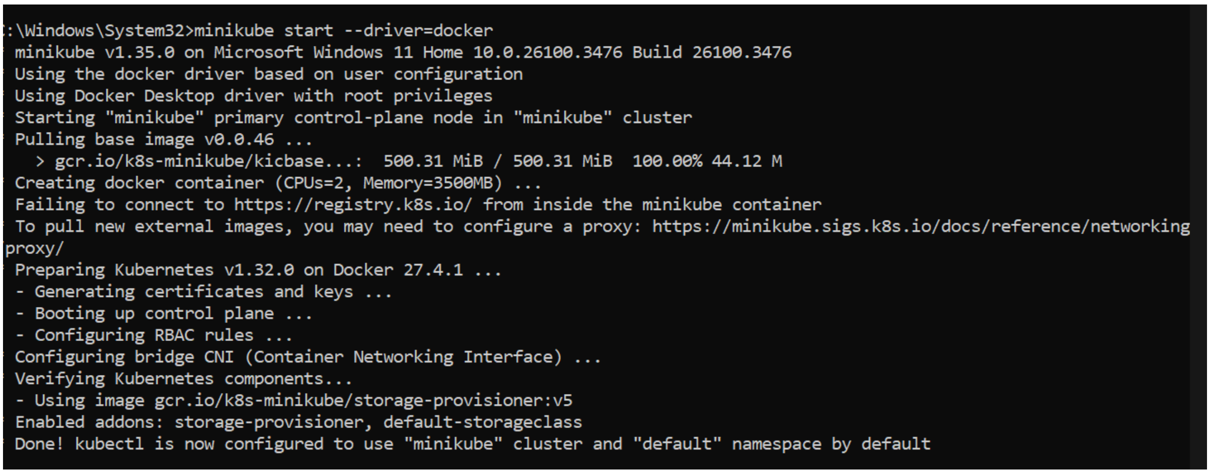
Lab 3

Mirella Glowinska

1. Creating a Kubernetes Cluster



```
:\Windows\System32>minikube start --driver=docker
 minikube v1.35.0 on Microsoft Windows 11 Home 10.0.26100.3476 Build 26100.3476
 Using the docker driver based on user configuration
 Using Docker Desktop driver with root privileges
 Starting "minikube" primary control-plane node in "minikube" cluster
 Pulling base image v0.0.46 ...
   > gcr.io/k8s-minikube/kicbase...:  500.31 MiB / 500.31 MiB  100.00% 44.12 M
 Creating docker container (CPUs=2, Memory=3500MB) ...
 Failing to connect to https://registry.k8s.io/ from inside the minikube container
 To pull new external images, you may need to configure a proxy: https://minikube.sigs.k8s.io/docs/reference/networking
proxy/
 Preparing Kubernetes v1.32.0 on Docker 27.4.1 ...
 - Generating certificates and keys ...
 - Booting up control plane ...
 - Configuring RBAC rules ...
 Configuring bridge CNI (Container Networking Interface) ...
 Verifying Kubernetes components...
 - Using image gcr.io/k8s-minikube/storage-provisioner:v5
 Enabled addons: storage-provisioner, default-storageclass
 Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
```

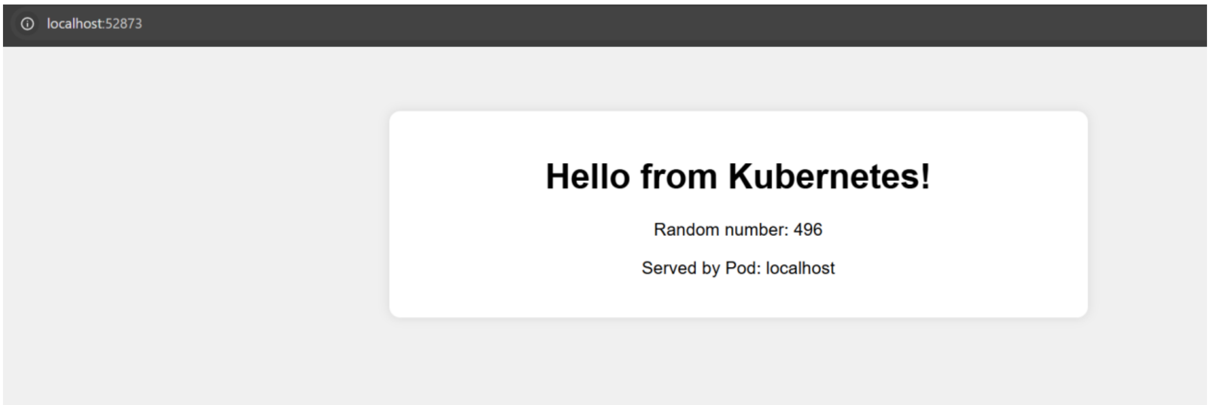
2. Deployment of the HTML application (using Lens software)

Application Deployment	Application Expose	Application Config

# Deployment 	
apiVersion: apps/v1
kind: Deployment
metadata:
  name: web-app
spec:
  replicas: 2
  selector:
    matchLabels:
      app: web-app
  template:
    metadata:
      labels:
        app: web-app
    spec:
      containers:
      - name: nginx
        image: nginx:alpine
        ports:
        - containerPort: 80
        resources:
          requests:
            memory: "64Mi"
            cpu: "50m"
          limits:
            memory: "128Mi"
            cpu: "100m"
        livenessProbe:
          httpGet:
            path: /
            port: 80
          initialDelaySeconds: 5
          periodSeconds: 10
        readinessProbe:
          httpGet:
            path: /
            port: 80
          initialDelaySeconds: 2
          periodSeconds: 5
	# Service
	apiVersion: v1
	kind: Service
	metadata:
	  name: web-service
	spec:
	  type: LoadBalancer
	  selector:
	    app: web-app
	  ports:
	    - protocol: TCP
	      port: 80
	      targetPort: 80
		# ConfigMap with HTML content
		apiVersion: v1
		kind: ConfigMap
		metadata:
		  name: html-content
		data:
		  index.html: |
		    <!DOCTYPE html>
		    <html>
		    <head>
		        <title>Random Kubernetes App</title>
		        <style>
		            body {
		                font-family: Arial, sans-serif;
		                background: #f0f0f0;
		                text-align: center;
		                padding: 50px;
		            }
		            .container {
		                background: white;
		                border-radius: 10px;
		                padding: 20px;
		                box-shadow: 0 0 10px rgba(0,0,0,0.1);
		                max-width: 600px;
		                margin: 0 auto;
		            }
		        </style>
		    </head>
		    <body>
		        <div class="container">
		            <h1>Hello from Kubernetes!</h1>
		            <p>Random number: <span
		id="random"></span></p>
		            <p>Served by Pod: <span
		id="podname"></span></p>
		            <script>
		
		document.getElementById('random').textConte
		nt = Math.floor(Math.random() * 1000);

volumeMounts: - name: html-content mountPath: /usr/share/nginx/html volumes: - name: html-content configMap: name: html-content		document.getElementById('podname').textContent = window.location.hostname; </script> </div> </body> </html>

3. HTML application preview



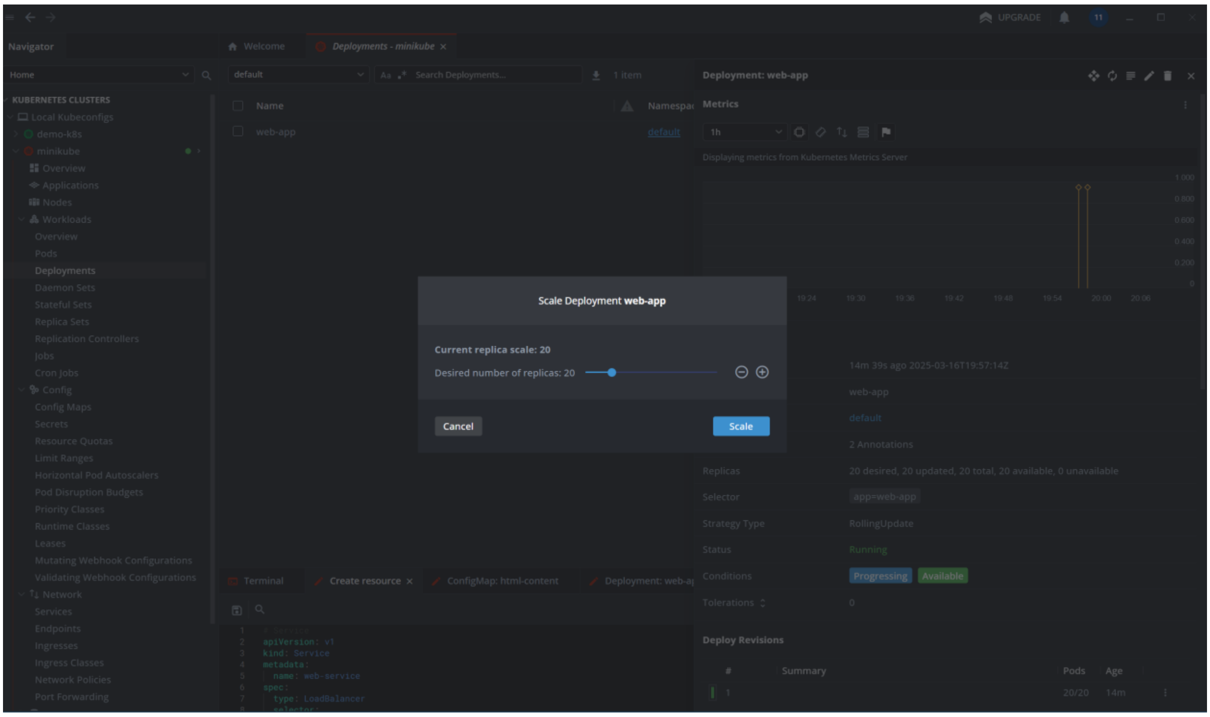
localhost:52873

Hello from Kubernetes!

Random number: 496

Served by Pod: localhost

4. Application Scaling



Scale Deployment **web-app**

Current replica scale: 20

Desired number of replicas: 20

Cancel

Scale

Deployment: web-app

14m 39s ago 2025-03-16T19:57:14Z

web-app

default

2 Annotations

Replicas: 20 desired, 20 updated, 20 total, 20 available, 0 unavailable

Selector: app=web-app

Strategy Type: RollingUpdate

Status: Running

Conditions: Progressing Available

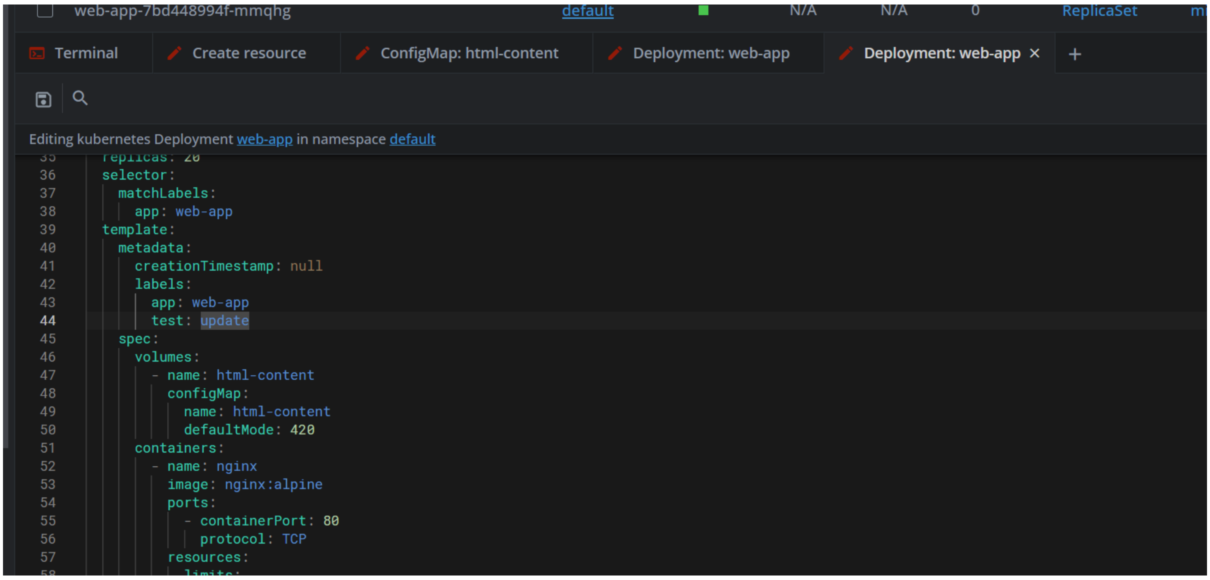
Tolerations: 0

Deploy Revisions

#	Summary	Pods	Age
1		20/20	14m

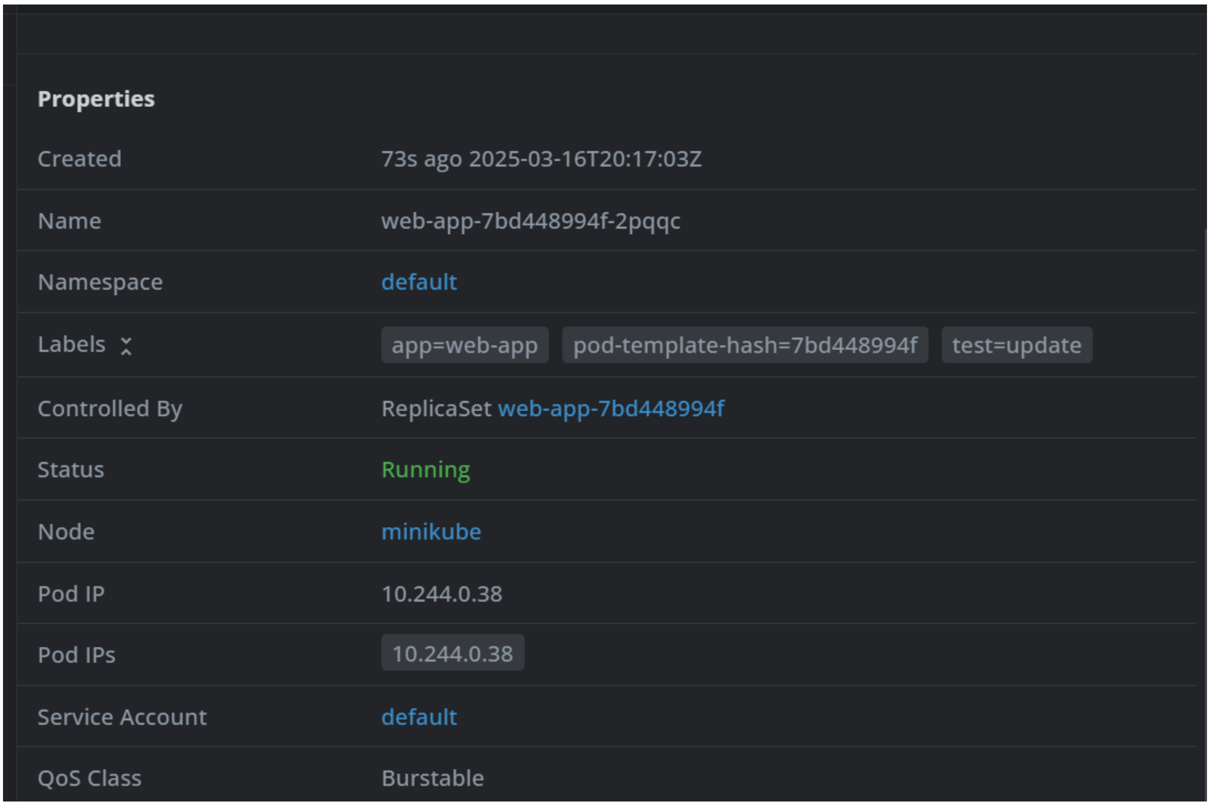
```
# Service
apiVersion: v1
kind: Service
metadata:
  name: web-service
spec:
  type: LoadBalancer
  selector:
```

5. **Manifest Update**



Editing kubernetes Deployment web-app in namespace default

```
  replicas: 20
  selector:
    matchLabels:
      app: web-app
  template:
    metadata:
      creationTimestamp: null
      labels:
        app: web-app
        test: update
    spec:
      volumes:
        - name: html-content
          configMap:
            name: html-content
            defaultMode: 420
      containers:
        - name: nginx
          image: nginx:alpine
          ports:
            - containerPort: 80
              protocol: TCP
          resources:
            limits:
```



Properties

Created	73s ago 2025-03-16T20:17:03Z
Name	web-app-7bd448994f-2pqqc
Namespace	default

Labels	app=web-app
	pod-template-hash=7bd448994f
	test=update

Controlled By	ReplicaSet web-app-7bd448994f
Status	Running
Node	minikube
Pod IP	10.244.0.38
Pod IPs	10.244.0.38
Service Account	default
QoS Class	Burstable