

DevOps - Provisioning - K8s - Lab

Hands on practice with Kubernetes

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Mental Arts

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Agenda

- Kubernetes Recap: 50 min
- Kubernetes Lab Part 1: 50 min
- Kubernetes Lab Part 2: 50 min

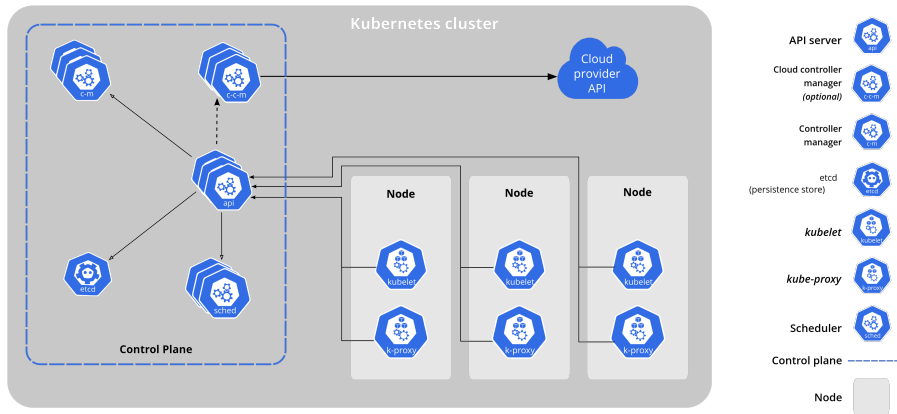
- Kubernetes Recap
- Kubernetes Lab
 - KinD Installation
 - Deploying FastAPI Application in Kubernetes
 - Homework Assignment
 - Q&A
- Homework Assignment
- Q&A
- Thank you!
- References

Kubernetes Definition

At the highest level Kubernetes is two things:

- A **cluster** to run applications on
- An **orchestrator** of **cloud-native** **microservices** apps

Kubernetes Components



Deployment Theory

Deployment

(Rolling updates and rollbacks)

ReplicaSet

(Self-healing, scalability)

Pod

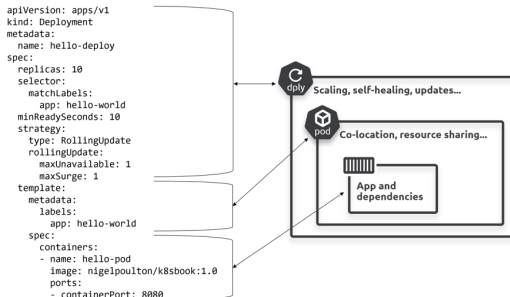


Pod



More
Pods...

Deployment Theory



Kubernetes Services

There are three primary types of Kubernetes services:

- ClusterIP
- NodePort
- LoadBalancer

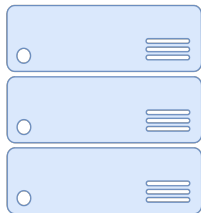
The Ingress resource is not a type of Service, although it serves a somewhat similar purpose. It will be described later.

Kubernetes Services

	ClusterIP Service	NodePort Service	LoadBalancer Service	Ingress + Service
Native K8s Resource	Yes	Yes	Yes, but needs cloud provider load balancer	Yes, but needs ingress controller deployed in cluster
Protocol (OSI Layer)	layer 4	layer 4	layer 4 and below*	layer 7 - http and https only
Allows multiple services per IP	No	No	Yes, but not same port**	Yes
Can expose outside the cluster	No	Yes	Yes (1 service)	Yes (multiple services)

Getting Kubernetes

- Bare Metal: Anywhere you've got a server
- Cloud: AWS, GCP, Azure, DigitalOcean, etc.
- Local Development: Kind, Minikube, MicroK8s, K3D, etc.



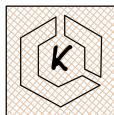
Server Rack



Google Kubernetes Engine



Azure Kubernetes Services



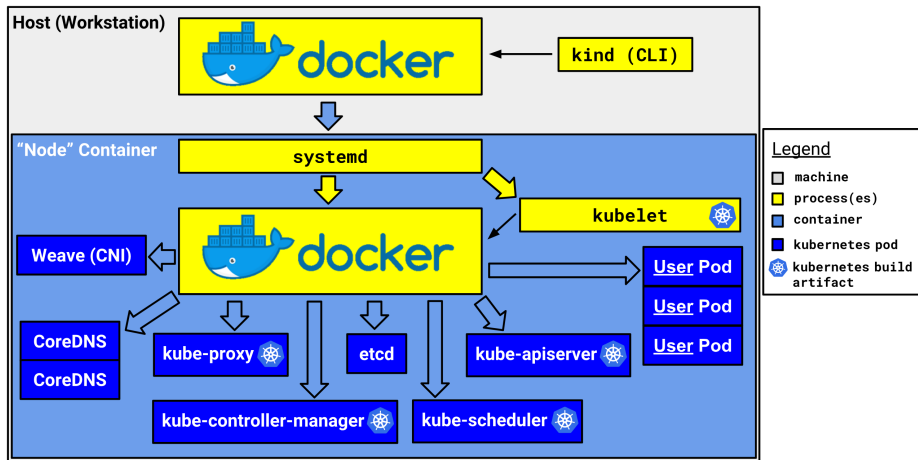
AWS EKS



minikube

KinD Architecture

kind - Kubernetes IN Docker

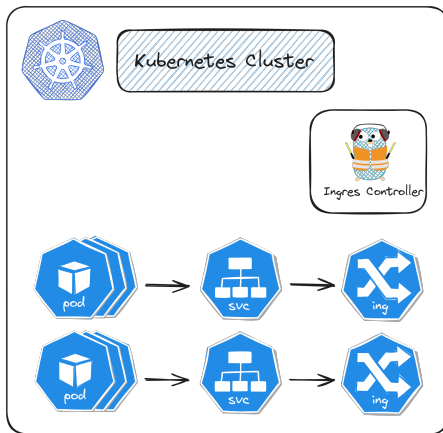


KinD Installation

- KinD Documentation
- Installing with a Package Manager
- Installing from Release Binaries
- Installing from Source

Please install KinD on your local machine, and let me know once it's done.

Deploying FastAPI Application in Kubernetes



Homework Assignment

- Project Assignment
- Project Work

Thank you!

- Thanks you for listening!
- You are now 1 step closer to becoming a Kubernetes expert!

References

- [Kubernetes Documentation](#)
- [KinD Documentation](#)
- [FastAPI Documentation](#)
- [Traefik Documentation](#)
- [Kubernetes Service vs LoadBalancer vs Ingress](#)
- [The Kubernetes Book - Nigel Poulton](#)
- [TechWorld with Nana](#)
- [Minikube vs K3D vs KinD vs GetDeck Beiboot](#)