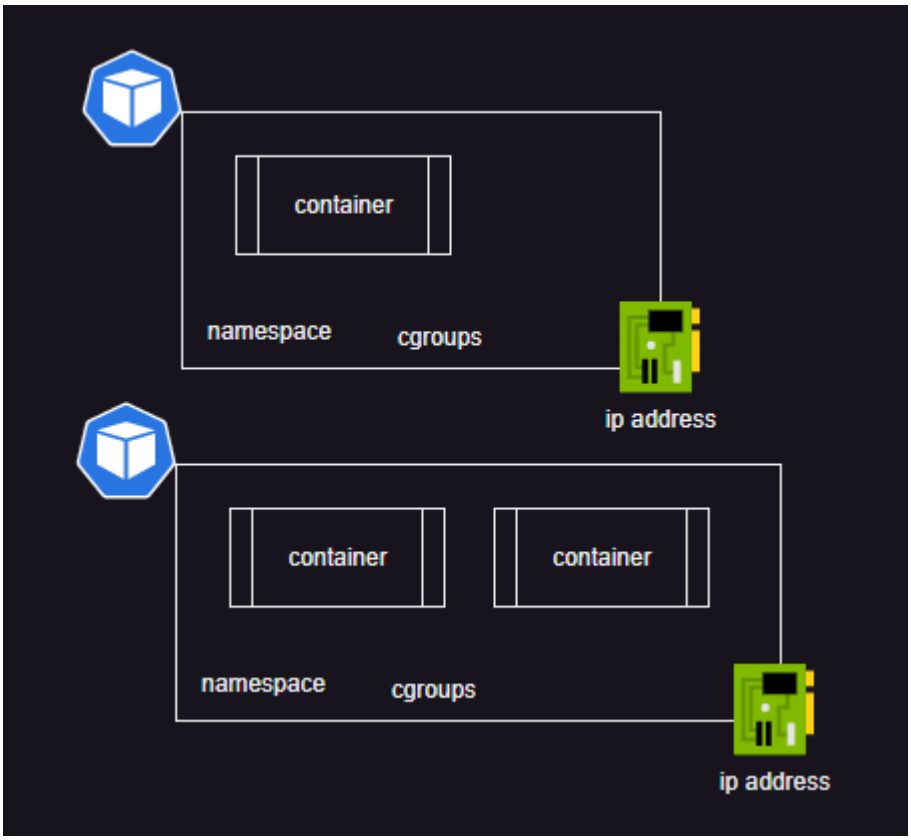
Kubernetes (k8s)

- Refer Here for kubernetes.
- K8s helps in running containers in production on scale.
- k8s uses clustering technology which is collection of nodes but it looks as if we are communicating with one endpoint.
- Go through the following articles
    - introduction Refer Here
    - components Refer Here
- Desired State: Desired state is expressing what we want rather than how to create.

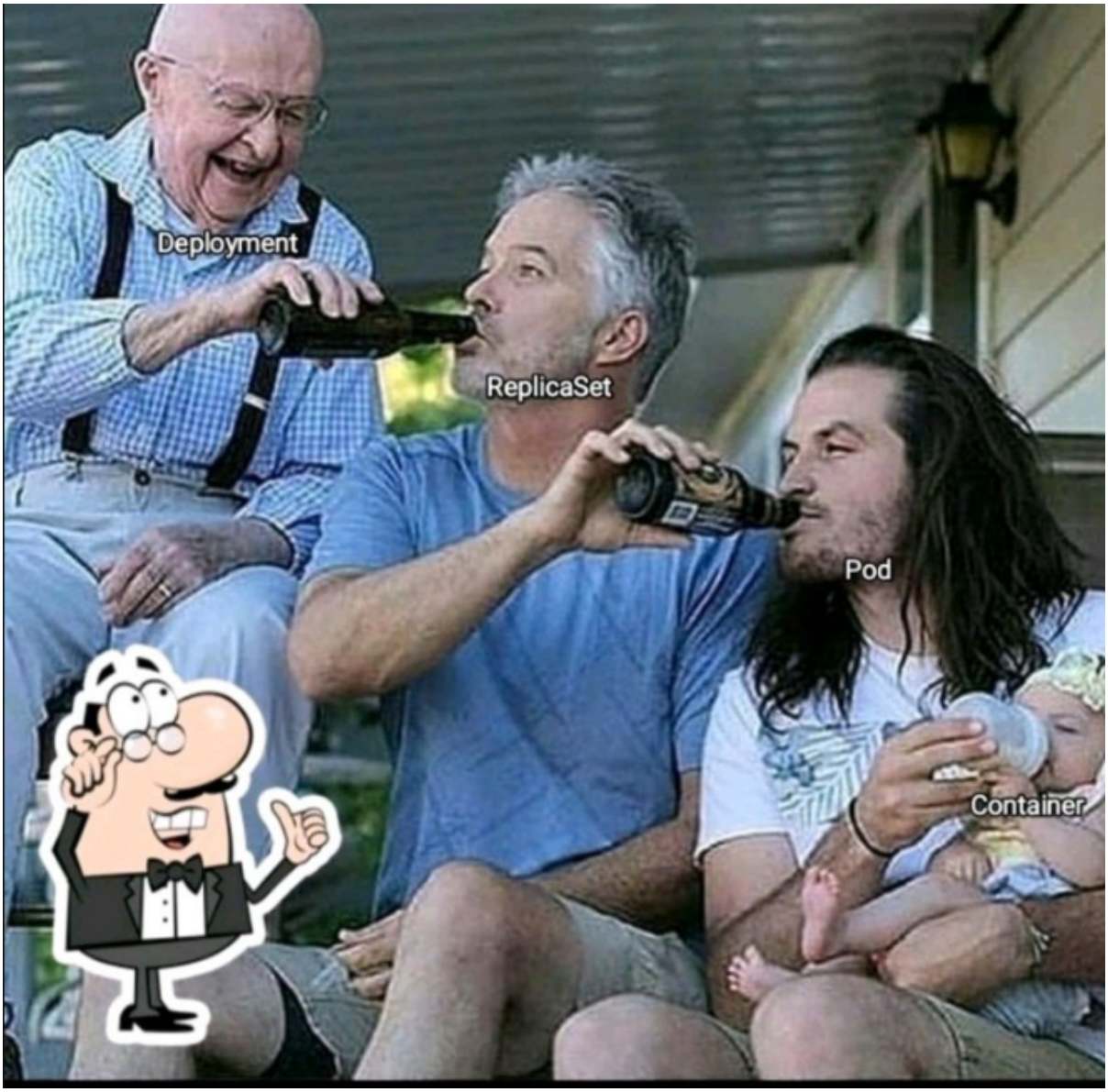
Overview of k8s components

- Pod:
    - Pod is atomic unit of creation in k8s.
    - POd will have container(s) in it.
    - All containers in the pod share the same namespaces
    - Each pod gets a unique ip address in the container
    - Pod specification will have details about running containers



- Replica Set:
    - Replica sets are controller objects
    - Replica sets create multiple replicas of pods
    - Desired state will be about pods and number of replicas
- Deployment:
    - This controller helps in performing zero downtime deployments
    - Deployment internally creates replicasets and replica set create pods and pod creates containers

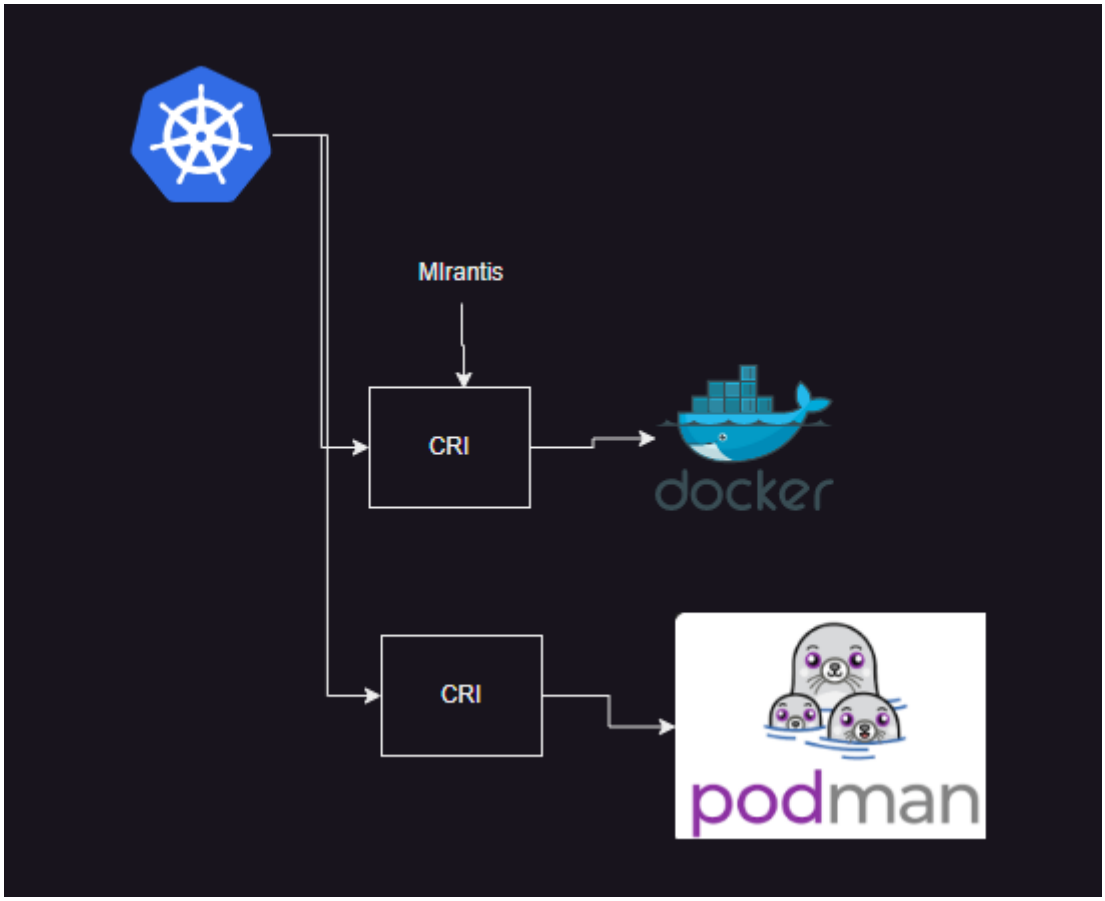
    - Deployment enables rollout and rollbacks



- Labels:
    - A Label is a key value attached to any k8s object
    - labels are query mechanisms in k8s
- Service:
    - service is used to expose pods with matching labels to
        - other pods
        - externally

CRI (Container Runtime Interface)

- Refer Here for docs. CRI is an interface for k8s to communicate with container engines



- CRI is an interface that any container technology can implement to be used in k8s
- Till k8s 1.23 k8s used to maintain docker cri from 1.24 k8s have removed this and other opensources such as cri-dockerd and mirantis have written this component.

CNI (Container Network Interface)

- This is used for networking implementation in the k8s cluster
- This can also be implemented by any one
- There are many CNI's available.
    - Weavenet
    - flannel
    - calico
    - vpc-cni
    - azure network fabric cni
    - google kubernetes CNI

CSI (Container storage interface)

- Refer Here
- CSI interface helps in creation, updation and management of volumes in various storage sources.

K8s installation options

- Desktops:
    - minikube
    - kind

- On-prem servers
    - kubeadmin
    - kubespray
- Cloud based (k8s as a service)
    - AKS
    - EKS
    - GKE