**What is Kubernetes (k8s)?**

**Kubernetes** is an open-source Container Management tool that automates container deployment, container scaling, descaling, and container load balancing (also called a container orchestration tool). It is written in Golang and has a vast community because it was first developed by Google and later donated to CNCF (Cloud Native Computing Foundation). Kubernetes can group ‘n’ number of containers into one logical unit for managing and deploying them easily. It works brilliantly with all cloud vendors i.e. public, hybrid, and on-premises.

**Benefits of Using Kubernetes**

Kubernetes simplifies the orchestration of containerized applications, making it an essential tool in DevOps. The[**DevOps Engineering – Planning to Production**](https://gfgcdn.com/tu/S86/) course provides an in-depth introduction to Kubernetes and its integration into DevOps workflows.

**1. Automated deployment and management**

* If you are using Kubernetes for deploying the application then no need for manual intervention kubernetes will take care of everything like automating the deployment, scaling, and containerizing the application.
* Kubernetes will reduce the errors that can be made by humans which makes the deployment more effective.

**2. Scalability**

* You can scale the application containers depending on the incoming traffic Kubernetes offers Horizontal pod scaling the pods will be scaled automatically depending on the load.

**3. High availability**

* You can achieve high availability for your application with the help of Kubernetes and also it will reduce the latency issues for the end users.

**4. Cost-effectiveness**

* If there is unnecessary use of infrastructure the cost will also increase kubernetes will help you to reduce resource utilization and control the overprovisioning of infrastructure.

**5. Improved developer productivity**

* Developer can concentrate more on the developing part kubernetes will reduce the efforts of deploying the application.

**Use cases of Kubernetes in real-world scenarios**

Following are the some of the use cases of kuberneets in real-world scenarios

* **E-commerce:** You deploy and manage the e-commerce websites by autoscaling and load balancing you can manage the millions of users and transactions.
* **Media and entertainment:**You can store the static and dynamic data can deliver it to the across the world with out any latency to the end users.
* **Financial services:**kubernetes is well suited for the sinical application because of the level of security it is offering.
* **Healthcare:**You can store the data of patient and take care the outcomes of the health of patient.

**Features of Kubernetes**

1. **Automated Scheduling**– Kubernetes provides an advanced scheduler to launch containers on cluster nodes. It performs resource optimization.
2. **Self-Healing Capabilities**– It provides rescheduling, replacing, and restarting the containers that are dead.
3. **Automated Rollouts and Rollbacks**– It supports rollouts and rollbacks for the desired state of the containerized application.
4. **Horizontal Scaling and Load Balancing**– Kubernetes can scale up and scale down the application as per the requirements.
5. **Resource Utilization**– Kubernetes provides resource utilization monitoring and optimization, ensuring containers are using their resources efficiently.
6. **Support for multiple clouds and hybrid clouds**– Kubernetes can be deployed on different cloud platforms and run containerized applications across multiple clouds.
7. **Extensibility**– Kubernetes is very extensible and can be extended with custom plugins and controllers.
8. **Community Support-** Kubernetes has a large and active community with frequent updates, bug fixes, and new features being added.

## Architecture of Kubernetes

