

# Series of events

When you run the following command, a bunch of things happen

```
kubectl create deployment nginx-deployment --image=nginx --port=80 --replicas=1
```

## Step-by-Step Breakdown:

### 1. Command Execution:

- You execute the command on a machine with **kubectl** installed and configured to interact with your Kubernetes cluster.

### 2. API Request:

- **kubectl** sends a request to the Kubernetes API server to create a Deployment resource with the specified parameters.

### 3. API Server Processing:

- The API server receives the request, validates it, and then processes it. If the request is valid, the API server updates the desired state of the cluster stored in etcd. The desired state now includes the new Deployment resource.

### 4. Storage in etcd:

- The Deployment definition is stored in etcd, the distributed key-value store used by Kubernetes to store all its configuration data and cluster state. etcd is the source of truth for the cluster's desired state.

### 5. Deployment Controller Monitoring:

- The Deployment controller, which is part of the **kube-controller-manager**, continuously watches the API server for changes to

the Deployment you created.

### 6. ReplicaSet Creation:

- The Deployment controller creates a ReplicaSet based on the Deployment's specification. The ReplicaSet is responsible for maintaining a stable set of replica Pods running at any given time.

## 7. Pod Creation:

- The ReplicaSet controller (another part of the `kube-controller-manager`) ensures that the desired number of Pods (in this case, 3) are created and running. It sends requests to the API server to create these Pods.

## 8. Scheduler Assignment:

- The Kubernetes scheduler watches for new Pods that are in the "Pending" state. It assigns these Pods to suitable nodes in the cluster based on available resources and scheduling policies.

## 9. Node and Kubelet:

- The kubelet on the selected nodes receives the Pod specifications from the API server. It then pulls the necessary container images (nginx in this case) and starts the containers.

### ► Hierarchical Relationship



A good question to ask at this point is why do you need a `deployment` when a `replicaset` is good enough to bring up and heal pods?