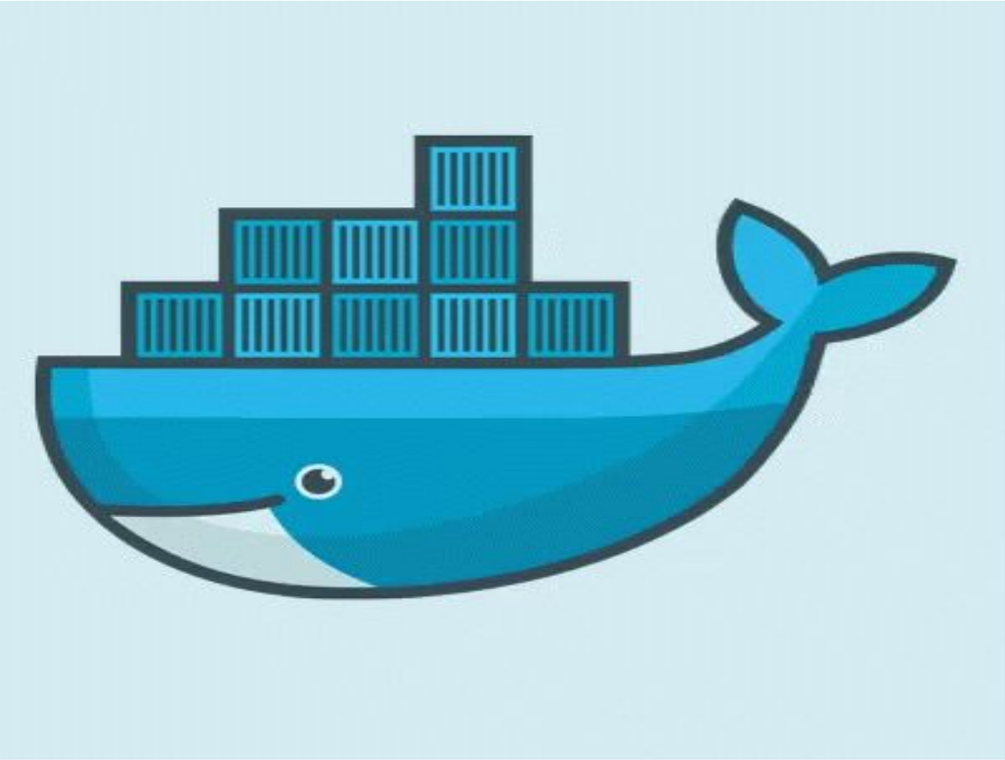


Docker: Run Anything, Anywhere

An introduction to containerisation

What's in for you?

- **Robust deployment of applications**
- **Leveraging on open-source ecosystem**

Today's Agenda

- **What is Docker?**
  Understanding containers vs VMs
- **When to Containerise?**
  Decision framework for containerisation
- **Using Docker as a Developer**
  Creating your own containers from scratch
- **Using Docker as a end user**
  Running pre-built containers

What is Docker?

The "App Store" for microservices

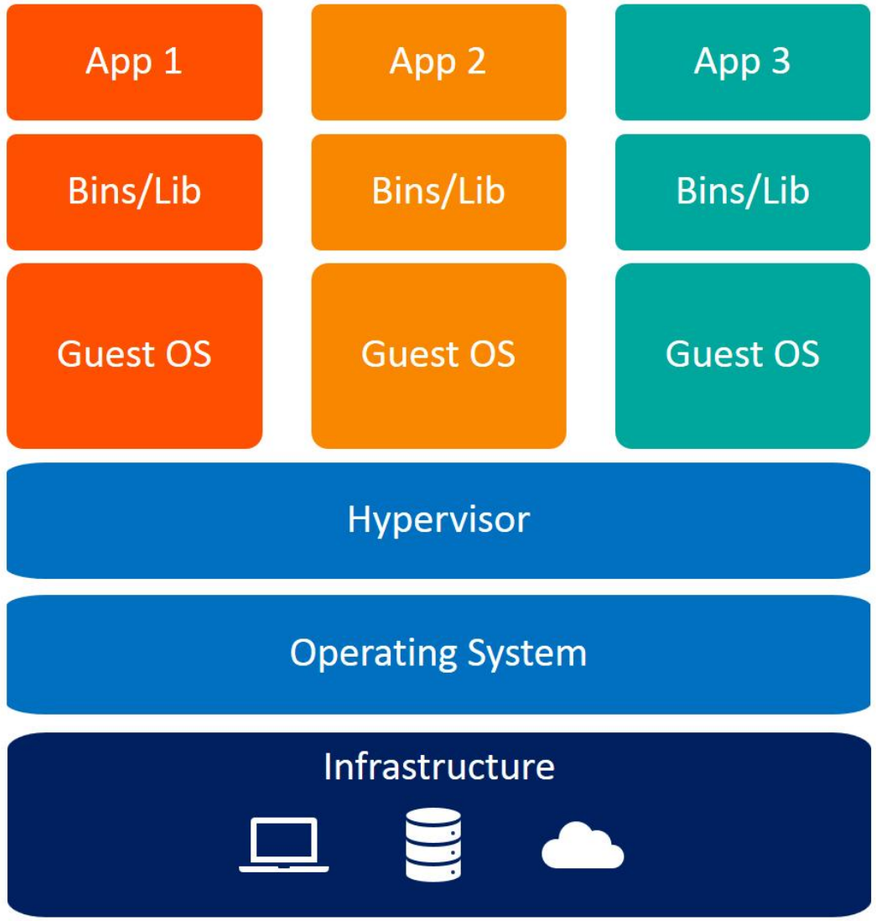
Accelerate how you build, share, and run applications

Docker helps developers build, share, run, and verify applications anywhere — without tedious environment configuration or management.

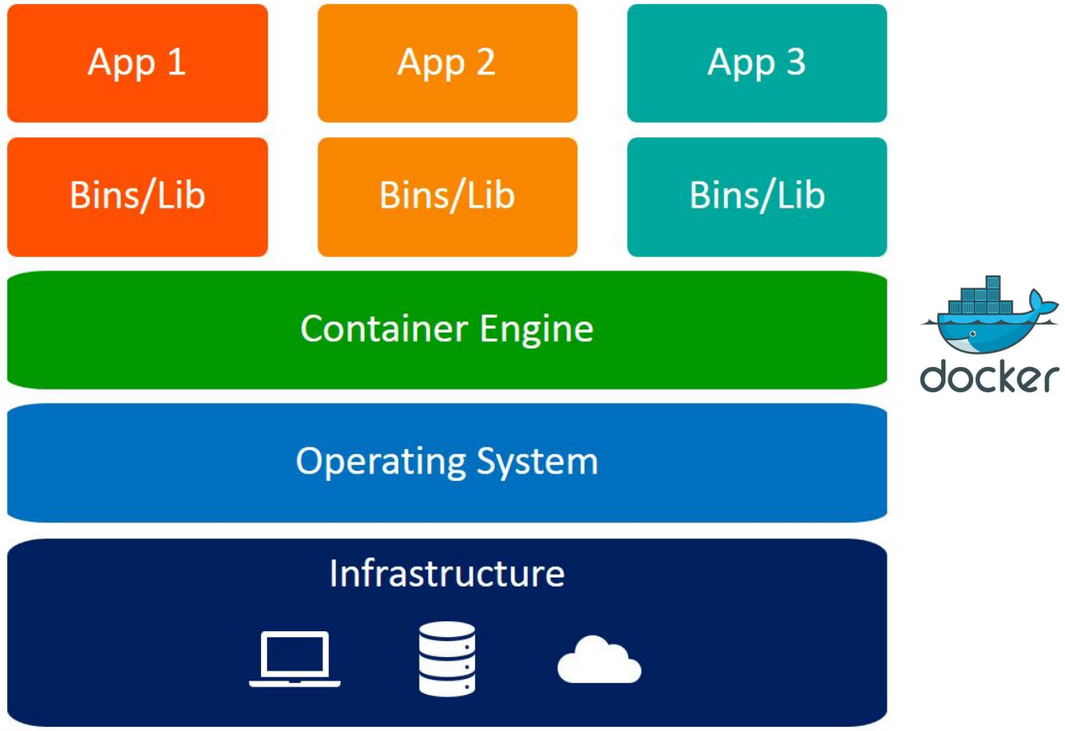
Virtual Machines vs Containers

- Heavy weight - Each VM runs a complete OS
- Slower to start (minutes)
- GB of storage

- Lightweight - Shares host OS kernel
- Start in seconds
- MB of storage

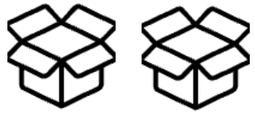


Parallels for mac
VMware
Oracle Virtualbox
MS HyperV Mgr



When to Containerise?

Containerisation isn't always necessary for simple, single-environment applications with minimal dependencies that don't need to be shared widely.



Dependency Isolation?

Avoid messy local dependencies?

Consistent Runs?

Need same behavior across platforms?

Easy Sharing?

Want simple distribution to others?

Deployment

Scalability & reliability

Using Docker as a Developer

5 Steps to build your own container

01 Prepare your application code

Make sure your application works locally first

02 Write a Dockerfile

Define the environment, dependencies, and

how to run your app

03 Build your image

Execute `docker build -t myapp .`

04 Run your container

Execute `docker run -p 5000:5000 myapp`

05 Share your image

Push to Docker Hub, Github Container Registry

or a private registry/artifact

Simple Demonstration on using Google Cloud Run

https://github.com/zey-2/Docker_Gcloud_Gradio

python
Docker Official Images

Python is an interpreted, interactive, object-oriented, open-source programming language.

node
Docker Official Images

Node.js is a JavaScript-based platform for server-side and networking applications.

mongo
Docker Official Images

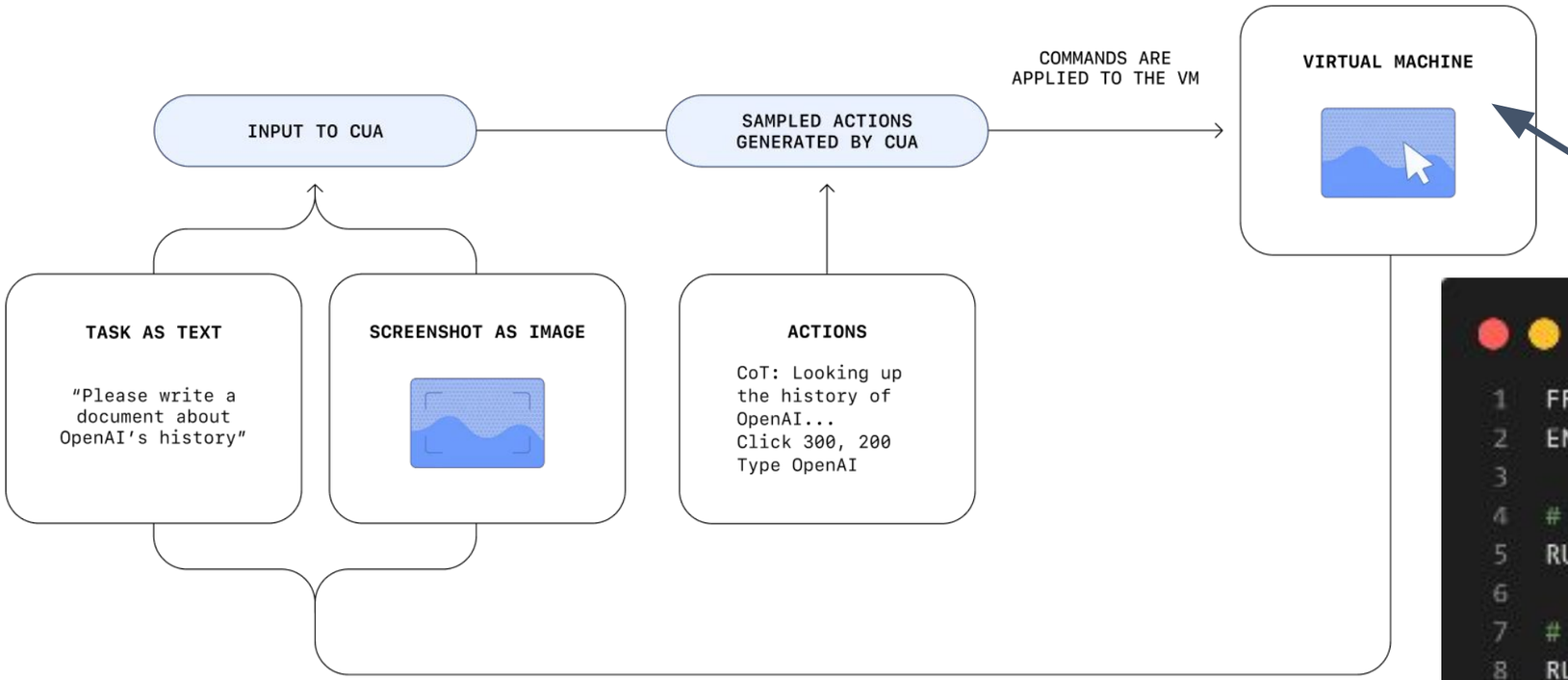
MongoDB document databases provide high availability and easy scalability.

postgres
Docker Official Images

The PostgreSQL object-relational database system provides reliability and data integrity.

https://hub.docker.com/

Using Docker as a Developer



ubuntu
Docker Official Images

Ubuntu is a Debian-based Linux operating system based on free software.

Dockerfile

```
FROM ubuntu:22.04
ENV DEBIAN_FRONTEND=noninteractive

# 1) Install Xfce, x11vnc, Xvfb, xdotool, etc., but rem
RUN apt-get update && apt-get install -y     xfce4

# 2) Add the mozillateam PPA and install Firefox ESR
RUN add-apt-repository ppa:mozillateam/ppa  && apt-get

# 3) Create non-root user
RUN useradd -ms /bin/bash myuser     && echo "myuser AL
USER myuser
WORKDIR /home/myuser

# 4) Set x11vnc password ("secret")
RUN x11vnc -storepasswd secret /home/myuser/.vncpass

# 5) Expose port 5900 and run Xvfb, x11vnc, Xfce (no lo
EXPOSE 5900
CMD ["/bin/sh", "-c", "    Xvfb :99 -screen 0 1280x800x
```

January 23, 2025 Release

Computer-Using Agent

Powering Operator with Computer-Using Agent, a universal interface for AI to interact with the digital world.

https://openai.com/index/computer-using-agent/
https://platform.openai.com/docs/guides/tools-computer-use?integration_cua=docker

Using Docker as a end user

Tons of ready-to-use applications for your NAS or home server

Nextcloud
Productivity platform that keeps you in control

Tailscale
Zero config VPN to access your Umbrel from anywhere

LibrePhotos
A photo management service

Uptime Kuma
Self-hosted uptime monitoring tool

Plex
Stream Movies & TV Shows

Grafana
The open-source platform for monitoring and observability

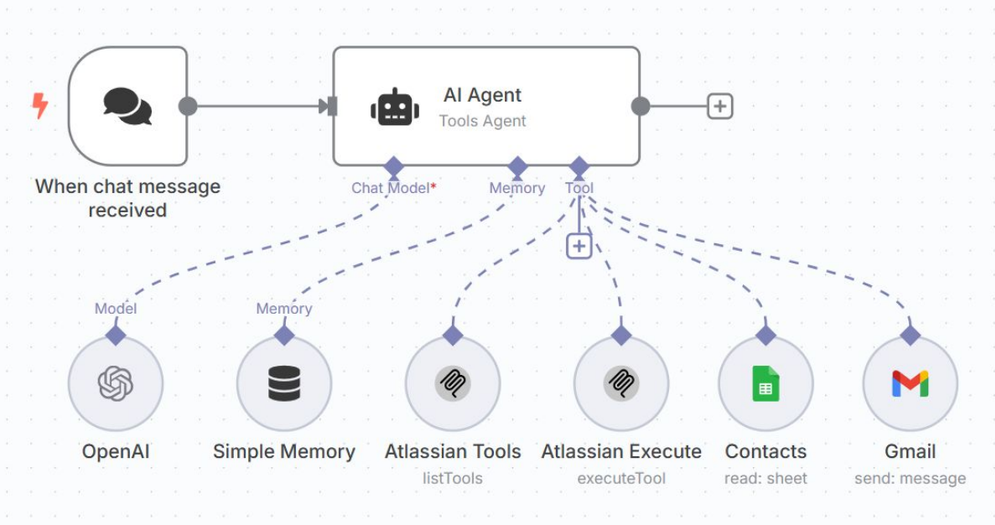
Home Assistant
Home automation that puts local control & privacy first

Pi-hole
Block ads on your entire network

GitLab
Software. Faster.

Vaultwarden
Unofficial Bitwarden® compatible server

n8n



Docker commands

```
docker volume create n8n_data

docker run -it --rm \
 --name n8n \
 -p 5678:5678 \
 -e GENERIC_TIMEZONE="<YOUR_TIMEZONE>" \
 -e TZ="<YOUR_TIMEZONE>" \
 -e N8N_ENFORCE_SETTINGS_FILE_PERMISSIONS=true \
 -e N8N_RUNNERS_ENABLED=true \
 -v n8n_data:/home/node/.n8n \
 docker.n8n.io/n8nio/n8n
```

Key Takeaways

Docker simplifies running, sharing, and scaling app

No more "works on my machine" problems

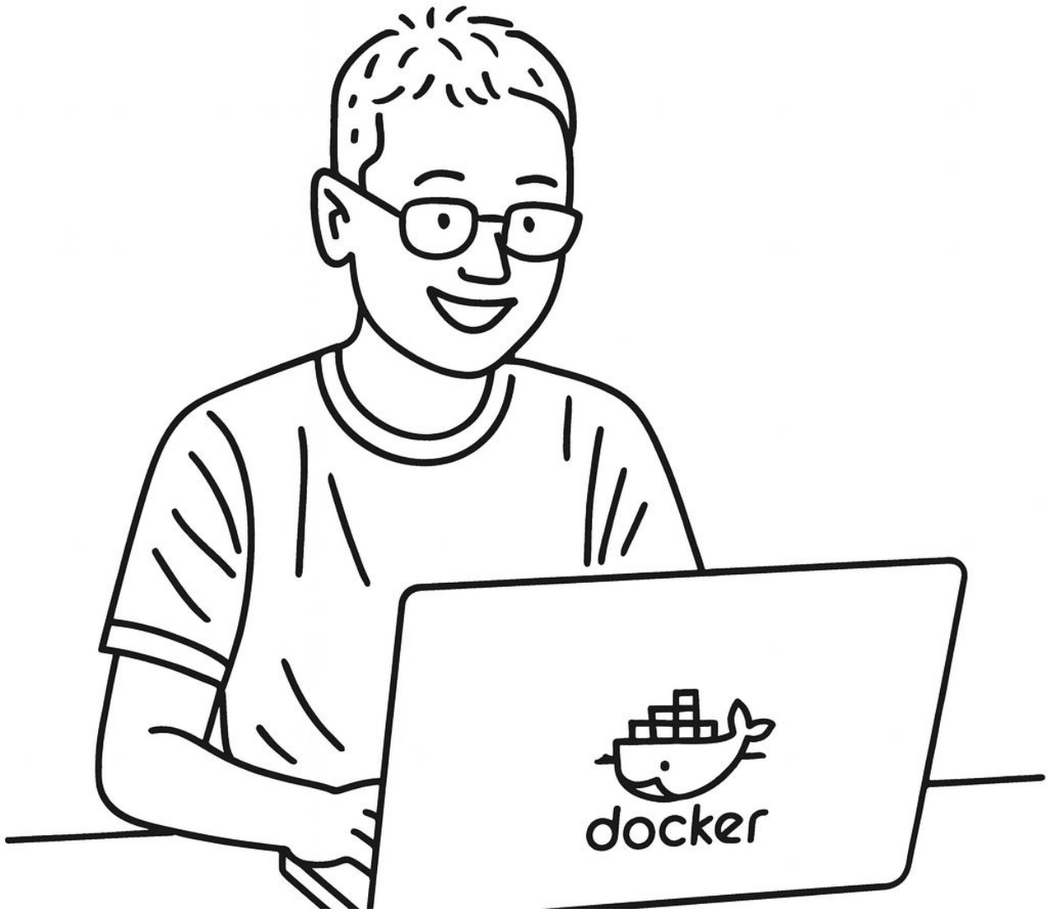
Consistent environments from development to production

No need for containerise most of the time

Simple program for own consumption

As a end user, you get instant access to thousands of applications

From media servers to AI automation and plenty more on **github**



Ready to try Docker?
Start with docker run hello-world