Hello World Kubernetes Deployment

This project demonstrates how to deploy a simple "Hello World" application using Kubernetes. It includes:

- A **Deployment** to run the `crccheck/hello-world` Docker image.
- A **Service** to expose the application internally.
- An **Ingress** to route external traffic to the service using a custom domain.

Prerequisites

- A Kubernetes cluster with an **NGINX Ingress Controller** installed.
- `kubectl` configured to access your cluster.

Deployment Steps

1. Create the Deployment

The deployment runs the `crccheck/hello-world` image and exposes port **8000**.

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: hello-world-deployment
spec:
  replicas: 1
  selector:
    matchLabels:
      app: hello-world
  template:
    metadata:
      labels:
        app: hello-world
    spec:
      containers:
      - name: hello-world-container
        image: crccheck/hello-world
        ports:
        - containerPort: 8000
```

Apply the deployment:

```
kubectl apply -f deployment.yaml
```

2. Create the Service

The service exposes the deployment internally on port **80** and routes traffic to the pods on port **8000**.

```
apiVersion: v1
kind: Service
metadata:
  name: hello-world-service
spec:
  selector:
    app: hello-world
  ports:
    - protocol: TCP
      port: 80
      targetPort: 8000
```

Apply the service:

```
kubectl apply -f service.yaml
```

3. Create the Ingress

The ingress routes external traffic to the service using the domain **sub-domain.abdelhamedabdelnasser.com**.

```
apiVersion: networking.k8s.io/v1
kind: Ingress
metadata:
  name: hello-world-ingress
spec:
  ingressClassName: nginx
  rules:
  - host: sub-domain.abdelhamedabdelnasser.com
    http:
      paths:
      - path: /
        pathType: Prefix
        backend:
          service:
            name: hello-world-service
            port:
              number: 80
```

Apply the ingress:

```
kubectl apply -f ingress.yaml
```

Testing the Application

1. Using kubectl port-forward

You can forward a local port to the service for testing:

```
kubectl port-forward svc/hello-world-service 8080:80
```

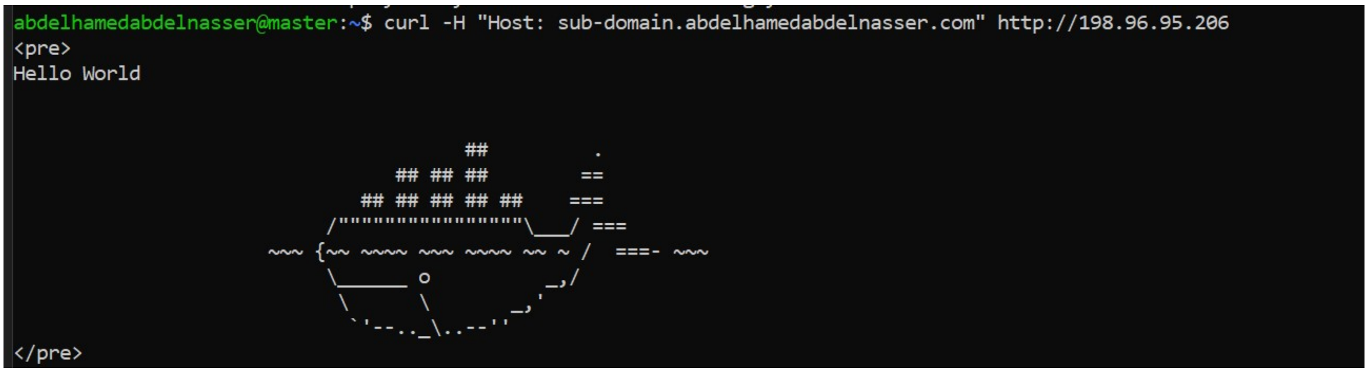
Then, open your browser or use `curl` to access:

```
http://localhost:8080
```

2. Testing the Ingress

Method 1: Use curl with a Custom Host Header

```
curl -H "Host: sub-domain.abdelhamedabdelnasser.com" http://198.96.95.206
```



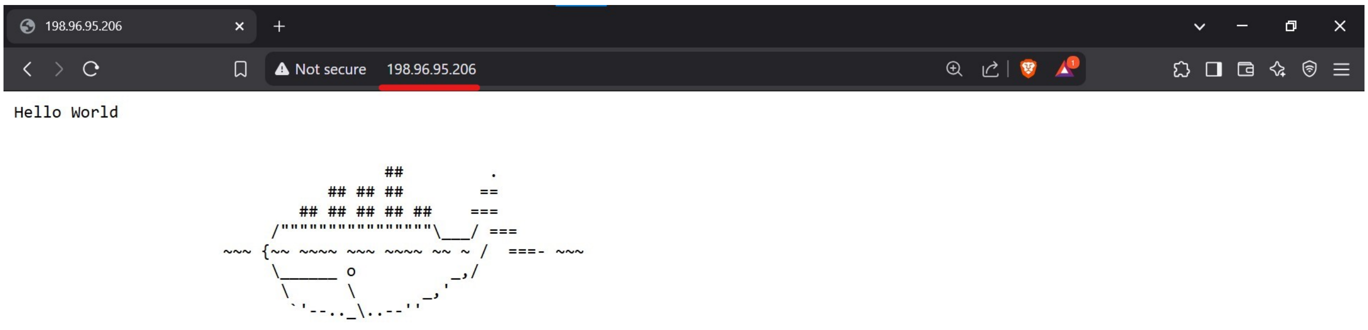
```
abdelhamedabdelnasser@master:~$ curl -H "Host: sub-domain.abdelhamedabdelnasser.com" http://198.96.95.206
<pre>
Hello World


                                       ##          .
                                 ## ## ##         ==
                              ## ## ## ## ##     ===
                           /"""""""""""""""""\___/ ===
                      ~~~ {~~ ~~~~ ~~~ ~~~~ ~~ ~ /  ===- ~~~
                           \______ o          _,/
                            \      \       _,'
                             `'--.._\..--''

</pre>
```

Method 2: Use a Browser Extension

- Install **ModHeader** (Chrome/Edge) and add a custom header:
  - **Header Name:** Host
  - **Header Value:** sub-domain.abdelhamedabdelnasser.com
- Navigate to: `http://198.96.95.206`



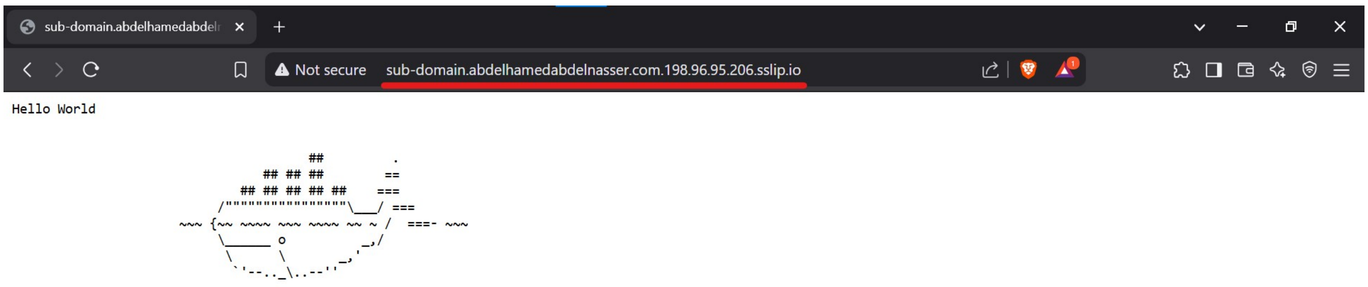
```
Hello World

                ##         .
          ## ## ##        ==
       ## ## ## ## ##    ===
   /""""""""""""""""\___/ ===
~~~ {~~ ~~~~ ~~~ ~~~~ ~~ ~ /  ===- ~~~
   \______ o          _,/
    \      \       _,'
     `'--.._\..--''
```

Method 3: Use a Temporary DNS Service

Use a service like `sslip.io` or `nip.io` to resolve the domain:

```
http://http://sub-domain.abdelhamedabdelnasser.com.198.96.95.206.sslip.io/
```


sub-domain.abdelhamedabdel
Not secure
sub-domain.abdelhamedabdelnasser.com.198.96.95.206.sslip.io

```
Hello World

                ##         .
          ## ## ##        ==
       ## ## ## ## ##    ===
   /""""""""""""""""\___/ ===
~~~ {~~ ~~~~ ~~~ ~~~~ ~~ ~ /  ===- ~~~
   \______ o          _,/
    \      \       _,'
     `'--.._\..--''
```

Verify Resources

Check the status of your resources:

```
kubectl get deployment hello-world-deployment
kubectl get service hello-world-service
kubectl get ingress hello-world-ingress
```

Clean Up

To delete all resources:

```
kubectl delete -f deployment.yaml
kubectl delete -f service.yaml
kubectl delete -f ingress.yaml
```

Notes

- Replace `198.96.95.206` with the actual IP address of your ingress.
- Ensure your **DNS** or `/etc/hosts` is configured correctly if using a custom domain.