

Practical Task 7: Configure and Use ConfigMaps and Secrets in AKS

Requirements:

1. Create a ConfigMap to store non-sensitive configuration data with only the required key-value pairs for the application.
2. Create a Kubernetes Secret to store sensitive data (e.g., API keys) with the least amount of information needed.
3. Update the application deployment to use the ConfigMap and Secret.
4. Remove the ConfigMap, Secret, and deployment after testing.

Practical Task 8: Scale Applications in AKS

Requirements:

1. Deploy a stateless application to the AKS cluster using minimal resource specifications.
2. Use the `kubectl scale` command to manually scale the application to only 2–3 replicas for testing.
3. Set up Horizontal Pod Autoscaler (HPA) with reasonable CPU usage thresholds to minimize pod creation.

Clients list

ID ^	Name ⇅	Email ⇅	Shipping Address ⇅	Active ⇅	Operations
1	Mercury	mercury@gmail.com	123 Mercury St, Solar City, SC 12345	true	Lock
2	Venus	venus@gmail.com	456 Venus Ave, Solar City, SC 12345	true	Lock
3	Earth	earth@gmail.com	789 Earth Blvd, Solar City, SC 12345	true	Lock
4	Mars	iamGod@gmail.com	101 Mars Rd, Solar City, SC 12345	true	Lock
5	Jupiter	jupiter@gmail.com	202 Jupiter Ln, Solar City, SC 12345	true	Lock

```
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* connect to 48.214.169.41 port 80 from 10.0.0.250 port 36058 failed: Connection timed out
* Failed to connect to 48.214.169.41 port 80 after 131561 ms: Couldn't connect to server
* Closing connection
curl: (28) Failed to connect to 48.214.169.41 port 80 after 131561 ms: Couldn't connect to server
stanislav [ ~ ]$ kubectl get deployments
NAME                                READY    UP-TO-DATE    AVAILABLE    AGE
appliancestoretestspringboot        1/1      1              1             78m
nginx                                1/1      1              1            4h21m
stanislav [ ~ ]$ vi deployment2.yaml
stanislav [ ~ ]$ kubectl apply -f deployment2.yaml
deployment.apps/appliancestoretestspringboot unchanged
service/appliancestoretestspringbootmain-app-service configured
stanislav [ ~ ]$ kubectl get deployments
NAME                                READY    UP-TO-DATE    AVAILABLE    AGE
appliancestoretestspringboot        1/1      1              1             81m
nginx                                1/1      1              1            4h24m
stanislav [ ~ ]$ kubectl get services
NAME                                TYPE      CLUSTER-IP    EXTERNAL-IP    PORT(S)      AGE
appliancestoretestspringboot-service LoadBalancer 10.0.26.214    52.230.159.186 80:32301/TCP  81m
appliancestoretestspringbootmain-app-service LoadBalancer 10.0.63.221    48.214.169.41 80:32607/TCP  8m52s
kubernetes                           ClusterIP    10.0.0.1       <none>         443/TCP      5h18m
nginx                                 LoadBalancer 10.0.151.67    64.236.63.178 80:31137/TCP  4h24m
stanislav [ ~ ]$ curl -v http://48.214.169.41
* Trying 48.214.169.41:80...
* Connected to 48.214.169.41 (48.214.169.41) port 80
> GET / HTTP/1.1
> Host: 48.214.169.41
> User-Agent: curl/8.8.0
> Accept: */*
>
* Request completely sent off
```

```
creationTimestamp: null
labels:
  app: appliancestoretestspringboot
spec:
  containers:
  - env:
    - name: PORT
      valueFrom:
        configMapKeyRef:
          key: PORT
          name: app-config
    - name: API_KEY
      valueFrom:
        secretKeyRef:
          key: API_KEY
          name: app-secret
  image: devregistry20250126.azurecr.io/appliancestoretestspringbootmain_app:v1
  imagePullPolicy: IfNotPresent
  lifecycle:
    preStop:
      exec:
        command:
        - /bin/sh
        - -c
        - sleep 10
  livenessProbe:
    failureThreshold: 3
    httpGet:
      path: /actuator/health
      port: 8080
      scheme: HTTP
```

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stanislav [ ~ ]$ vi deployment2.yaml
stanislav [ ~ ]$ kubectl apply -f deployment2.yaml
deployment.apps/appliancestoretestspringboot configured
service/appliancestoretestspringbootmain-app-service created
stanislav [ ~ ]$ kubectl get deployments
NAME                                READY    UP-TO-DATE    AVAILABLE    AGE
appliancestoretestspringboot        1/1      1              1            73m
nginx                                1/1      1              1            4h16m
stanislav [ ~ ]$ kubectl get deployments appliancestoretestspringboot -o yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  annotations:
    deployment.kubernetes.io/revision: "2"
    kubectl.kubernetes.io/last-applied-configuration: |
      {"apiVersion":"apps/v1","kind":"Deployment","metadata":{"annotations":{},"name":"appliancestoretestspringboot","name
space":"default"},"spec":{"replicas":1,"selector":{"matchLabels":{"app":"appliancestoretestspringboot"},"template":{"meta
data":{"labels":{"app":"appliancestoretestspringboot"},"spec":{"containers":[{"env":[{"name":"PORT","valueFrom":{"configM
apKeyRef":{"key":"PORT","name":"app-config"}}},{ "name":"API_KEY","valueFrom":{"secretKeyRef":{"key":"API_KEY","name":"app-
secret"}}}], "image":"devregistry20250126.azurecr.io/appliancestoretestspringbootmain_app:v1","lifecycle":{"preStop":{"exec
":{"command":["/bin/sh","-c","sleep 10"]}}},"livenessProbe":{"httpGet":{"path":"/actuator/health","port":8080},"initialDel
aySeconds":10,"periodSeconds":5},"name":"appliancestoretestspringboot","ports":[{"containerPort":8080},"readinessProbe":{"
"httpGet":{"path":"/actuator/health","port":8080},"initialDelaySeconds":5,"periodSeconds":5},"resources":{"limits":{"cpu":
"500m","memory":"512Mi"},"requests":{"cpu":"250m","memory":"256Mi"}}},"imagePullSecrets":[{"name":"acr-secret"},"termina
tionGracePeriodSeconds":30}}}}
  creationTimestamp: "2025-01-30T16:03:26Z"
  generation: 2
  name: appliancestoretestspringboot
  namespace: default
  resourceVersion: "76212"
  uid: b0fbd1fb-babd-4453-b432-310c334ff603
```

untitledHere are the **CloudWatch Logs Insights** interview.java xuntitledThe ""missing signature key"" error usually happuntitledMiddle Java Engineer (Support).java xuntitled

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```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: appliancestoretestspringboot
spec:
  replicas: 1
  selector:
    matchLabels:
      app: appliancestoretestspringboot
  template:
    metadata:
      labels:
        app: appliancestoretestspringboot
    spec:
      containers:
        - name: appliancestoretestspringboot
          image: devregistry20250126.azurecr.io/appliancestoretestspringbootmain_app:v1
          ports:
            - containerPort: 8080
          env:
            - name: PORT
              valueFrom:
                configMapKeyRef:
                  name: app-config
                  key: PORT
            - name: API_KEY
              valueFrom:
                secretKeyRef:
                  name: app-secret
                  key: API_KEY
          resources:
            requests:
              cpu: "250m"
              memory: "256Mi"
            limits:
              cpu: "500m"
              memory: "512Mi"
          livenessProbe:
            httpGet:
              path: /actuator/health
              port: 8080
            initialDelaySeconds: 10
            periodSeconds: 5
          readinessProbe:
            httpGet:
              path: /actuator/health
              port: 8080
            initialDelaySeconds: 5
            periodSeconds: 5
          lifecycle:
            preStop:
              exec:
                command: ["/bin/sh", "-c", "sleep 10"]
```

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stanislav [ ~ ]$ vi secret.yaml
stanislav [ ~ ]$ kubectl apply -f secret.yaml
secret/app-secret created
stanislav [ ~ ]$ kubectl get secrets
NAME          TYPE          DATA  AGE
acr-secret    kubernetes.io/dockerconfigjson  1      62m
app-secret    Opaque        1      11s
stanislav [ ~ ]$ kubectl get secrets app-secret -o yaml
apiVersion: v1
data:
  API_KEY: dXNlci1zZWMyZXQ=
kind: Secret
metadata:
  annotations:
    kubectl.kubernetes.io/last-applied-configuration: |
      {"apiVersion":"v1","data":{"API_KEY":"dXNlci1zZWMyZXQ="},"kind":"Secret","metadata":{"annotations":{},"name":"app-se
cret","namespace":"default"},"type":"Opaque"}
    creationTimestamp: "2025-01-30T17:03:11Z"
  name: app-secret
  namespace: default
  resourceVersion: "73048"
  uid: 4cb6b269-551b-44e0-8dfd-d9a1d0c32be5
type: Opaque
stanislav [ ~ ]$
```

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stanislav [ ~ ]$ vi configmap.yaml
stanislav [ ~ ]$ kubectl apply -f configmap.yaml
configmap/app-config created
stanislav [ ~ ]$ kubectl get configmaps configmap -o yaml
Error from server (NotFound): configmaps "configmap" not found
stanislav [ ~ ]$ kubectl get configmaps
NAME          DATA   AGE
app-config    1       3m4s
kube-root-ca.crt 1       4h53m
stanislav [ ~ ]$ kubectl get configmaps app-config -o yaml
apiVersion: v1
data:
  PORT: "8080"
kind: ConfigMap
metadata:
  annotations:
    kubectl.kubernetes.io/last-applied-configuration: |
      {"apiVersion":"v1","data":{"PORT":"8080"},"kind":"ConfigMap","metadata":{"annotations":{},"name":"app-config","names
pace":"default"}}
  creationTimestamp: "2025-01-30T16:57:45Z"
  name: app-config
  namespace: default
  resourceVersion: "71732"
  uid: 00f3714f-39ce-4817-8c58-047c8e774cb1
stanislav [ ~ ]$
```


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```
apiVersion: v1
kind: ConfigMap
metadata:
  name: app-config
data:
  PORT: "8080"
```

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All

Practical Task 7: Configure and Use ConfigMaps and Secrets in AKS

Requirements:

1. Create a ConfigMap to store non-sensitive configuration data with only the required key-value pairs for the application.
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