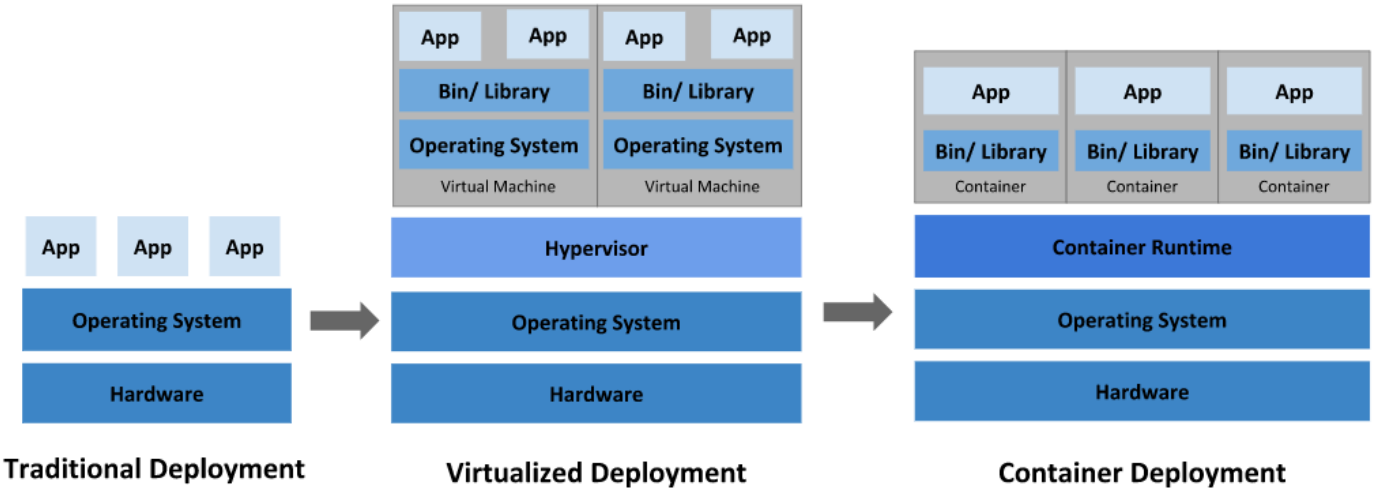
6.1) Kubernetes Detailed notes

Topic:Overview of Containers :-



Why do we need Kubernetes

Question or Concerns about containers

- Containers are a wonderful way of bundling and running your applications, But are they production ready?
- What would happen if the container or the Docker Host goes down?
- How to make containers available 24*7 ?
- How to handle loads during peak time for the applications ?
- How to replace containers without having downtime with new Docker Image based containers ?
- How to monitor containers?

Solution to above Questions or Concerns

Wouldn't it be good if there is some system which can help for handling all the questions/concerns raised in the above section. That is exactly what Kubernetes does.

- Kubernetes takes care of
    - Scaling requirements
    - failover
    - deployment patterns

- Kubernetes Provides
    - **Service Discovery & Load Balancing**
    - **Storage Orchestration**
    - **Automated rollouts and rollbacks**
    - **Automated bin packing**
    - **Self-Healing**
    - **Secret & Configuration Management**
- Kubernetes is not only for the open source community embraced containers, It is deeply embraced by the Cloud Providers.
    - Amazon Web Service offers **Elastic Kubernetes Services(EKS)**
    - Google Cloud platform offers **Google Kubernetes Engine(GKE)**
    - Microsoft Azure offers **Azure Kubernetes Services(AKS)**

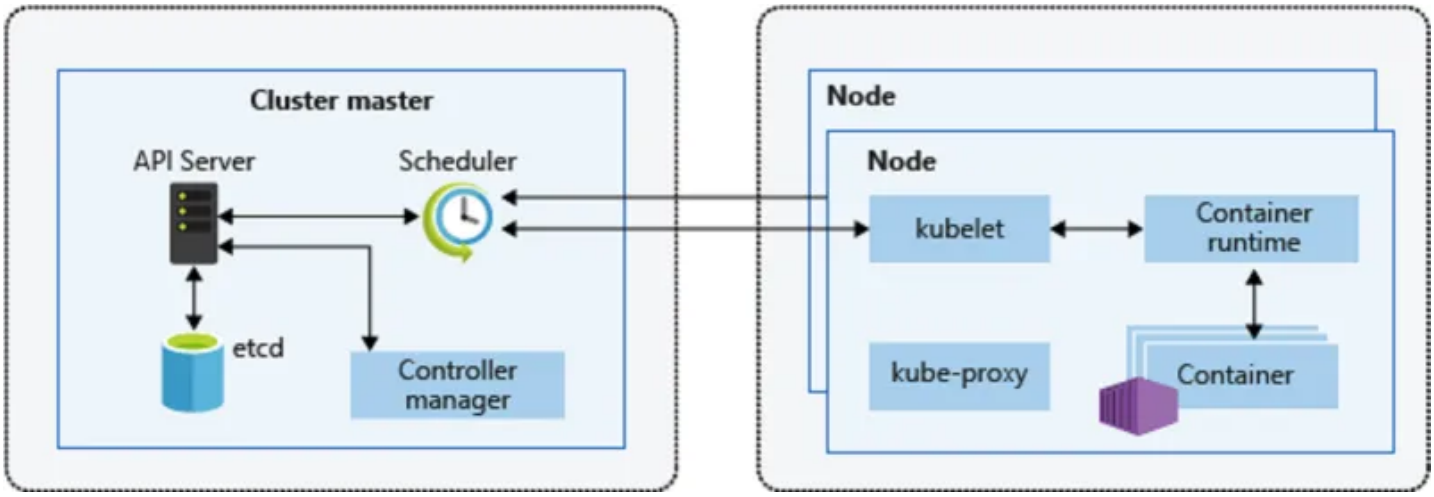
Topic:What is Kubernetes:-

- Kubernetes is a platform that manages container-based applications, their networking and storage components.
- In Kubernetes, we focus on the application workloads rather than the underlying infrastructure.
- Kubernetes provides a declarative approach to deployments, backed by a rich set of APIs for management operations.
- Cluster: Cluster is a collection of compute, storage and networking resources that Kubernetes uses to run workloads.
- Node: It is a single host. Now we can put the cluster as a collection of nodes.

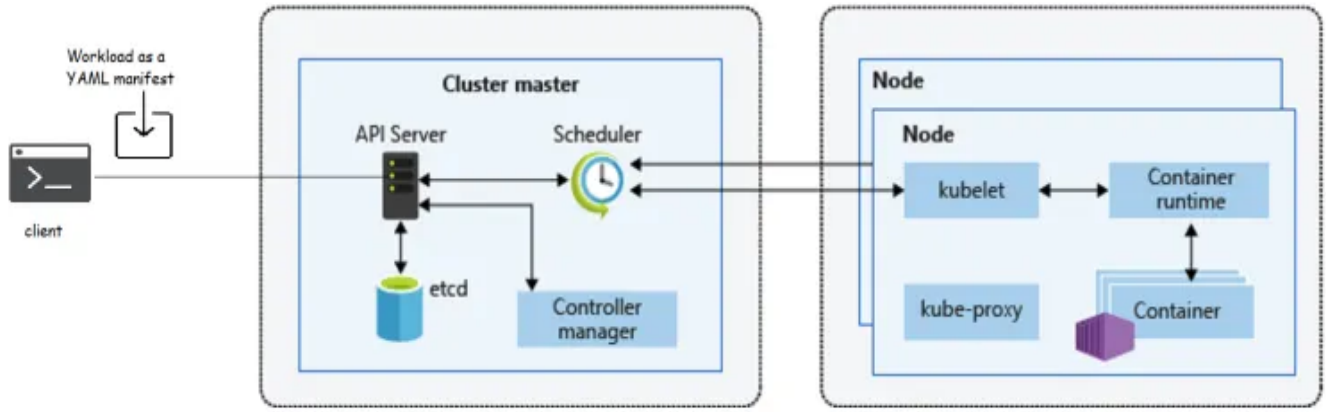
Kubernetes has two kinds of Nodes

- **Master**:
    - Provides core Kubernetes Services and orchestration to application workloads
- **Node**:
    - run your application workloads

Kubernetes Cluster Architecture



What would be our approach with workloads in Kubernetes?



- We would be describing our application as a YAML manifest and pass it to Kubernetes master from some client, and Cluster Master does the rest.