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Certified Kubernetes Application Developer (CKAD) Program

Linux Foundation CKAD

Version Demo

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QUESTION NO: 1 - (SIMULATION)

Context

As a Kubernetes application developer you will often find yourself needing to update a running application.

Task

Please complete the following:

• Update the app deployment in the kdpd00202 namespace with a maxSurge of 5% and a maxUnavailable of 2%

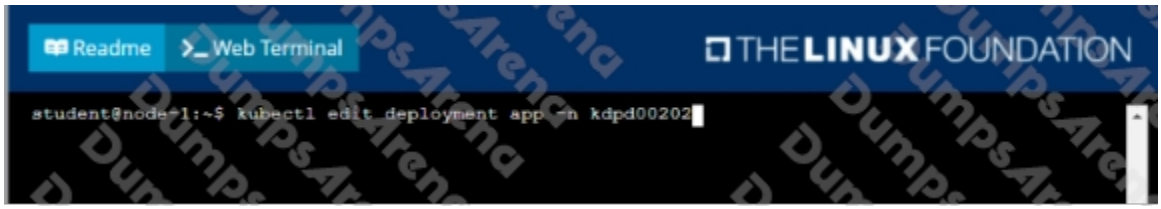
• Perform a rolling update of the web1 deployment, changing the lfccncf/ngmx image version to 1.13

• Roll back the app deployment to the previous version

ANSWER: Seethesolutionbelow.

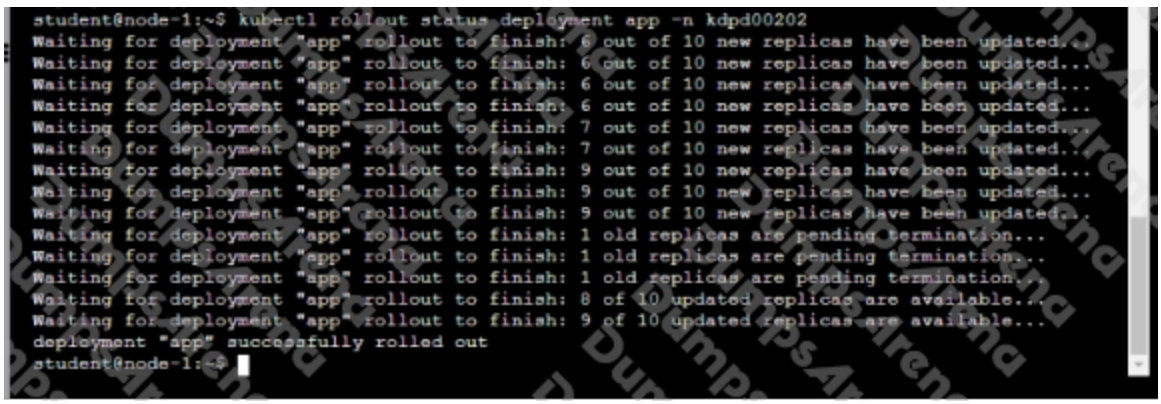
Explanation:

Solution:

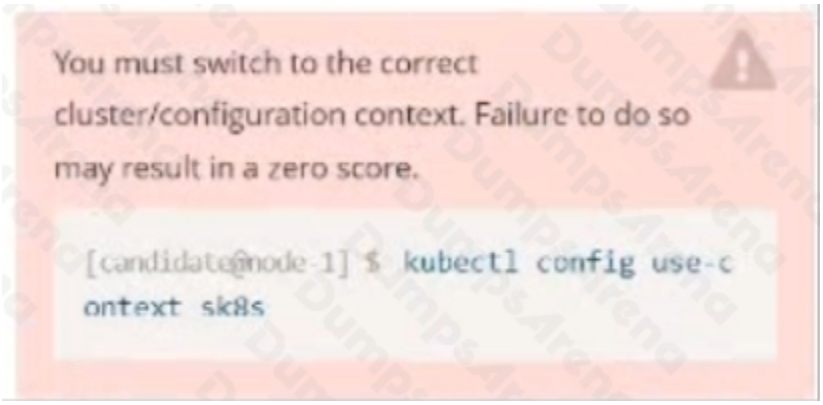



Readme
Web Terminal
THE LINUX FOUNDATION
uid: 1dfa2527-5c61-46a9-8dd3-e24643d3ce14
spec:
progressDeadlineSeconds: 600
replicas: 10
revisionHistoryLimit: 10
selector:
matchLabels:
app: nginx
strategy:
rollingUpdate:
maxSurge: 5%
maxUnavailable: 1
type: RollingUpdate
template:
metadata:
creationTimestamp: null
labels:
app: nginx
spec:
containers:
- image: lfccncf/nginx:1.13
imagePullPolicy: IfNotPresent
name: nginx
ports:
- containerPort: 80
protocol: TCP
:wq!


Readme
Web Terminal
THE LINUX FOUNDATION
student@node-1:~$ kubectl edit deployment app -n kdpd00202
deployment.apps/app edited
student@node-1:~$ kubectl rollout status deployment app -n kdpd00202
Waiting for deployment "app" rollout to finish: 6 out of 10 new replicas have been updated...
Waiting for deployment "app" rollout to finish: 7 out of 10 new replicas have been updated...
Waiting for deployment "app" rollout to finish: 7 out of 10 new replicas have been updated...
Waiting for deployment "app" rollout to finish: 7 out of 10 new replicas have been updated...
Waiting for deployment "app" rollout to finish: 8 out of 10 new replicas have been updated...
Waiting for deployment "app" rollout to finish: 8 out of 10 new replicas have been updated...
Waiting for deployment "app" rollout to finish: 8 out of 10 new replicas have been updated...
Waiting for deployment "app" rollout to finish: 8 out of 10 new replicas have been updated...
Waiting for deployment "app" rollout to finish: 9 out of 10 new replicas have been updated...
Waiting for deployment "app" rollout to finish: 9 out of 10 new replicas have been updated...
Waiting for deployment "app" rollout to finish: 9 out of 10 new replicas have been updated...
Waiting for deployment "app" rollout to finish: 1 old replicas are pending termination...
Waiting for deployment "app" rollout to finish: 8 of 10 updated replicas are available...
Waiting for deployment "app" rollout to finish: 9 of 10 updated replicas are available...
deployment "app" successfully rolled out
student@node-1:~$ kubectl rollout undo deployment app -n kdpd00202
deployment.apps/app rolled back
student@node-1:~$ kubectl rollout status deployment app -n kdpd00202


student@node-1:~$ kubectl rollout status deployment app -n kdpd00202
Waiting for deployment "app" rollout to finish: 6 out of 10 new replicas have been updated...
Waiting for deployment "app" rollout to finish: 6 out of 10 new replicas have been updated...
Waiting for deployment "app" rollout to finish: 6 out of 10 new replicas have been updated...
Waiting for deployment "app" rollout to finish: 6 out of 10 new replicas have been updated...
Waiting for deployment "app" rollout to finish: 7 out of 10 new replicas have been updated...
Waiting for deployment "app" rollout to finish: 7 out of 10 new replicas have been updated...
Waiting for deployment "app" rollout to finish: 9 out of 10 new replicas have been updated...
Waiting for deployment "app" rollout to finish: 9 out of 10 new replicas have been updated...
Waiting for deployment "app" rollout to finish: 9 out of 10 new replicas have been updated...
Waiting for deployment "app" rollout to finish: 1 old replicas are pending termination...
Waiting for deployment "app" rollout to finish: 1 old replicas are pending termination...
Waiting for deployment "app" rollout to finish: 1 old replicas are pending termination...
Waiting for deployment "app" rollout to finish: 8 of 10 updated replicas are available...
Waiting for deployment "app" rollout to finish: 9 of 10 updated replicas are available...
deployment "app" successfully rolled out
student@node-1:~$

QUESTION NO: 2 - (SIMULATION)



Task:

Create a Pod named nginx resources in the existing pod resources namespace.

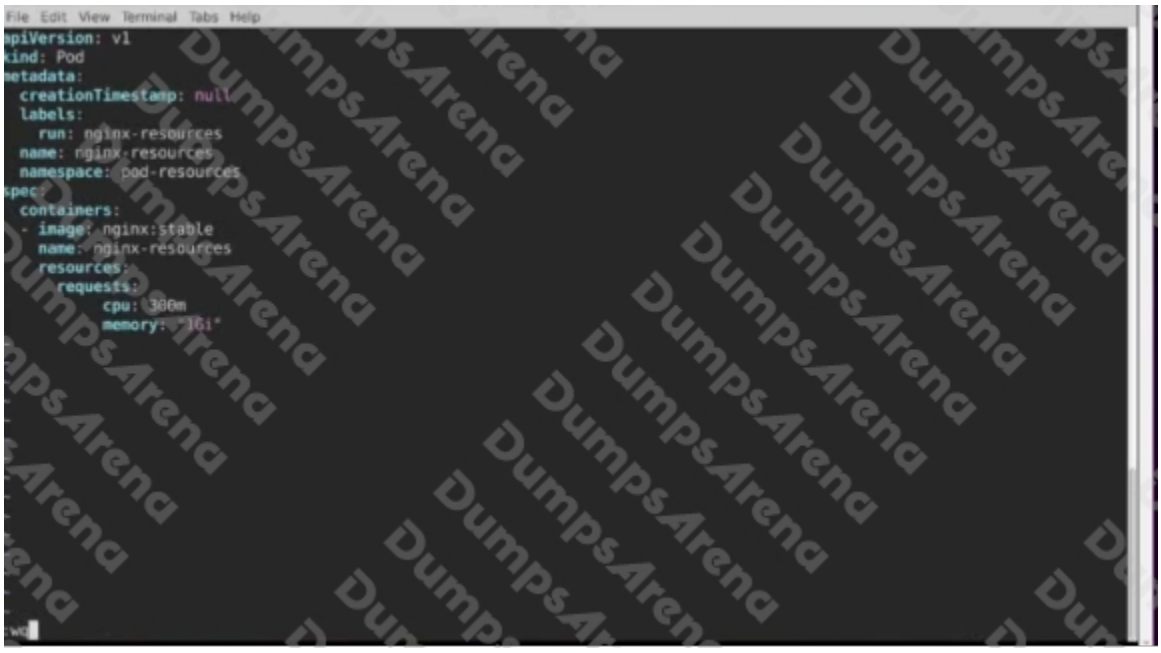
Specify a single container using nginx:stable image.

Specify a resource request of 300m cpus and 1G1 of memory for the Pod's container.

ANSWER: Seethesolutionbelow.

Explanation:

Solution:



```
candidate@node-1:~$ kubectl config use-context k8s
Switched to context "k8s".
candidate@node-1:~$ kubectl  run nginx-resources -n pod-resources  --image=nginx:stable --dry-run=client -o yaml > hw.yaml
candidate@node-1:~$ vim hw.yaml
candidate@node-1:~$ kubectl  create  -f hw.yaml
pod/nginx-resources created
candidate@node-1:~$ kubectl get pods -n pod-resources
NAME              READY   STATUS    RESTARTS   AGE
nginx-resources   1/1     Running   0          13s
candidate@node-1:~$ kubectl  describe  pods -n pod-resources
```

```
File  Edit  View  Terminal  Tabs  Help
      memory:     1Gi
    Environment:  <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-dmx9j (ro)
Conditions:
  Type              Status
  Initialized       True
  Ready             True
  ContainersReady   True
  PodScheduled      True
Volumes:
  kube-api-access-dmx9j:
    Type:                    Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds:  3607
    ConfigMapName:           kube-root-ca.crt
    ConfigMapOptional:       <nil>
    DownwardAPI:             true
QoS Class:                   Burstable
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  20s   default-scheduler  Successfully assigned pod-resources/nginx-resources to k8s-node-0
  Normal  Pulling    19s   kubelet            Pulling image "nginx:stable"
  Normal  Pulled     13s   kubelet            Successfully pulled image "nginx:stable" in 6.55664052s
  Normal  Created    13s   kubelet            Created container nginx-resources
  Normal  Started    12s   kubelet            Started container nginx-resources
candidate@node-1:~$ kubectl config use-context k8s
Switched to context "k8s".
candidate@node-1:~$ kubectl  create  deploy expose -n  ckad00014  --image lfccncf/nginx:1.13.7 --dry-run=client -o yaml>
```

QUESTION NO: 3 - (SIMULATION)

Context

A project that you are working on has a requirement for persistent data to be available.

Task

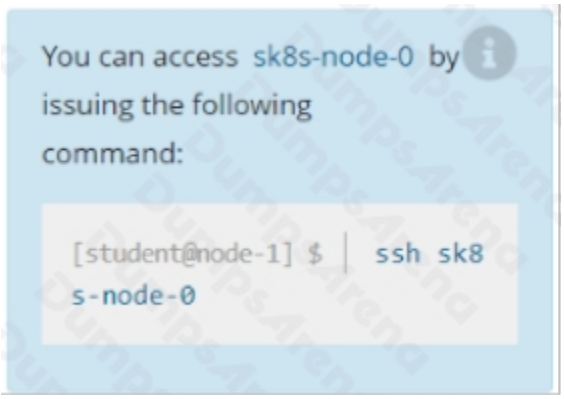
To facilitate this, perform the following tasks:

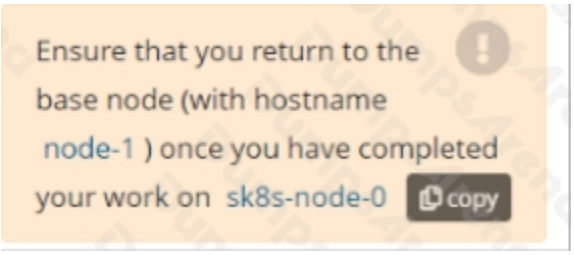
• Create a file on node sk8s-node-0 at /opt/KDSP00101/data/index.html with the content Acct=Finance

• Create a PersistentVolume named task-pv-volume using hostPath and allocate 1Gi to it, specifying that the volume is at /opt/KDSP00101/data on the cluster's node. The configuration should specify the access mode of ReadWriteOnce . It should define the StorageClass name exam for the PersistentVolume , which will be used to bind PersistentVolumeClaim requests to this PersistenetVolume.

• Create a PefsissentVolumeClaim named task-pv-claim that requests a volume of at least 100Mi and specifies an access mode of ReadWriteOnce

• Create a pod that uses the PersistentVolmeClaim as a volume with a label app: my-storage-app mounting the resulting volume to a mountPath /usr/share/nginx/html inside the pod

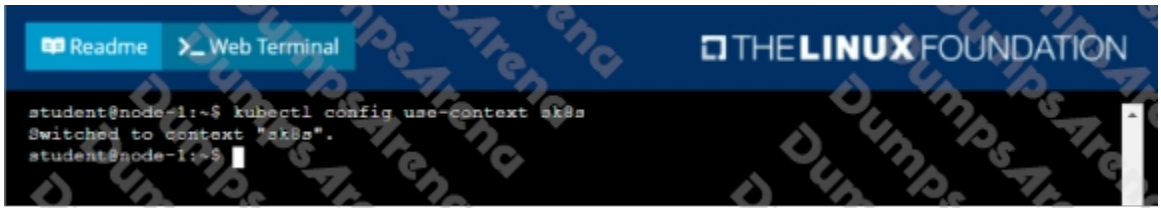




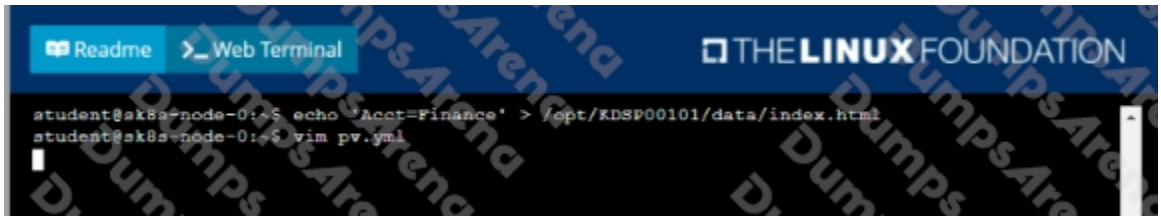
ANSWER: Seethesolutionbelow.

Explanation:

Solution:



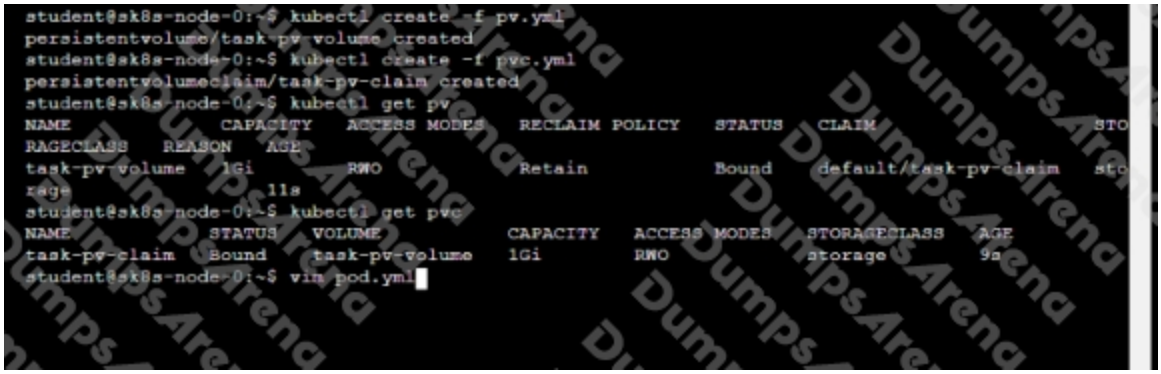

Readme
Web Terminal
THE LINUX FOUNDATION
* Documentation: https://help.ubuntu.com
* Management: https://landscape.canonical.com
* Support: https://ubuntu.com/advantage
System information as of Fri Oct 9 08:52:09 UTC 2020
System load: 2.02
Usage of /: 10.3% of 242.29GB
Memory usage: 2%
Swap usage: 0%
Processes: 38
Users logged in: 0
IP address for eth0: 10.250.3.115
IP address for docker0: 172.17.0.1
IP address for cni0: 10.244.1.1
* Kubernetes 1.19 is out! Get it in one command with:
sudo snap install microk8s --channel=1.19 --classic
https://microk8s.io/ has docs and details.
7 packages can be updated.
1 update is a security update.
New release '20.04.1 LTS' available.
Run 'do-release-upgrade' to upgrade to it.
student@sk8s-node-0:~$

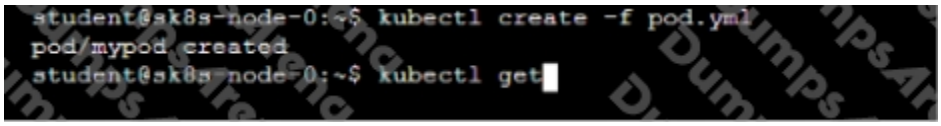

Readme
Web Terminal
THE LINUX FOUNDATION
student@sk8s-node-0:~$ echo 'Acct=Finance' > /opt/KDSP00101/data/index.html
student@sk8s-node-0:~$ vim pv.yml


Readme
Web Terminal
THE LINUX FOUNDATION
-- INSERT --
0,1
All

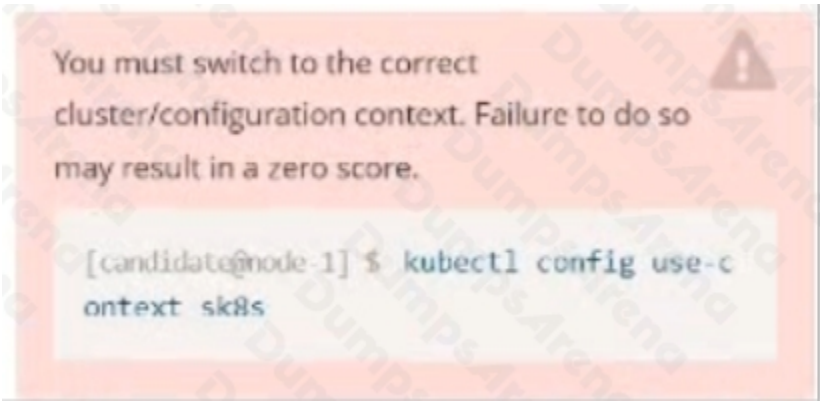

Readme
Web Terminal
THE LINUX FOUNDATION
apiVersion: v1
kind: PersistentVolume
metadata:
name: task-pv-volume
spec:
capacity:
storage: 1Gi
accessModes:
- ReadWriteOnce
storageClassName: storage
hostPath:
path: /opt/KDSP00101/data
type: Directory


Readme
Web Terminal
THE LINUX FOUNDATION
apiVersion: v1
kind: PersistentVolumeClaim
metadata:
name: task-pv-claim
spec:
accessModes:
- ReadWriteOnce
resources:
requests:
storage: 100Mi
storageClassName: storage


student@sk8s-node-0:~$ kubectl create -f pv.yml
persistentvolume/task-pv-volume created
student@sk8s-node-0:~$ kubectl create -f pvc.yml
persistentvolumeclaim/task-pv-claim created
student@sk8s-node-0:~$ kubectl get pv
NAME CAPACITY ACCESS MODES RECLAIM POLICY STATUS CLAIM STO
RAGECLASS REASON AGE
task-pv-volume 1Gi RWO Retain Bound default/task-pv-claim sto
rage 11s
student@sk8s-node-0:~$ kubectl get pvc
NAME STATUS VOLUME CAPACITY ACCESS MODES STORAGECLASS AGE
task-pv-claim Bound task-pv-volume 1Gi RWO storage 9s
student@sk8s-node-0:~$ vim pod.yml



QUESTION NO: 4 - (SIMULATION)



Task:

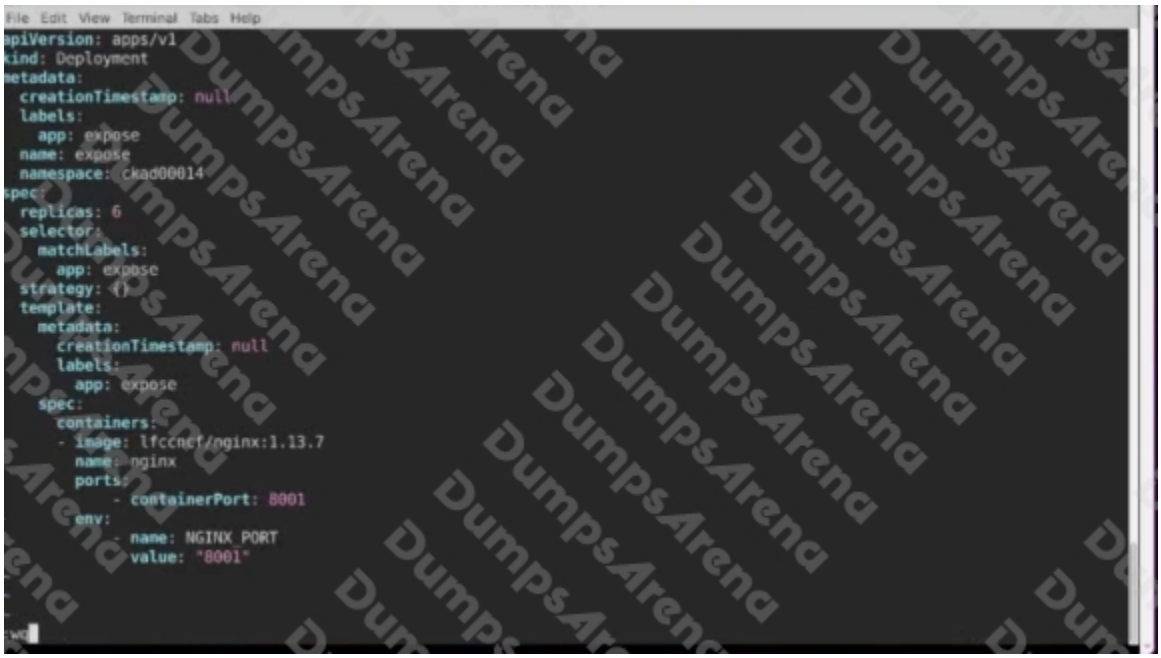
Create a Deployment named expose in the existing ckad00014 namespace running 6 replicas of a Pod. Specify a single container using the ifccncf/nginx: 1.13.7 image

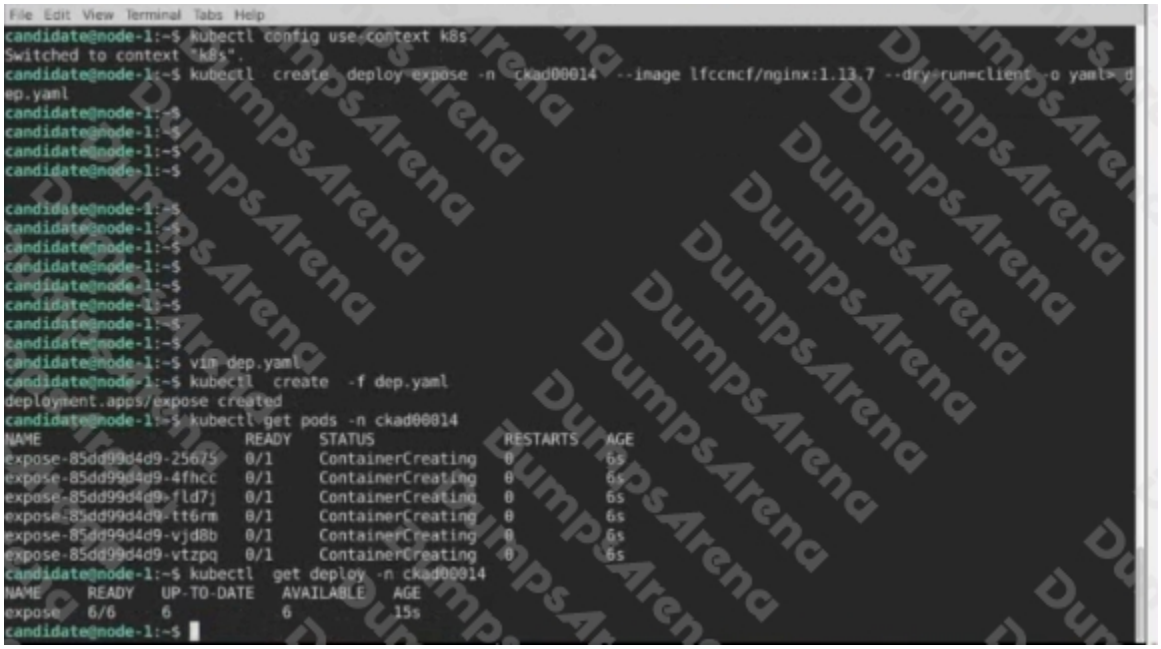
Add an environment variable named NGINX_PORT with the value 8001 to the container then expose port 8001

ANSWER: Seethesolutionbelow.

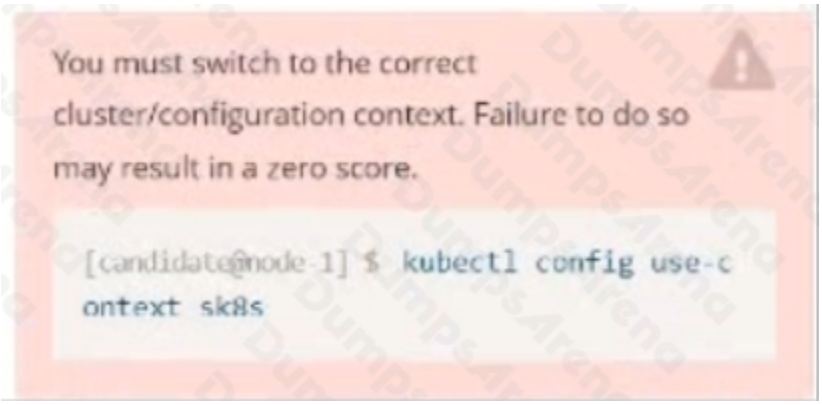
Explanation:

Solution:





QUESTION NO: 5 - (SIMULATION)



Task:

Modify the existing Deployment named broker-deployment running in namespace quetzal so that its containers.

1) Run with user ID 30000 and

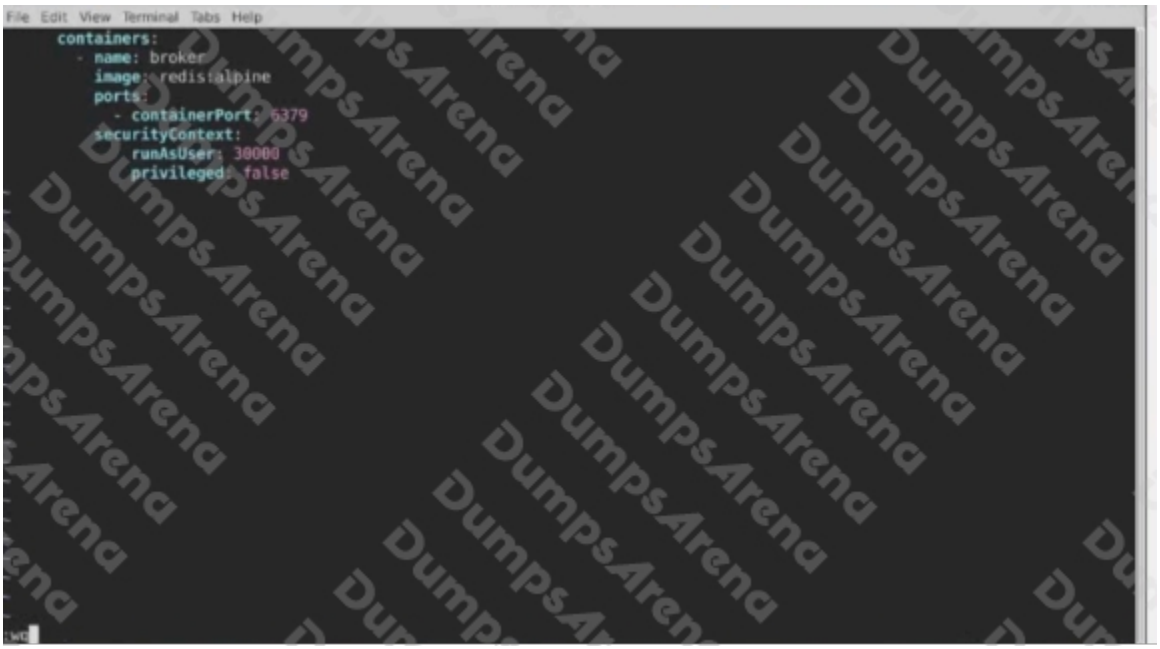
2) Privilege escalation is forbidden

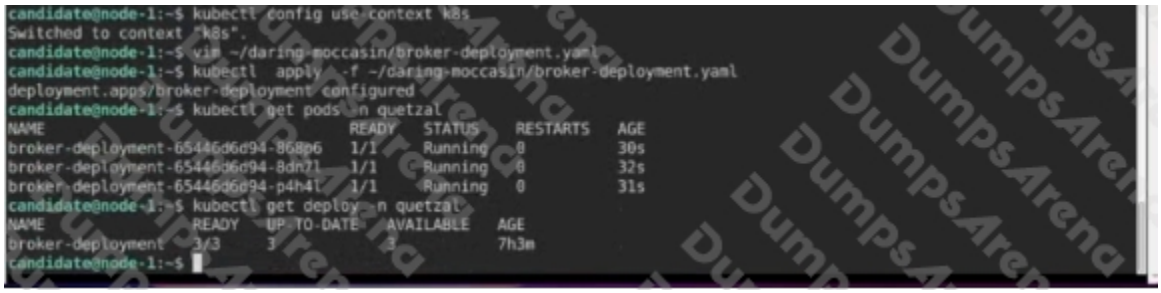
The broker-deployment is manifest file can be found at:

ANSWER: Seethesolutionbelow.

Explanation:

Solution:




candidate@node-1:~$ kubectl config use-context k8s
Switched to context "k8s".
candidate@node-1:~$ vim ~/daring-moccasin/broker-deployment.yaml
candidate@node-1:~$ kubectl apply -f ~/daring-moccasin/broker-deployment.yaml
deployment.apps/broker-deployment configured
candidate@node-1:~$ kubectl get pods -n quetzal
NAME READY STATUS RESTARTS AGE
broker-deployment-65446d6d94-86896 1/1 Running 0 30s
broker-deployment-65446d6d94-8dn7l 1/1 Running 0 32s
broker-deployment-65446d6d94-p4h4l 1/1 Running 0 31s
candidate@node-1:~$ kubectl get deploy -n quetzal
NAME READY UP-TO-DATE AVAILABLE AGE
broker-deployment 3/3 3 3 7h3m
candidate@node-1:~$