Sprawozdanie nieobowiązkowe z laboratorium numer 5

Kacper Adamiak

https://github.com/Kacper-adamiak/full_stack_laboratory/tree/master/lab_5

Zawartość pliku lab_5.yaml

```yaml
apiVersion: v1
kind: Namespace
metadata:
  name: zad5

---

apiVersion: v1
kind: ResourceQuota
metadata:
  name: zad5-quota
  namespace: zad5
spec:
  hard:
    pods: "10"
    cpu: "2000m"
    memory: 1.5Gi

---

apiVersion: v1
kind: Pod
metadata:
  name: worker
  namespace: zad5
spec:
  containers:
  - name: nginx-container
    image: nginx
    resources:
      limits:
        memory: 200Mi
        cpu: 200m
      requests:
        memory: 100Mi
        cpu: 100m

---

apiVersion: apps/v1
```

```yaml
kind: Deployment
metadata:
  name: php-apache
  namespace: zad5
spec:
  selector:
    matchLabels:
      run: php-apache
  template:
    metadata:
      labels:
        run: php-apache
    spec:
      containers:
      - name: php-apache
        image: registry.k8s.io/hpa-example
        ports:
        - containerPort: 80
        resources:
          limits:
            memory: 250Mi
            cpu: 250m
          requests:
            memory: 150Mi
            cpu: 150m

---

apiVersion: v1
kind: Service
metadata:
  name: php-apache
  namespace: zad5
  labels:
    run: php-apache
spec:
  ports:
  - port: 80
  selector:
    run: php-apache

---

apiVersion: autoscaling/v2
kind: HorizontalPodAutoscaler
metadata:
  name: php-apache
  namespace: zad5
spec:
  scaleTargetRef:
    apiVersion: apps/v1
    kind: Deployment
    name: php-apache
  minReplicas: 1
```

```
  maxReplicas: 5
  metrics:
  - type: Resource
    resource:
      name: cpu
      target:
        type: Utilization
        averageUtilization: 50
```

Uzasadnienie wybranych maxReplicas

Po sprawdzeniu zasobów potrzebnych do funkcjonowania poda workera, deploymen i zsumowaniu tych zasobów, wyszło mi że mogę ustawić maksymalną liczbę replik na 5. Jest to najwyższa liczba możliwa do ustawienia spełniająca warunki quoty przy najgorszym scenariuszu.

Utworzenie elementów z zadania

```
kubectl create -f lab_5.yaml
```

```
NAME              STATUS   AGE
default           Active   21s
kube-node-lease   Active   21s
kube-public       Active   21s
kube-system       Active   21s
zad5              Active   7s
```

```
kubectl get pods -n zad5
```

```
NAME                          READY   STATUS    RESTARTS   AGE
php-apache-74dccfb695-j2g6b   1/1     Running   0          29m
worker                        1/1     Running   0          29m
```

```
kubectl describe namespace zad5
```

```
Name:         zad5
Labels:       kubernetes.io/metadata.name=zad5
Annotations:  <none>
Status:       Active

Resource Quotas
  Name:      zad5-quota
  Resource  Used   Hard
  --------  ---    ---
  cpu       250m   2
  memory    250Mi  1536Mi
  pods      2      10

No LimitRange resource.
```

```
kubectl describe deployments.apps php-apache -n zad5
```

```
Name:                   php-apache
Namespace:              zad5
CreationTimestamp:      Wed, 15 Nov 2023 13:26:58 +0100
Labels:                 <none>
Annotations:            deployment.kubernetes.io/revision: 1
Selector:               run=php-apache
Replicas:               5 desired | 5 updated | 5 total | 5 available | 0 unavailable
StrategyType:           RollingUpdate
MinReadySeconds:        0
RollingUpdateStrategy:  25% max unavailable, 25% max surge
Pod Template:
  Labels:  run=php-apache
  Containers:
   php-apache:
    Image:      registry.k8s.io/hpa-example
    Port:       80/TCP
    Host Port:  0/TCP
    Limits:
      cpu:     250m
      memory:  250Mi
    Requests:
      cpu:        150m
      memory:     150Mi
    Environment:  <none>
    Mounts:       <none>
  Volumes:        <none>
Conditions:
  Type           Status  Reason
  ----           ------  ------
  Progressing    True    NewReplicaSetAvailable
  Available      True    MinimumReplicasAvailable
OldReplicaSets:  <none>
NewReplicaSet:   php-apache-74dccfb695 (5/5 replicas created)
Events:
  Type    Reason             Age    From                   Message
  ----    ------             ----   ----                   -------
  Normal  ScalingReplicaSet  21m    deployment-controller  Scaled up replica set php-apache-74dccfb695 to 1
  Normal  ScalingReplicaSet  9m58s  deployment-controller  Scaled up replica set php-apache-74dccfb695 to 2 from 1
  Normal  ScalingReplicaSet  7m58s  deployment-controller  Scaled up replica set php-apache-74dccfb695 to 4 from 2
  Normal  ScalingReplicaSet  5m58s  deployment-controller  Scaled up replica set php-apache-74dccfb695 to 5 from 4
```

Użycie load-generatora

```
kubectl run -i --tty load-generator --rm --image=busybox:1.28 --
restart=Never -- /bin/sh -c "while sleep 0.01; do wget -q -O- http://php-
apache.lab5.svc.cluster.local; done"
```

```
If you don't see a command prompt, try pressing enter.
OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!
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OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!OK!
OK!OK!OK!OK!OK!OK!^Cpod "load-generator" deleted
pod default/load-generator terminated (Error)
```

Sprawdzenie działania hpa

```
kubectl get hpa php-apache --watch -n zad5
```

```
NAME         REFERENCE               TARGETS          MINPODS   MAXPODS   REPLICAS   AGE
php-apache   Deployment/php-apache   <unknown>/50%    1         5         1          10m
php-apache   Deployment/php-apache   0%/50%           1         5         1          10m
php-apache   Deployment/php-apache   90%/50%          1         5         1          11m
php-apache   Deployment/php-apache   90%/50%          1         5         2          11m
php-apache   Deployment/php-apache   83%/50%          1         5         2          12m
php-apache   Deployment/php-apache   97%/50%          1         5         2          13m
php-apache   Deployment/php-apache   97%/50%          1         5         4          13m
php-apache   Deployment/php-apache   73%/50%          1         5         4          14m
php-apache   Deployment/php-apache   70%/50%          1         5         4          15m
php-apache   Deployment/php-apache   70%/50%          1         5         5          15m
php-apache   Deployment/php-apache   53%/50%          1         5         5          16m
php-apache   Deployment/php-apache   0%/50%           1         5         5          17m
php-apache   Deployment/php-apache   0%/50%           1         5         5          21m
php-apache   Deployment/php-apache   0%/50%           1         5         5          22m
php-apache   Deployment/php-apache   0%/50%           1         5         1          22m
```

```
kubectl describe namespace zad5
```

```
Name:         zad5
Labels:       kubernetes.io/metadata.name=zad5
Annotations:  <none>
Status:       Active

Resource Quotas
  Name:     zad5-quota
  Resource  Used   Hard
  --------  ---    ---
  cpu       850m   2
  memory    850Mi  1536Mi
  pods      6      10

No LimitRange resource.
```

jak widać nie byłem w stanie wygenerować dostatecznego obciążenia by wykorzystać całe zasoby