Kubernetes Architecture

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Topics to be covered

- Kubernetes Architecture
- ETCD
- Kube-API server
- Controller Managers
- Kube-Scheduler
- Kubelet
- Kube-proxy

Analogy

- Kubernetes helps to host applications in the form of containers in an automated fashion
- This helps us to easily deploy as many instances as required
- Easy communication between services

Let’s consider ships which has some containers

- Cargo ships: This carries the containers across the sea

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Analogy

- Control ships: Monitoring and managing the cargo ships

Architecture

- Consists of set of nodes - cargo nodes
- Worker ships can load the containers, called **Worker Node**
- Some ship needs to know when and how to load the containers
- This is done by control ships which has managers to monitor cargo ships
- Called **Master Node**
- Master node has set of components called Control Plain Component

Master Node Components

- **ETCD cluster** - stores information about each node, i.e. the container loaded on each node, the time and health of each node in a key-value form
- **Scheduler** - Identifies the right node to place the containers allowed on a node on the basis of size, capacity, destination etc
- **Node Controllers, Replication Controllers**: These take care if any container is damaged or if more worker nodes in the cluster are required. Together they are managed by Controller Manager
- **Kube-API server** : Responsible for inter node communication, orchestrating all operation within the cluster
- **Container runtime engine**: software used to run the container, eg. Docker

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Worker Node Components

- Every cargo ship has a captain signaling the master node about its status i.e. availability, size, health, etc
- Kubelet : The worker node captain on each node
- Kube-api server listens from every Kubelet about the status of the node
- Kube-proxy: This helps in communication between different containers on a node. Makes sure that certain rules are followed to be able to communicate

Thank you