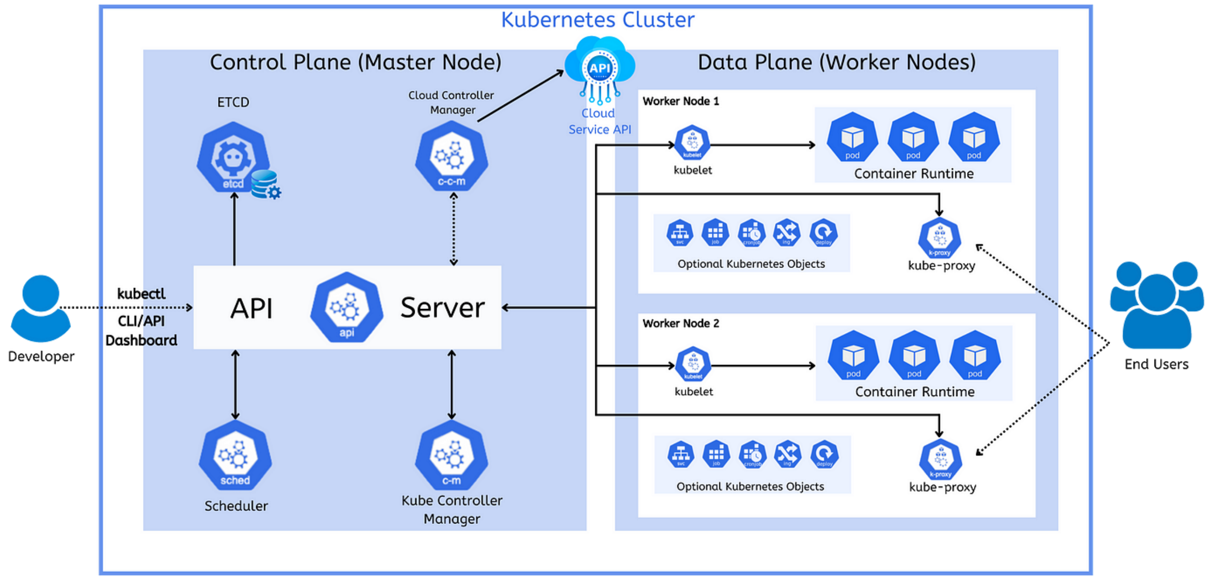
Kubernetes Architecture Simplified :-

Kubernetes Cluster: A Kubernetes cluster consists of a control plane plus a set of worker machines, called nodes, that run containerized applications. Every cluster has at least one worker node in order to run Pods.

Kubernetes cluster components:



1.Control Plane/Master Node: The control plane manages the worker nodes and the Pods in the cluster. In production environments, the control plane usually runs across multiple computers and a cluster usually runs multiple nodes, providing fault-tolerance and high availability.
In Control plane ,we have API Server,Schedular,Controller Manager, Cloud Controller Manager (CCM),etcd.

*API Server:The API Server talks to all the components in the K8s cluster.All the operations on pods are executed by the talking to the API Server.

*Schedular : Decides which nodes will run a new Pod.Its like the air traffic controller,ensuring that workloads are eventually distributed.

*etcd: etcd is act as a backup store service.Entire kubernetes cluster information store as key-value store.

*Controller Manager: Controller Manager runs the controllers, including Node Controller, Job Controller ,EndPoint Slice Controller and Service Account controller. It watches over the cluster to ensure the desired state matches the actual state.

*Cloud Controller Manager :Manages cloud specific tasks, such as handling load balancers or storage in cloud environment.

2. Data Plane/Worker Node: These are the machine (virtual or physical machine)where your application actually runs.

* Pods :A Pod is a group of Containers and is the smallest unit that K8s administers. Pods have a single IP address applied to every container within the pod.

*Kubelet: Kubelet is basically responsible for creation of Pods and ensure that the Pod is always in a running state.

*Kube-Proxy: Kube Proxy Manages networking for the Pods,ensuring they can communicate with each other and the outside world.Its routes the traffic coming into a node from the device.It forwards request for work to the correct containers.

*Container Runtime: A fundamental component that empowers Kubernetes to run containers effectively. This could be Docker,containerd,or another container runtime. It's the engine that runs the application within the pod.

3.Communication Tools:

*Kubectl:The command-line tool that yiu use to interact with your Kubernetes cluster.Whether you are deploying applications or checking the health of your cluster,kubectl is your go -to tool.

*Cloud provider API: Allows Kubernetes to interact with cloud resources like load balancers,storage,and more.Its how Kubernetes speaks to the cloud.