CNCF AND ITS LANDSCAPE

CNCF → cloud Native Computing Foundation.

- It acts as a home for many Fast growing open source foundation

Sandbox project → when a project just enters the CNCF it is called sandbox project

Incubating project → means it satisfies the sandbox requirement & and it is allowed to run in minimum free production with proper documentation

Graduated project → All the requirement of Incubating are satisfied & some other security purpose.

Orchestration and Kubernetes

Orchestration is basically creating, managing and monitoring our project

Container Orchestration : we we have more containers we can't manage it manually for that we are going for Container orchestration.

- creating and Managing containers.
- Monitoring. (monitor the containers)
- Scaling. (add or delete containers)
- Networking.
- self healing. (when the container goes out of orchestration it heals it and make it within orchestration process).

Kubernetes aka K8S

- Kubernetes is an open-source system for automating deployment, scaling and management of containerized application.
- Born at Google and share the same DNA (same as) with BORN and OMEGA
- CNCF => Graduated project.
- Extensibility => it is easily extensible.
- Community → Kubernetes has a big community support.

Introduction to K3s.

- Fully compatible Kubernetes distribution. (approved by CNCF)
- started by Rancher Labs.
- K3S and K8S (→ Kubernetes) → 3 is less than 8" K3S is more approachable and less complex than K8S.

Single binary

- it is under 100mB.
- Installs everything it needs to run either as a control plane node or join a cluster
  - API server, scheduler, controller
  - kubelet.
  - containerd (it manages the complete container lifecycle of its host system from image transfer (→ file or software code everything) and storage to container execution and supervision).

Opinionated

K3s bundles in

Default ingress controller → Traefik
Containerd runtime → containerd
Virtual networking within the cluster → Flannel
cluster service discovery → coreDNS
Embedded load balancer → Klipper-lb.

→ All these are present in K3s.

In order to be lightweight K3s throws lot of code

K3s throws out.

- cloud provider specific code is removed
  - Replaced with cloud controller Manager (CCM).
- Third party - specific storage drivers.
  - Replaced with container storage interface (CSI).

Single Node

- A control plane node can also perform work.
- memory requirement increase
- You can run a single node "cluster"

Minimum requirement - 512 MB RAM for control plane.

"Anything that Kubernetes K8's can run then K3s can also run".

K3s is
- Fully compatible and CNCF conformant distribution of Kubernetes.
- Packaged in a single binary.
- Opinionated.