KUBERNET CLUSTER

A **Kubernetes Cluster** is a group of machines (nodes) that work together to run containerized applications.

It has two main parts they are:

- **MASTER NODE (CONTROL PANEL)**
- **WORKER NODE**

MASTER NODE

- This is the brain of the cluster.
- It manage, schedule and monitor everything.

ROLE:

- Decision making
- Management
- Monitoring

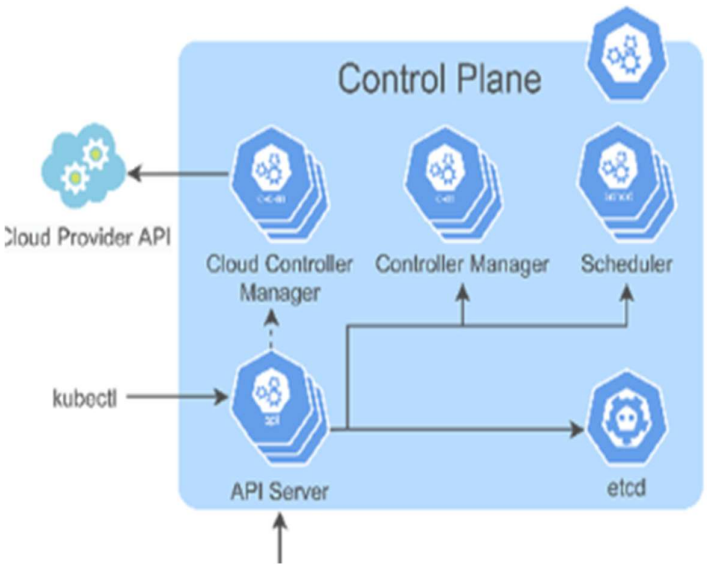
COMPONENTS:

API Server – Entry point; receives all commands (kubectl).

Scheduler – Decides which worker node runs a pod.

Controller Manager – Keeps the desired state (recreates failed pods).

ETCD – Database that stores cluster configuration and state.



Control panel

WORKER NODE

- These are the **machines that actually run applications**.

ROLE:

- Execute workloads
- Execute host applications

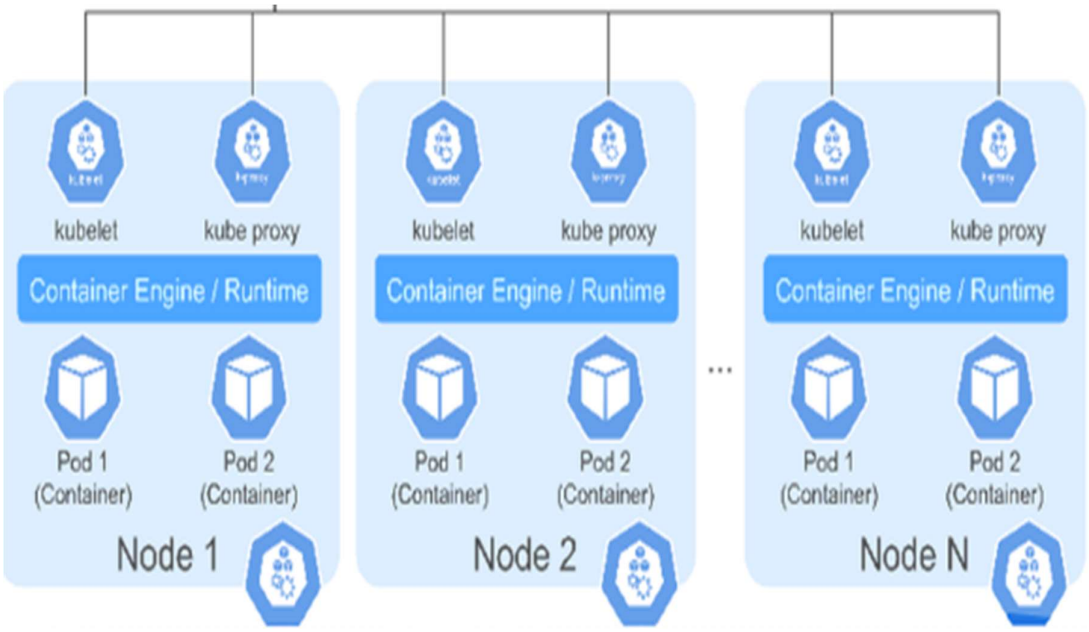
COMPONENTS:

Kubelet – Agent that communicates with Control Plane.

Container Runtime – Runs containers (Docker / containerd).

Kube-Proxy – Handles networking and traffic routing.

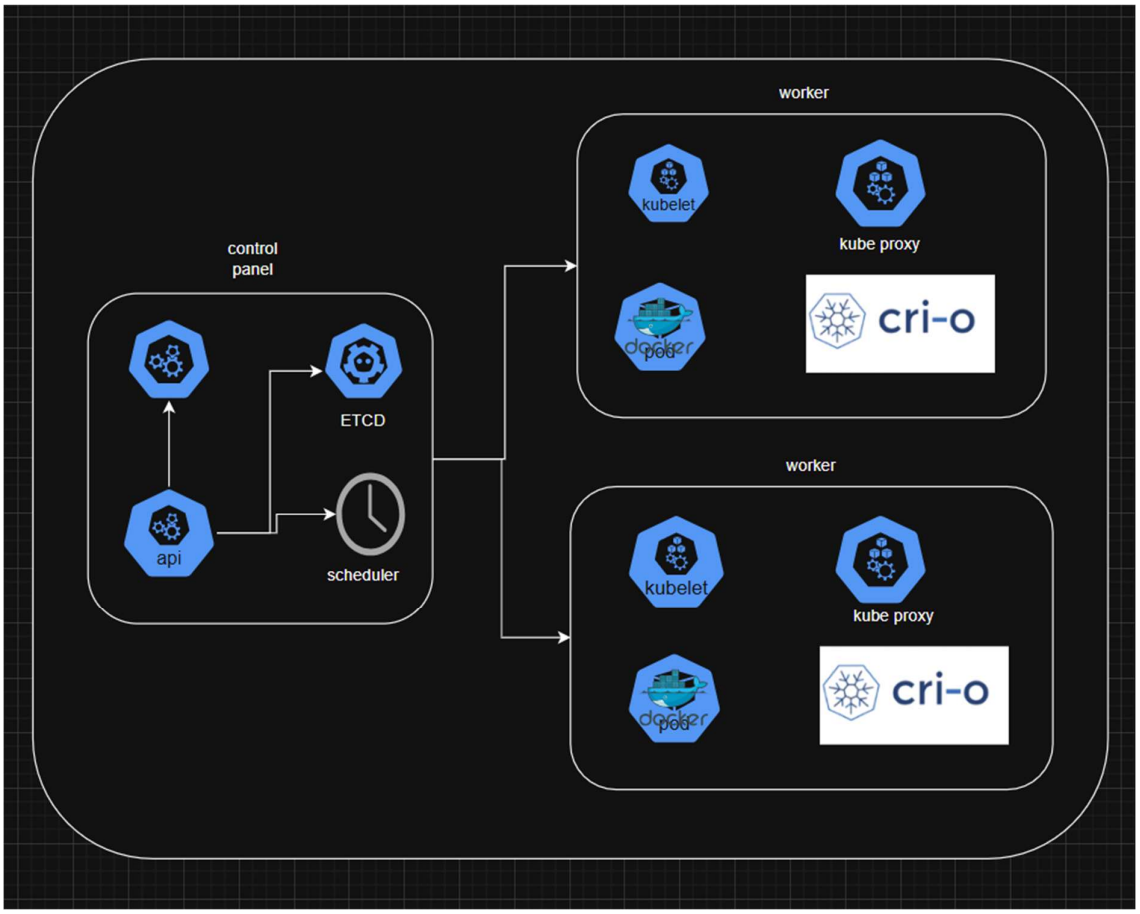
Pods – Smallest unit; contains containers (your app).



WORKER NODE

Cluster WorksFlow

- Developer sends command using kubectl.
- API Server receives request.
- Scheduler selects a Worker Node.
- Controller Manager ensures correct state.
- Kubelet starts containers inside Pods.
- Kube-Proxy manages networking.
- ETCD stores all information.



Cluster-diagram