

# **Kubernetes-k8s VS. Docker**

**How kubernetes/Docker works**

1.pod and node

2.docker image

3.docker cmd

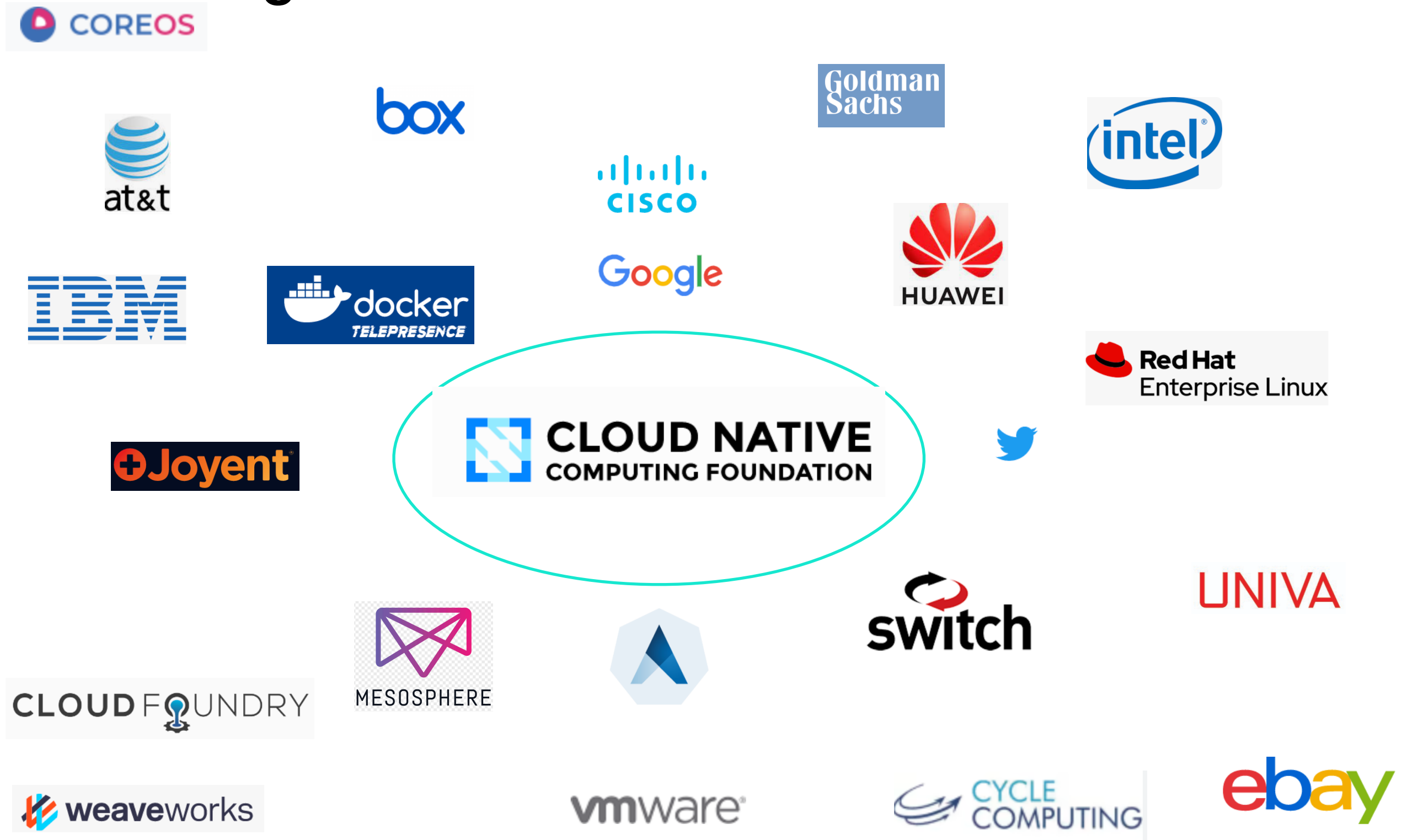
# Kubernetes

## K8s

- 1.Kubernetes is an open source system
- 2.K8s managing containerized applications across multiple hosts.
- 3.K8s provides basic mechanisms for
  - 1.deployment of applications
  - 2.maintenance of applications
  - 3.scaling of applications
4. K8s is hosted by **Cloud Native Computing Foundation(CNCF)**
5. CNCF is focused on:
  - 1.drive alignment among container techs
  - 2.container-packaged
  - 3.dynamically scheduled
  - 4.microservices-oriented

# Cloud Native Computing Foundation

## CNCF organization members



# Core of CNCF

- 1.CNCF **collaborate** among devs and operators for:
  - 1.CNCF **deploying** cloud native application services
  - 2.CNCF bring the open source code in **neutral** and collaborative forum
  - 3.CNCF aims to advance the **application development at internet scale**
- 2.CNCF create set of **container techs** driven by tech merit
  1. advance in containers
  2. advance in automation
  - 3.advance in orchestration
  - 4.improve the dev experience
  - 5.faster code reuse
  - 6.improve machine efficiency
  - 7.reduce costs
  - 8.increase agility/maintainability of applications
- 3.CNCF look at open source at the **orchestration** level:
  1. Container orchestration
  - 2.CNCF integration of hosts and services(assemble components)
  - 3.CNCF defining API and standards to container-packaged application infrastructure.
  - 4.CNCF work with Open Container initiative on its container image specification
  - 5.CNCF represents the next step in the evolution of open source software.
    - 1.provides a mechanism for complementary projects to come together as a single and harmonized solution architecture.
- 3.CNCF** provides collaborative and organizational **framework**:
  - 1.project hosts can focus on innovation and results
  - 2.provide you with a framework to run distributed systems resiliently
- 4.CNCF **span**:
  - 1.enterprise
  - 2.Mobile
  - 3.embedded
  - 4.life sciences markets

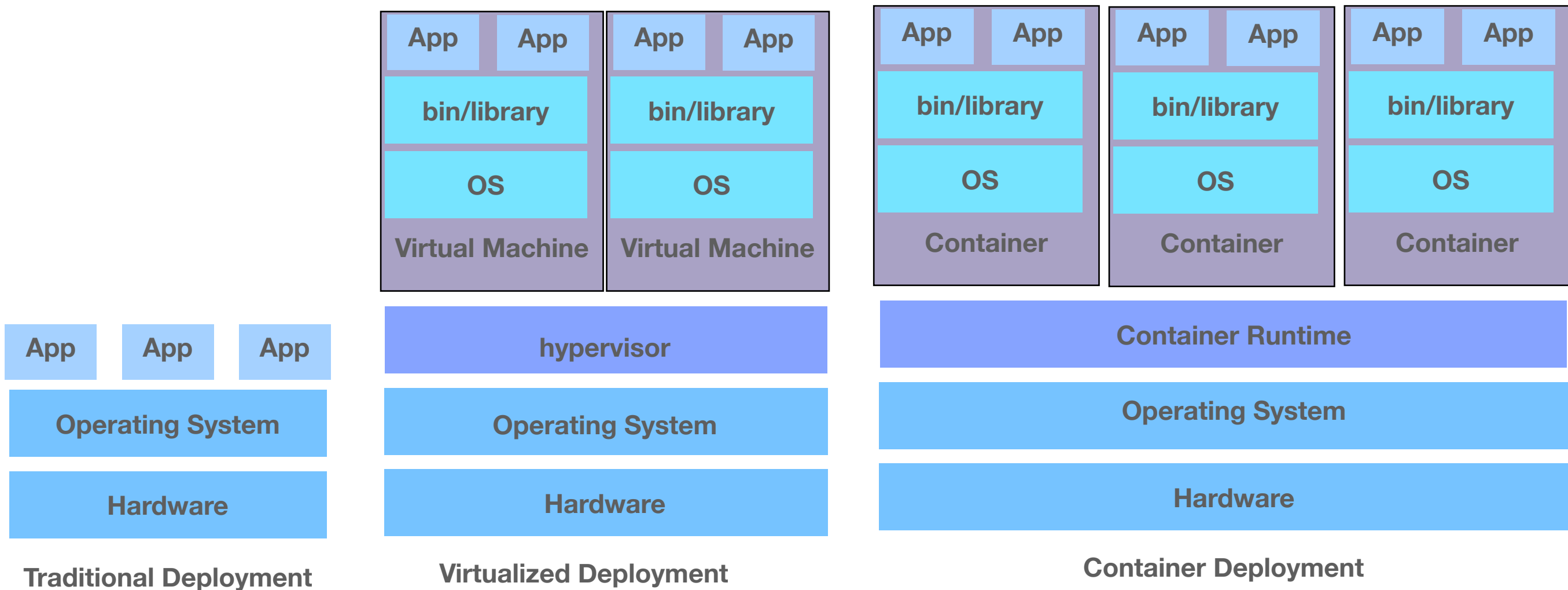
# CNCF are critical for companies:

- 1.scale their business quickly and successfully
- 2.simplify and improve the overall developer experience
- 3.increase access to compute for big data, analytics and batch computing
- 4.remove the barriers to resources that analysts, engineers depend on.
- 5.become ubiquitous in application development, deployment and management
- 6.simplifies use case from web and data apps to distributed systems
- 7.help to define common cloud native computing APIs, tools and frameworks.
- 8.make applications born in the cloud and driven by open innovation
- 9.make it possible for thousands of stateful and stateless services to run multi-tenant on:
  1. the same clusters.
  - 2.simplifying operations
  - 3.maintaining proper access controls
  - 4.security isolation between workloads
  - 5.above are requirements for modern datacenters

# Kubernetes Features

1. Automated rollouts and rollbacks
2. Storage orchestration
  1. automatically mount the storage system of your choice
3. Batch execution
  1. K8s can manage your batch and CI workloads
4. IPv4/IPv6 dual-stack
  1. allocation of IP addresses to pods
5. self-healing
  1. restarts containers that fail
  2. reschedule containers when nodes dies
  3. kill containers that don't respond to your user-defined health check.
6. Automatic bin packing
  1. Automatically places containers
  2. mix critical and best-effort workloads
7. Horizontal scaling
  1. scale your application up and down with a simple cmd, with a UI, or automatically based on CPU usage

# Deployment





# Deployment components

## when you deploy kubernetes, you get a cluster

### 1.Node

1.kubernetes cluster consists of a set of worker machines, called nodes.

1.a node is a worker machine

1.a node is either a virtual or physical machine

2.a node can have multiple pods

2.nodes run containerized applications

### 2.pod

1.pod is the components of the application workload

2.pod have a lifecycle

3.when a worker nodes dies, the pods running on the Node are also lost

4.Each pod in a cluster has a unique IP address

1.although each pod has a unique IP address, those IPs are not exposed outside the cluster without a service.

2.we couldn't refer to pods by IP

3.we are able to refer to Pods by their logical name rather than their specifics IP number

### 3. control plane

1.manages the worker nodes and the pods in the cluster