



# K8s

Kubernetes is an open-source container orchestration system for automating software deployment, scaling, and management.

Developed by 



# Why K8s? - Goals

Main objectives, stated by devs, for community

## **Achieve velocity**

- **m**aximum things shipping with high availability

## **Allow scaling**

- decoupled structure

## **Present abstract infrastructure**

- managed by k8s, portability of containers

## **Gain efficiency**

- optimised use of resources of nodes

# Computing

```
graph TD; C[Computing] --- L1[ ]; L1 --- P[POD]; L1 --- PS[POD SCHEDULING]; L1 --- PHC[POD HEALTH CHECKS]; L1 --- L2[ ]; L2 --- CMS[CONFIG MAPS & SECRETS]; L2 --- LA[LABELS & ANNOTATIONS];
```

## POD

smallest deployable unit  
container, pod, node,  
cluster

## POD SCHEDULING

scatter replicas  
reliability  
delete pods of a dead  
node

## POD HEALTH CHECKS

check if it does what it is  
supposed to do

## CONFIG MAPS & SECRETS

pods configuration

## LABELS & ANNOTATIONS

key-value pair  
identification, grouping

# Communication



## SERVICE

abstraction over pods  
having same function  
(microservice)



## CLUSTERIP SERVICE

intra-cluster comm.  
can't be changed unless  
deleted



## NODEPORTS SERVICE

outside cluster access of  
pods



## NODEBALANCER SERVICE

access to pods easier in  
cloud based env.

# Coordination



## RECONCILIATION LOOP

current == desired

## REPLICASET

given no. of identical pods  
are present at a time

## DAEMONSET

making sure pod is  
executed on node  
rollUpdate

## JOBS

w/ the help of replicaset &  
daemonset  
makes sure pod runs in  
nodes and exit when job  
is done, otherwise restart



# Application Versioning



## DEPLOYMENT - RECREATE

previous pods destroyed  
new created  
downtime

## DEPLOYMENT - ROLLING UPDATE

no downtime  
uses existing as well as  
additional pods

## HORIZONTAL POD AUTOSCALING

shrink/expand no. of pods  
based on needs



# Summarize

- computing building block = Pod
- communication building block = Service
- grouping = Labels and Annotations
- configuration = ConfigMap and Secrets
- pod coordination = ReplicaSet, DaemonSet, Job
- application updates = Deployment
- kubectl - CLI to comm. with API Server