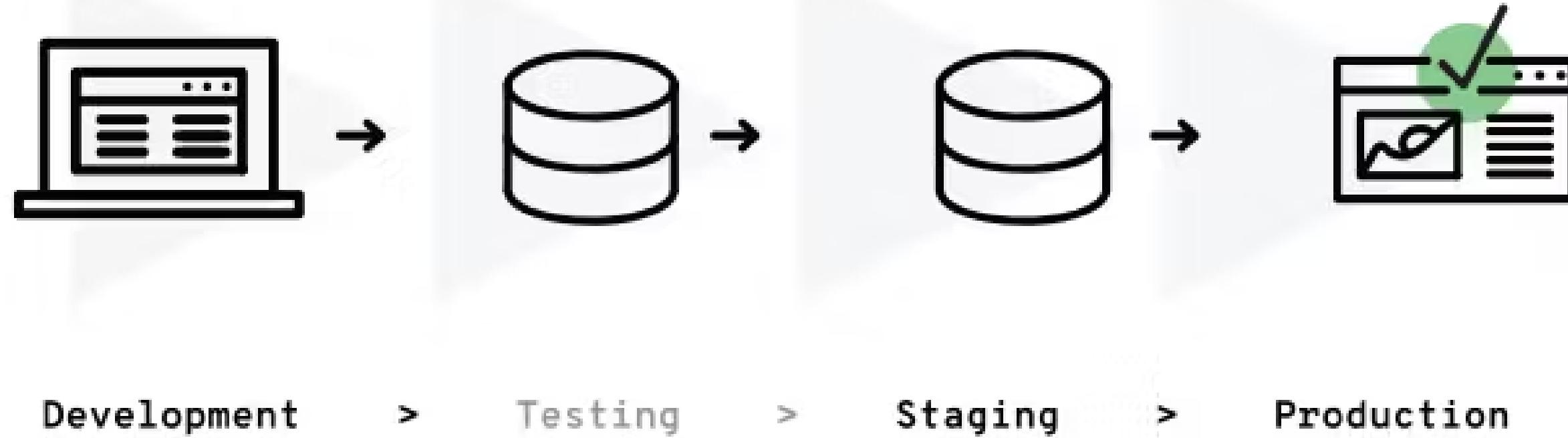


Intro to "Docker & Kubernetes"



What is SDLC?



monolithic architecture, microservices - A monolithic application is built as a single unified unit while a microservices architecture is a collection of smaller, independently deployable services.

Blue-green deployment

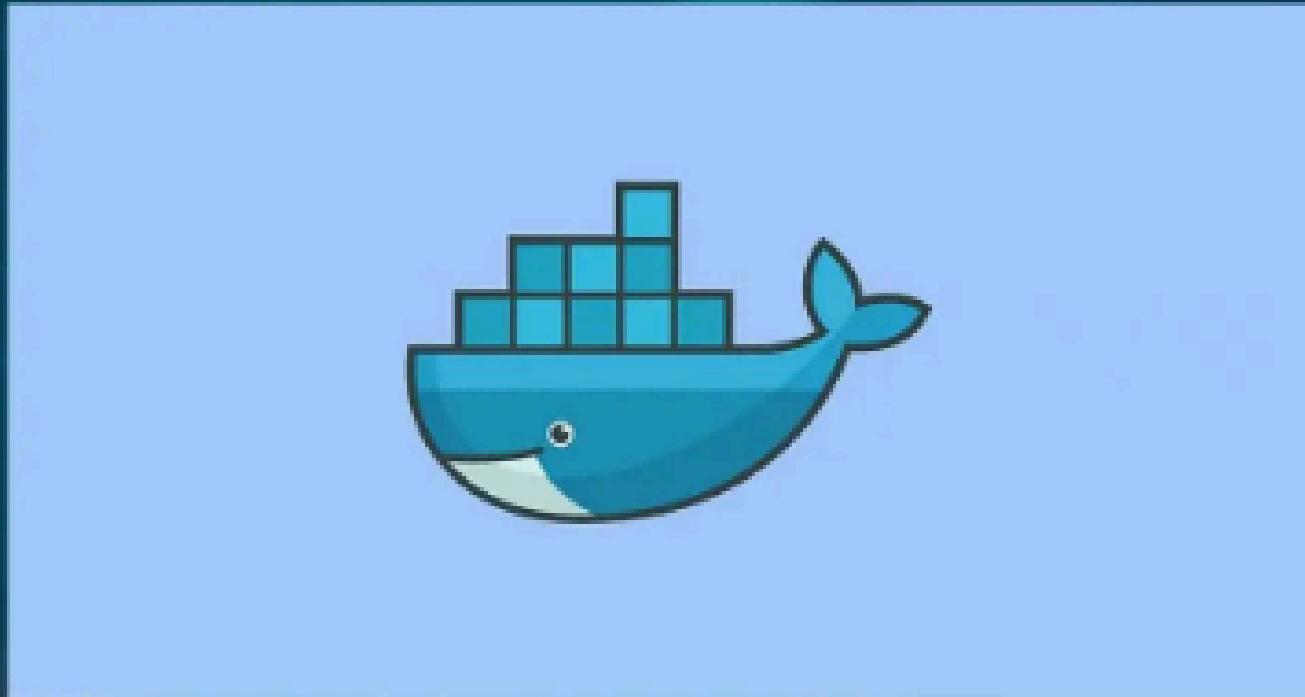


Storage Container Sizes





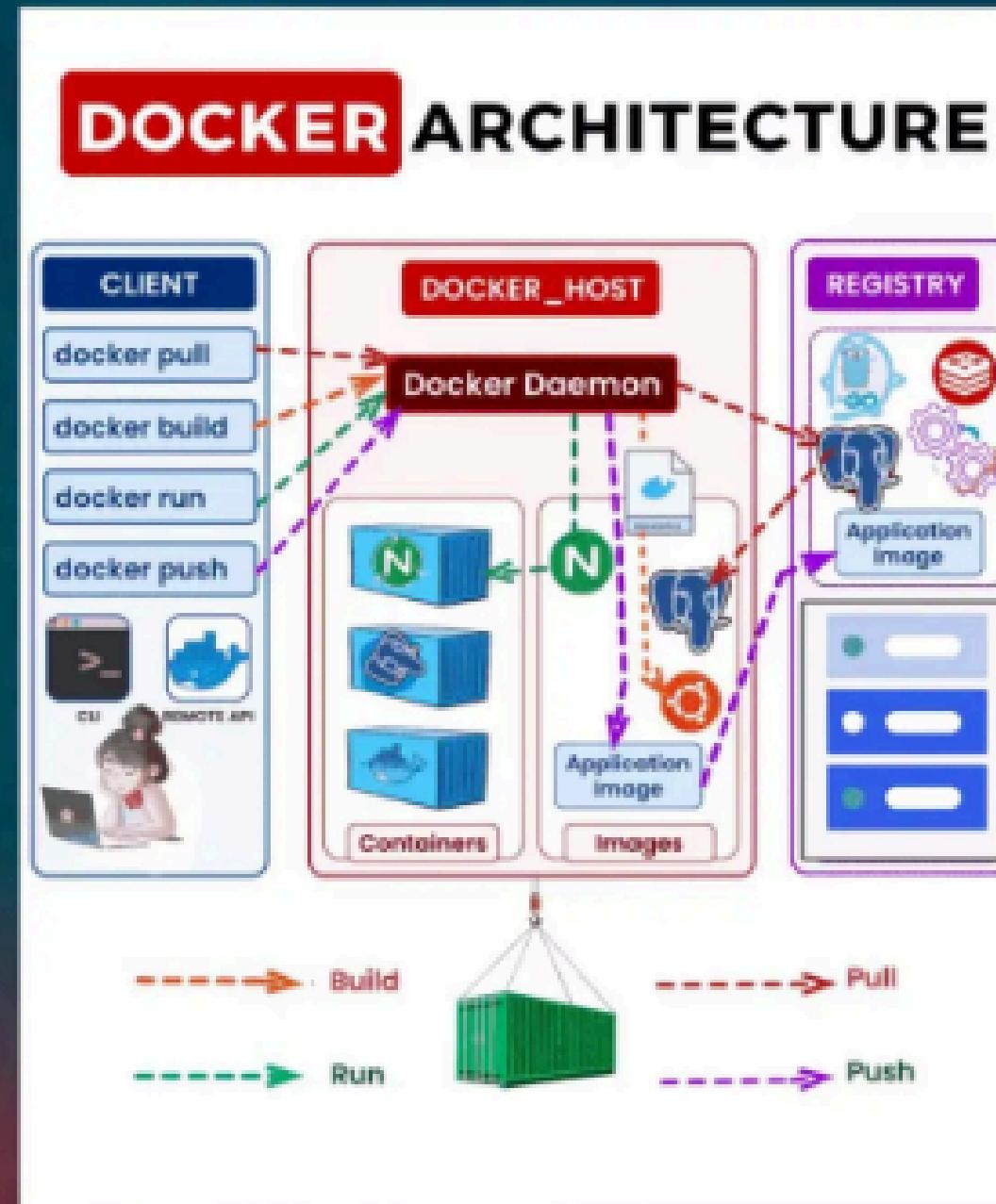
What is Docker?



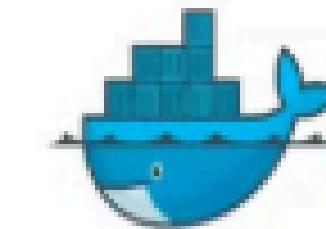
- ❖ Docker is an open-source **platform used for containerization**, allowing you to package an application and its dependencies into a standardized unit called a container.
- ❖ Containers are lightweight, portable, and isolated environments that ensure consistent behavior across different computing environments.



Docker Architecture Overview:

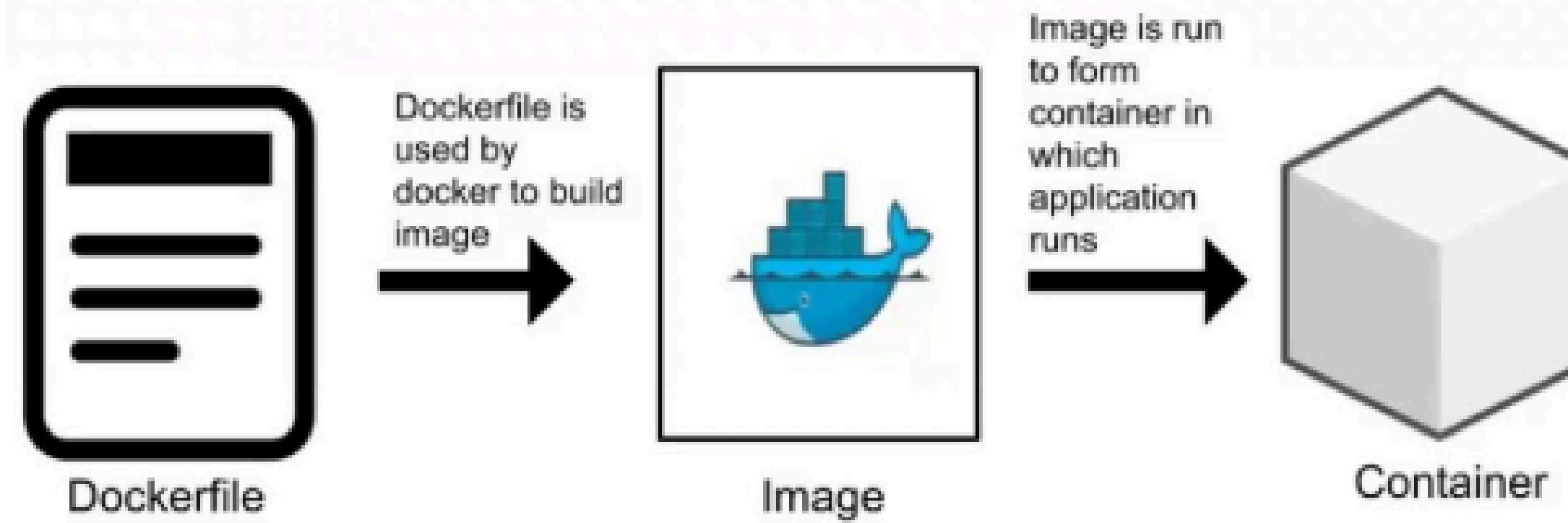


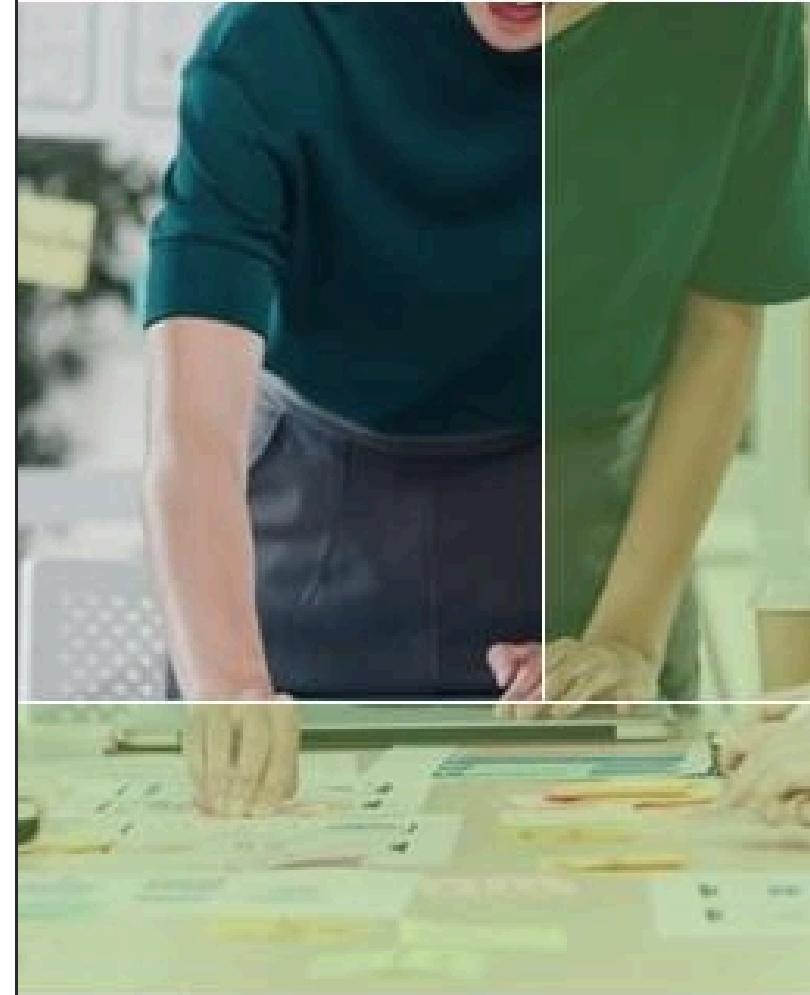
- ❖ Docker Engine: The core component of Docker that runs and manages containers.
- ❖ Docker Client: CLI tool used to interact with Docker Engine.
- ❖ Docker Daemon: Background service responsible for managing containers, images, networks, and volumes.
- ❖ Docker Registry: Stores Docker images (e.g., Docker Hub, private registries).



Dockerfile, Image and Container

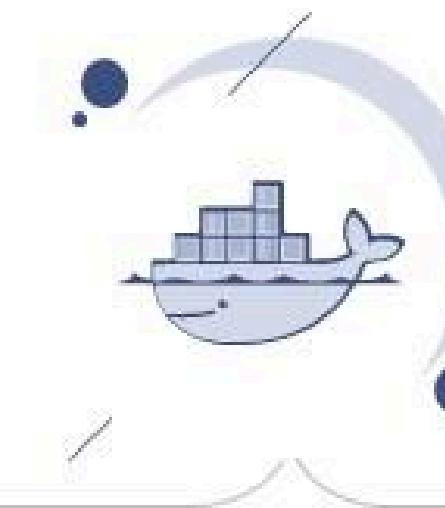
- Docker is a platform to build images and run containers.
- Dockerfile is a recipe guiding how to build the image.
- A container is a running instance of an image.





Ducker Hub

is a service provided my manual laborer for finding and sharing instrumentality pictures along with your team. It provides the subsequent major features:
Repositories: Push and pull instrumentality pictures, ... Builds: mechanically build instrumentality pictures from GitHub and Bitbucket and push them to Docker Hub.



Docker Hub



Get Image from
Docker Hub



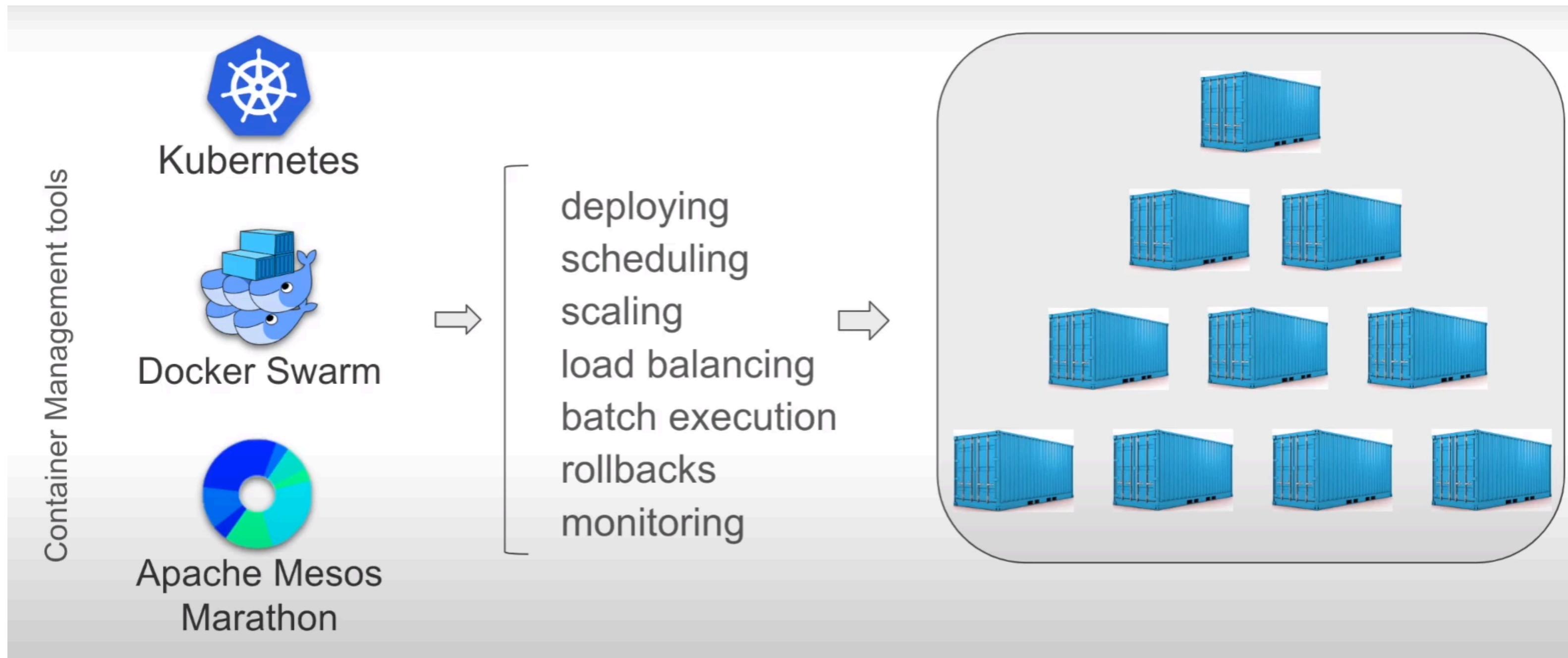
Upload Image
to Docker Hub

Share Work Environment
Using Docker

Problem with docker

- Manual management and maintenance
- Upgradation
- Migration
- Autoscaling
- Downtime

Why do we need **Kubernetes** ?

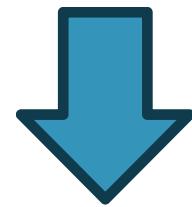


Container Orchestration Tool

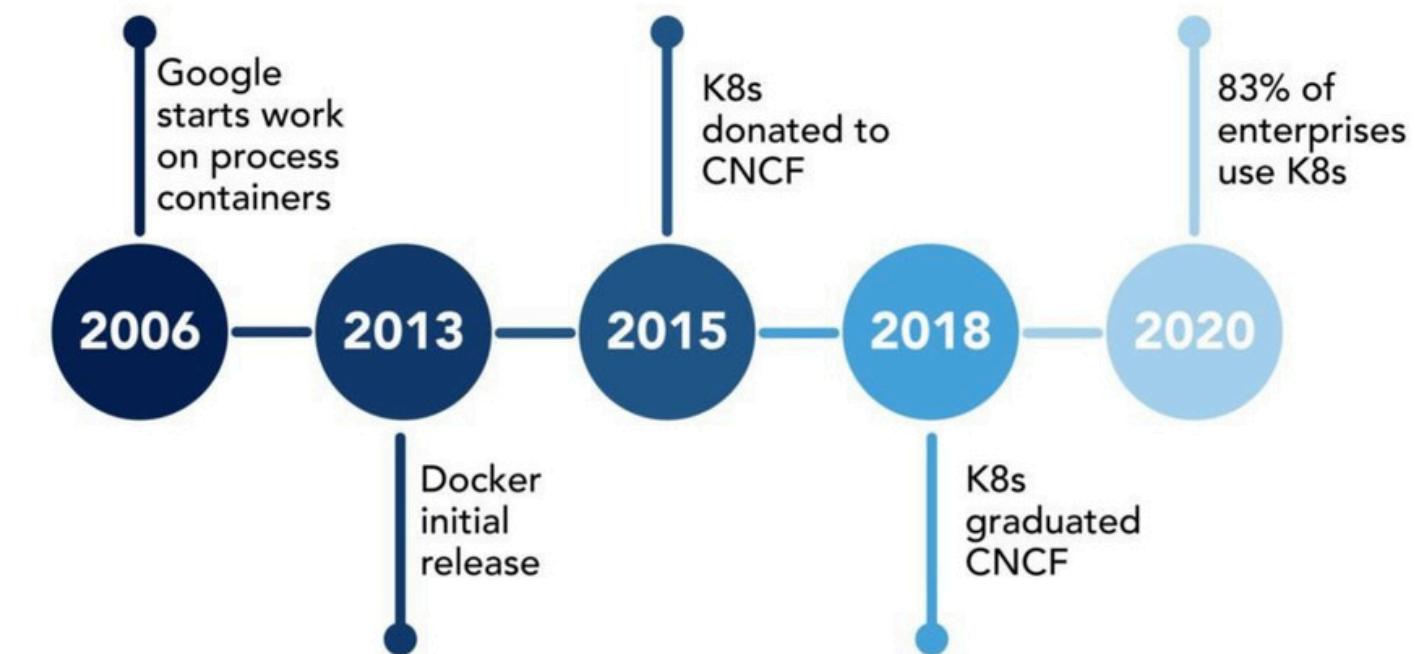
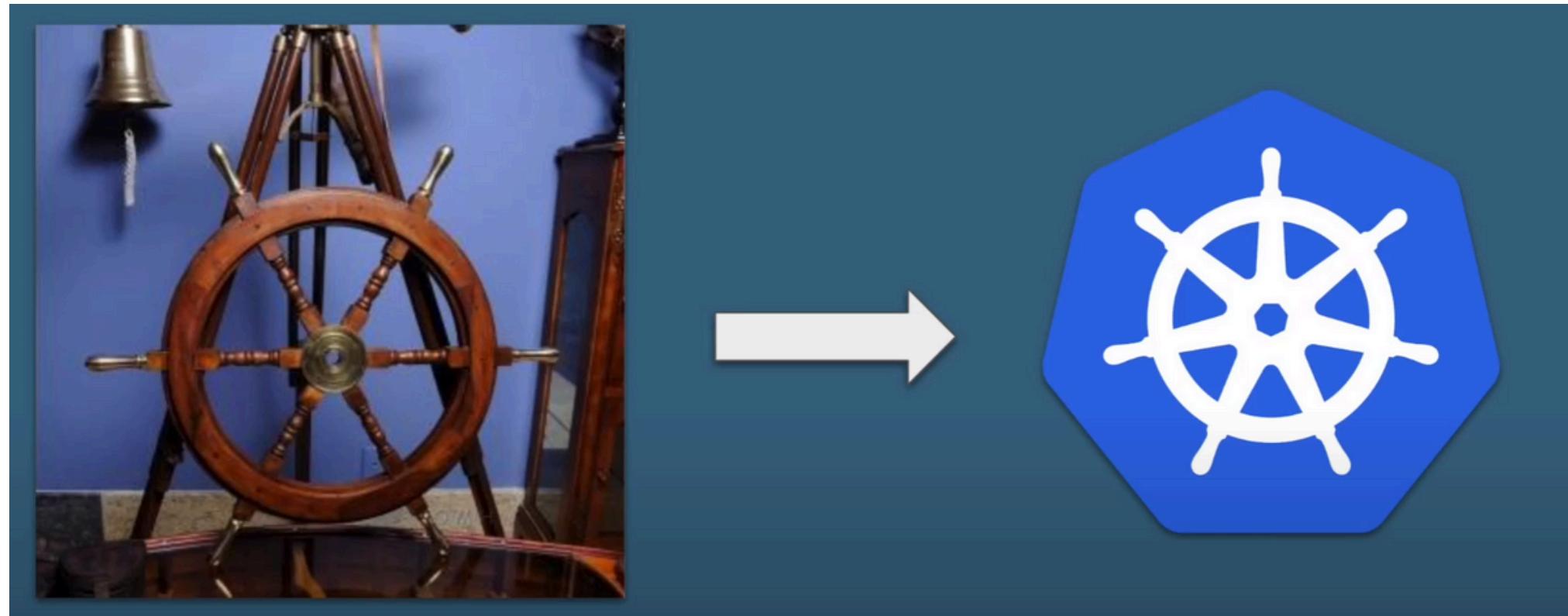
- Kubernetes
- Docker Swarm
- Apache Mesos

"Kubernetes" is derived from Greek, specifically from the word "kubernetes," which translates to "helmsman" or "pilot." Kubernetes (K8s) logo is inspired by the concept of a ship's helm (steering wheel). The helm is what navigates and controls the direction of a ship, just like Kubernetes manages and orchestrates multiple containers.

Kubernetes



K8s

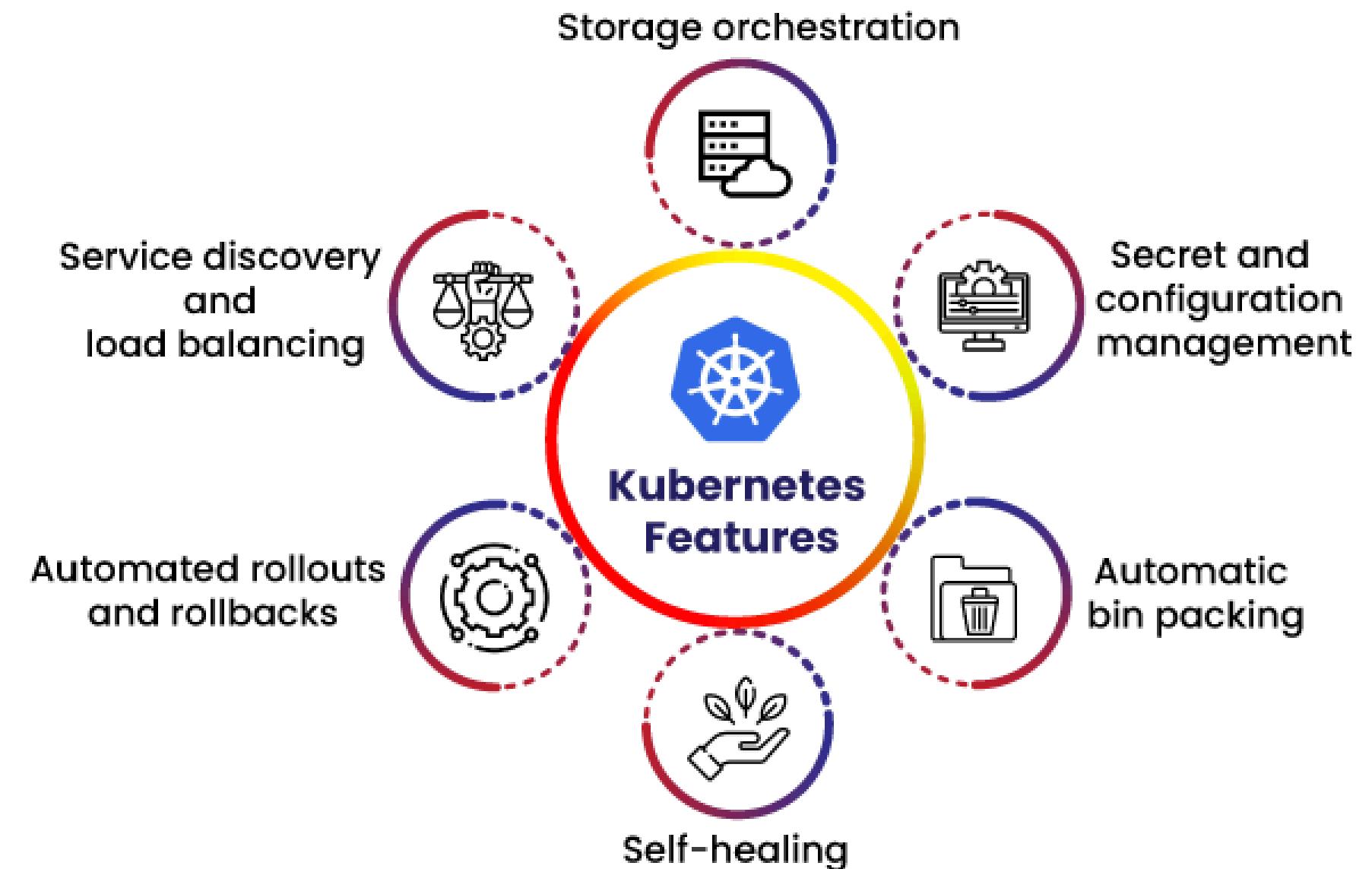


What is k8s and Why k8s?

1. Open Source
2. Container Orchestration System
3. Designed by Google
4. Written in Golang
5. Automate Computer Application Deployment, Scaling, and Management

Features of k8s

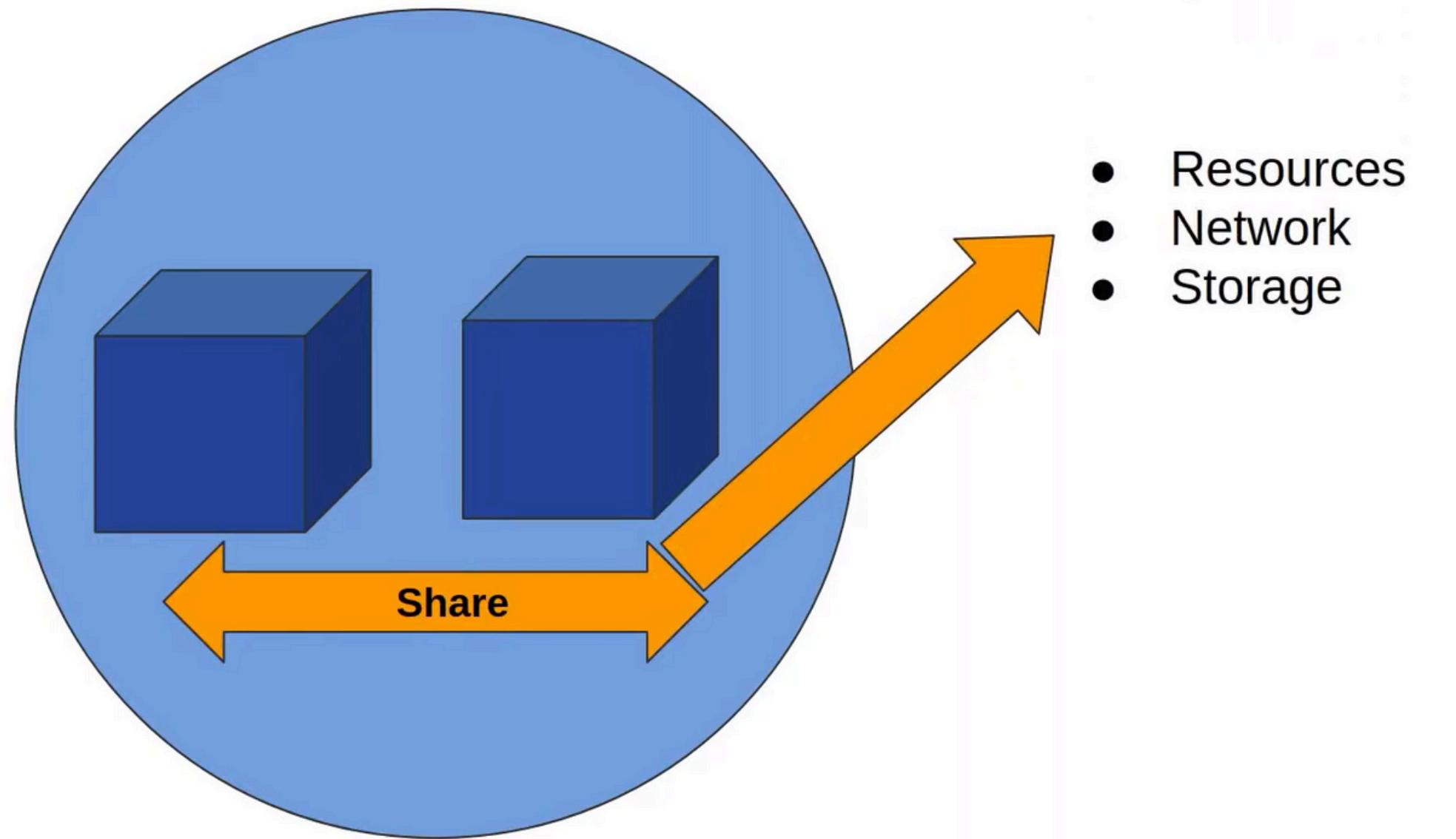
- Storage orchestration
- Automated rollouts and rollbacks
- Secret and configuration management
- Horizontal scaling
- Service discovery and load balancing



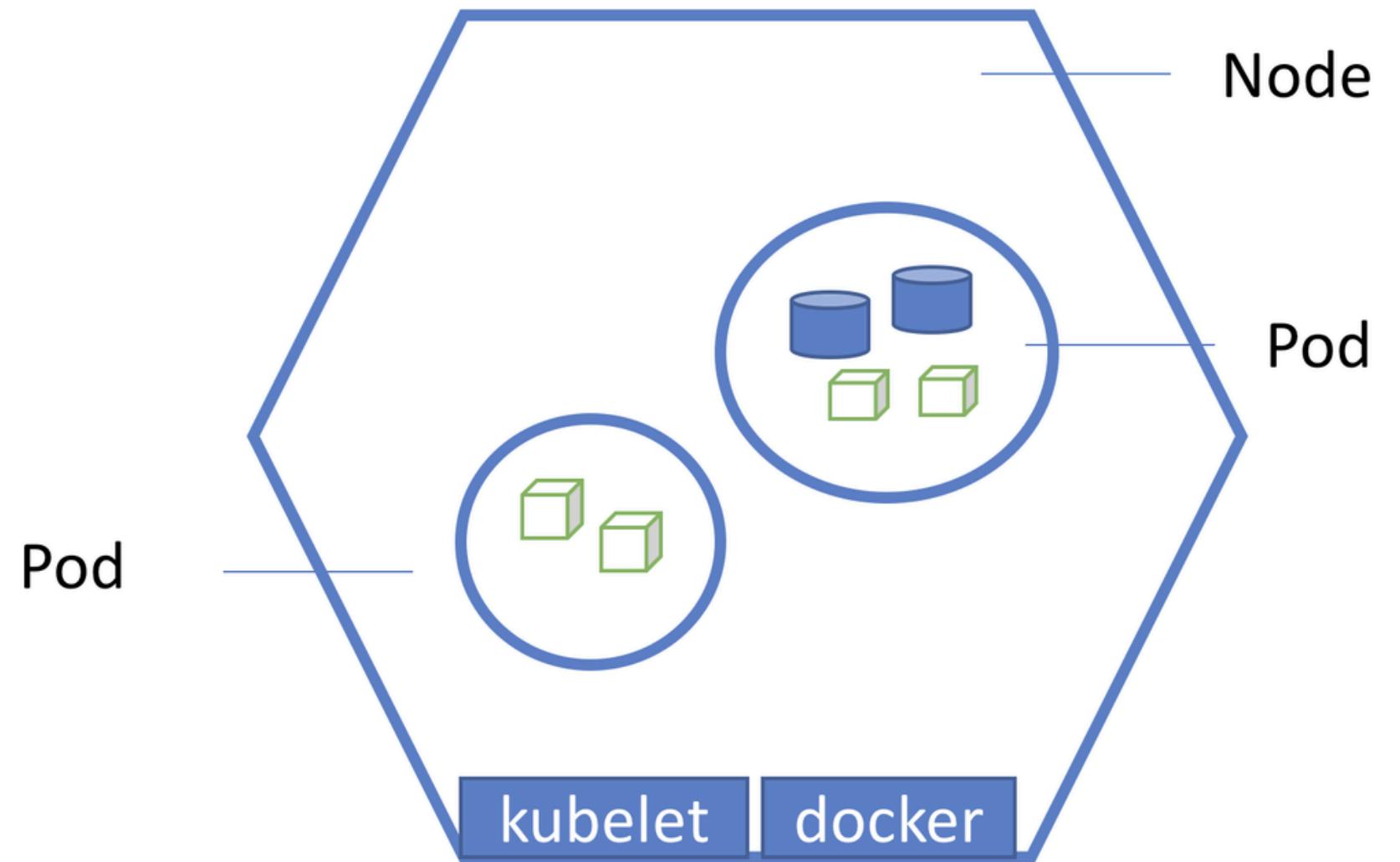
Kubernetes Architecture

Pod - Wrapper for the container

Smallest Unit Of Kubernetes

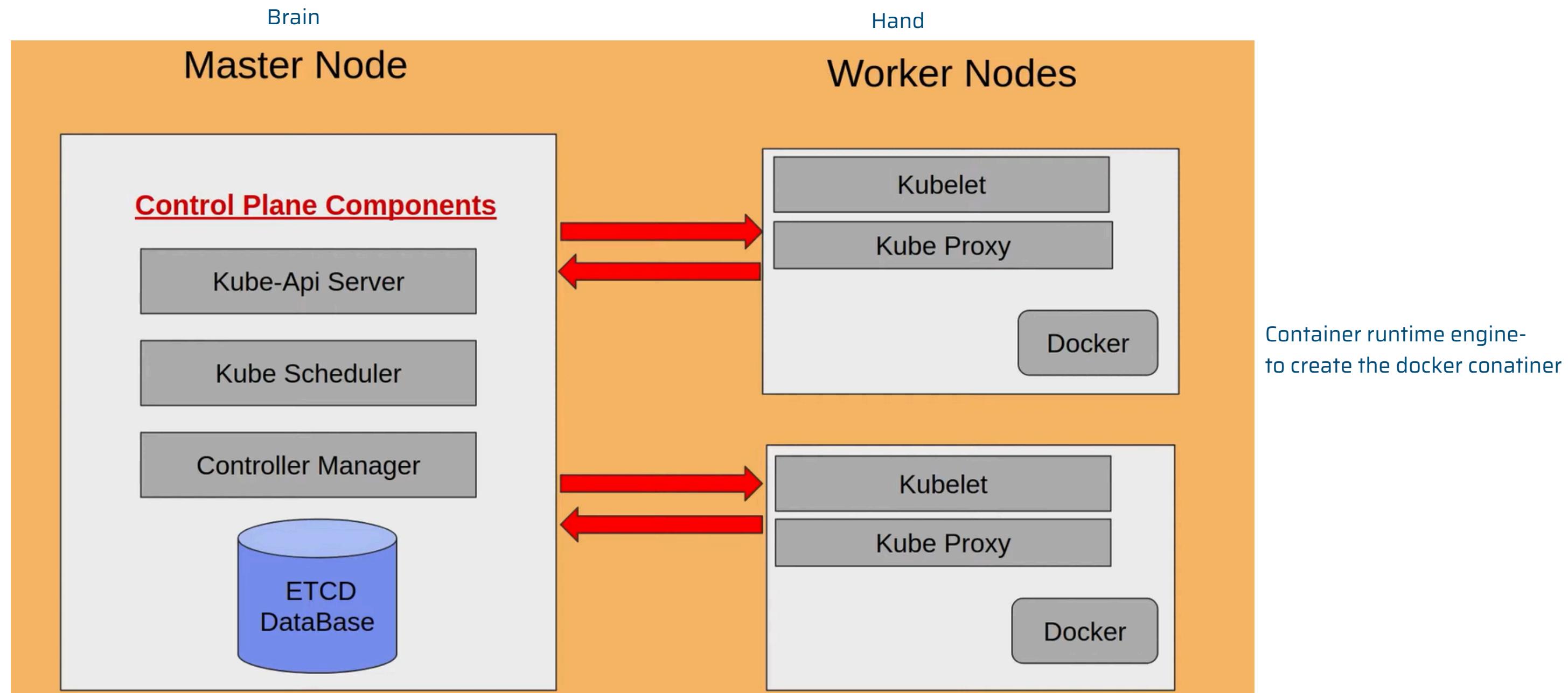


Kubernetes Architecture



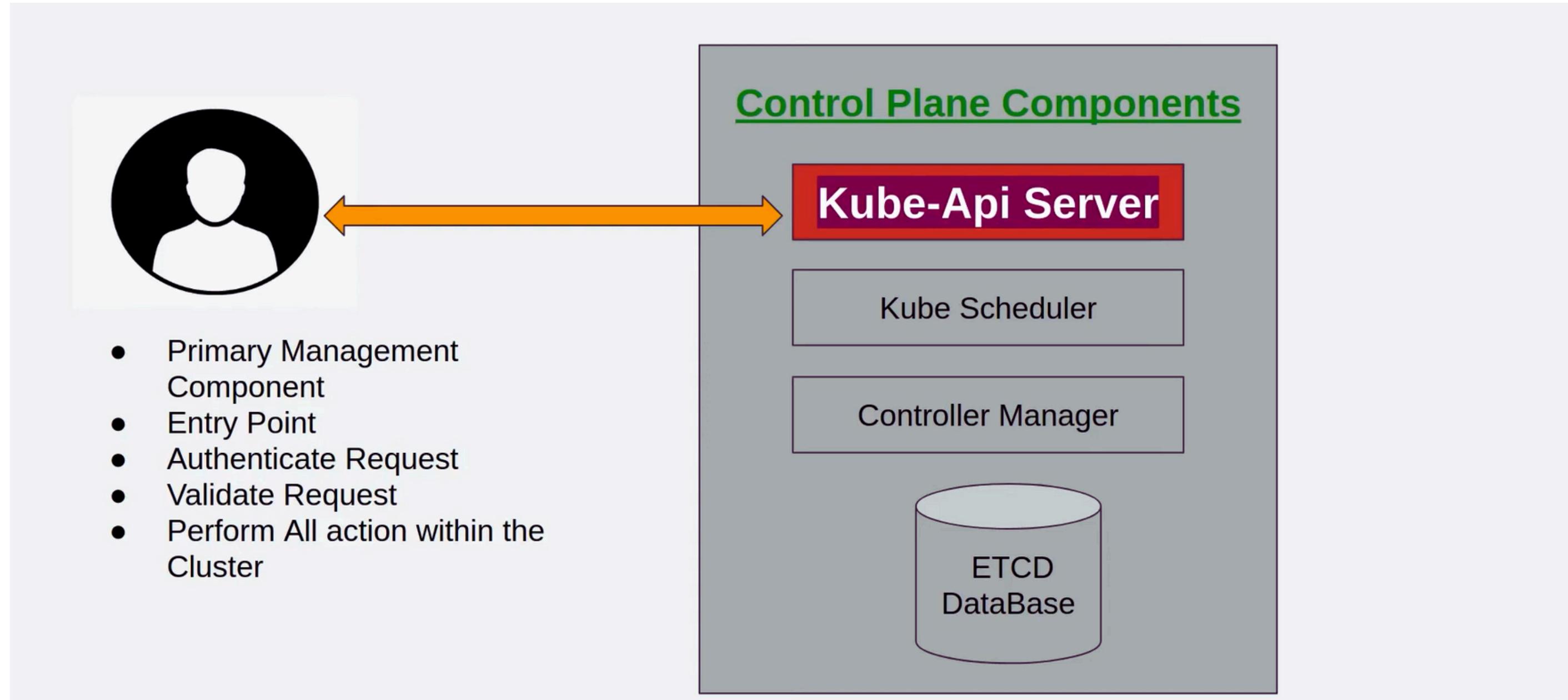
Kubernetes Architecture

Control Plane Components



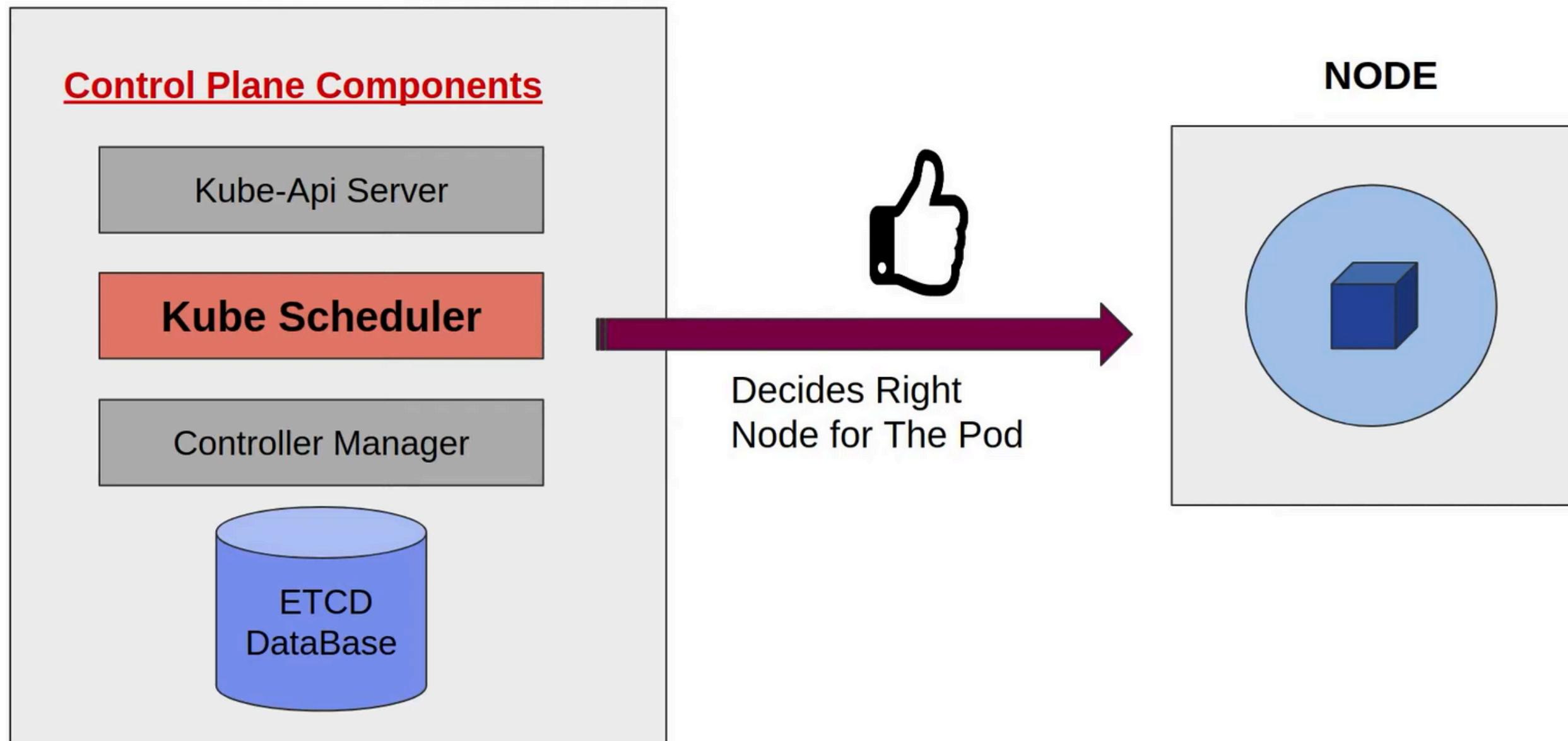
Kubernetes Architecture

Control Plane Components - Kube-Api Server - Cluster access request



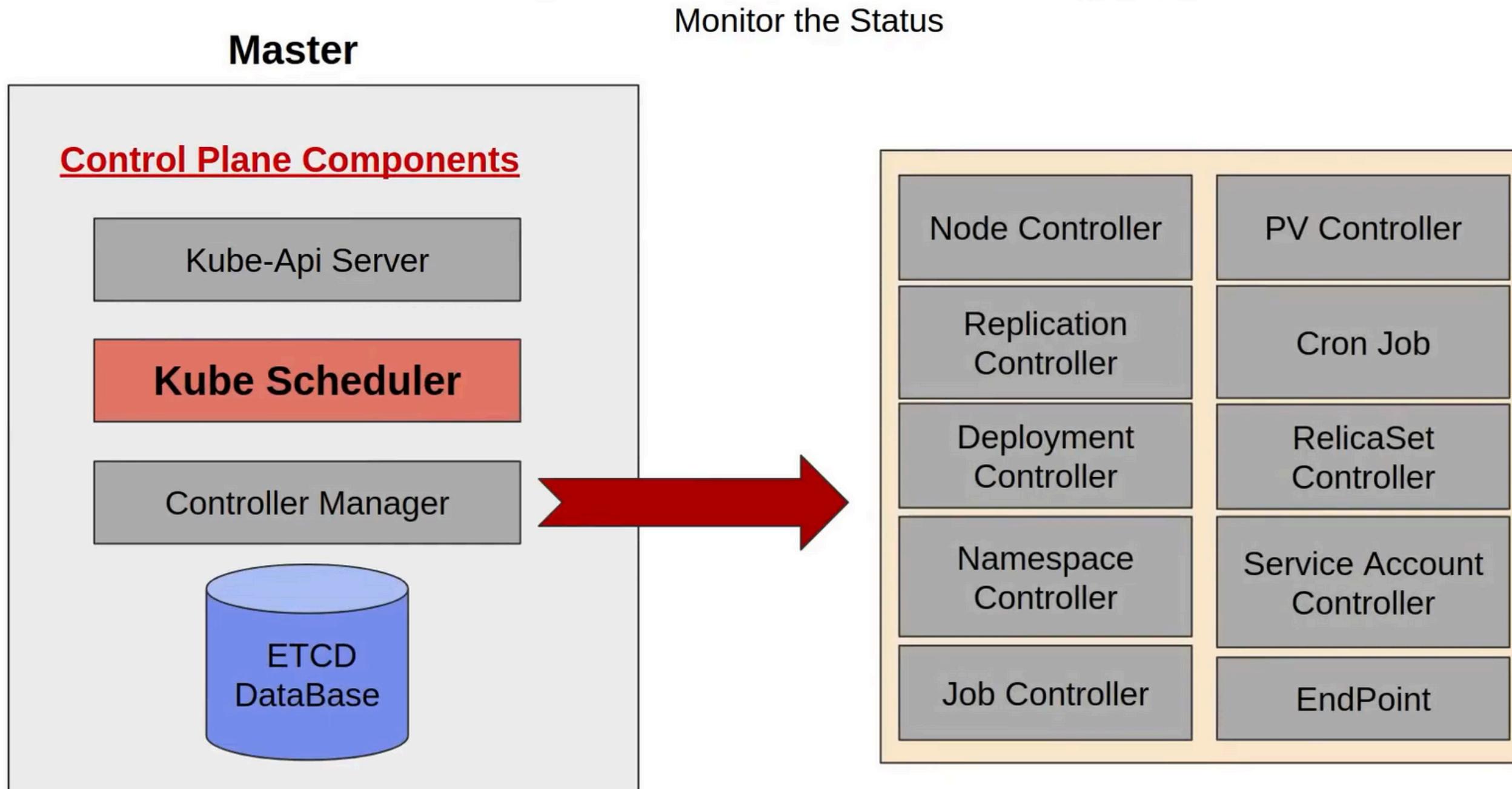
Kubernetes Architecture

Control Plane Components - kube Scheduler



Kubernetes Architecture

Control Plane Components - Controller Manager

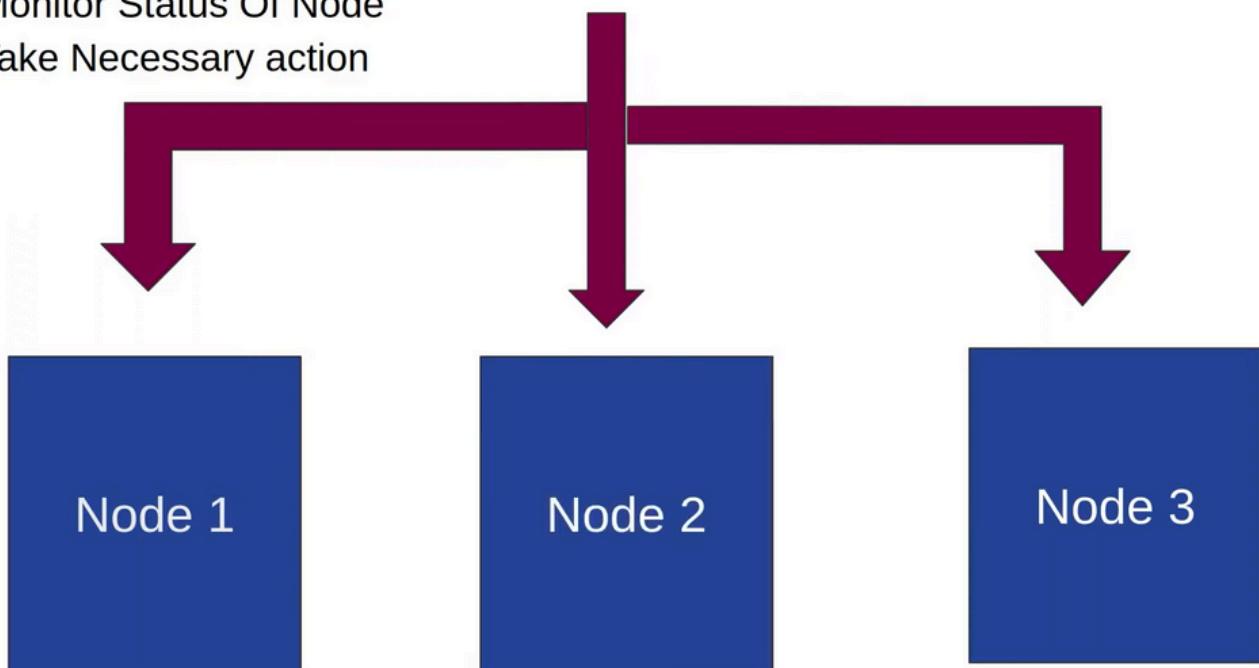


Kubernetes Architecture

Control Plane Components - Controller Manager

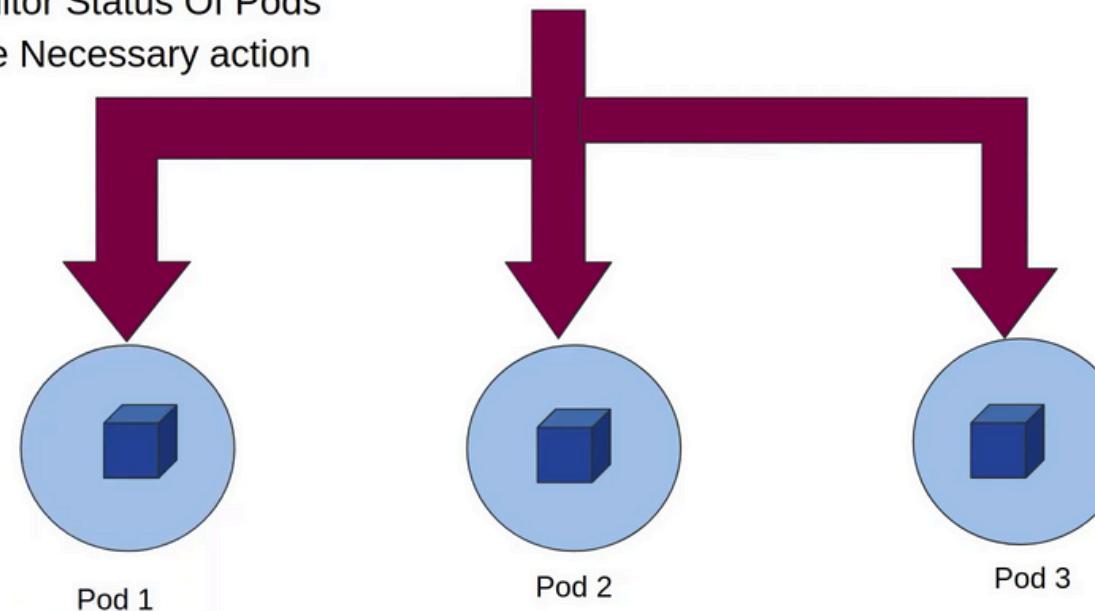
Node Controller

- Monitor Status Of Node
- Take Necessary action



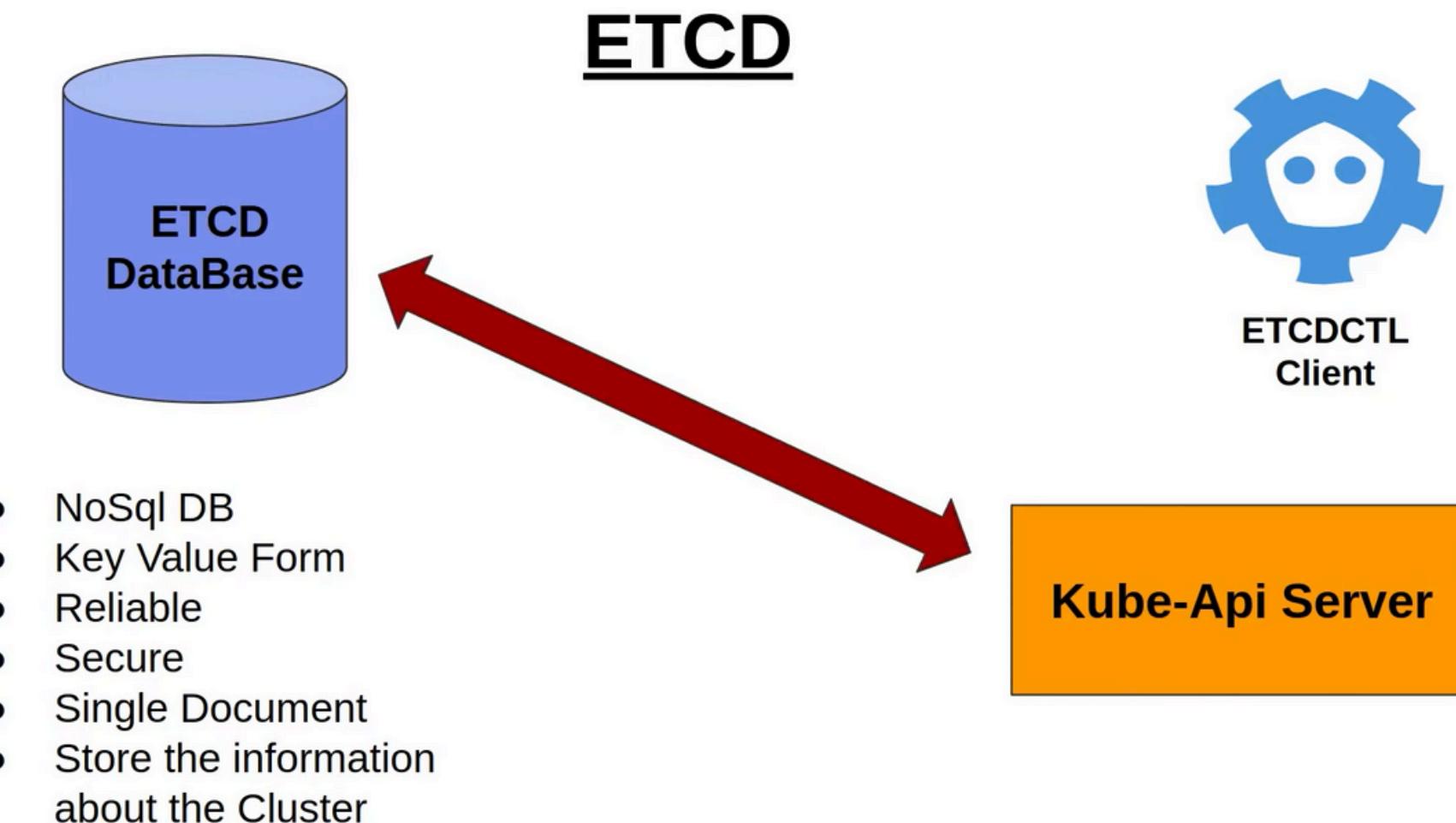
Replication Controller

- Monitor Status Of Pods
- Take Necessary action



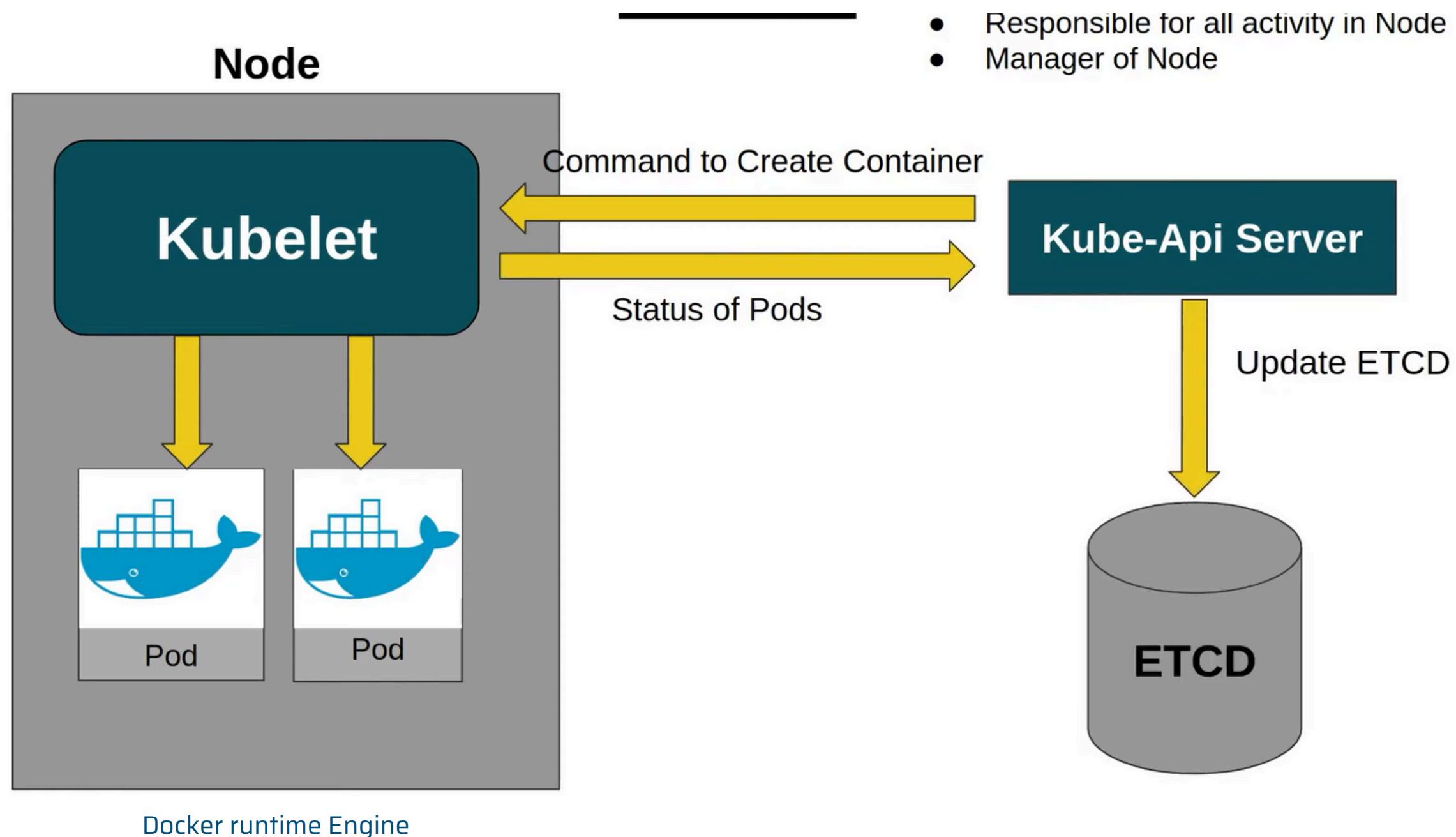
Kubernetes Architecture

Control Plane Components - ETCD - Complete cluster information



Kubernetes Architecture

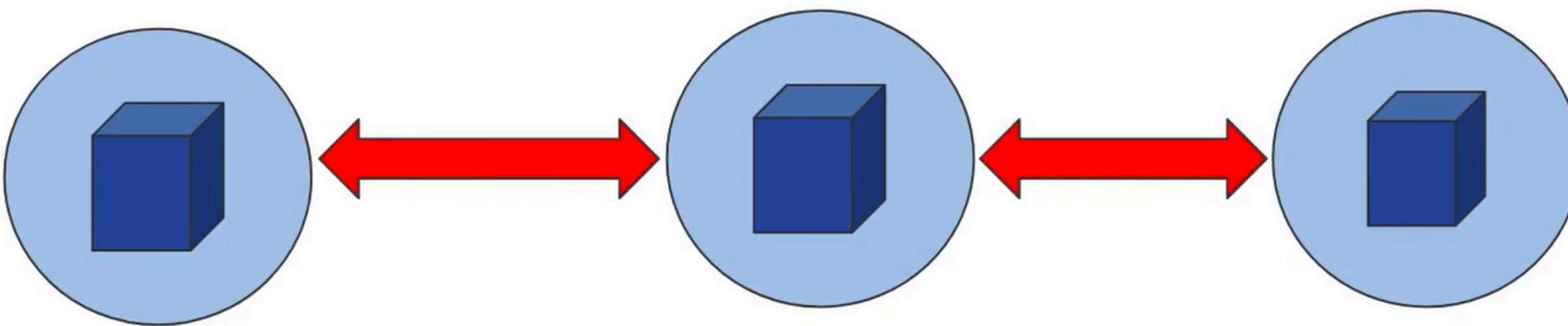
Control Plane Components - Kubelet



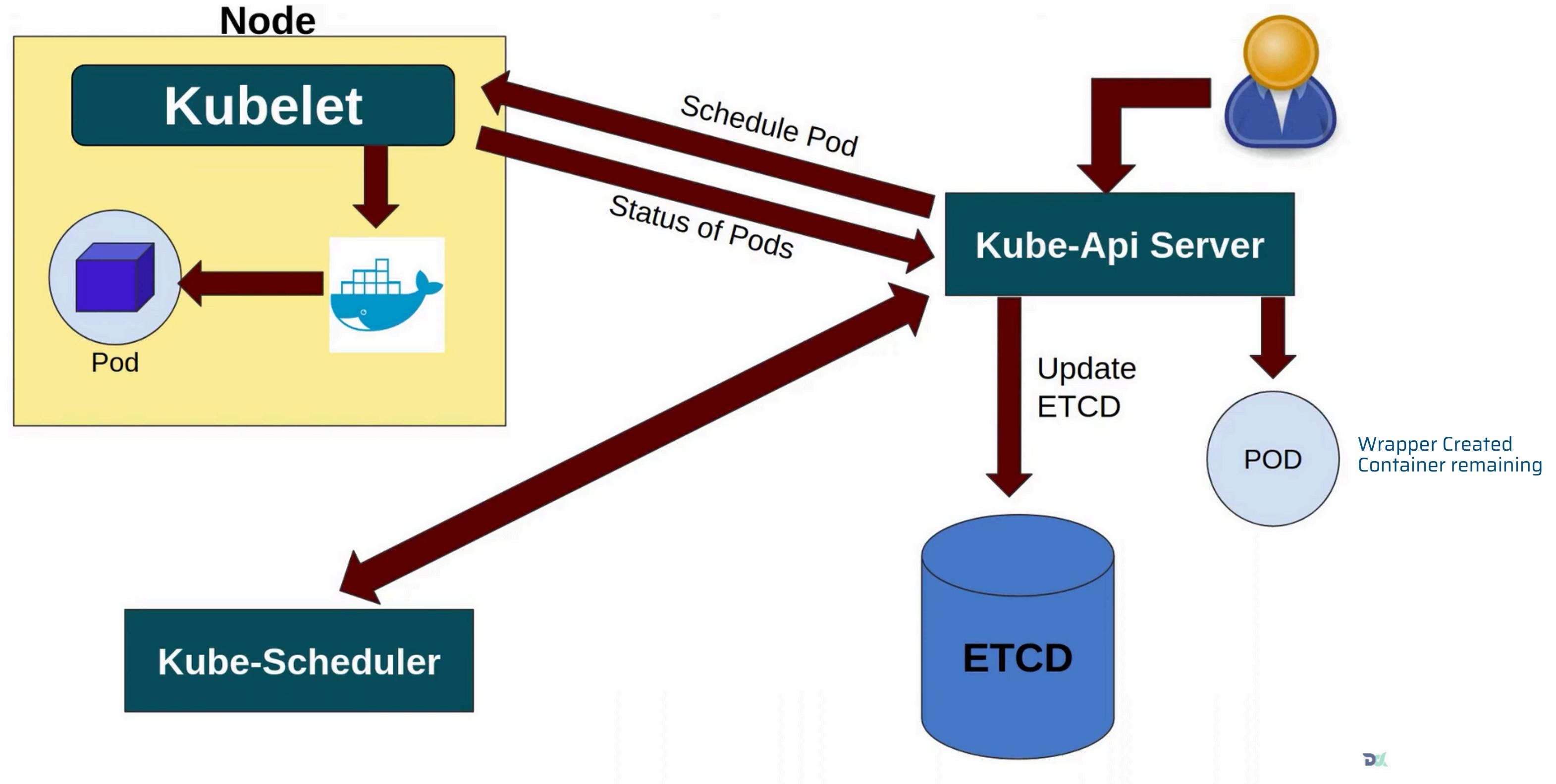
Kubernetes Architecture

Control Plane Components - kube Proxy

- Responsible for communication between Pod



Kubernetes Architecture



Thank You!!