

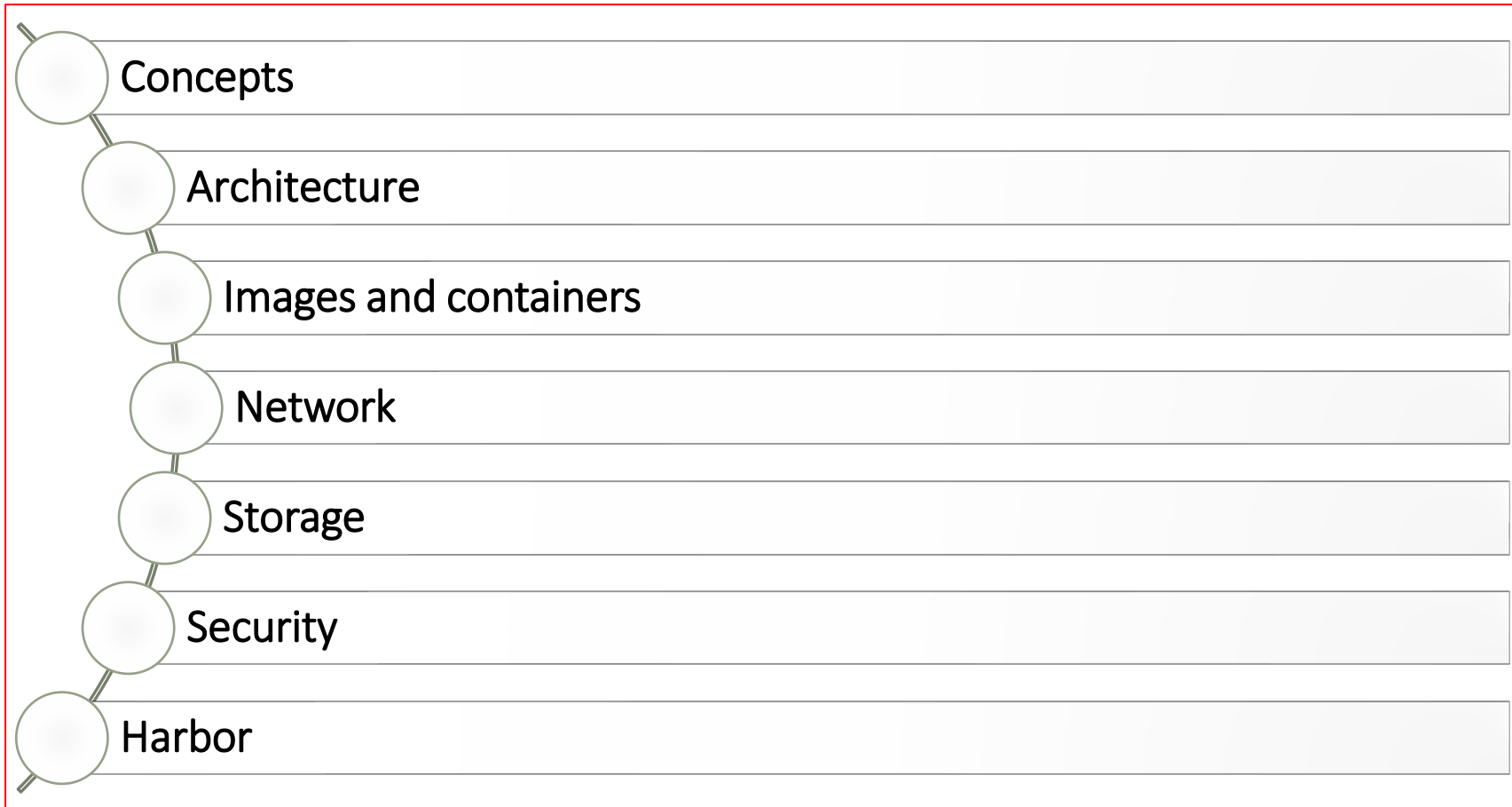
DEVSECOPS COURSE  
**CONTAINERIZED**

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TRAINER: TRAN HUU HOA

# AGENDA

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# CONCEPTS

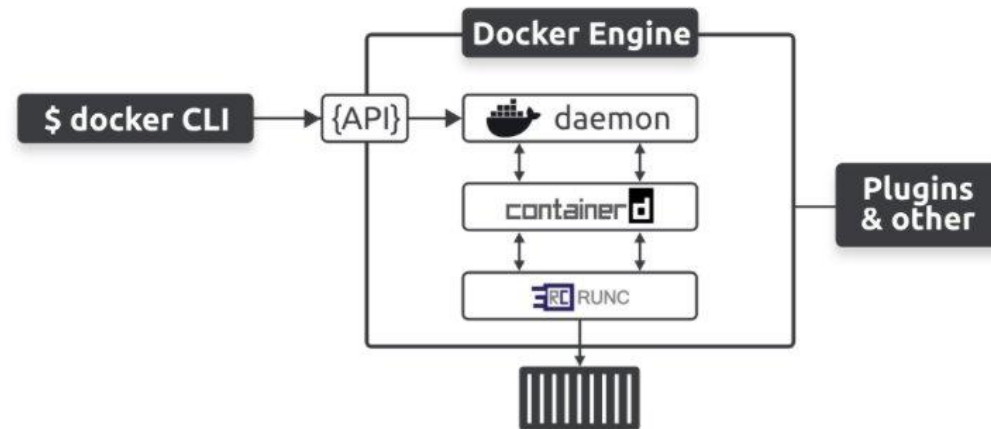
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**Containerization** is defined as a form of operating system virtualization, through which applications are run in isolated user spaces called containers, all using the same shared operating system.

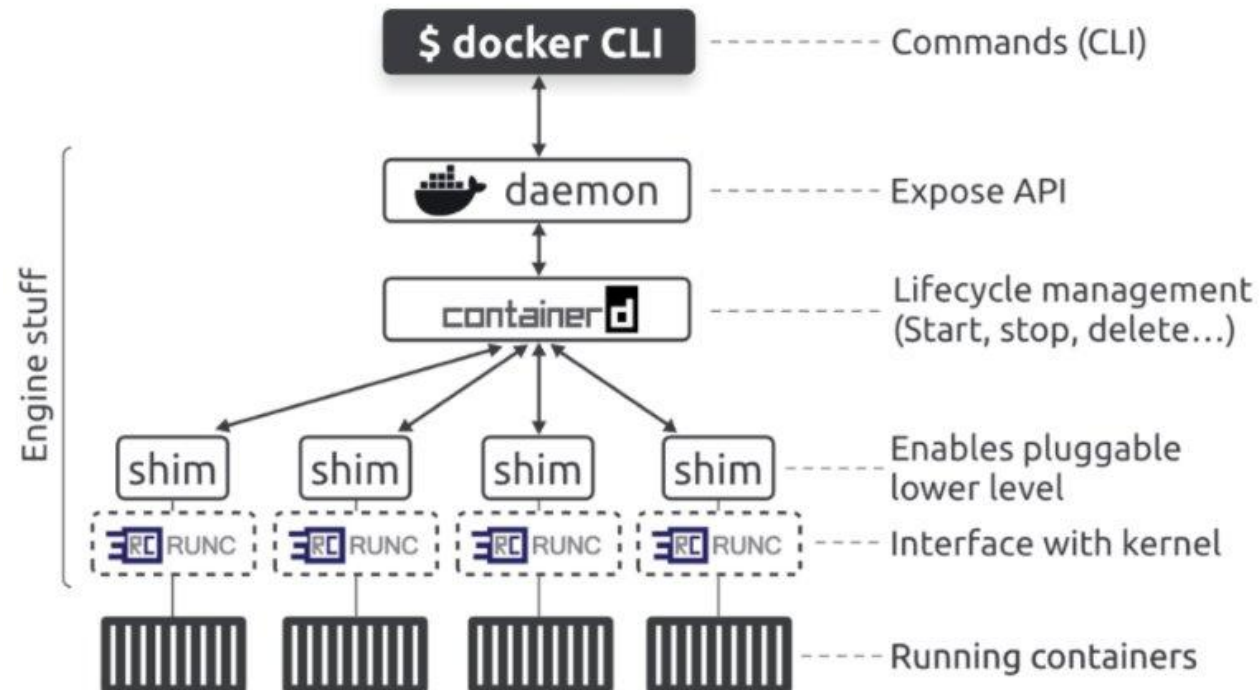
**The Docker Engine** is a practical technology for containerization. It is made from many specialized tools that work together to create and run containers — APIs, execution driver, runtimes, shims etc. The major components that make up the Docker engine are: the Docker daemon, containerd, runc, and various plugins such as networking and storage

# DOCKER ARCHITECTURE

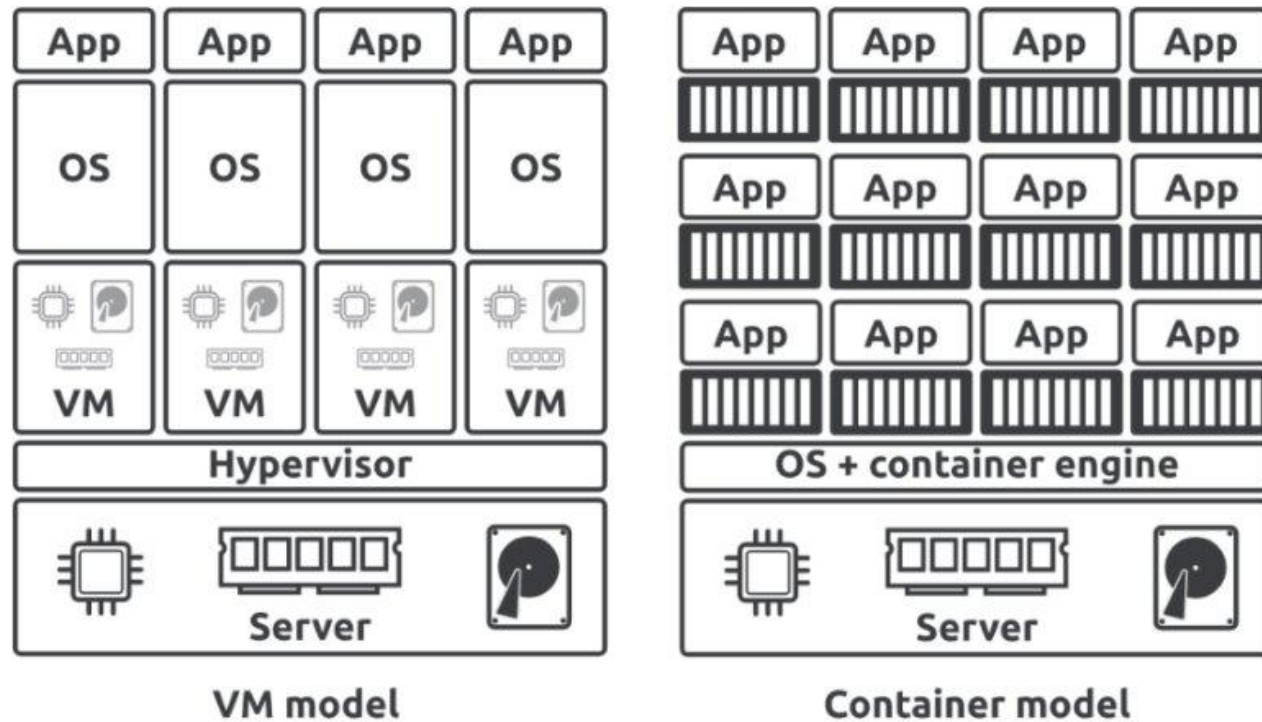
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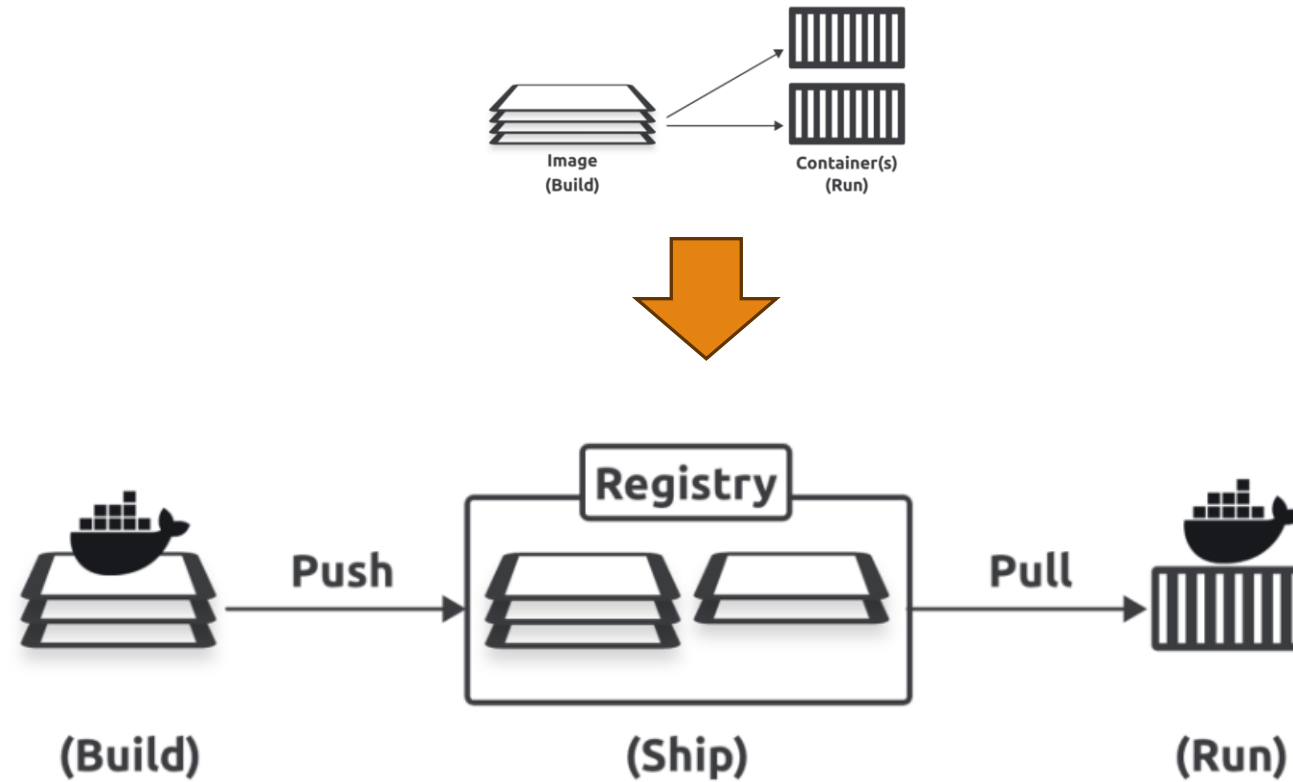
# DOCKER ARCHITECTURE



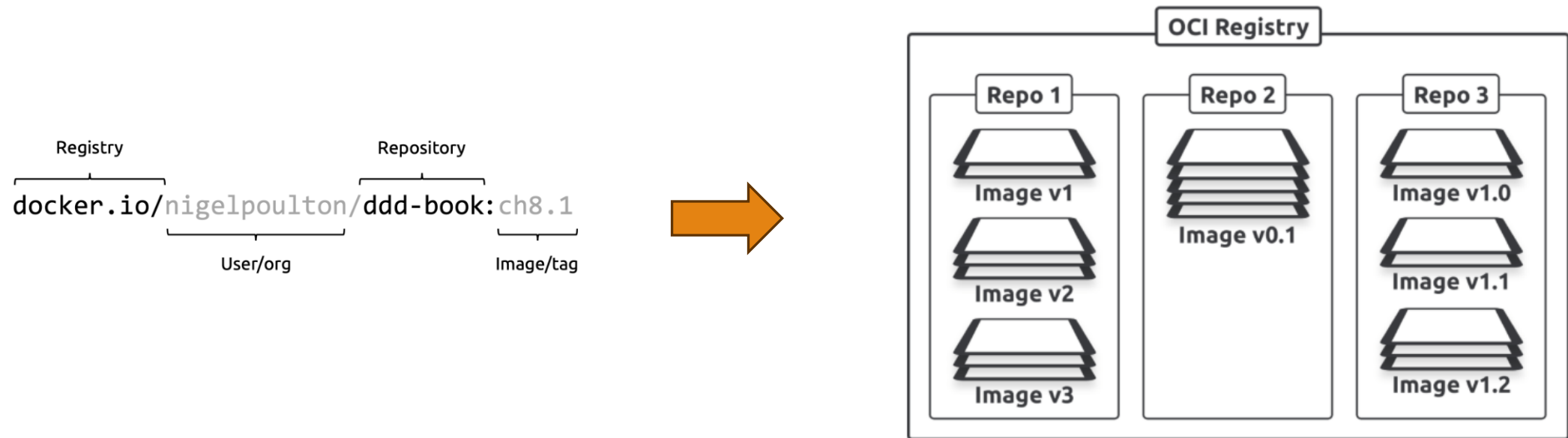
# DOCKER ARCHITECTURE



# DOCKER IMAGE AND CONTAINER

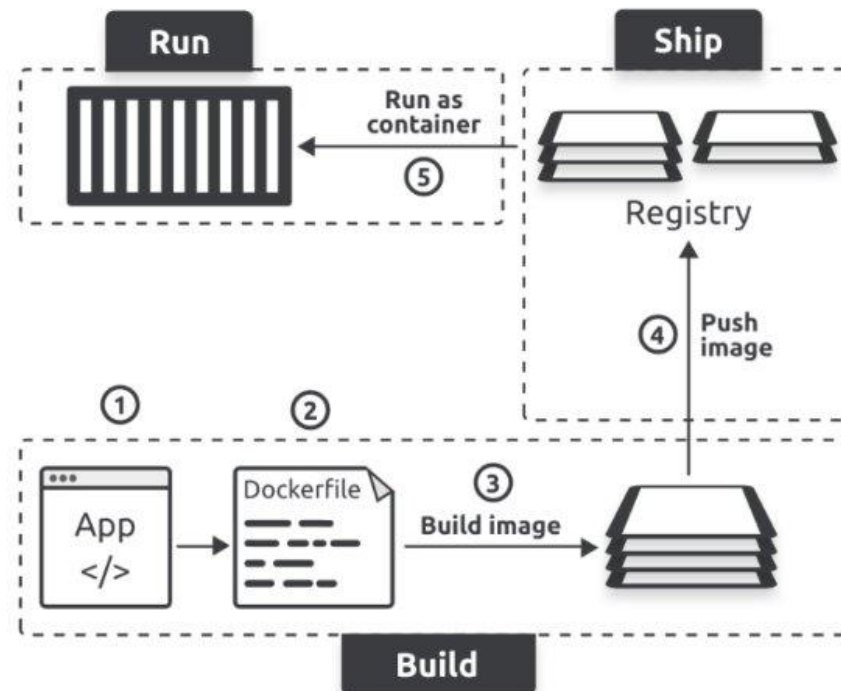


# DOCKER IMAGE AND CONTAINER

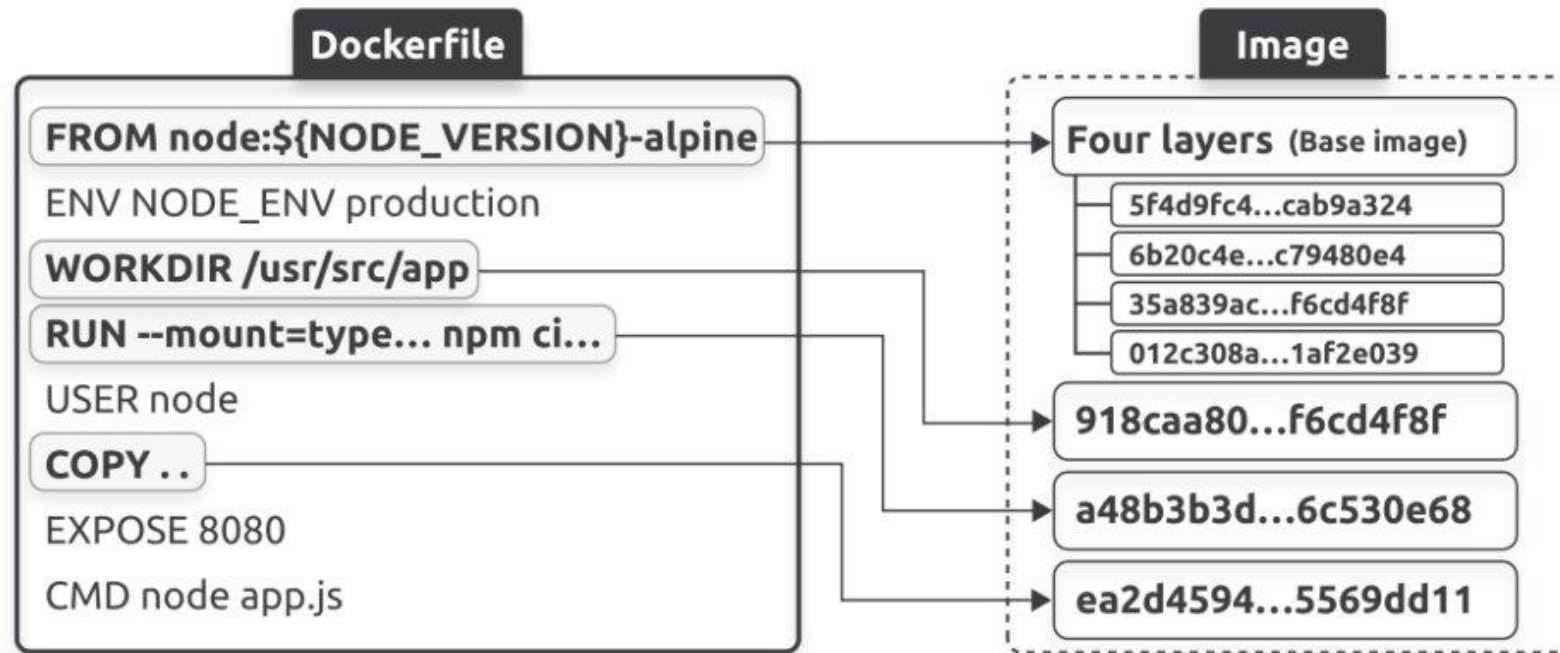




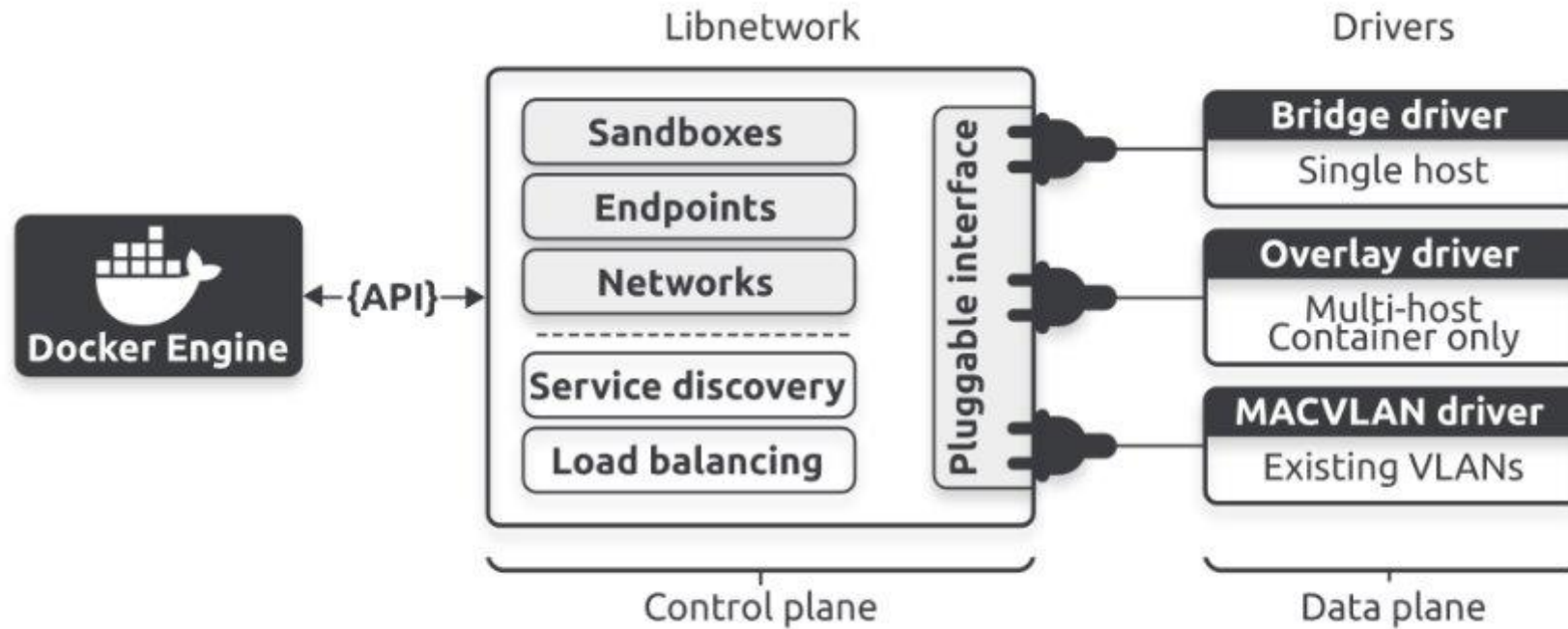
# DOCKER IMAGE AND CONTAINER



# DOCKER IMAGE AND CONTAINER

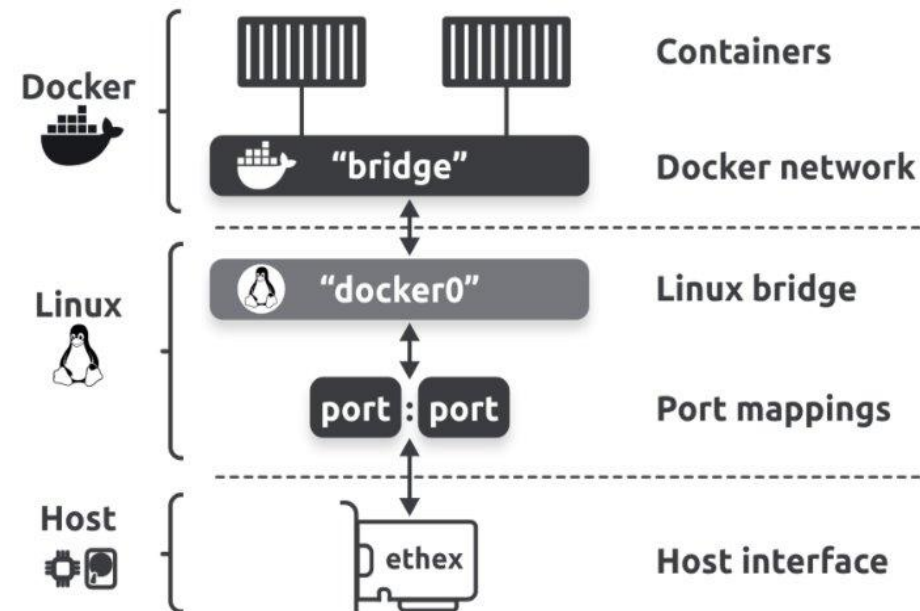


# DOCKER NETWORK



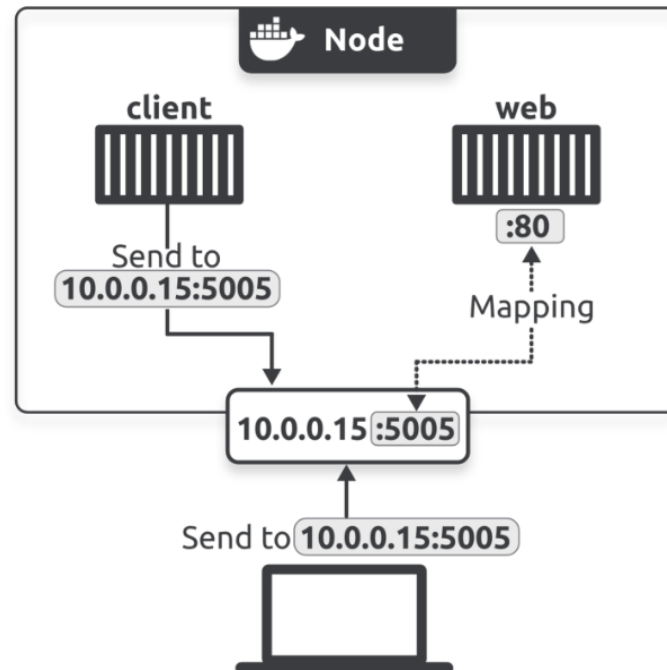
# DOCKER NETWORK

## Bridge (default mode)



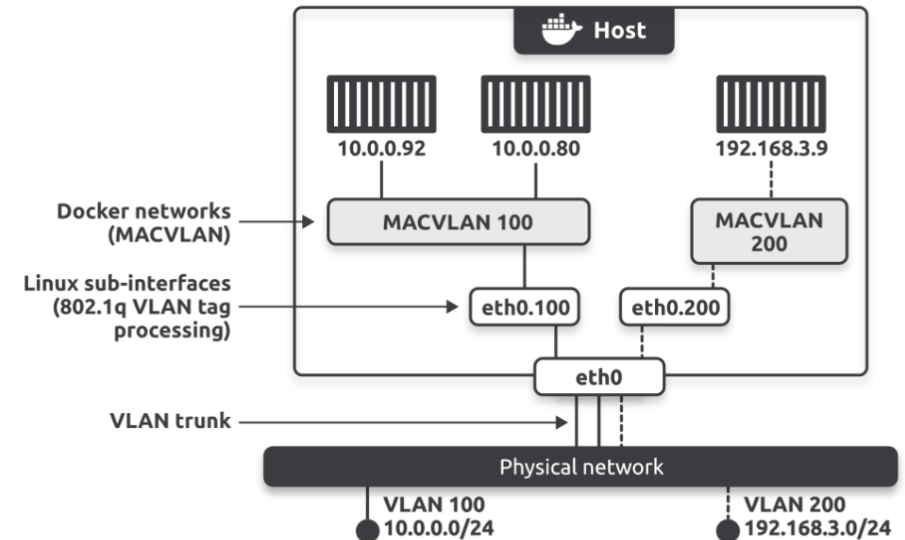
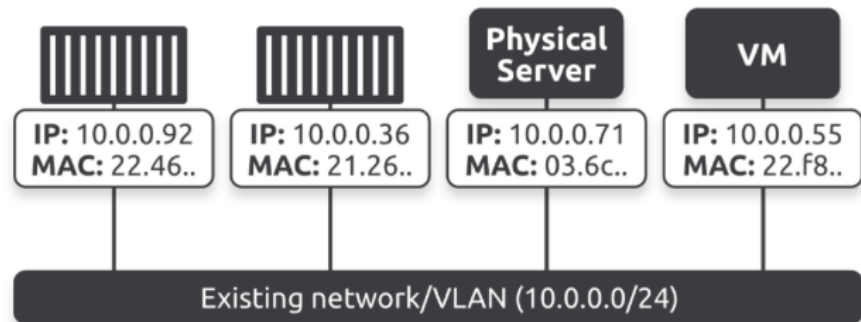
# DOCKER NETWORK

## Port mapping



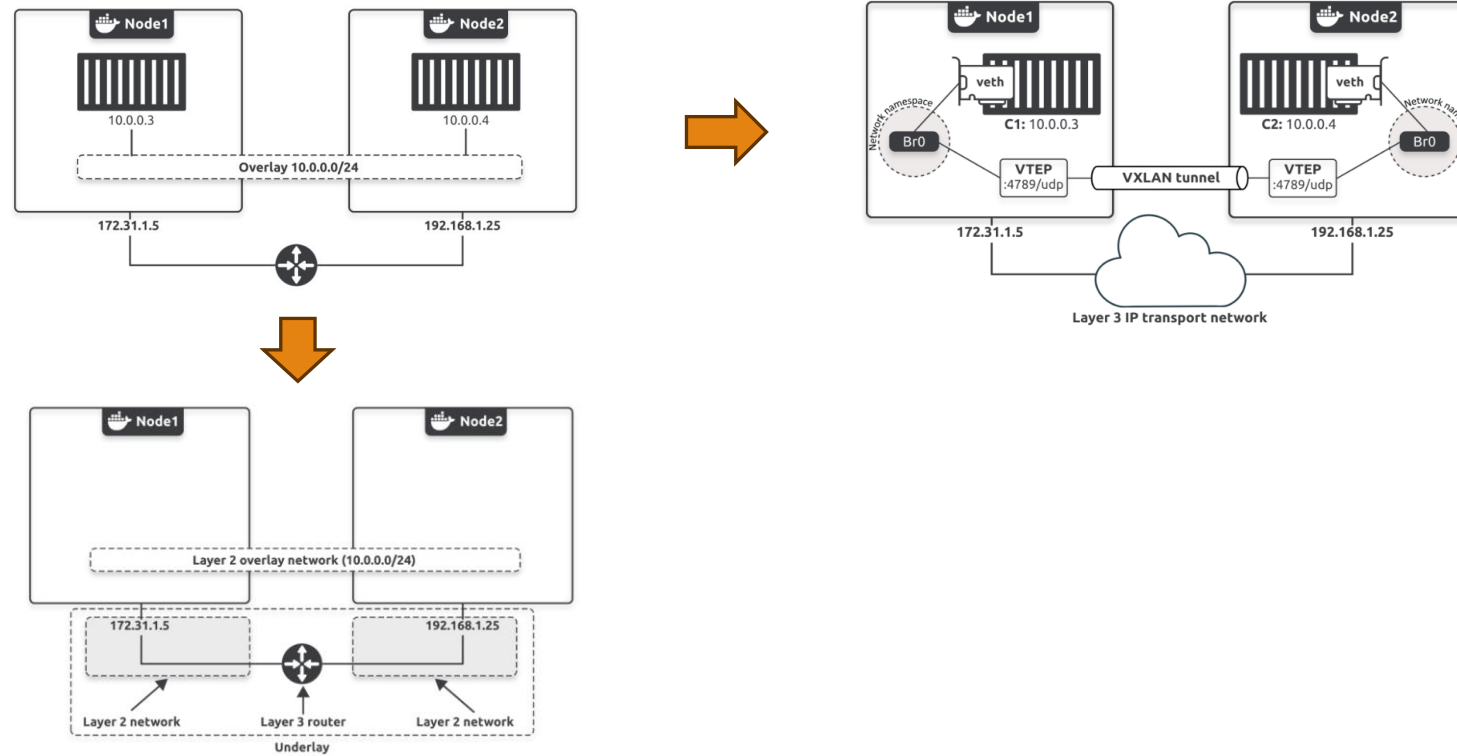
# DOCKER NETWORK

## VLANs mode

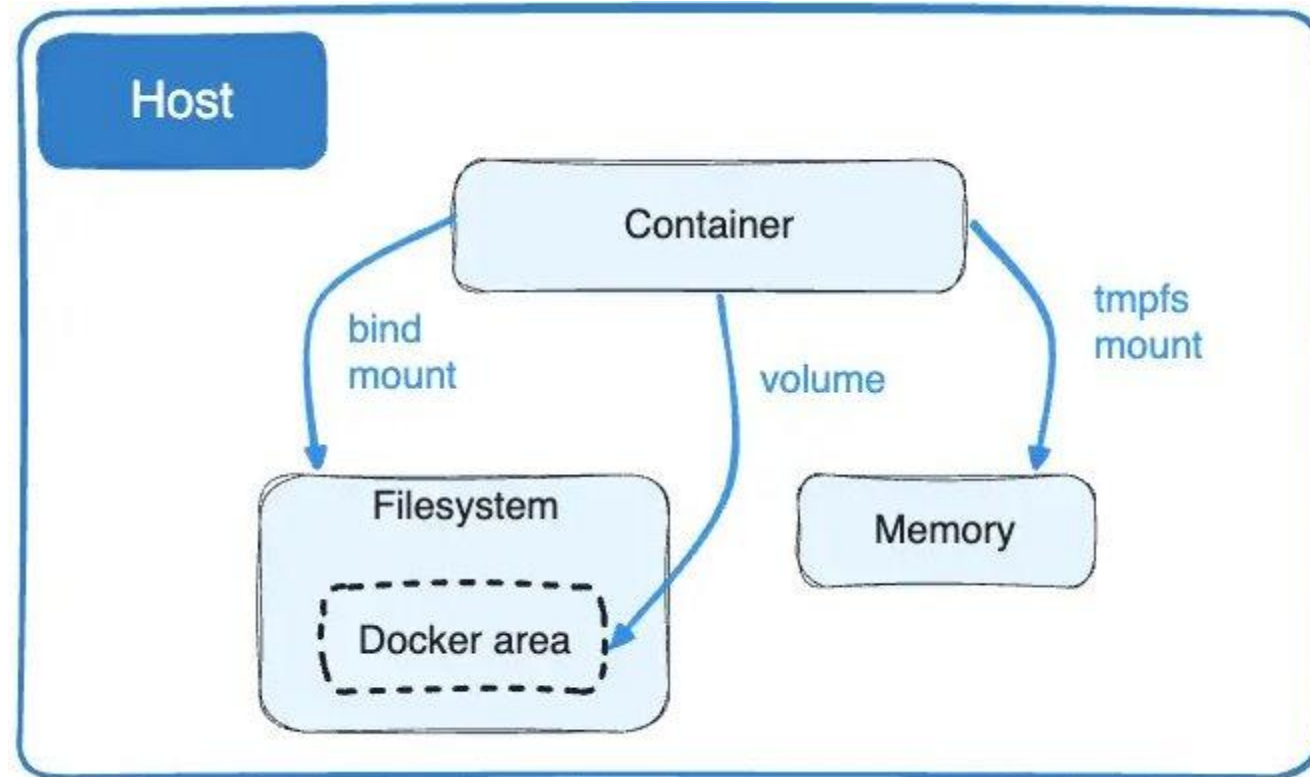


# DOCKER NETWORK

## Overlay networking

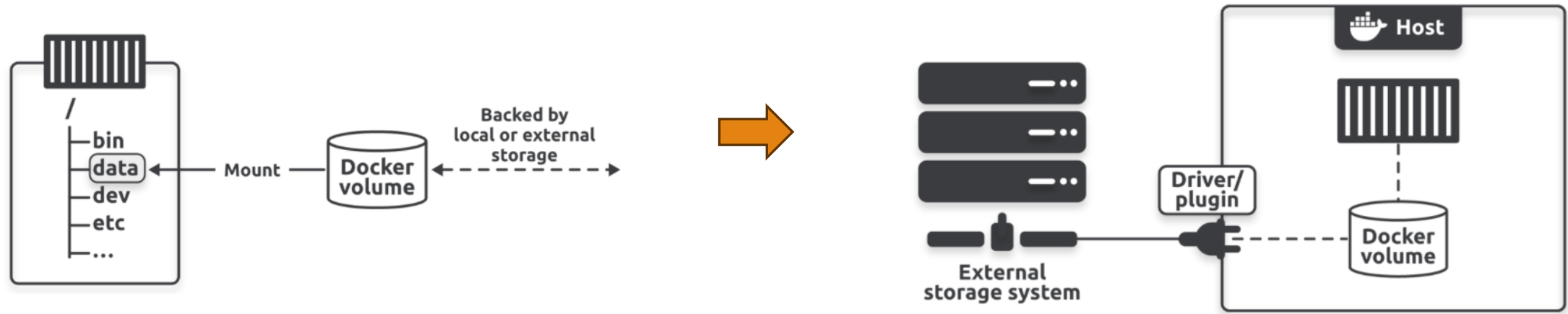


# DOCKER STORAGE



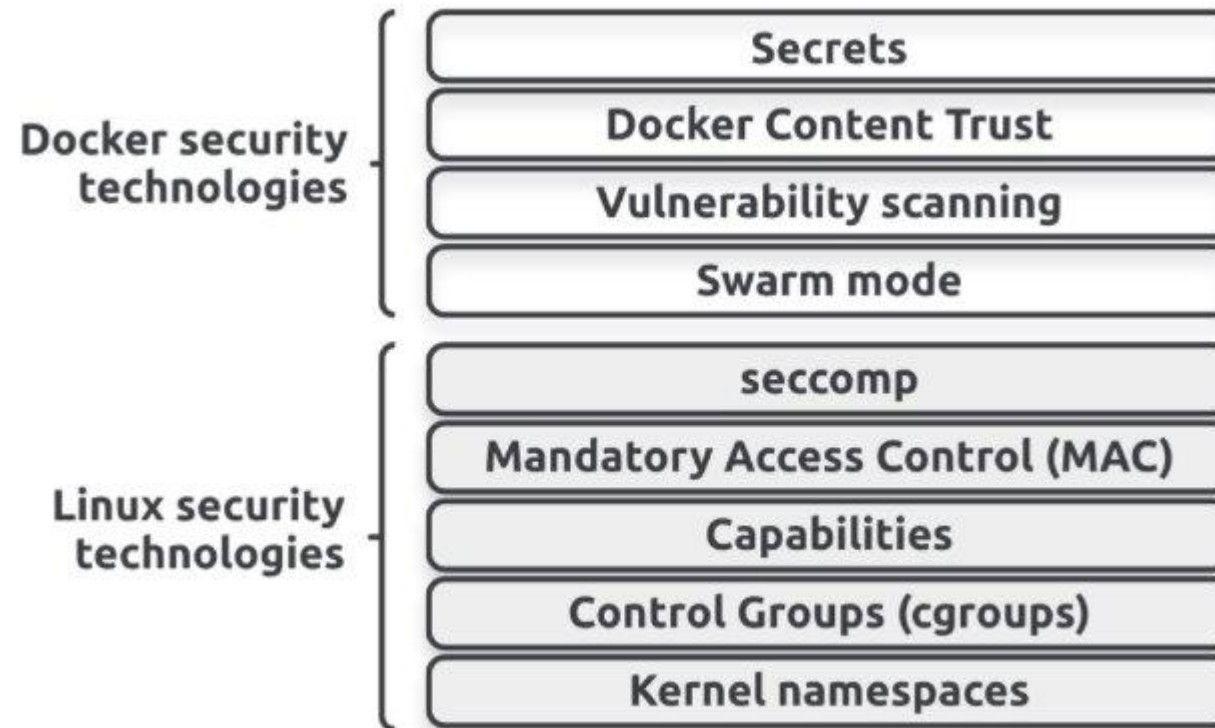


# DOCKER STORAGE



# DOCKER SECURITY

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# HARBOR

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## Introduction

an open source registry that secures artifacts with policies and role-based access control, ensures images are scanned and free from vulnerabilities, and signs images as trusted. Harbor, a CNCF Graduated project, delivers compliance, performance, and interoperability to help you consistently and securely manage artifacts across cloud native compute platforms like Kubernetes and Docker.

# HARBOR

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## Features

### **Security**

- Security and vulnerability analysis
- Content signing and validation

### **Management**

- Multi-tenant
- Extensible API and web UI
- Replication across many registries, including Harbor
- Identity integration and role-based access control

# HARBOR

## How-to provision

### Hardware

Resource	Minimum	Recommended
CPU	2 CPU	4 CPU
Mem	4 GB	8 GB
Disk	40 GB	160 GB

### Software

Software	Version	Description
Docker engine	Version 17.06.0-ce+ or higher	For installation instructions, see <a href="#">Docker Engine documentation</a>
Docker Compose	docker-compose (v1.18.0+) or docker compose v2 (docker-compose-plugin)	For installation instructions, see <a href="#">Docker Compose documentation</a>
Openssl	Latest is preferred	Used to generate certificate and keys for Harbor

# HARBOR

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## How-to provision

- Harbor installer
- Helm (Kubernetes)

# HARBOR

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## How-to provision

- Manage users and their permissions
- Setup projects
- Manage container registry
- Enable container security scanning