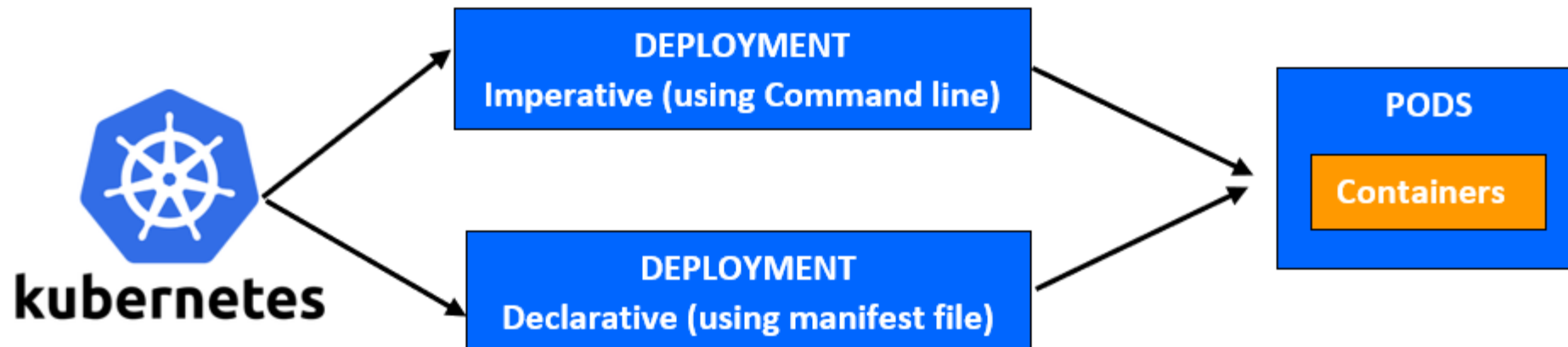


# Project: Deploying an Nginx Web Server on Kubernetes

In this project, we will:

1. Create a pod using both declarative and imperative approaches.
2. Check CPU and memory utilization of the pod.
3. Verify logs for troubleshooting.



# Kubernetes - Imperative & Declarative

## Kubernetes Fundamentals

Imperative

Declarative

kubectl

Pod

ReplicaSet

Deployment

Service

YAML & kubectl

Pod

ReplicaSet

Deployment

Service

## Step 1: Create a Pod Using the Declarative Approach

We'll start by creating a pod using a YAML definition file.

### 1.1 Create a YAML file (nginx-pod.yaml)

```
apiVersion: v1
kind: Pod
metadata:
  name: nginx-pod
  labels:
    app: nginx
spec:
  containers:
    - name: nginx-container
      image: nginx:latest
      ports:
        - containerPort: 80
```

## 1.2 Apply the YAML file to create the pod

```
kubectl apply -f nginx-pod.yaml
```

## 1.3 Verify that the pod is running

```
kubectl get pods
```

## Step 2: Create a Pod Using the Imperative Approach

For quick testing, let's create another pod using a single

```
kubectl run nginx-imperative --image=nginx --restart=Never
```

## Check that the pod is running

```
kubectl get pods
```

## Step 3: Check CPU and Memory Utilization

Now that we have two running pods, let's check their resource usage:

### 3.1 Check resource utilization for all pods

```
kubectl top pods
```

### 3.2 Check resource utilization for a specific pod

```
kubectl top pod nginx-pod
```

### Step 4: Check Logs for Troubleshooting

Logs help us understand if there are any issues with the running pods.

#### 4.1 View logs for the declarative pod

```
kubectl logs nginx-pod
```

#### 4.2 View logs for the imperative pod

```
kubectl logs nginx-imperative
```

### 4.3 Stream logs in real-time

```
kubectl logs nginx-pod -f
```

### Step 5: Clean Up the Environment

Once you are done, delete the pods to clean up your environment:

```
kubectl delete pod nginx-pod  
kubectl delete pod nginx-imperative
```

## **Project Summary**

In this project, you:

- Learned how to create Kubernetes resources using both declarative (YAML file) and imperative (CLI) approaches.
- Checked the CPU and memory usage of running pods.
- Used logs to troubleshoot any issues.

This is a simple project, but it covers the fundamentals of working with Kubernetes and will help you get comfortable with both approaches and basic monitoring/troubleshooting commands.