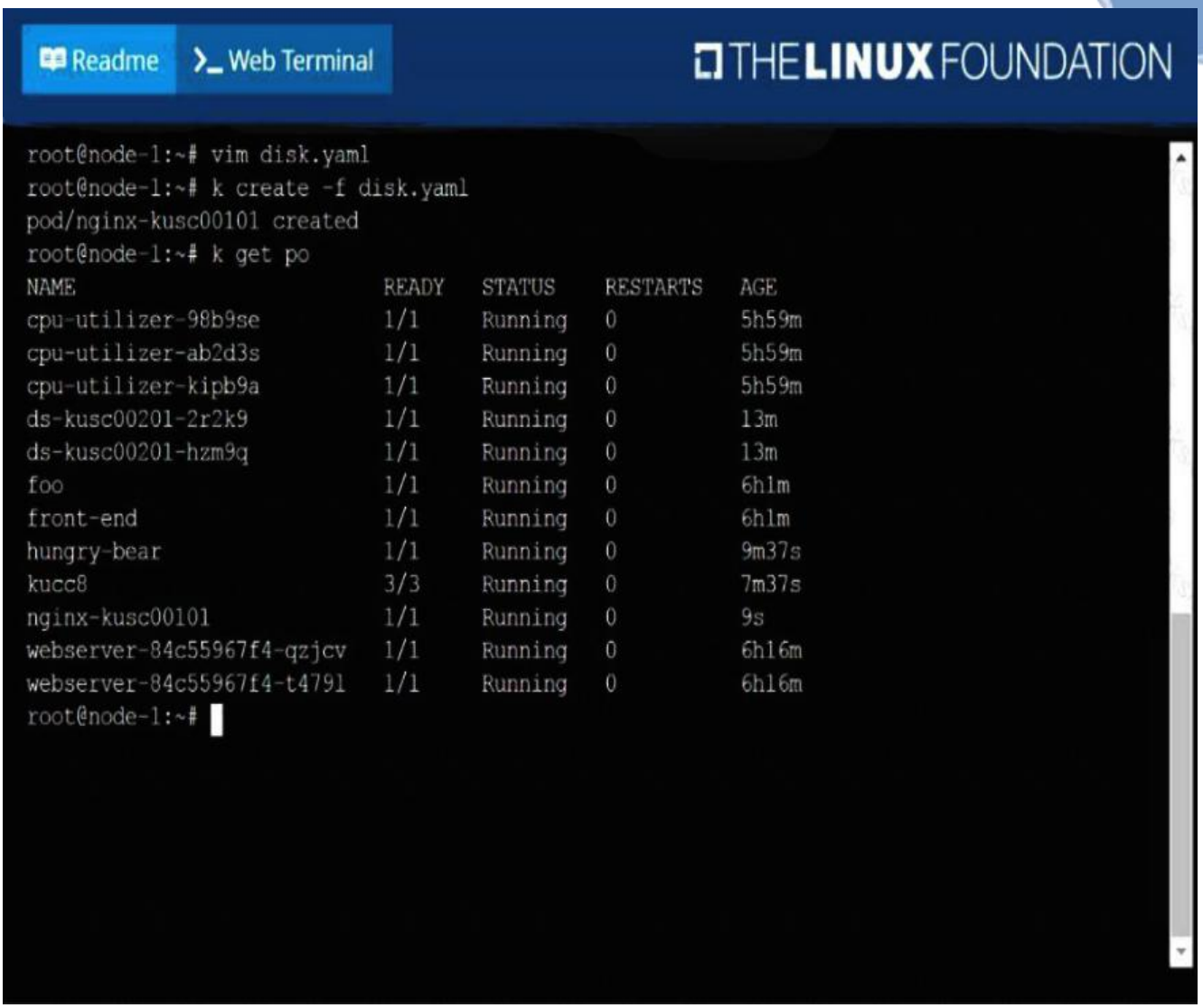
F:\Work\Data Entry Work\Data Entry\20200827\CKA\6 C.JPG

Readme | Web Terminal

THE LINUX FOUNDATION

```
apiVersion: v1
kind: Pod
metadata:
  name: nginx-kusc00101
spec:
  containers:
  - name: nginx
    image: nginx
    imagePullPolicy: IfNotPresent
  nodeSelector:
    disk: ssd
~
~
~
~
~
~
~
~
~
~
~
~
~
"disk.yaml" [New] 11L, 176C written
```

F:\Work\Data Entry Work\Data Entry\20200827\CKA\6 D.JPG



59. A Kubernetes worker node, named wk8s-node-0 is in state NotReady. Investigate why this is the case, and perform any appropriate steps to bring the node to a Ready state, ensuring that any changes are made permanent.

You can ssh to the failed node using:

[student@node-1] $ | ssh Wk8s-node-0

You can assume elevated privileges on the node with the following command:

[student@w8ks-node-0] $ | sudo –i

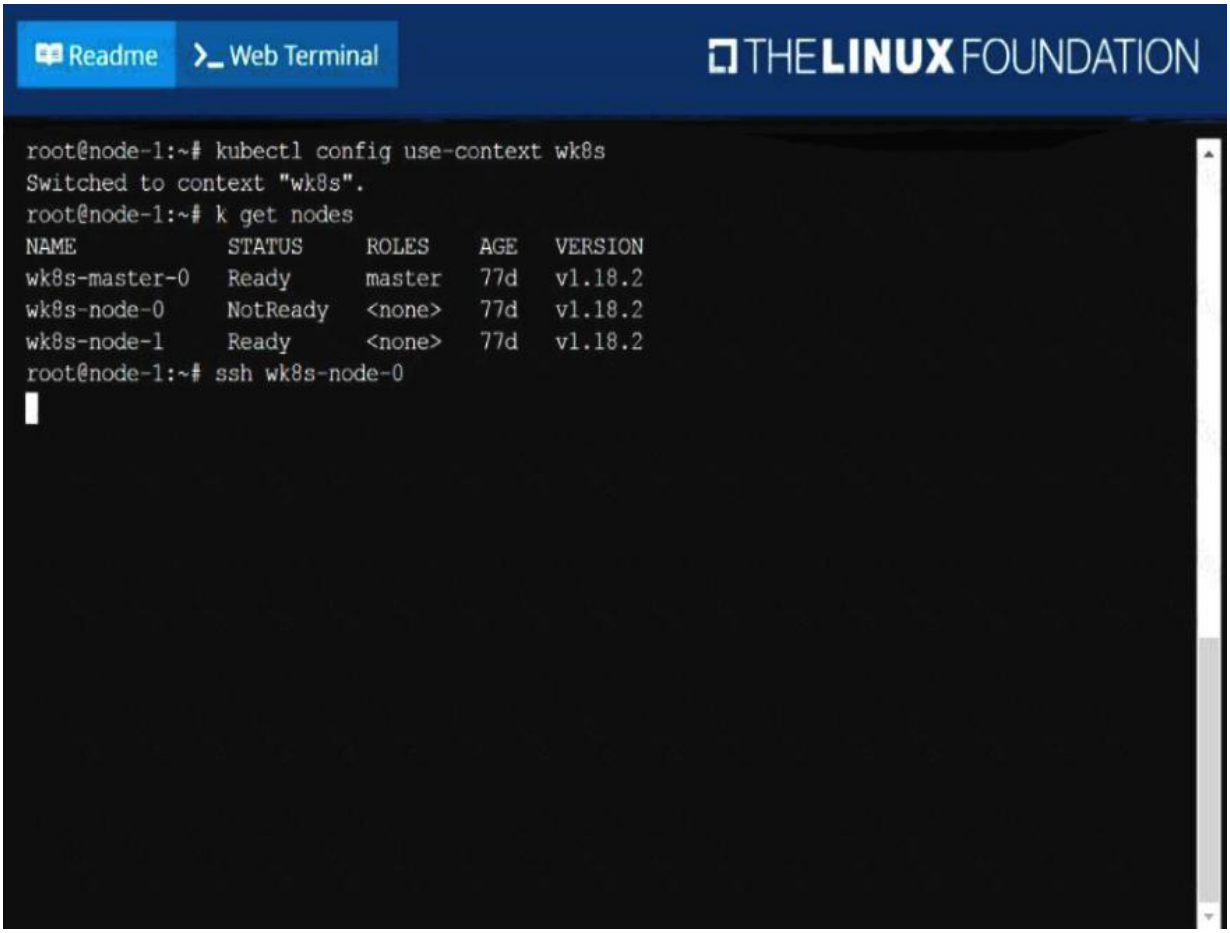
Answer:

See the solution below.

Explanation:

solution

F:\Work\Data Entry Work\Data Entry\20200827\CKA\20 C.JPG



F:\Work\Data Entry Work\Data Entry\20200827\CKA\20 D.JPG

Readme | Web Terminal

THE LINUX FOUNDATION

```
wk8s-node-0     NotReady   <none>   77d   v1.18.2
wk8s-node-1     Ready      <none>   77d   v1.18.2
root@node-1:~# ssh wk8s-node-0
Welcome to Ubuntu 16.04.6 LTS (GNU/Linux 4.4.0-1109-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

 * Are you ready for Kubernetes 1.19? It's nearly here! Try RC3 with
   sudo snap install microk8s --channel=1.19/candidate --classic

   https://microk8s.io/ has docs and details.

4 packages can be updated.
1 update is a security update.

New release '18.04.5 LTS' available.
Run 'do-release-upgrade' to upgrade to it.


student@wk8s-node-0:~$ sudo -i
root@wk8s-node-0:~# systemctl  restart kubelet
root@wk8s-node-0:~# systemctl  enable kubelet
```

F:\Work\Data Entry Work\Data Entry\20200827\CKA\20 E.JPG

Readme | Web Terminal

THE LINUX FOUNDATION

```
   https://microk8s.io/ has docs and details.

4 packages can be updated.
1 update is a security update.

New release '18.04.5 LTS' available.
Run 'do-release-upgrade' to upgrade to it.


student@wk8s-node-0:~$ sudo -i
root@wk8s-node-0:~# systemctl  restart kubelet
root@wk8s-node-0:~# systemctl  enable kubelet
Created symlink from /etc/systemd/system/multi-user.target.wants/kubelet.service to /lib/sys
temd/system/kubelet.service.
root@wk8s-node-0:~# exit
logout
student@wk8s-node-0:~$ exit
logout
Connection to 10.250.5.34 closed.
root@node-1:~# k get nodes
NAME            STATUS   ROLES    AGE   VERSION
wk8s-master-0   Ready    master   77d   v1.18.2
wk8s-node-0     Ready    <none>   77d   v1.18.2
wk8s-node-1     Ready    <none>   77d   v1.18.2
root@node-1:~#
```

60. Score:7%

Set configuration context:

```
[student@node-1] $ kube
ctl config use-context k
8s
```

Context

An existing Pod needs to be integrated into the Kubernetes built-in logging architecture (e. g. kubectl logs).

Adding a streaming sidecar container is a good and common way to accomplish this requirement.

Task

Add a sidecar container named sidecar, using the busybox Image, to the existing Pod big-corp-app. The new sidecar container has to run the following command:

/bin/sh -c tail -n+1 -f /va r/log/big-corp-app.log

Use a Volume, mounted at /var/log, to make the log file big-corp-app.log available to the sidecar container.

Don't modify the specification of the existing container other than adding the required volume mount.

Answer:

See the solution below.

Explanation:

Solution:

#

kubectl get pod big-corp-app -o yaml

#

apiVersion: v1 kind: Pod metadata:

name: big-corp-app spec:

containers:

- name: big-corp-app image: busybox

args:

- /bin/sh

- -c

- > i=0;

while true; do

echo "$(date) INFO $i" >> /var/log/big-corp-app.log; i=$((i+1));

sleep 1; done

volumeMounts:

- name: logs mountPath: /var/log

- name: count-log-1 image: busybox

args: [/bin/sh, -c, 'tail -n+1 -f /var/log/big-corp-app.log'] volumeMounts:

- name: logs mountPath: /var/log volumes:

- name: logs emptyDir: {

}

#

kubectl logs big-corp-app -c count-log-1

61. Create and configure the service front-end-service so it's accessible through NodePort and routes to the existing pod named front-end.

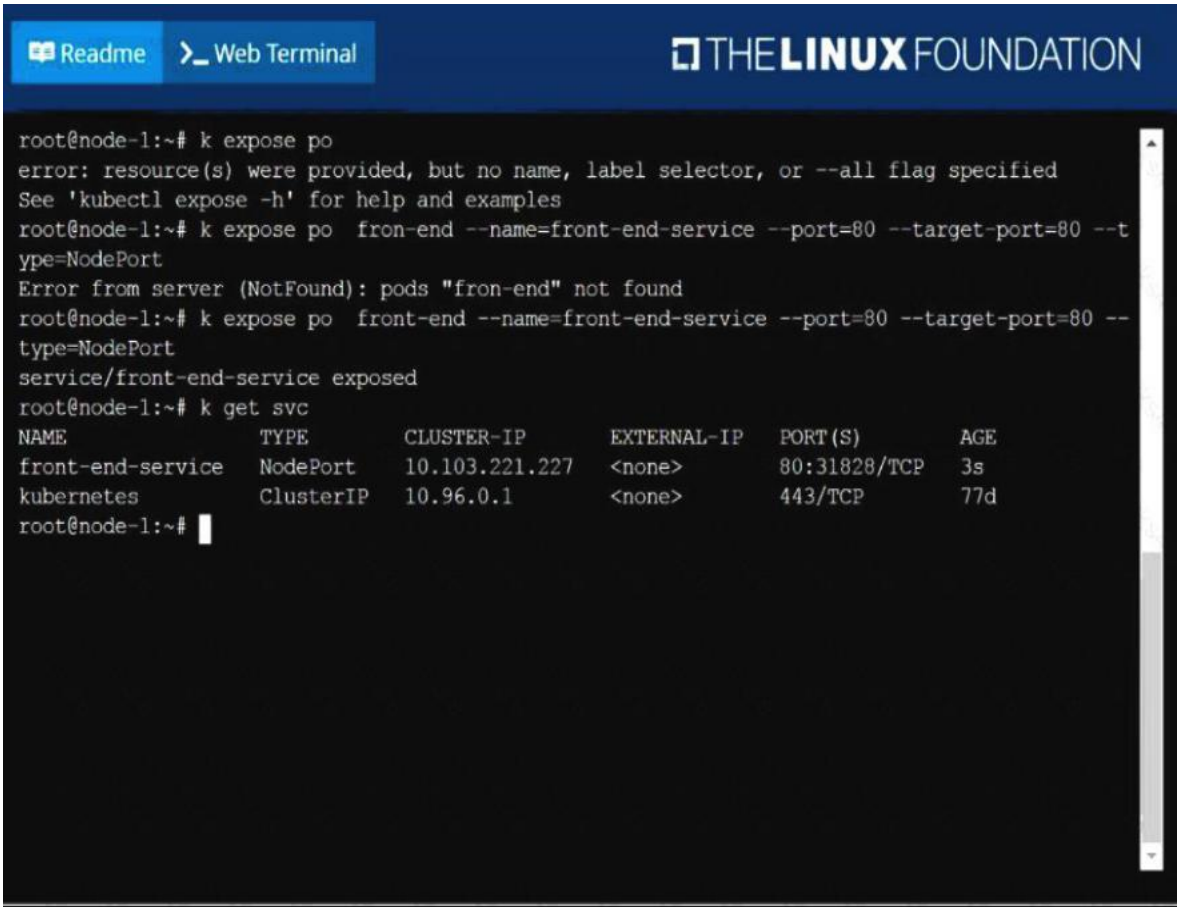
Answer:

See the solution below.

Explanation:

solution

F:\Work\Data Entry Work\Data Entry\20200827\CKA\8 B.JPG



62. Get list of all pods in all namespaces and write it to file “/opt/pods-list.yaml”

Answer:

See the solution below.

Explanation:

kubectl get po –all-namespaces > /opt/pods-list.yaml

63. Score: 7%

Set configuration context:

```
[student@node-1] $ kube
ctl config use-context k
8s
```

Task

Reconfigure the existing deployment front-end and add a port specification named http exposing port 80/tcp of the existing container nginx.

Create a new service named front-end-svc exposing the container port http.

Configure the new service to also expose the individual Pods via a NodePort on the nodes on which they are scheduled.

Answer:

See the solution below.

Explanation:

Solution:

kubectl get deploy front-end

kubectl edit deploy front-end -o yaml

#port specification named http

#service.yaml apiVersion: v1

kind: Service metadata:

name: front-end-svc labels:

app: nginx spec: ports:

- port: 80 protocol: tcp name: http selector: app: nginx

type: NodePort

kubectl create -f service.yaml

kubectl get svc

port specification named http

kubectl expose deployment front-end --name=front-end-svc --port=80 --tarport=80 --type=NodePort

64. List all persistent volumes sorted by capacity, saving the full kubectl output to /opt/KUCC00102/volume_list. Use kubectl 's own functionality for sorting the output, and do not manipulate it any further.

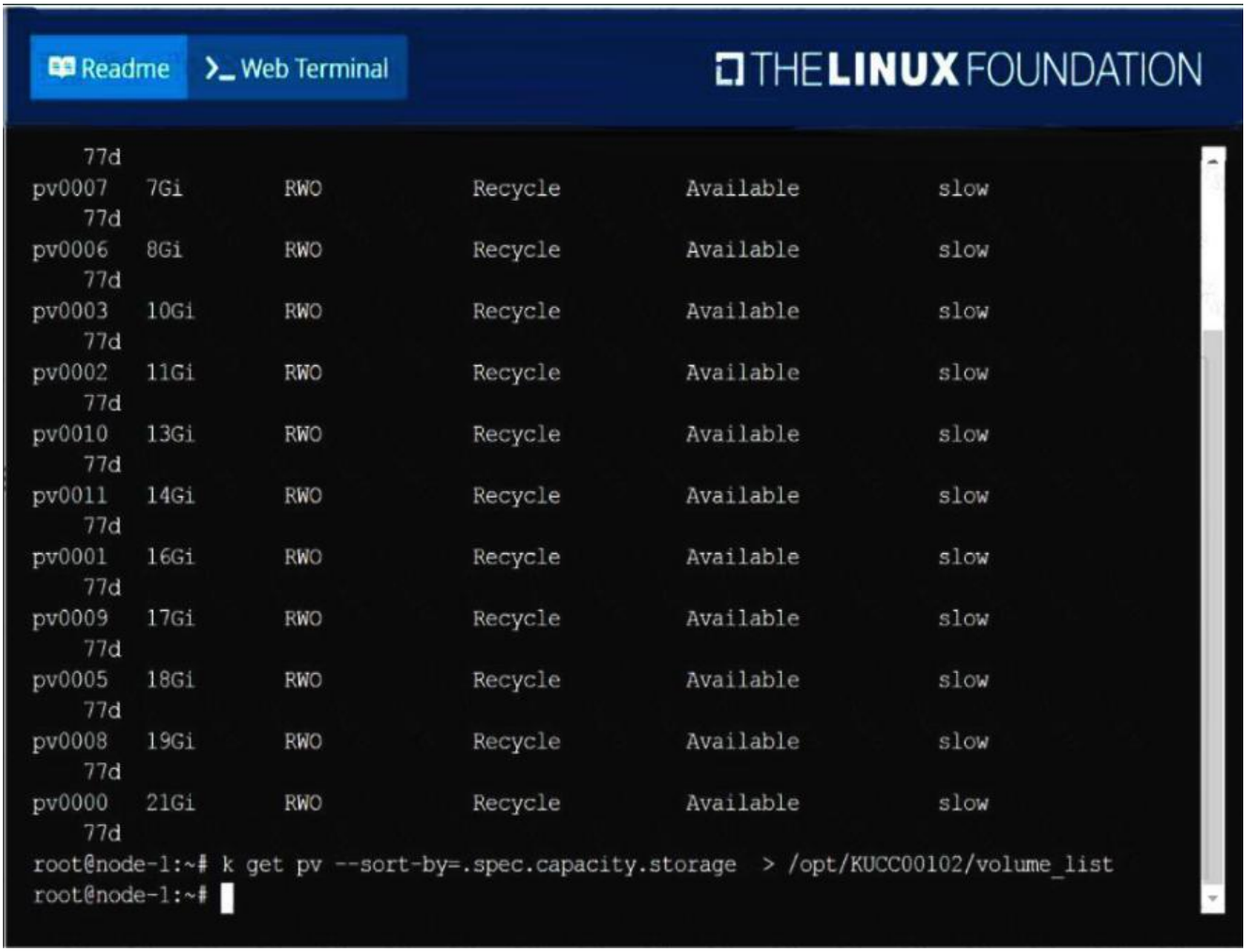
Answer:

See the solution below.

Explanation:

solution

F:\Work\Data Entry Work\Data Entry\20200827\CKA\2 C.JPG



65. Score: 4%

Set configuration context:

```
[student@node-1] $ kube
ctl config use-context h
k8s
```

Task

Create a persistent volume with name app-data , of capacity 1Gi and access mode ReadOnlyMany. The type of volume is hostPath and its location is /srv/app-data .

Answer:

See the solution below.

Explanation:

Solution:

#vi pv.yaml apiVersion: v1

kind: PersistentVolume metadata:

name: app-config spec:

capacity: storage: 1Gi accessModes:

- ReadOnlyMany hostPath:

path: /srv/app-config

#

kubectl create -f pv.yaml

66. Score: 5%

Set configuration context:

```
[student@node-1] $ kube
ctl config use-context k
8s
```

Task

Monitor the logs of pod bar and:

• Extract log lines corresponding to error file-not-found

• Write them to /opt/KUTR00101/bar

Answer:

See the solution below.

Explanation:

Solution:

kubectl logs bar | grep 'unable-to-access-website' > /opt/KUTR00101/bar cat /opt/KUTR00101/bar

67. Score: 7%

Set configuration context:

```
[student@node-1] $ kube
ctl config use-context m
k8s
```

Task

Given an existing Kubernetes cluster running version 1.20.0, upgrade all of the Kubernetes control plane and node components on the master node only to version 1.20.1.

Be sure to drain the master node before upgrading it and uncordon it after the upgrade.

You can ssh to the master node using:

```
[student@node-1] $ ssh mk8s-master-0
```

You can assume elevated privileges on the master node with the following command:

```
[student@mk8s-master-0] $ sudo -i
```

You are also expected to upgrade kubelet and kubectl on the master node.

Do not upgrade the worker nodes, etcd, the container manager, the CNI plugin, the DNS service or any other addons.

Answer:

See the solution below.

Explanation:

SOLUTION:

[student@node-1] > ssh ek8s

kubectl cordon k8s-master

kubectl drain k8s-master --delete-local-data --ignore-daemonsets --force

apt-get install kubeadm=1.20.1-00 kubelet=1.20.1-00 kubectl=1.20.1-00 --disableexcludes=kubernetes

kubeadm upgrade apply 1.20.1 --etcd-upgrade=false

systemctl daemon-reload systemctl restart kubelet kubectl uncordon k8s-master