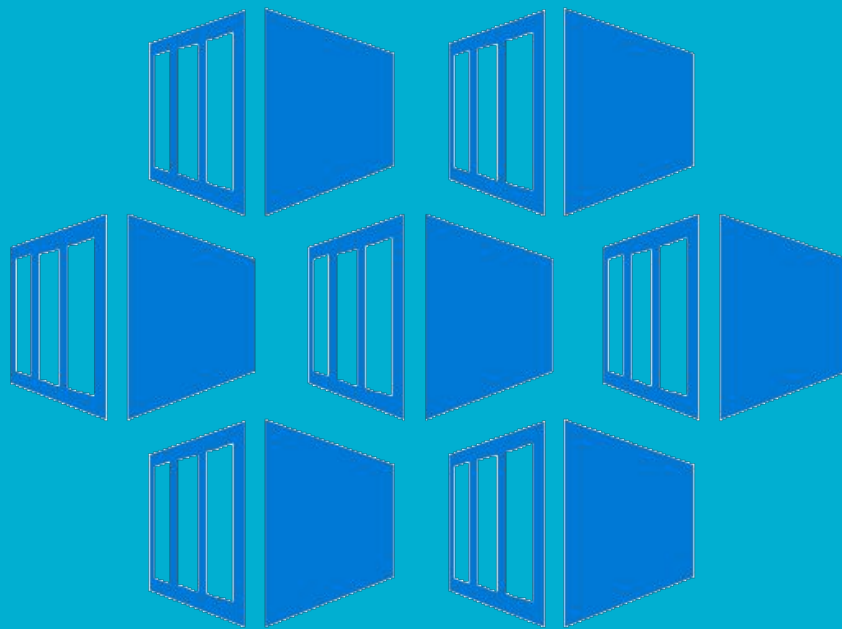


# Kubernetes

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# What is K8s:

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Let's Start with what Containers are:

- Containers are like portable boxes for your applications.
- They bundle code, libraries, and settings, allowing them to run consistently across different environments, from development machines to production servers.
- This isolates applications, saves resources, and simplifies deployments.

# What is K8s:

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Let's begin by discussing the advantages of containers.:

## **Mobility**

Identical experience running locally or in the cloud.

Bug in one container will not affect other containers in the environment.

## **Efficiency**

Less resources required to run.

Can utilize resources you want to specify like X amount of hardware.

## **Speed**

Deployment is fast because less resources are required to run.

# What is K8s:

Let's discuss the challenges of containers:

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## Deployment

Spin up one or two containers pretty easily, but multiple containers deployment become tedious in an environment.

## Scaling

Dynamically scaling based on workload is unavailable.

## Updates

Difficult to update all containers with zero downtime.

## Networking

Difficult to handle communication inside and outside of network.

## Health

No central way of hardware or software failures.

# What is K8s:

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There are still pain points that can be addressed!

Individual container management is unsustainable in large environment.

How do we fix it? -----> Orchestration



# What is an Orchestration ?

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A management layer to help deploy, maintain, and operate containers.

The most popular and accepted orchestrator tool is kubernetes

K8s was initially developed by Google & now is an open source tool

# K8s benefits:

Let's discuss the advantages of K8s:

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## Abstraction

a way of declaring the state that I want, and then Kubernetes will take care of the rest.

## Resource Allocation

Kubernetes provides the intelligence to decide what is the most efficient way to utilize your resources, while at the same time, provide high availability.

## Self Healing

Restart or replace failing containers for high availability

## Networking

Provides network management and load balancing.

## Update

Rolling update to minimize downtime

## Elastic scale

K8s allows you to auto-scale your env, which means to increase or decrease the resources based on the changes in the env.