



Linux Foundation

CKAD Exam

Certified Kubernetes Application Developer

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Version: 6.1

Question: 1

Refer to Exhibit:



The exhibit shows a terminal window with a pink background. At the top, it says "Set configuration context:" followed by a warning icon (a triangle with an exclamation mark). Below this, there is a terminal prompt: "[student@node-1] \$ | kubectl config use-context k8s".

Context

A web application requires a specific version of redis to be used as a cache.

Task

Create a pod with the following characteristics, and leave it running when complete:

- The pod must run in the web namespace.
- The namespace has already been created
- The name of the pod should be cache
 - Use the lfcncf/redis image with the 3.2 tag
 - Expose port 6379

Answer: See the solution below.

Explanation:

Solution:



```
student@node-1:~$ kubectl run cache --image=lfcncf/redis:3.2 --port=6379 -n web
pod/cache created
student@node-1:~$ kubectl get pods -n web
NAME     READY   STATUS             RESTARTS   AGE
cache    0/1     ContainerCreating   0           6s
student@node-1:~$ kubectl get pods -n web
NAME     READY   STATUS    RESTARTS   AGE
cache    1/1     Running   0           9s
student@node-1:~$
```

Question: 2

Refer to Exhibit:



Context

You are tasked to create a secret and consume the secret in a pod using environment variables as follow:

Task

- Create a secret named another-secret with a key/value pair; key1/value4
- Start an nginx pod named nginx-secret using container image nginx, and add an environment variable exposing the value of the secret key key 1, using COOL_VARIABLE as the name for the environment variable inside the pod

Answer: See the solution below.

Explanation:

Solution:

```
student@node-1:~$ kubectl create secret generic some-secret --from-literal=key1=value4
secret/some-secret created
student@node-1:~$ kubectl get secret
NAME                 TYPE                                DATA  AGE
default-token-4kvr5  kubernetes.io/service-account-token  3      2d11h
some-secret          Opaque                               1      5s
student@node-1:~$ kubectl run nginx-secret --image=nginx --dry-run=client -o yaml > nginx_secret
.yml
student@node-1:~$ vim nginx_secret.yml
```

```
Readme Web Terminal THE LINUX FOUNDATION
apiVersion: v1
kind: Pod
metadata:
  creationTimestamp: null
  labels:
    run: nginx-secret
  name: nginx-secret
spec:
  containers:
  - image: nginx
    name: nginx-secret
    resources: {}
  dnsPolicy: ClusterFirst
  restartPolicy: Always
status: {}
~
~
~
~
~
~
~
~
~
~
"nginx_secret.yml" 15L, 253C 1,1 All
```

```
Readme Web Terminal THE LINUX FOUNDATION
apiVersion: v1
kind: Pod
metadata:
  labels:
    run: nginx-secret
  name: nginx-secret
spec:
  containers:
  - image: nginx
    name: nginx-secret
    env:
    - name: COOL_VARIABLE
      valueFrom:
        secretKeyRef:
          name: some-secret
          key: key1
~
~
~
~
~
~
~
~
~
~
-- INSERT -- 16,20 All
```

```

student@node-1:~$ kubectl get pods -n web
NAME      READY   STATUS    RESTARTS   AGE
cache     1/1     Running   0           9s
student@node-1:~$ kubectl create secret generic some-secret --from-literal=key1=value4
secret/some-secret created
student@node-1:~$ kubectl get secret
NAME      TYPE      DATA   AGE
default-token-4kvr5   kubernetes.io/service-account-token   3       2d11h
some-secret           Opaque                                 1       5s
student@node-1:~$ kubectl run nginx-secret --image=nginx --dry-run=client -o yaml > nginx_secret.yml
student@node-1:~$ vim nginx_secret.yml
student@node-1:~$ kubectl create -f nginx_secret.yml
pod/nginx-secret created
student@node-1:~$ kubectl get pods
NAME      READY   STATUS    RESTARTS   AGE
liveness-http  1/1     Running   0           6h38m
nginx-101     1/1     Running   0           6h39m
nginx-secret  0/1     ContainerCreating   0           4s
poller       1/1     Running   0           6h39m
student@node-1:~$ kubectl get pods
NAME      READY   STATUS    RESTARTS   AGE
liveness-http  1/1     Running   0           6h38m
nginx-101     1/1     Running   0           6h39m
nginx-secret  1/1     Running   0           8s
poller       1/1     Running   0           6h39m
student@node-1:~$

```

Question: 3

Refer to Exhibit:



Task

You are required to create a pod that requests a certain amount of CPU and memory, so it gets scheduled to a node that has those resources available.

- Create a pod named `nginx-resources` in the `pod-resources` namespace that requests a minimum of 200m CPU and 1Gi memory for its container
- The pod should use the `nginx` image
- The `pod-resources` namespace has already been created



The image consists of three vertically stacked screenshots of a web terminal interface. Each screenshot has a dark blue header with 'Readme' and 'Web Terminal' buttons on the left, and 'THE LINUX FOUNDATION' logo on the right. The terminal content is as follows:

Screenshot 1: Shows a YAML configuration for a pod named 'nginx-resources' in the 'pod-resources' namespace. The pod has a single container named 'nginx-resources' using the 'nginx' image. The container requests 200m CPU and 1Gi memory. The terminal shows the configuration being inserted into a file.

```
apiVersion: v1
kind: Pod
metadata:
  labels:
    run: nginx-resources
  name: nginx-resources
  namespace: pod-resources
spec:
  containers:
  - image: nginx
    name: nginx-resources
    resources:
      requests:
        cpu: 200m
        memory: 1Gi
```

Screenshot 2: Shows the user running a series of commands to create the pod. The first command is a dry-run to validate the configuration. The second command is to create the pod using 'kubectyl create -g', which fails with an error: 'Error: unknown shorthand flag: 'g' in -g'. The third command is 'kubectyl create -f nginx_resources.yml', which succeeds. The final command is 'kubectyl get pods -n pod-re'.

```
student@node-1:~$ kubectyl run nginx-resources -n pod-resources --image=nginx --dry-run=client -o
yaml > nginx_resources.yml
student@node-1:~$ vim nginx_resources.yml
student@node-1:~$ kubectyl create -g nginx_resources.yml
Error: unknown shorthand flag: 'g' in -g
See 'kubectyl create --help' for usage.
student@node-1:~$ kubectyl create -f nginx_resources.yml
pod/nginx-resources created
student@node-1:~$ kubectyl get pods -n pod-re
```

Screenshot 3: Shows the user running 'kubectyl get pods -n pod-resources' to verify the pod's status. The output shows a single pod named 'nginx-resources' in the 'Running' state, with 1/1 ready containers, 0 restarts, and an age of 8s.

```
student@node-1:~$ kubectyl get pods -n pod-resources
NAME          READY   STATUS    RESTARTS   AGE
nginx-resources 1/1     Running   0           8s
student@node-1:~$
```

Question: 4

Refer to Exhibit:



Context

You are tasked to create a ConfigMap and consume the ConfigMap in a pod using a volume mount.

Task

Please complete the following:

- Create a ConfigMap named another-config containing the key/value pair: key4/value3
- start a pod named nginx-configmap containing a single container using the nginx image, and mount the key you just created into the pod under directory /also/a/path

Answer: See the solution below.

Explanation:

Solution:

```
student@node-1:~$ kubectl create configmap another-config --from-literal=key4=value3  
configmap/another-config created  
student@node-1:~$ kubectl get configmap  
NAME          DATA   AGE  
another-config 1       5s  
student@node-1:~$ kubectl run nginx-configmap --image=nginx --dry-run=client -o yaml > nginx_conf  
igmap.yml  
student@node-1:~$ vim nginx_configmap.yml ^C  
student@node-1:~$ mv nginx_configmap.yml nginx_configmap.yml  
student@node-1:~$ vim nginx_co
```



```

Readme  Web Terminal THE LINUX FOUNDATION
apiVersion: v1
kind: Pod
metadata:
  creationTimestamp: null
  labels:
    run: nginx-configmap
    name: nginx-configmap
spec:
  containers:
  - image: nginx
    name: nginx-configmap
    resources: {}
  dnsPolicy: ClusterFirst
  restartPolicy: Always
status: {}
"nginx_configmap.yml" 15L, 262C 1,1 All

```

```

Readme  Web Terminal THE LINUX FOUNDATION
apiVersion: v1
kind: Pod
metadata:
  labels:
    run: nginx-configmap
    name: nginx-configmap
spec:
  containers:
  - image: nginx
    name: nginx-configmap
    volumeMounts:
    - name: myvol
      mountPath: /also/a/path
  volumes:
  - name: myvol
    configMap:
      name: another-config
13,6 All

```

```

student@node-1:~$ kubectl create configmap another-config --from-literal=key4=value3
configmap/another-config created
student@node-1:~$ kubectl get configmap
NAME          DATA   AGE
another-config 1       5s
student@node-1:~$ kubectl run nginx-configmap --image=nginx --dry-run=client -o yaml > nginx_conf
igmap.yml
student@node-1:~$ vim nginx_configmap.yml ^C
student@node-1:~$ mv nginx_configmap.yml nginx_configmap.yml
student@node-1:~$ vim nginx_configmap.yml
student@node-1:~$

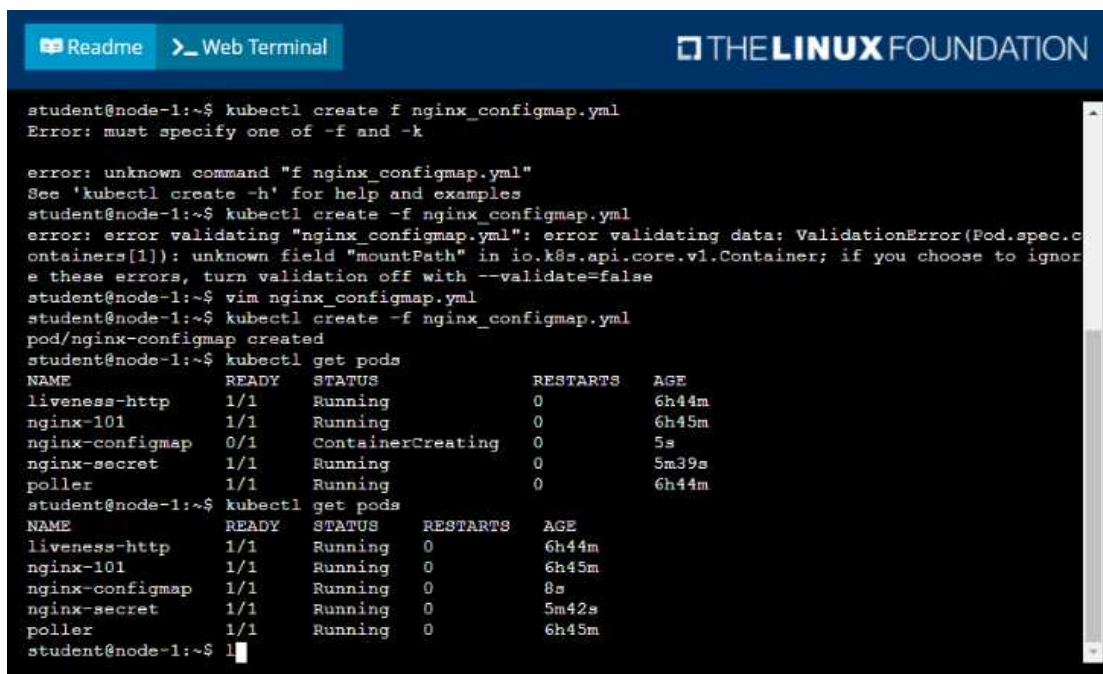
```

```

student@node-1:~$ kubectl run nginx-configmap --image=nginx --dry-run=client -o yaml > nginx_conf
igmap.yml
student@node-1:~$ vim nginx_configmap.yml ^C
student@node-1:~$ mv nginx_configmap.yml nginx_configmap.yml
student@node-1:~$ vim nginx_configmap.yml
student@node-1:~$ kubectl create f nginx_configmap.yml
Error: must specify one of -f and -k

error: unknown command "f nginx_configmap.yml"
See 'kubectl create -h' for help and examples
student@node-1:~$ kubectl create -f nginx_configmap.yml
error: error validating "nginx_configmap.yml": error validating data: ValidationError(Pod.spec.c
ontainers[1]): unknown field "mountPath" in io.k8s.api.core.v1.Container; if you choose to ignor
e these errors, turn validation off with --validate=false
student@node-1:~$ vim nginx_configmap.yml

```



```

Readme  Web Terminal  THE LINUX FOUNDATION

student@node-1:~$ kubectl create f nginx_configmap.yml
Error: must specify one of -f and -k

error: unknown command "f nginx_configmap.yml"
See 'kubectl create -h' for help and examples
student@node-1:~$ kubectl create -f nginx_configmap.yml
error: error validating "nginx_configmap.yml": error validating data: ValidationError(Pod.spec.c
ontainers[1]): unknown field "mountPath" in io.k8s.api.core.v1.Container; if you choose to ignor
e these errors, turn validation off with --validate=false
student@node-1:~$ vim nginx_configmap.yml
student@node-1:~$ kubectl create -f nginx_configmap.yml
pod/nginx-configmap created
student@node-1:~$ kubectl get pods
NAME          READY   STATUS             RESTARTS   AGE
liveness-http 1/1     Running            0           6h44m
nginx-101     1/1     Running            0           6h45m
nginx-configmap 0/1     ContainerCreating  0           5s
nginx-secret  1/1     Running            0           5m39s
poller        1/1     Running            0           6h44m
student@node-1:~$ kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
liveness-http 1/1     Running   0           6h44m
nginx-101     1/1     Running   0           6h45m
nginx-configmap 1/1     Running   0           8s
nginx-secret  1/1     Running   0           5m42s
poller        1/1     Running   0           6h45m
student@node-1:~$ !

```

Question: 5

Refer to Exhibit:



```

Set configuration context:
[student@node-1] $ | kubectl config
use-context k8s

```

Context

Your application's namespace requires a specific service account to be used.

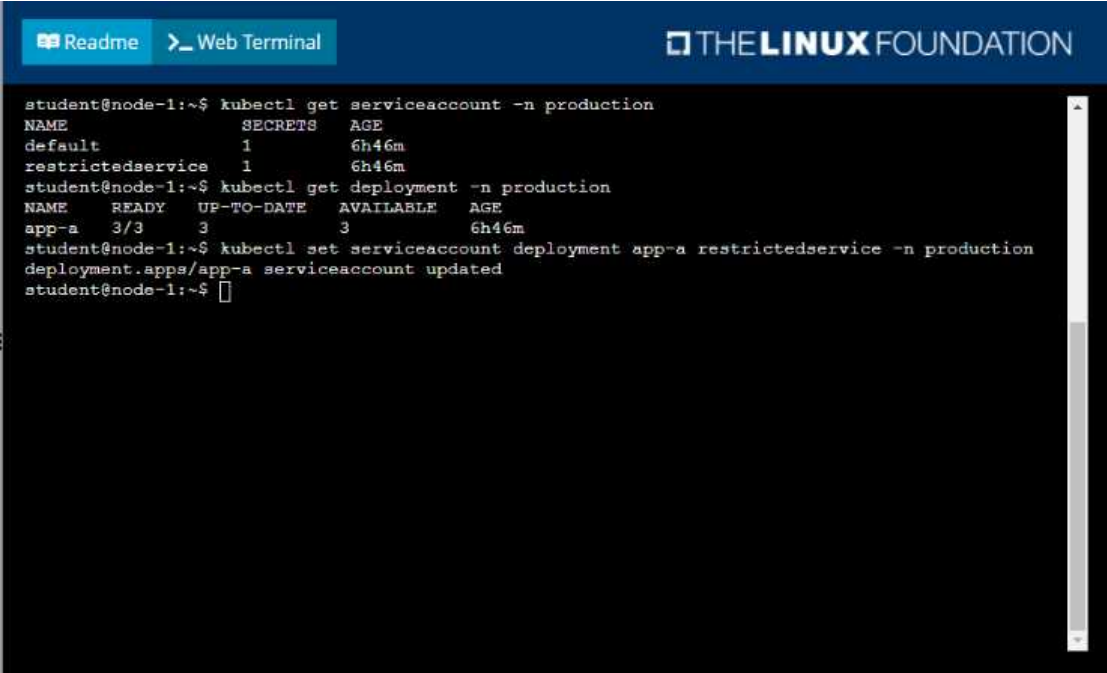
Task

Update the app-a deployment in the production namespace to run as the restrictedservice service account. The service account has already been created.

Answer: See the solution below.

Explanation:

Solution:



```
student@node-1:~$ kubectl get serviceaccount -n production
NAME          SECRETS  AGE
default       1         6h46m
restrictedservice 1         6h46m
student@node-1:~$ kubectl get deployment -n production
NAME    READY  UP-TO-DATE  AVAILABLE  AGE
app-a   3/3    3            3           6h46m
student@node-1:~$ kubectl set serviceaccount deployment app-a restrictedservice -n production
deployment.apps/app-a serviceaccount updated
student@node-1:~$
```

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