Introduction to Containers

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Introduction to Containers

- Azure Container Apps works with containers
- It's important to understand the concept of containers
- It will help later when we'll work with Container Apps

Containers

- Traditional deployment:
  - Code was copied and built on the production server
  - Problems were found on the servers that weren't found in the dev machines

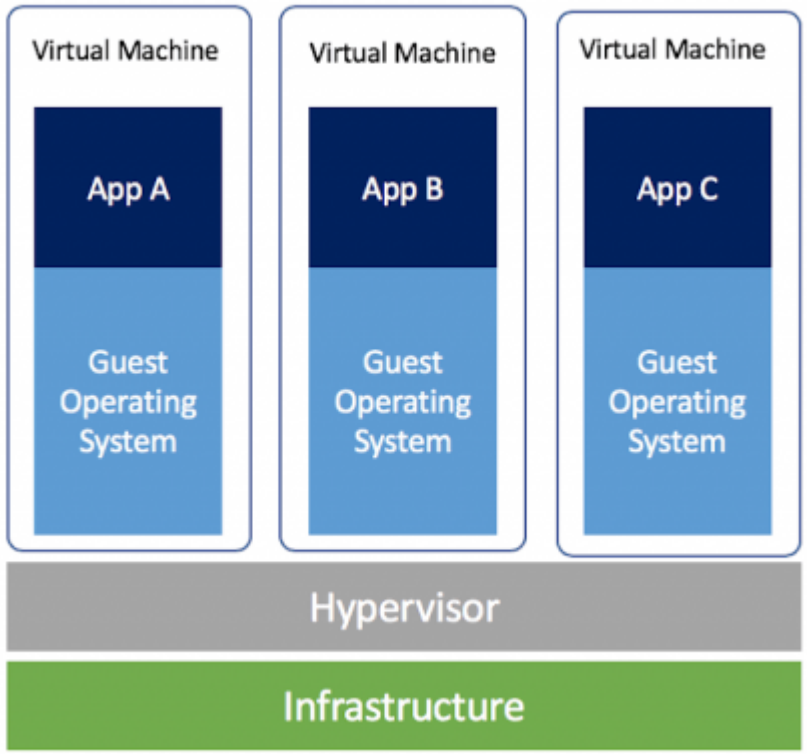
Containers to the Rescue!

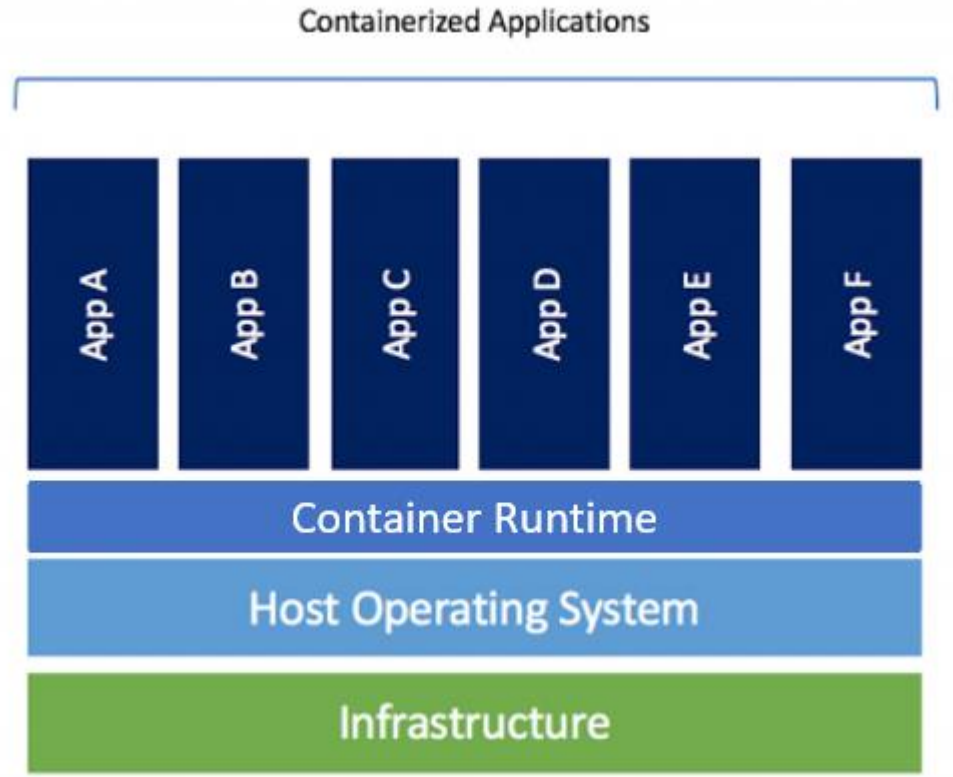
http://www.developermemes.com/2013/12/23/defect-production-works-machine/

Containers

- Thin packaging model
- Packages software, its dependencies, and configuration files
- Can be copied between machines
- Uses the underlying operating system

Container vs VM





Why Containers?

Predictability	The same package is deployed from the dev machine to the test to production
Performance	Container goes up in seconds vs minutes in VM
Density	One server can run thousands of containers vs dozens of VMs

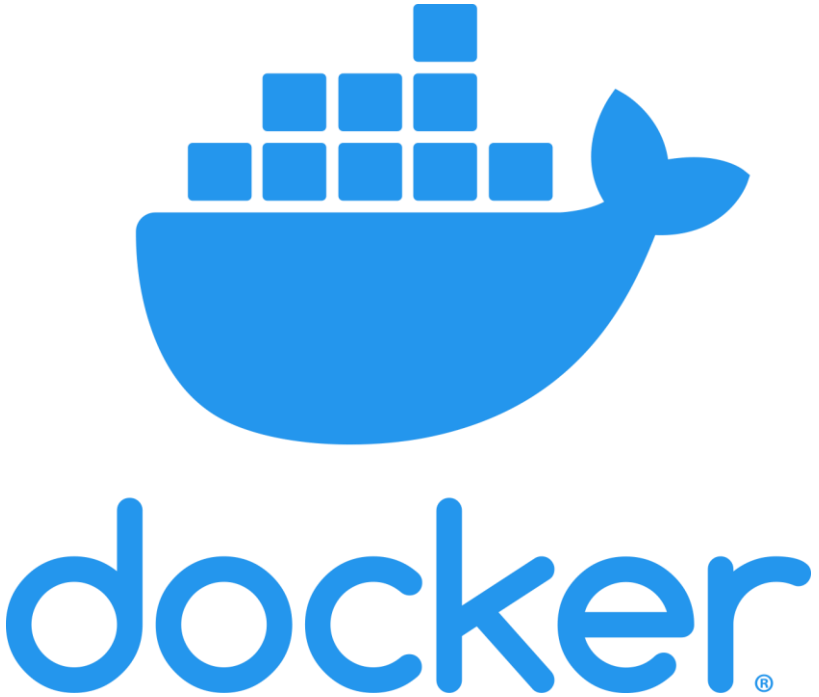
Why Not Containers?

Isolation

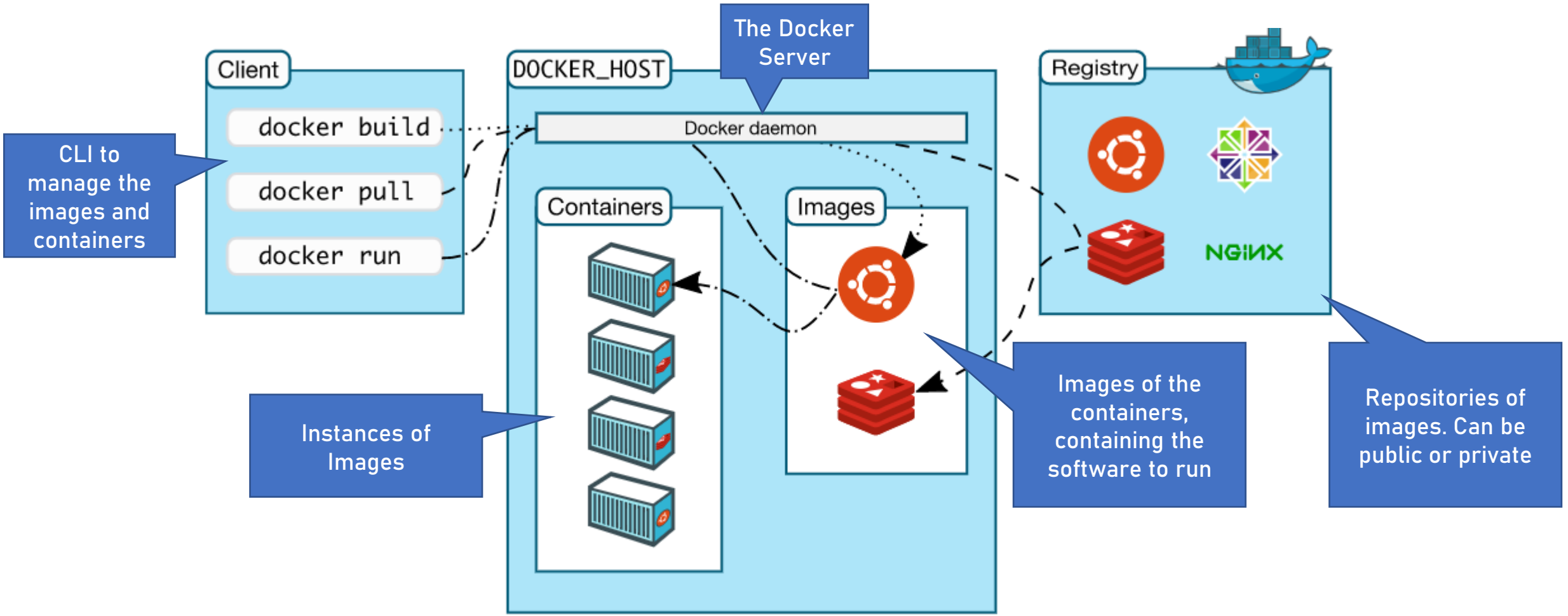
Containers share the same OS, so isolation is lighter than VM

Docker

- The most popular container environment
- De-facto standard for containers
- Released in 2013



Docker Architecture



https://docs.docker.com/get-started/overview/

dockerfile

- Contains instructions for building custom images

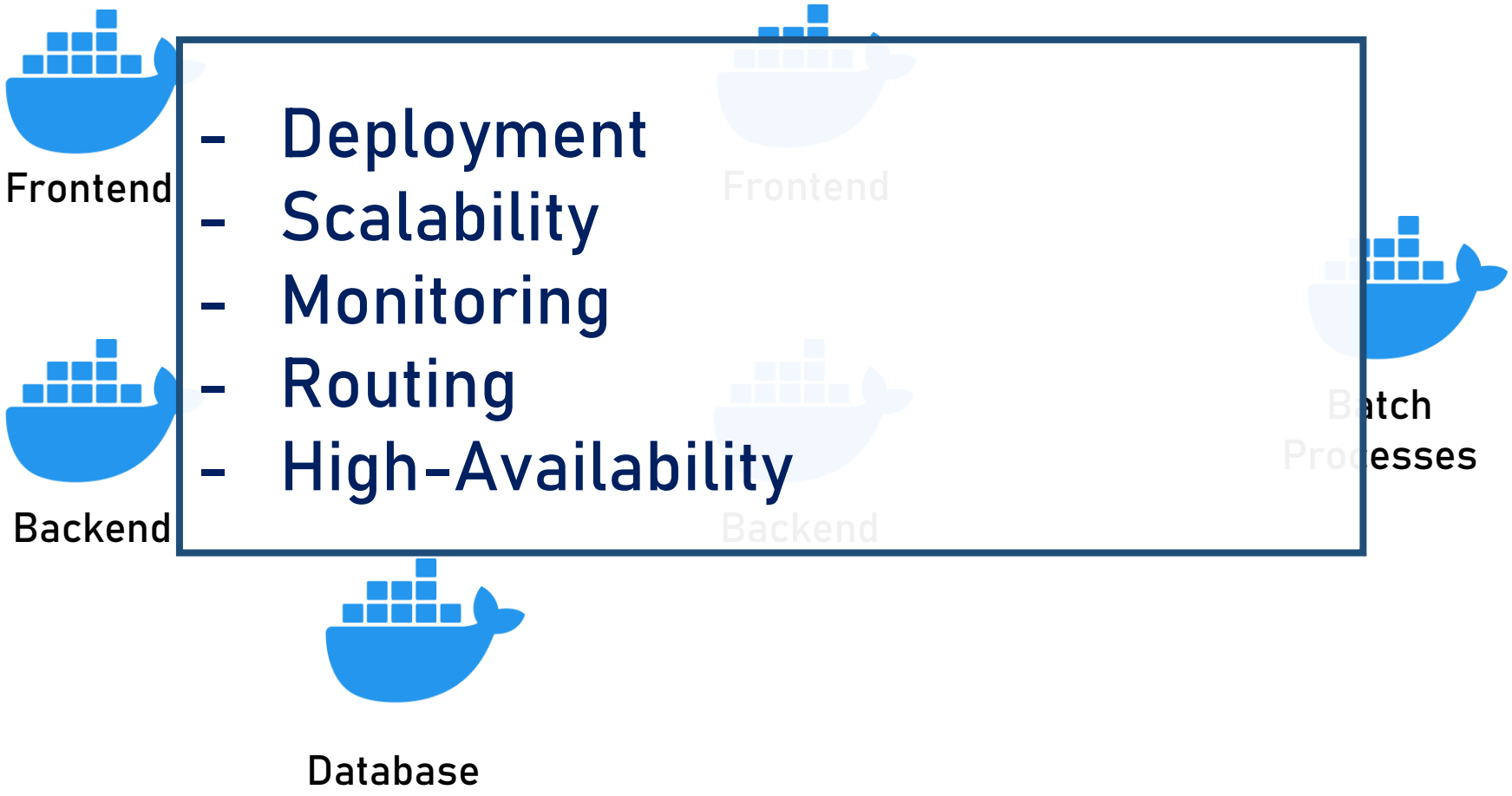
```
1  WORKDIR /opt/node_app
2  COPY package.json package-lock.json* ./
3  RUN npm install --no-optional && npm cache clean --force
4  ENV PATH /opt/node_app/node_modules/.bin:$PATH
5  WORKDIR /opt/node_app/app
6  COPY . .
```

https://www.docker.com/blog/keep-nodejs-rockin-in-docker/

Containers Management

- Containers are a great deployment mechanism
- Gain popularity
- What happens when there are too many of them?

Containers Management



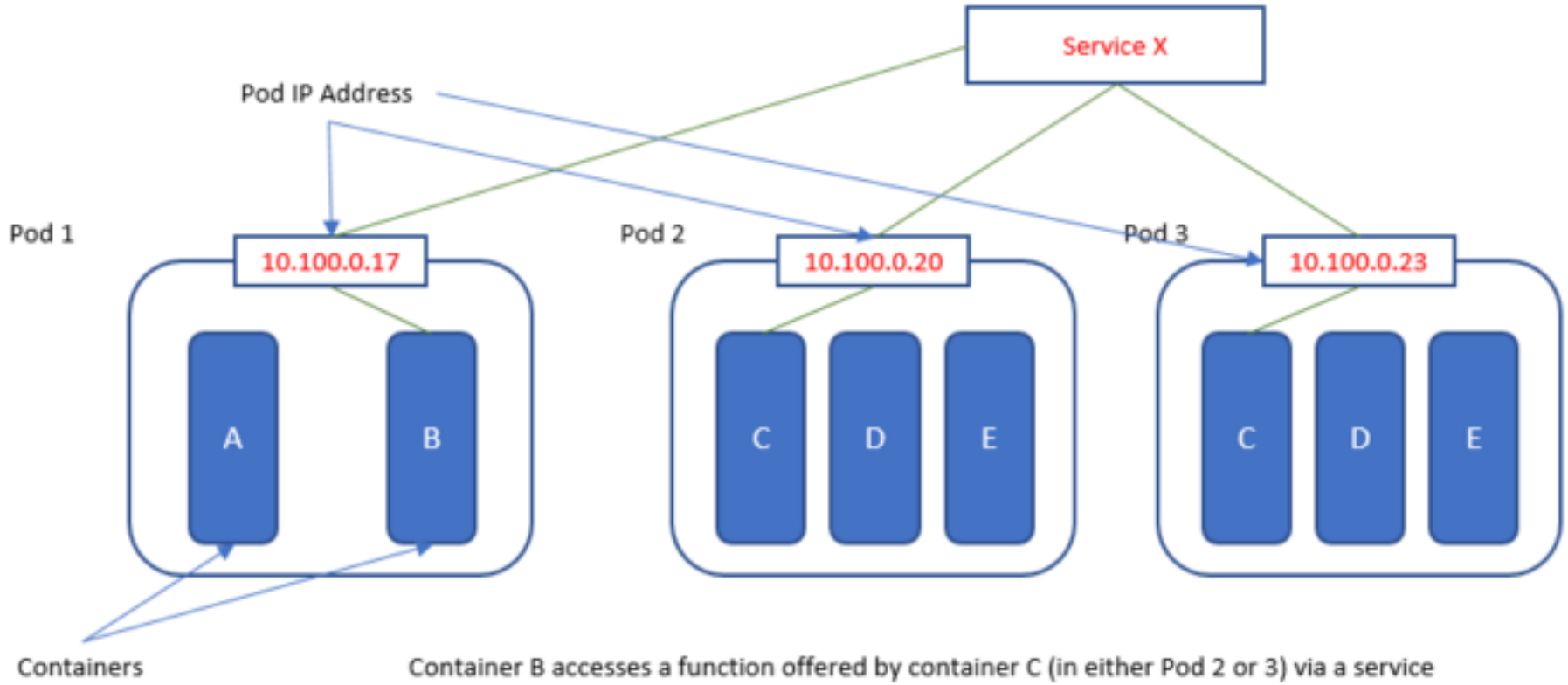
Kubernetes

- The most popular container management platform
- De-facto standard for container management
- Released by Google in 2014

Kubernetes

- Provides all aspects of management:
  - Routing
  - Scaling
  - High-Availability
  - Automated Deployment
  - Configuration Management
  - And more…

Kubernetes Architecture



https://en.wikipedia.org/wiki/Kubernetes