

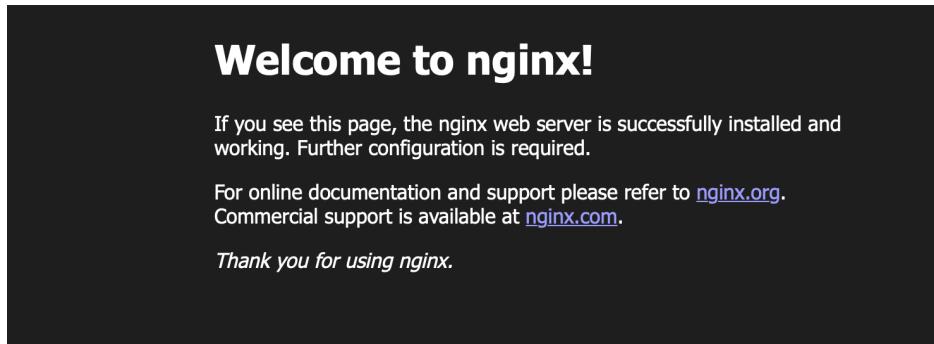
Лабораторная работа №4

Задание 1.

Скрины:

```
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apiVersion: apps/v1
kind: Deployment
metadata:
  name: explore-deploy
  labels:
    app: nginx
    environment: test
spec:
  replicas: 3
  selector:
    matchLabels:
      app: nginx
  template:
    metadata:
      labels:
        app: nginx
    spec:
      containers:
        - name: nginx-container
          image: nginx:1.25
          ports:
            - containerPort: 80
```



```
ptashko@MacBook-Air--Artem K8S % kubectl apply -f test2.yaml
deployment.apps/explore-deploy created
ptashko@MacBook-Air--Artem K8S % kubectl get deployments
NAME         READY   UP-TO-DATE   AVAILABLE   AGE
explore-deploy   3/3     3           3           19s
ptashko@MacBook-Air--Artem K8S % kubectl port-forward deployment/explore-deploy
error: TYPE/NAME and list of ports are required for port-forward
See 'kubectl port-forward -h' for help and examples
ptashko@MacBook-Air--Artem K8S % kubectl port-forward deployment/explore-deploy 8080:80
Forwarding from 127.0.0.1:8080 -> 80
Forwarding from [::1]:8080 -> 80
Handling connection for 8080
```

```

ptashko@MacBook-Air--Artem K8S % kubectl get deployment explore-deploy -o wide
NAME          READY   UP-TO-DATE   AVAILABLE   AGE   CONTAINERS   IMAGES   SELECTOR
explore-deploy  3/3     3           3           22s   nginx-container   nginx:1.25   app=nginx
ptashko@MacBook-Air--Artem K8S % kubectl describe deployment explore-deploy
Name:           explore-deploy
Namespace:      default
CreationTimestamp:  Fri, 03 Oct 2025 13:17:54 +0300
Labels:         app=nginx
                environment=test
Annotations:    deployment.kubernetes.io/revision: 1
Selector:       app=nginx
Replicas:       3 desired | 3 updated | 3 total | 3 available | 0 unavailable
StrategyType:   RollingUpdate
MinReadySeconds: 0
RollingUpdateStrategy: 25% max unavailable, 25% max surge
Pod Template:
  Labels:  app=nginx
  Containers:
    nginx-container:
      Image:      nginx:1.25
      Port:       80/TCP
      Host Port:  0/TCP
      Environment: <none>
      Mounts:    <none>
      Volumes:   <none>
      Node-Selectors: <none>
      Tolerations:  <none>
  Conditions:
    Type     Status  Reason
    ----     ----   -----
    Available  True    MinimumReplicasAvailable
    Progressing  True    NewReplicaSetAvailable
  OldReplicaSets: <none>
  NewReplicaSet:  explore-deploy-768d5b45f7 (3/3 replicas created)
Events:
  Type     Reason          Age   From           Message
  ----     ----          ----  --            -----
  Normal   ScalingReplicaSet 33s   deployment-controller  Scaled up replica set explore-deploy-768d5b45f7 from 0 to 3
ptashko@MacBook-Air--Artem K8S % kubectl get pods -l app=nginx
NAME          READY   STATUS    RESTARTS   AGE
explore-deploy-768d5b45f7-5kt46  1/1     Running   0          46s
explore-deploy-768d5b45f7-7vtlp  1/1     Running   0          46s
explore-deploy-768d5b45f7-hlzjg  1/1     Running   0          46s
ptashko@MacBook-Air--Artem K8S % kubectl logs deployment/explore-deploy --tail=5
Found 3 pods, using pod/explore-deploy-768d5b45f7-5kt46
2025/10/03 10:17:55 [notice] 1#1: start worker process 32

```

Ответы на вопросы:

Сколько Pod'ов управляет этим Deployment?

Ответ: 3

Какая стратегия обновления используется по умолчанию?

Ответ: RollingUpdate

Какой образ используется в контейнерах?

Ответ: nginx:1.25

Какая версия nginx запущена в Pod'ах?

Ответ: 1.25.5

Какой селектор использует Deployment для управления Pod'a?

Ответ: app=nginx

Задание 2.

Скрины:

```
ptashko@MacBook-Air--Artem K8S % kubectl exec -it explore-deploy-768d5b45f7-5kt46 -- nginx -v
nginx: nginx/1.25.5
ptashko@MacBook-Air--Artem K8S % kubectl scale deployment explore-deploy --replicas=5
deployment.apps/explore-deploy scaled
ptashko@MacBook-Air--Artem K8S % kubectl set image deployment/explore-deploy nginx=nginx:1.26
error: unable to find container named "nginx"
ptashko@MacBook-Air--Artem K8S % nano test2*
ptashko@MacBook-Air--Artem K8S % kubectl set image deployment/explore-deploy nginx-container=nginx:1.26
deployment.apps/explore-deploy image updated
ptashko@MacBook-Air--Artem K8S % kubectl get pods -l app=nginx --watch
NAME          READY   STATUS    RESTARTS   AGE
explore-deploy-9875d7b66-5rbgn  1/1     Running   0          3m8s
explore-deploy-9875d7b66-67hz2  1/1     Running   0          2m51s
explore-deploy-9875d7b66-g96n9  1/1     Running   0          3m8s
explore-deploy-9875d7b66-jc68w  1/1     Running   0          2m52s
explore-deploy-9875d7b66-w5hkw  1/1     Running   0          3m8s
^C%
ptashko@MacBook-Air--Artem K8S % kubectl rollout status deployment/explore-deploy
deployment "explore-deploy" successfully rolled out
```

Ответы на вопросы:

Как изменилось количество Pod'ов после масштабирования?

Ответ: с 3 на 5

Сколько времени заняло обновление до версии 1.26?

Ответ: 2s

Какие Pod'ы были созданы при обновлении (проверьте по именам)?

Ответ:

explore-deploy-9875d7b66-5rbgn
explore-deploy-9875d7b66-67hz2
explore-deploy-9875d7b66-g96n9
explore-deploy-9875d7b66-jc68w
explore-deploy-9875d7b66-w5hkw

Как проверить, что откат прошел успешно?

Ответ: deployment "explore-deploy" successfully rolled out

Задание 3.

Скрины:

```
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apiVersion: apps/v1
kind: Deployment
metadata:
  name: production-app
  labels:
    app: production
    env: staging
spec:
  replicas: 4
  strategy:
    type: RollingUpdate
    rollingUpdate:
      maxSurge: 1
      maxUnavailable: 0
  selector:
    matchLabels:
      app: production
  template:
    metadata:
      labels:
        app: production
    spec:
      containers:
        - name: nginx-container
          image: nginx:1.25
          ports:
            - containerPort: 80
          resources:
            limits:
              memory: "128Mi"
              cpu: "500m"
            requests:
              memory: "64Mi"
              cpu: "250m"
```

```
ptashko@MacBook-Air--Artem K8S % nano test2*
ptashko@MacBook-Air--Artem K8S % kubectl apply -f test2.yaml
deployment.apps/production-app created
```

Задание 4.

Скрины:

```
UW PICO 5.09

apiVersion: apps/v1
kind: Deployment
metadata:
  name: production-app
  labels:
    app: production
    env: staging
spec:
  replicas: 3
  strategy:
    type: RollingUpdate
    rollingUpdate:
      maxSurge: 1
      maxUnavailable: 0
  selector:
    matchLabels:
      app: production
  template:
    metadata:
      labels:
        app: production
    spec:
      containers:
        - name: nginx-container
          image: nginx:1.25
          ports:
            - containerPort: 80
          resources:
            limits:
              memory: "128Mi"
              cpu: "500m"
            requests:
              memory: "64Mi"
              cpu: "250m"
```

```
ptashko@MacBook-Air--Artem K8S % kubectl rollout history deployment/production-app --revision=1
deployment.apps/production-app with revision #1
Pod Template:
  Labels:      app=production
  pod-template-hash=669d8644df
  Containers:
    nginx-container:
      Image:      nginx:1.25
      Port:       80/TCP
      Host Port:  0/TCP
      Limits:
        cpu: 500m
        memory: 128Mi
      Requests:
        cpu: 250m
        memory: 64Mi
      Environment:  <none>
      Mounts:      <none>
      Volumes:     <none>
      Node-Selectors:  <none>
      Tolerations:  <none>
  
```

```
ptashko@MacBook-Air--Artem K8S % kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
production-app-669d8644df-rjxgh  1/1    Running   0          4m48s
production-app-669d8644df-xfn7   1/1    Running   0          107s
production-app-669d8644df-z4xnl  1/1    Running   0          5m45s
ptashko@MacBook-Air--Artem K8S % kubectl delete pod production-app-669d8644df-rjxgh
pod "production-app-669d8644df-rjxgh" deleted from default namespace
ptashko@MacBook-Air--Artem K8S %
```

```
kt*2
kubectl
Last login: Mon Oct  6 08:19:50 on ttys000
ptashko@MacBook-Air--Artem ~ % kubectl get pods --watch
NAME          READY   STATUS    RESTARTS   AGE
production-app-669d8644df-rjxgh  1/1    Running   0          4m31s
production-app-669d8644df-xfn7   1/1    Running   0          90s
production-app-669d8644df-z4xnl  1/1    Running   0          5m28s
production-app-669d8644df-rjxgh  1/1    Terminating 0          5m1s
production-app-669d8644df-rjxgh  1/1    Terminating 0          5m1s
production-app-669d8644df-vmrvx  0/1    Pending   0          0s
production-app-669d8644df-vmrvx  0/1    Pending   0          0s
production-app-669d8644df-vmrvx  0/1    ContainerCreating 0          0s
production-app-669d8644df-rjxgh  0/1    Completed  0          5m1s
production-app-669d8644df-vmrvx  1/1    Running   0          1s
production-app-669d8644df-rjxgh  0/1    Completed  0          5m2s
production-app-669d8644df-rjxgh  0/1    Completed  0          5m2s
production-app-669d8644df-rjxgh  0/1    Completed  0          5m2s
```

```

Containers:
  nginx-container:
    Image:      nginx:1.22.0
    Port:      80/TCP
    Host Port: 0/TCP
    Limits:
      cpu:      500m
      memory:   128Mi
    Requests:
      cpu:      250m
      memory:   64Mi
    Environment:
    Mounts:    <none>
    Volumes:   <none>
    Node-Selectors: <none>
    Tolerations:  <none>
  ptashko@MacBook-Air--Artem: ~ % kubectl get pods
  NAME                               READY   STATUS    RESTARTS   AGE
  production-app-669d8644df-vmrvx   1/1     Running   0          5m50s
  production-app-669d8644df-xfnm7   1/1     Running   0          7m50s
  production-app-669d8644df-z4xnl   1/1     Running   0          11m
  ptashko@MacBook-Air--Artem: ~ %
  ptashko@MacBook-Air--Artem: ~ % kubectl set image deployment/production-app nginx-container=nenginx:2.44
  deployment.apps/production-app image updated
  ptashko@MacBook-Air--Artem: ~ % kubectl rollout undo deployment/production-app
  deployment.apps/production-app rolled back
  ptashko@MacBook-Air--Artem: ~ % kubectl rollout undo deployment/production-app --to-revision=1
  deployment.apps/production-app rolled back
  ptashko@MacBook-Air--Artem: ~ % kubectl get pods
  NAME                               READY   STATUS    RESTARTS   AGE
  production-app-669d8644df-vmrvx   1/1     Running   0          5m50s
  production-app-669d8644df-xfnm7   1/1     Running   0          7m50s
  production-app-669d8644df-z4xnl   1/1     Running   0          11m
  ptashko@MacBook-Air--Artem: ~ %

```

Ответы на вопросы:

Сколько времени заняло автоматическое восстановление Pod'a?

Ответ: 2s

Какое состояние у Pod'ов при проблемном обновлении?

Ответ:

ContainerStatusUnknown

ErrImagePull

ImagePullBackOff

Terminating

Как Deployment обрабатывает ошибки обновления образов?

Ответ: trying and failing to pull image

Какие события отображаются в describe при ошибках?

Ответ: события изменений - попытка спулить новый образ

Задание 5.

Ответы на вопросы:

Сколько ревизий хранится в истории Deployment?

Ответ: 2

Какие команды вызывали изменения в Deployment?

Ответ: kubectl set image deployment/production-app nginx-container=nnginx:2.44

Есть ли предупреждения или ошибки в событиях?

Ответ: да, есть предупреждение о несуществовании образа

Какое потребление ресурсов у Pod'ов Deployment?

Ответ:

memory - 64 Mi

CPU - 250m