

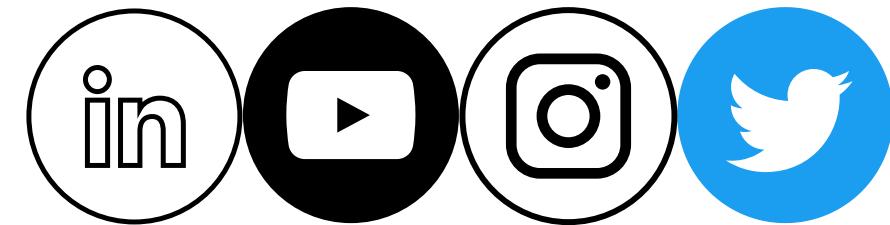
Mastering Docker: Build, Deploy, and Run Your First Containerized App

Setting Up Your Development Environment



Mehul Patel
Independent Cloud Consultant

@NomadicMehul



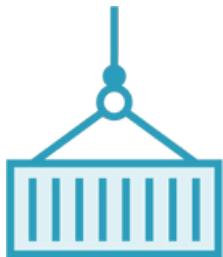
Aim of the Game



Setting Up Your Development Environment



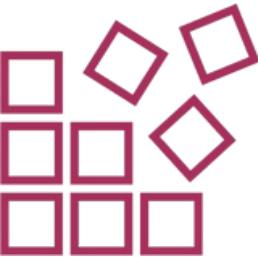
Create an Application Image



Run an Application Container



Communicate Between Multiple Containers



Orchestrate Multiple Containers with Docker Compose

Code Samples

<https://github.com/nomadicmehul/Docker-Ahmedabad-July-23>

A vibrant hot air balloon with horizontal stripes in purple, yellow, orange, red, and blue is positioned on the left side of the frame, facing towards the right. It is flying over a lush green vineyard with rows of grapevines. In the background, there are rolling hills covered in dense green forests under a vast sky transitioning from blue to warm orange and yellow hues of a setting sun.

**Gain the freedom to run
your applications anywhere!**

The Case for Docker



Shipping Applications the Traditional Way

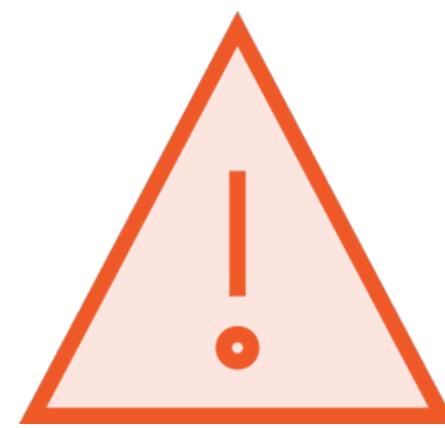
Shipping Applications with Docker



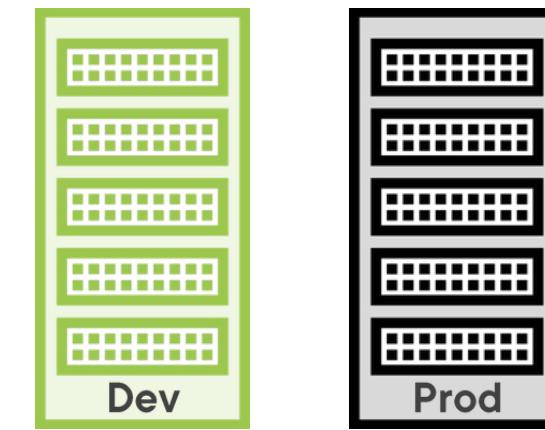
The Case for Docker



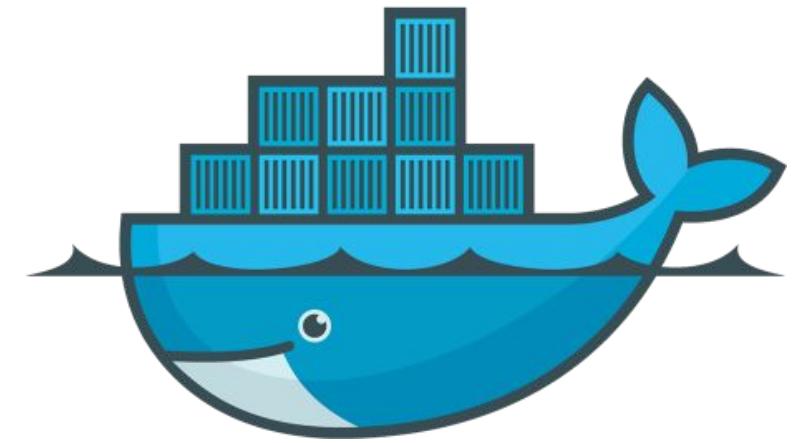
**Accelerate
Developer
Onboarding**



**Eliminate App
Conflicts**



**Environment
Consistency**



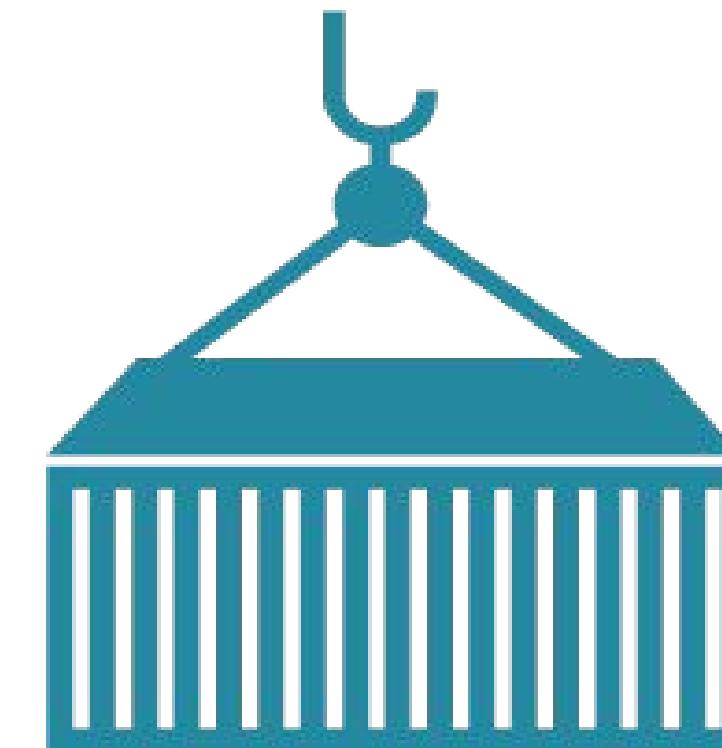
**Ship Software
Faster**

Images and Containers



Docker Image

Define the contents that are
needed to run a container



Docker Container

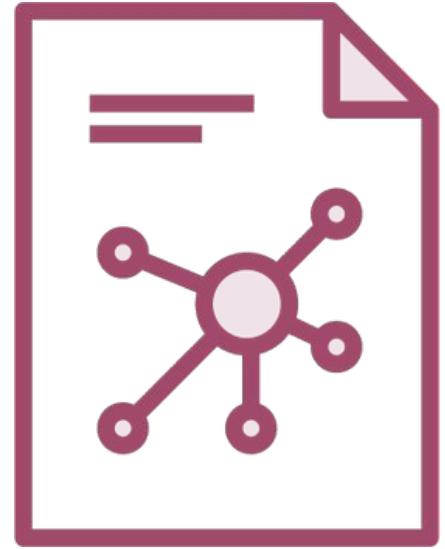
Runs your application

Your Code

Server Code

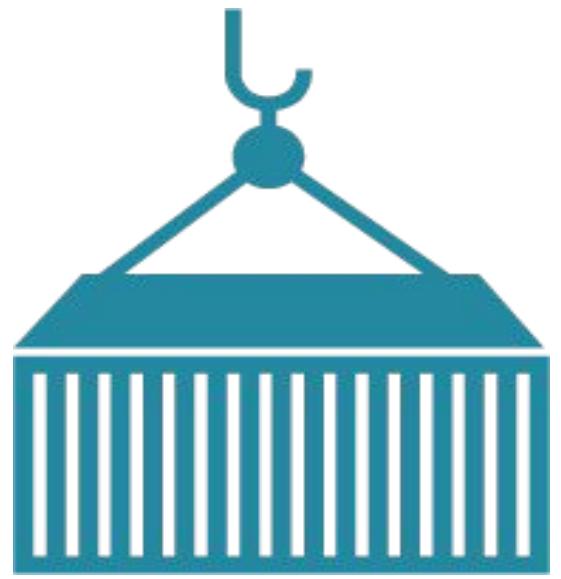
Environment Variables

Security Settings



Image

A read-only template composed of layered filesystems used to share common files and create Docker container instances.



Container

An isolated and secured shipping container created from an image that can be run, started, stopped, moved and deleted.

Software Installation

Docker Desktop



Docker Desktop (Windows or Mac)

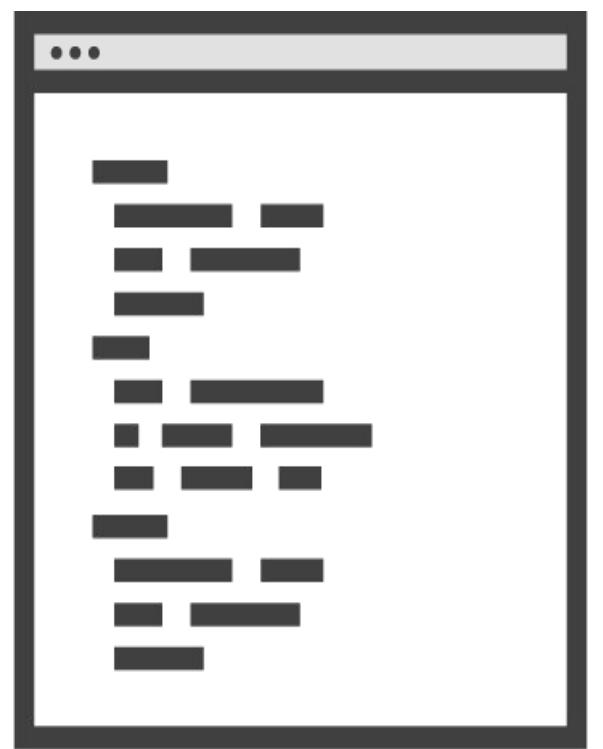
Provides image and container tools

Linux can run Docker Engine

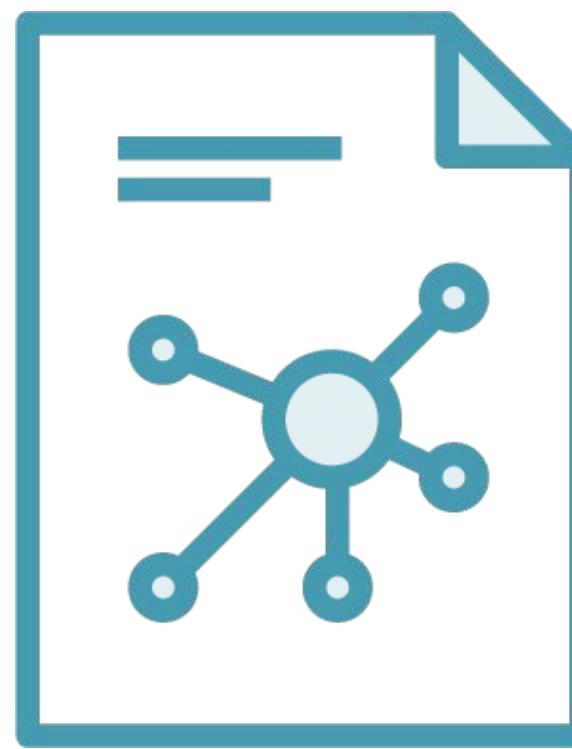
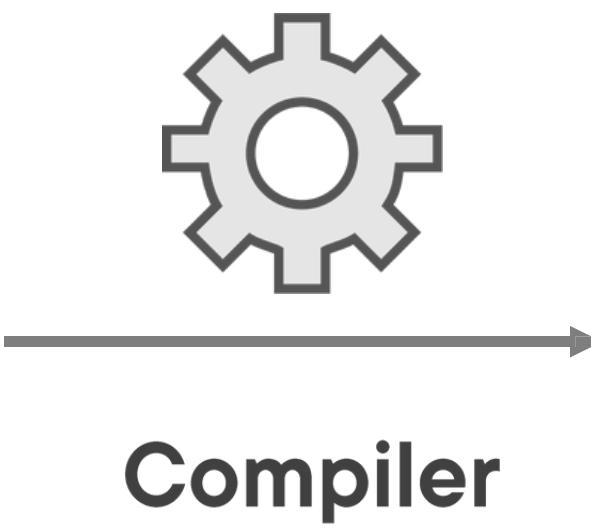
Windows and Mac use a hypervisor

<https://www.docker.com/get-started>

Understand Dockerfiles



Code

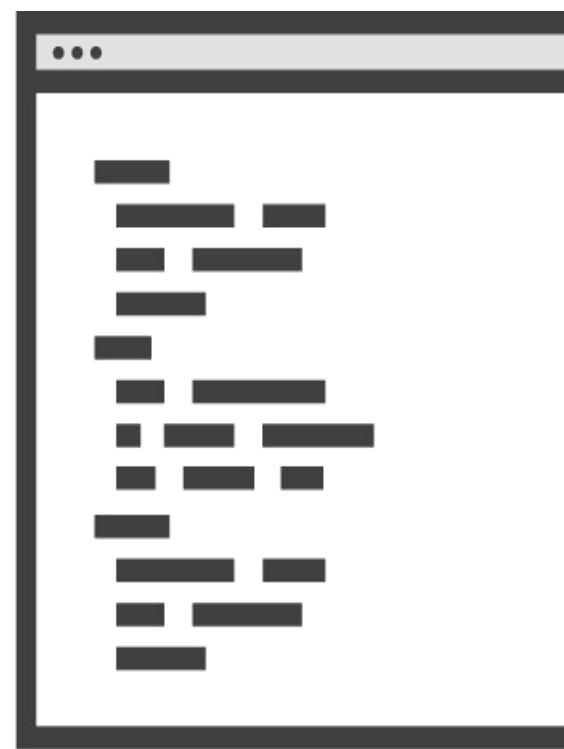


Binary

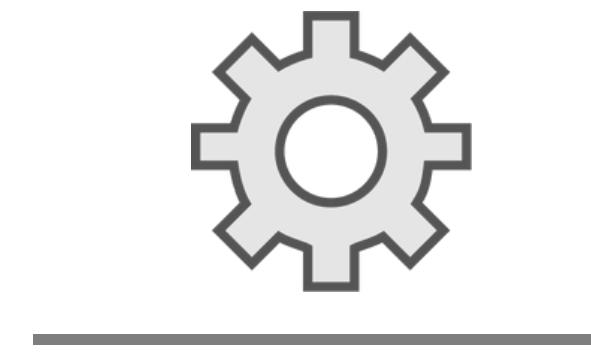
Dockerfile

is a text document that contains all the commands a user could call on the command line to assemble an image.

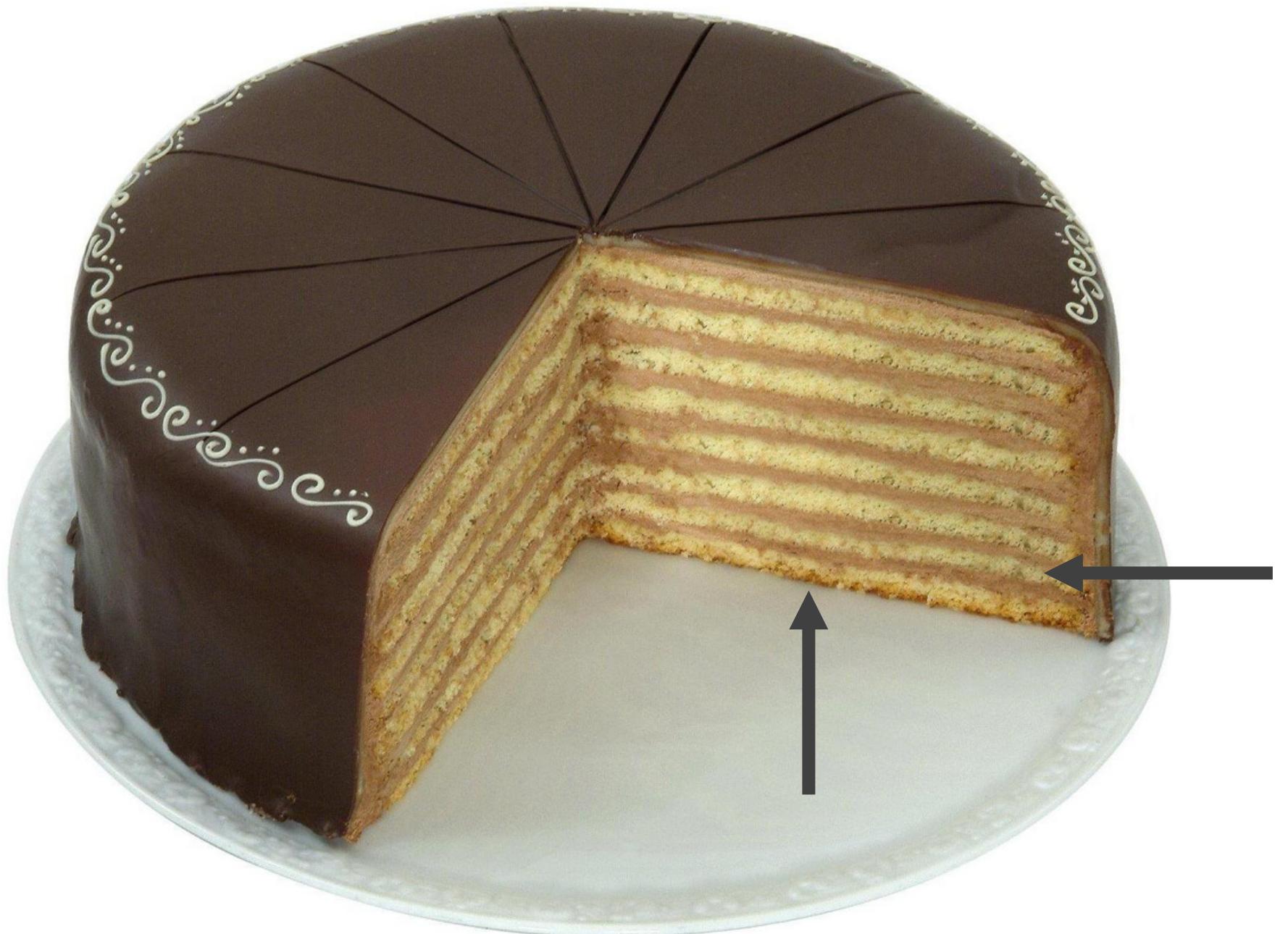
Dockerfile and Images



Dockerfile



Docker Image



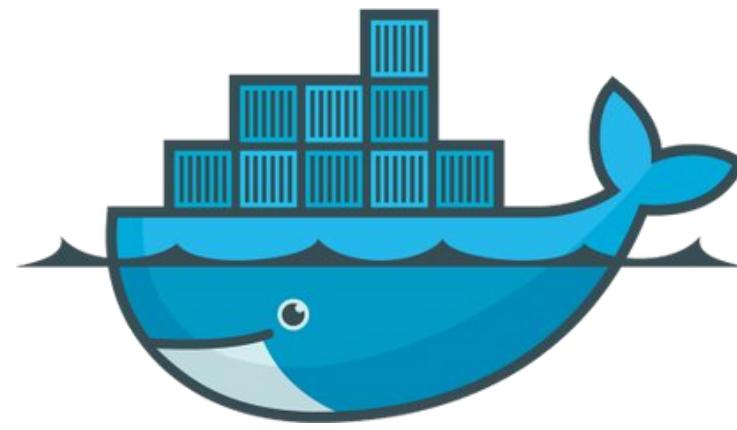
Dockerfile Instructions

```
FROM node:alpine
LABEL author="Mehul Patel"
ENV NODE_ENV=production
WORKDIR /var/www
COPY . .
EXPOSE 3000
ENTRYPOINT ["node", "server.js"]
```

Create a Custom Application Dockerfile

Using docker build

Docker Registries

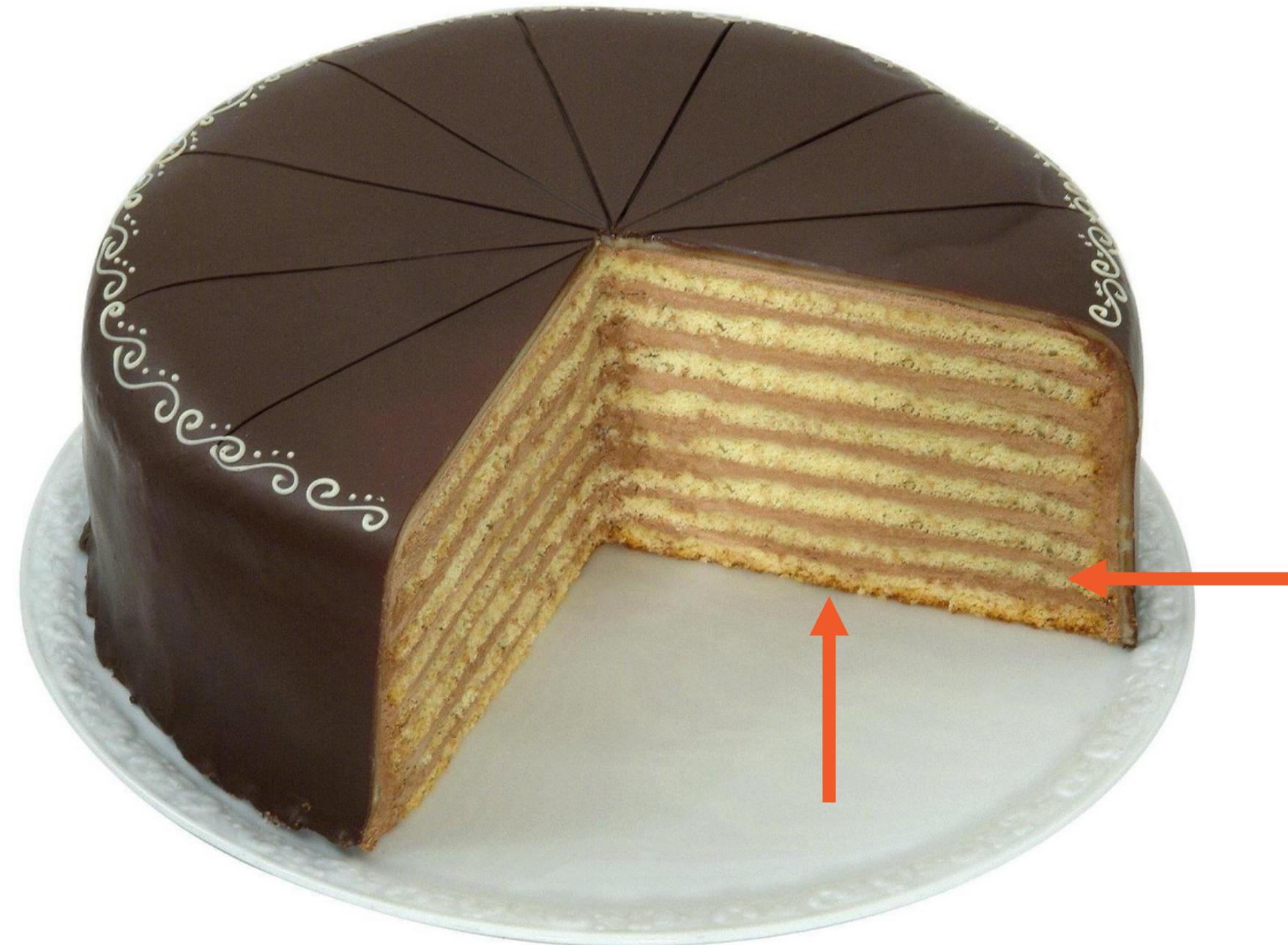


Internal Registry
Docker Hub
Amazon ECR
Azure Container Registry
Google Container Registry
More...

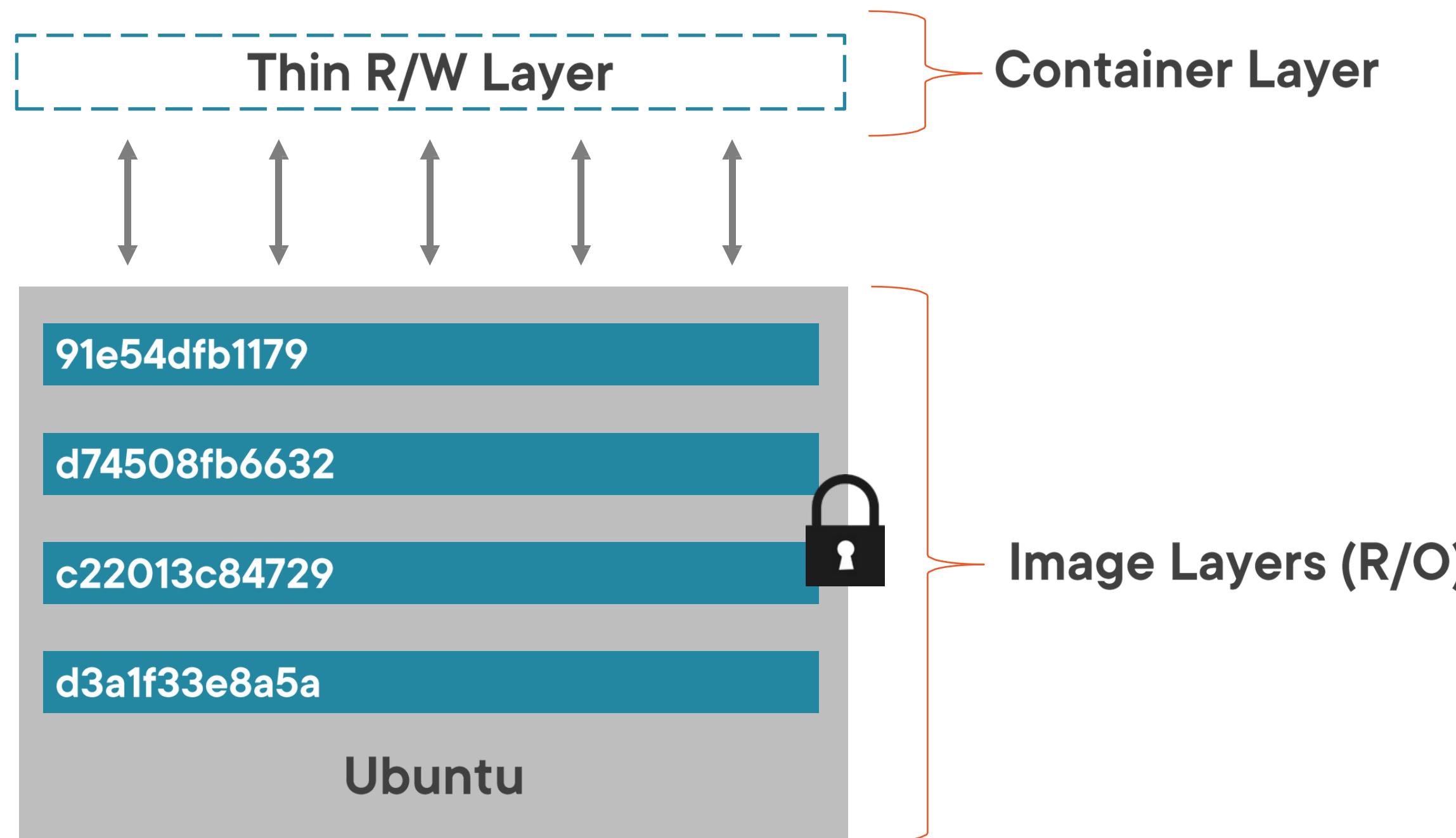
Deploy an Application Image to a Registry

Run an Application Container

Images and the Layered File System

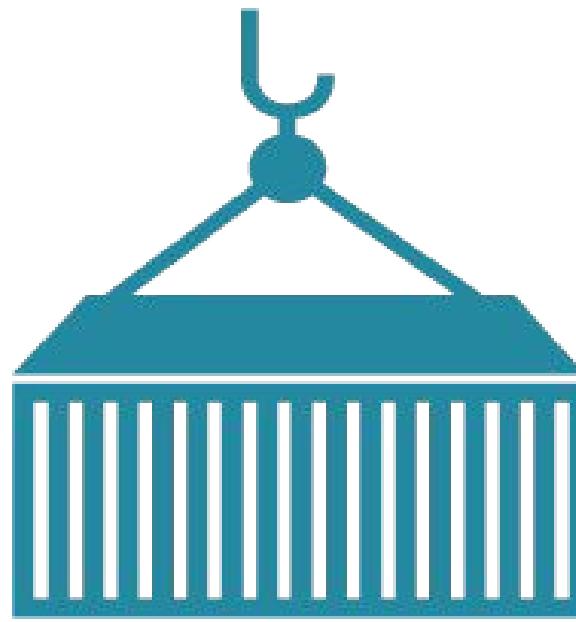


Images, Containers and File Layers

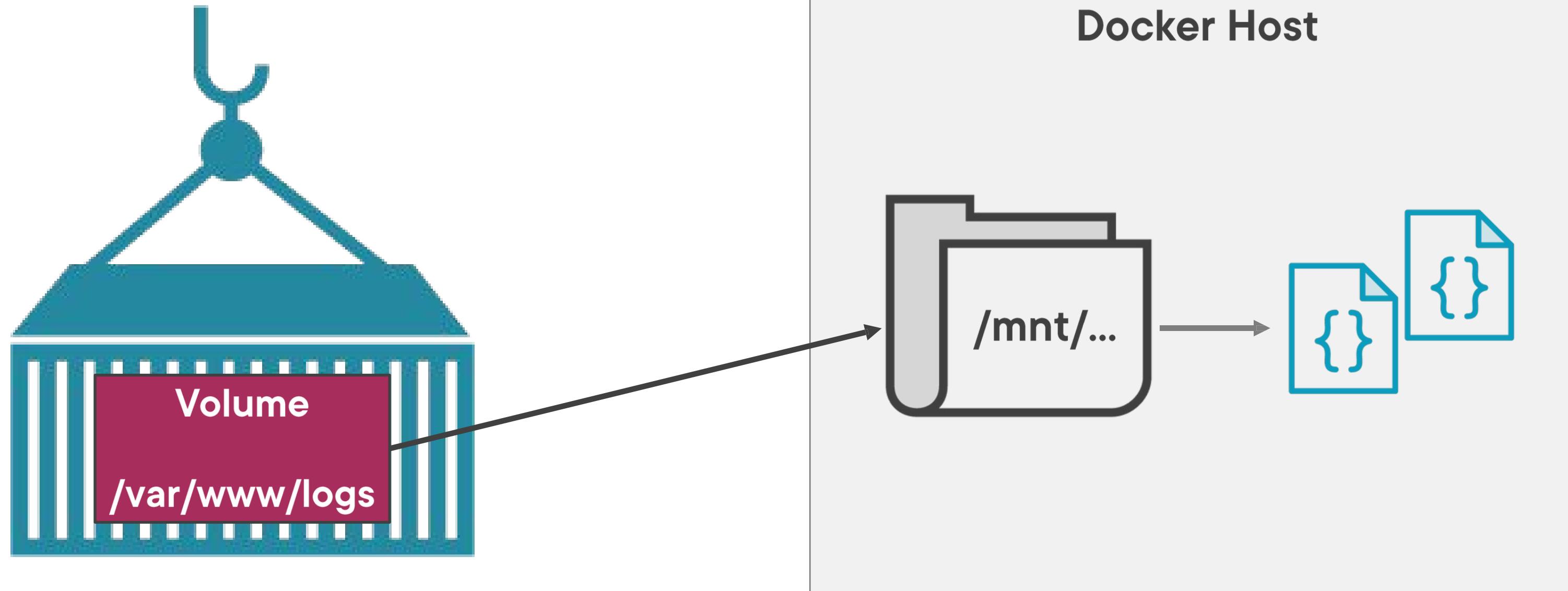


Using Container Volumes

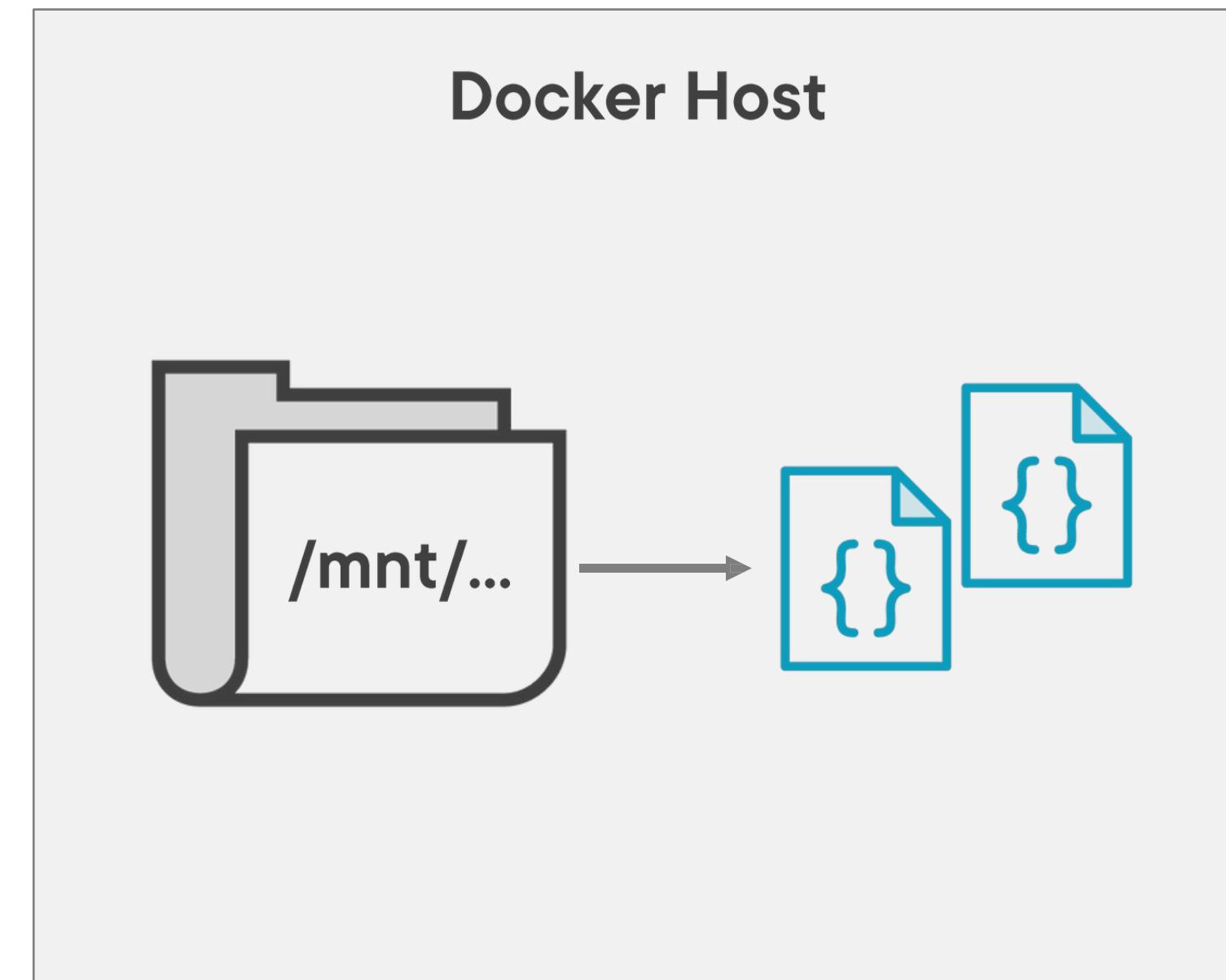
Storing Data Outside of a Container



Volume Mounts



Volume Mounts



Key Volume Scenarios

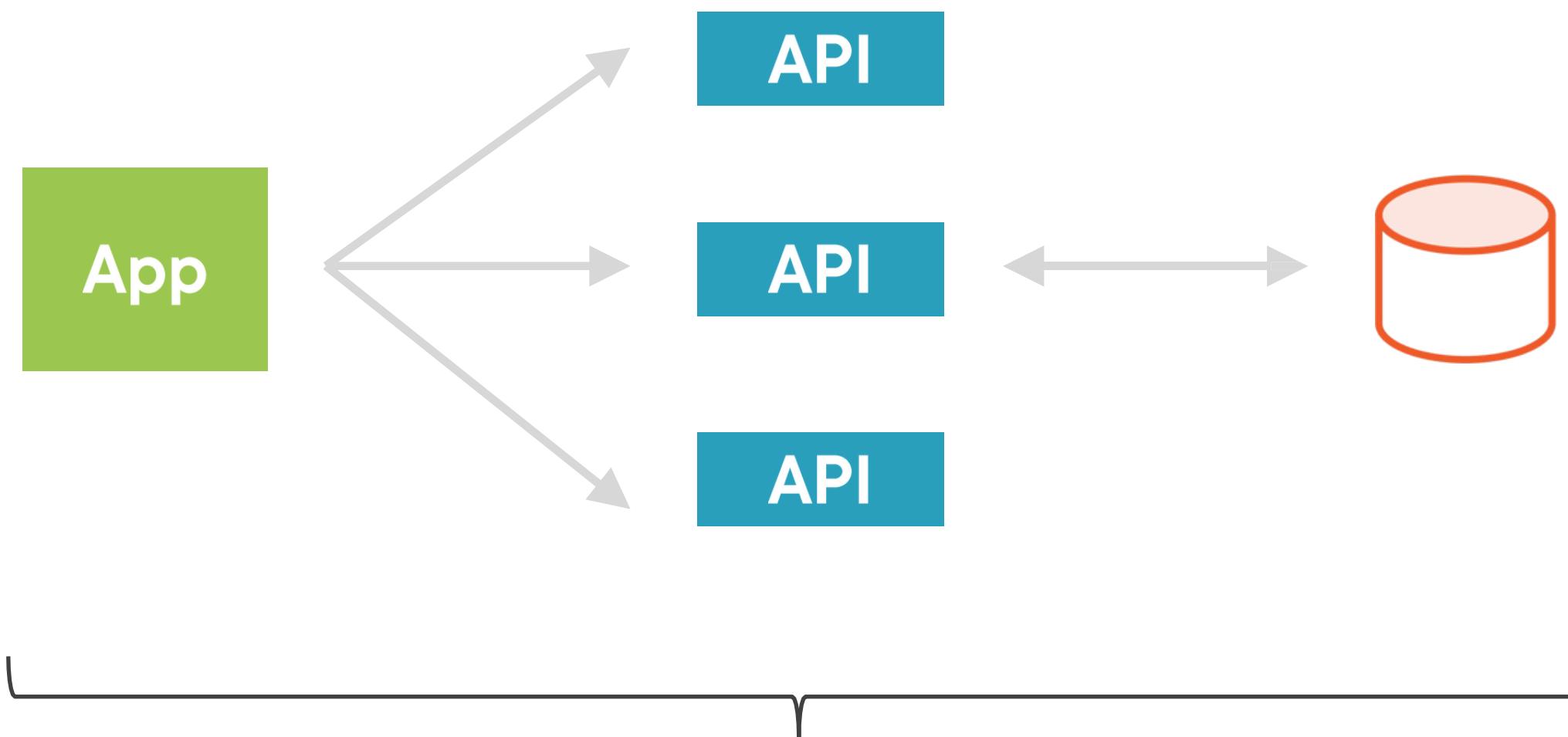
Production Scenarios
(logs, database files and more)

Development Scenarios
(develop using containers)

Create a Container Volume

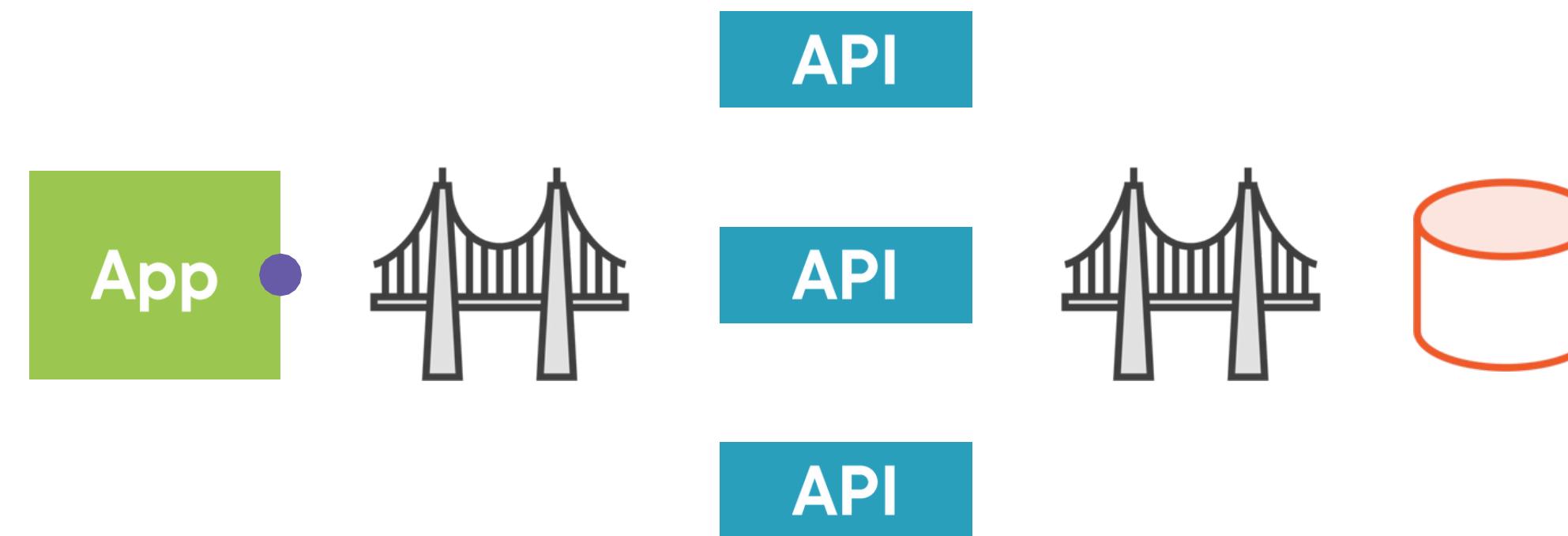
Create a Bridge Network

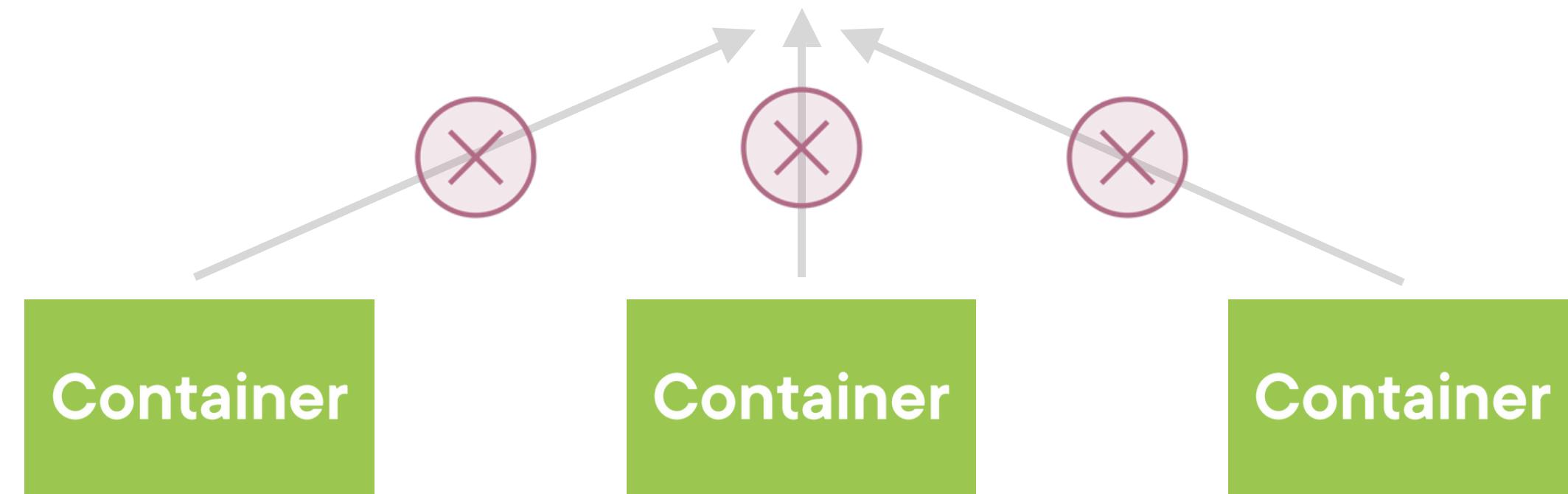
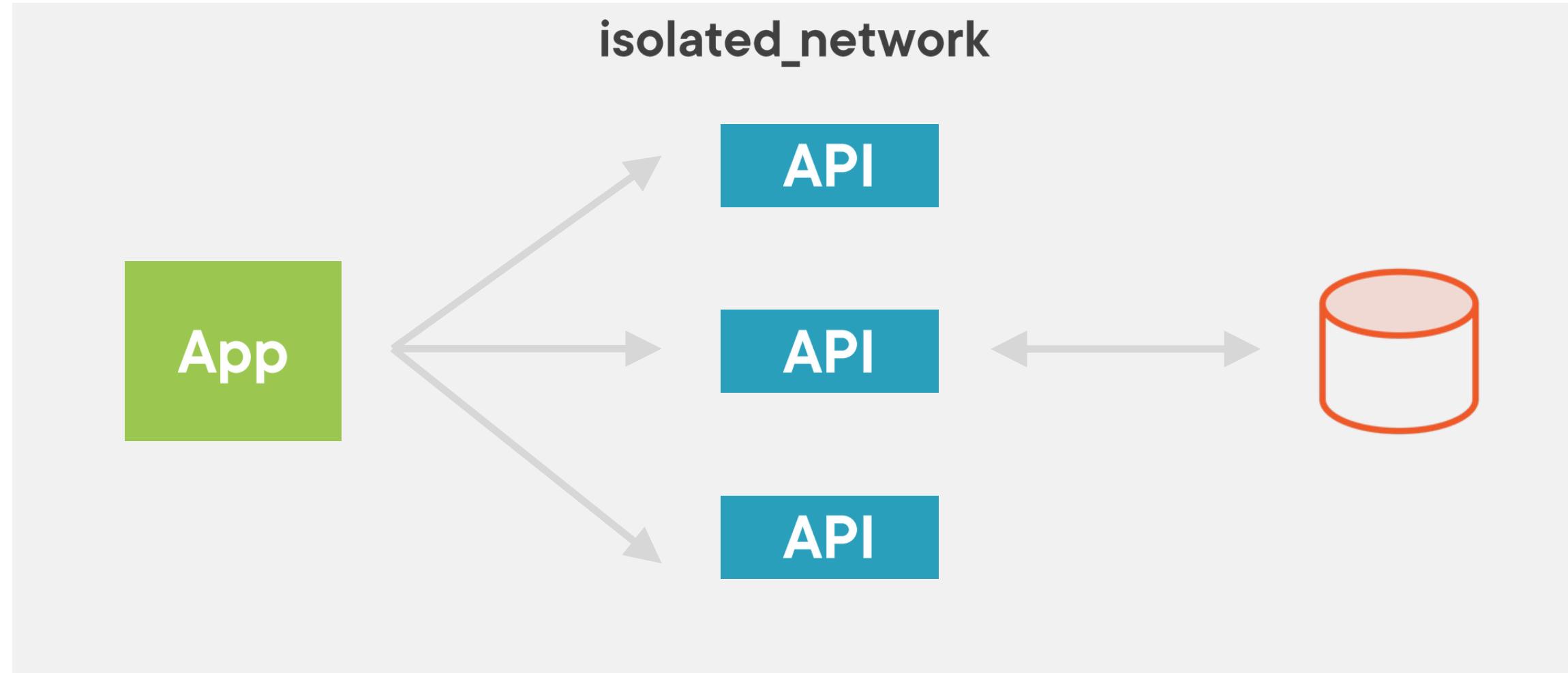
Communicating Between Containers



How do you communicate between containers?

Using a Bridge Network to Communicate





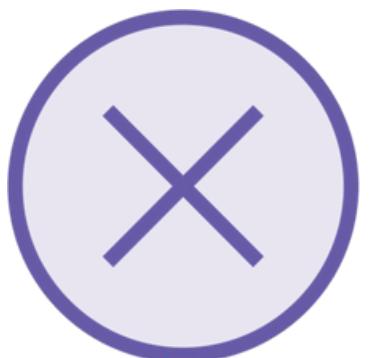
Key docker network Commands



`docker network create`



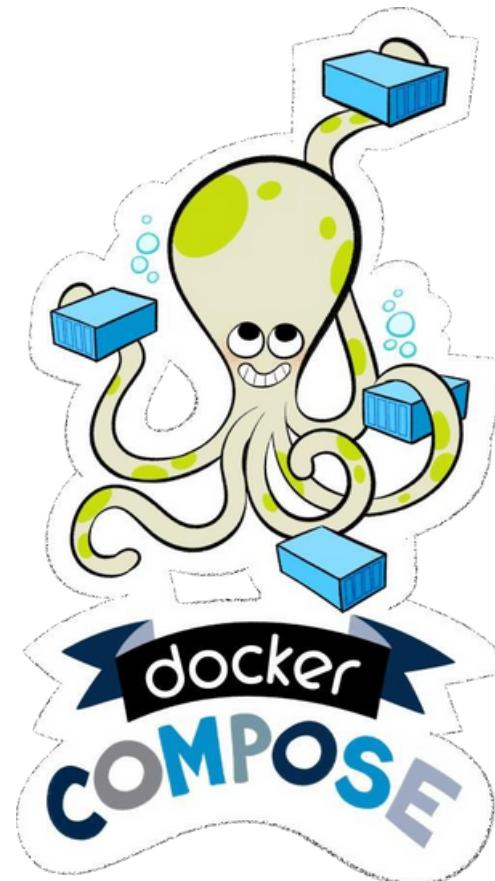
`docker network ls`



`docker network rm [network]`

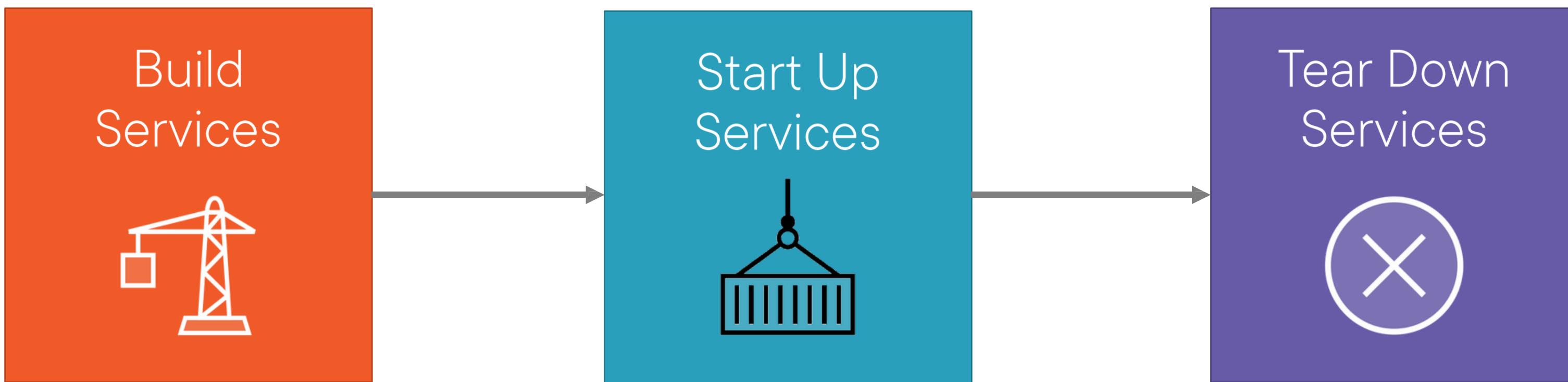
Building and Running Multiple Containers with Docker Compose

Docker Compose Features



- Define services using a YAML configuration file**
- Build one or more images**
- Start and stop services**
- View the status of running services**
- Stream the log output of running services**

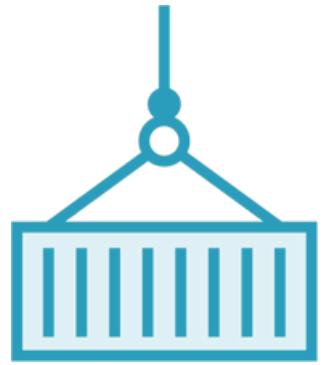
Docker Compose Workflow



Key Docker Compose Commands



`docker-compose build`



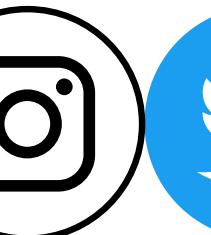
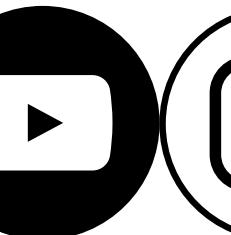
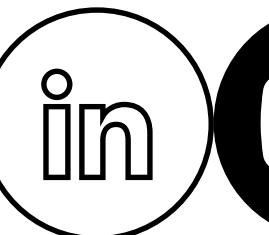
`docker-compose up`



`docker-compose down`



@NomadicMehul



Looking for one-stop-shop for all things cloud-related?





<https://github.com/nomadicmehul/CloudCaptain>

Thank You!



@NomadicMehul

