

Kubernetes

Let's deep dive into some other important concepts of K8S:

Deployment:

This is a manifest file in YAML format that makes the containers inside the pod supercharged, just like Tony Stark with the Iron Man suit, with extra features such as replicas, rolling updates, autoscaling, and auto-healing.

Replicas - Tells how many pods need to be created.

Rolling update – The update happens one by one for each container inside the pod. Let's assume I update the image of a container. In this case, not all containers will be updated at once; instead, they will be updated one by one. This avoids downtime and keeps the application running during the updates.

Autoscaling - Scale up or increase the container if needed.

Autohealing - Restart or create a new one if one of the containers gets off.

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: nginx-deployment # name of deployment
  namespace: nginx
spec:
  replicas: 2
  selector:
    matchLabels:
      app: nginx
  template:
    metadata:
      labels:
        app: nginx
    spec:
      containers:
        - name: nginx-cont
          image: nginx:latest
          ports:
            - containerPort: 80
```

ReplicaSets: -

Similar to Deployments, which help in the replication of pods, ReplicaSets also works on the same principle but without the additional features of Deployments, such as rolling updates.

So there is no big difference in the manifest file except for the kind and other details.

```
kind: ReplicaSet
apiVersion: apps/v1
metadata:
  name: nginx-replica-sets
  namespace: nginx
spec:
  replicas: 2
  selector:
    matchLabels:
      app: nginx-rep-pod
  template:
    metadata:
      labels:
        app: nginx-rep-pod
    spec:
      containers:
        - name: nginx-cont
          image: nginx:latest
          ports:
            - containerPort: 80
```

DaemonSet:

A DaemonSet is similar to a Deployment in managing workloads, but the key difference is that a DaemonSet ensures at least one pod runs on every worker node in the cluster without fail. There isn't much difference in the manifest file except for the type of resource. For instance, in a DaemonSet manifest file, you won't find a **replicas** field for the pods

```
apiVersion: apps/v1
kind: DaemonSet
metadata:
  name: nginx-daemonset
  namespace: nginx
spec:
  selector:
    matchLabels:
      app: nginx-daemon-pod
  template:
    metadata:
      labels:
        app: nginx-daemon-pod
    spec:
      containers:
        - name: nginx-cont
          image: nginx:latest
          ports:
            - containerPort: 80
```

In conclusion, this document provided an overview of Deployments, ReplicaSets, and DaemonSets, along with their respective YAML manifest files, highlighting their roles, features, and key differences in Kubernetes workload management.