

## Experiment - 10.

Aim - To Study and implements Container orchestration using Kubernetes.

### Theory:

Container orchestration tool:

A popular container orchestration tool Kubernetes is widely used for automating deployment scaling and management of containerized application.

### Kubernetes

Kubernetes is an open sources container orchestration platform that automates the deployment scaling and management of containerized application.

### Features of Kubernetes:

Automated deployment and scaling.

Service discovery and load balancing.

Self healing.

Rolling updates and Roll backs.

Storage orchestration.

Secrets and Configuration Management

Declarative Configuration

Horizontal and Vertical Scaling

Resources usage monitoring

Extensibility.

### Kubernetes Components its working and architecture

i) Master components:

→ App Server → Controller Manager

→ Scheduler → etcd,



## ii) Node Components:

→ Kubelet → container runtime.

→ kube-proxy

## iii) Add-ons.

→ DNS → Ingress Controller

→ Dashboard → Monitoring and logging.

## \* Difference between pod and node.

- | pod  | node                                    |
|--|---|
| i) Smallest deployable units in Kubernetes.  | Worker machine in Kubernetes            |
| ii) Represent a single instance of a process | Provides resources for running pods.    |
| iii) Can contain one or more containers.     | Runs the Kubernetes runtime environment |
| iv) Pods can be replicated for redundancy.   | node can have multiple for redundancy   |
| v) Pods are short lived.                     | nodes are long lived.                   |

## \* Different between Kubernetes and Docker Swarm

- | Kubernetes   | Docker Swarm  |
|--|---|
| i) Highly Scalable robust orchestration system.  | Lightweight orchestration solution.                             |
| ii) Rich networking features including services discovery load balancing and network policies. | Basic networking features.                                      |
| iii) Supports complex deployments with rolling update Canary deployments                       | Supports rolling updates limited advanced deployment strategies |

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