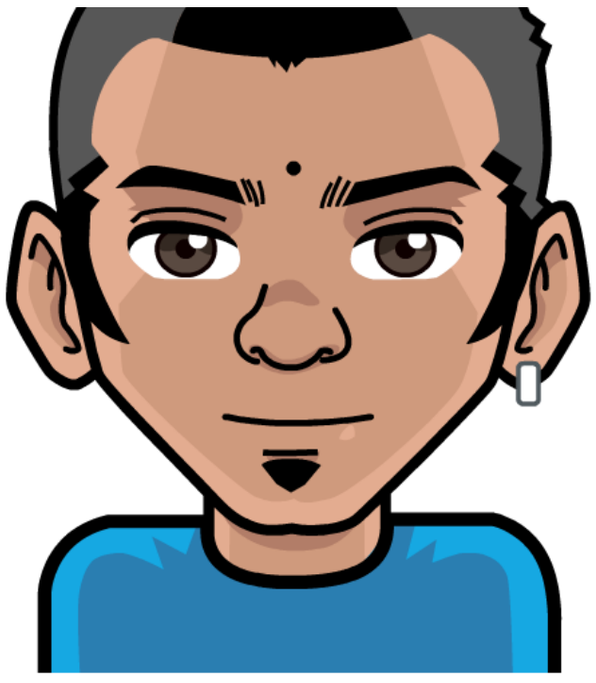
Raju Gandhi

DOCKER 101



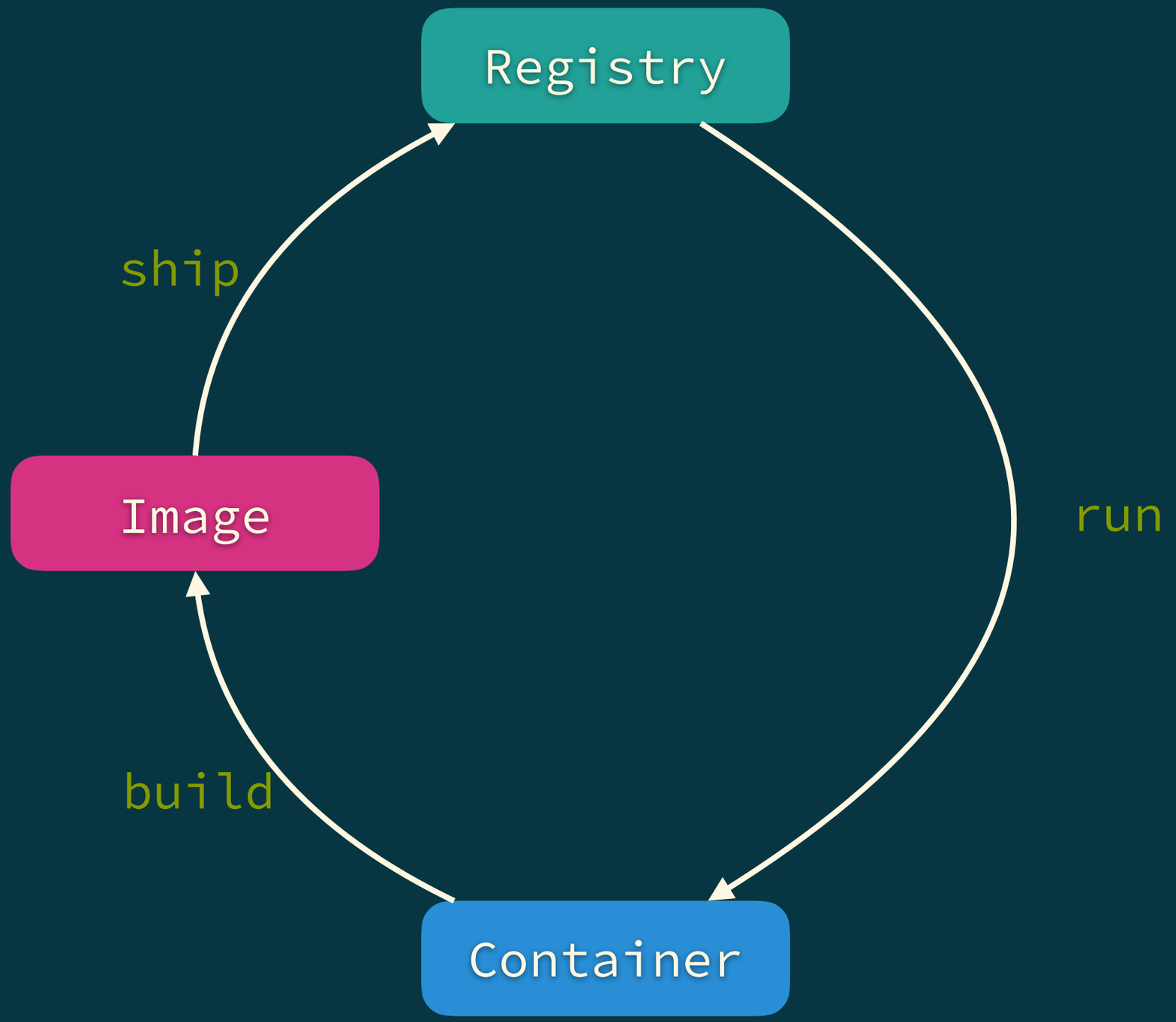
RAJU GANDHI

@LOOSELYTYPED

CTO - INTEGRALLIS SOFTWARE

WHY?

BUILD ONCE, RUN ANYWHERE


Registry
ship
Image
run
build
Container

WHY?

- Local application development and testing
- Team (and OSS) collaboration
- Ci/Cd

CONTAINERS?

CGROUPS

NAMESPACES

JAILS

CONTAINERS

- A container is a lightweight virtual runtime*
- Share the host kernel
- CPU/Memory/Network/File system isolation
- Own their on hostname, users, networking stack

NAMESPACES

"What you can see"

NAMESPACES

- Isolation of
  - Users
  - Filesystem
  - Process trees
  - Network
  - IPC

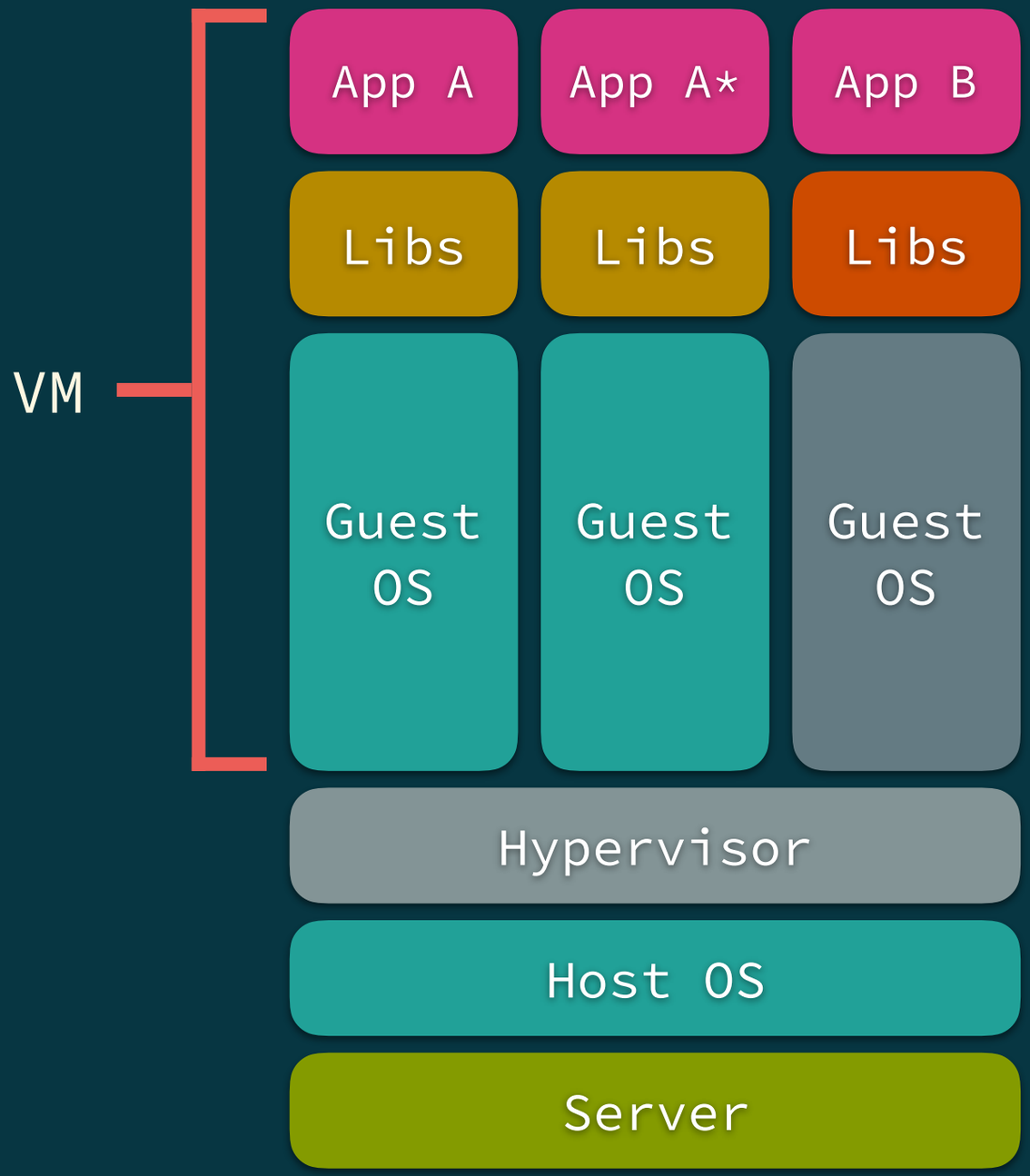
CGROUPS

"What you can use"

CGROUPS

- Limiting/Metering/ACL
  - CPU
  - Memory
  - I/O
  - Network
  - Device permissions

VM? CONTAINERS?


App A
App A*
App B
Libs
Libs
Libs
VM
Guest OS
Guest OS
Guest OS
Hypervisor
Host OS
Server

VM

App A | App A* | App B

Libs | Libs | Libs

Guest OS | Guest OS | Guest OS

Hypervisor

Host OS

Server

Container

App A | App A* | App A | App A* | App A | App A*

Libs | Libs

Docker Engine

Host OS

Server

TERMINOLOGY

TERMINOLOGY

- Docker Engine
- Docker client
- Dockerfile
- Docker Machine*
- Docker Compose
- Docker Swarm
- Kitematic

INSTALLATION

INSTALLATION

INSTALL THE PLATFORM

Install Docker with easy to use installers for the major desktop and cloud platforms.

MAC

A native Mac application with a user interface and auto-update capabilities, that is deeply integrated with OS X native virtualization.

Download

Learn More

WINDOWS

A native Windows application with a user interface and auto-update capabilities, that is deeply integrated with Windows native virtualization.

Download

Learn More

LINUX

Install Docker on nodes which have a Linux distribution already installed.

Install

Learn More

AWS

Quickly deploy, scale, and manage Docker on AWS. Docker for AWS takes optimal advantage of the underlying infrastructure, while providing a modern Docker platform that can be used to deploy portable apps.

Launch Stack

Learn More

AZURE

Quickly deploy, scale and manage Docker on Azure. Docker for Azure takes optimal advantage of the underlying infrastructure, while providing a modern Docker platform that can be used to deploy portable apps.

Deploy to Azure

Learn More

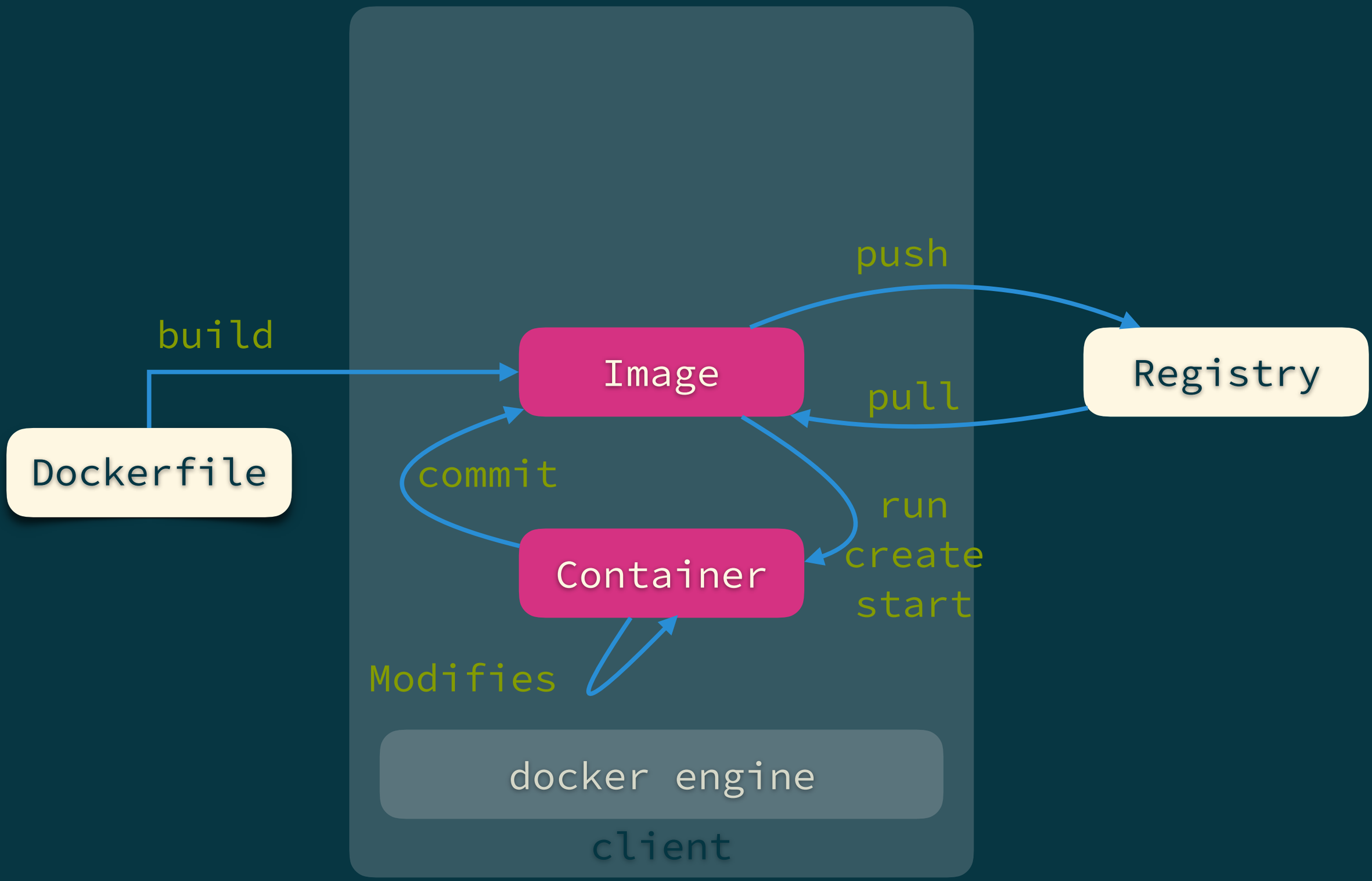
WINDOWS SERVER

Install Docker on nodes which have Windows Server 2016 already installed.

Learn More

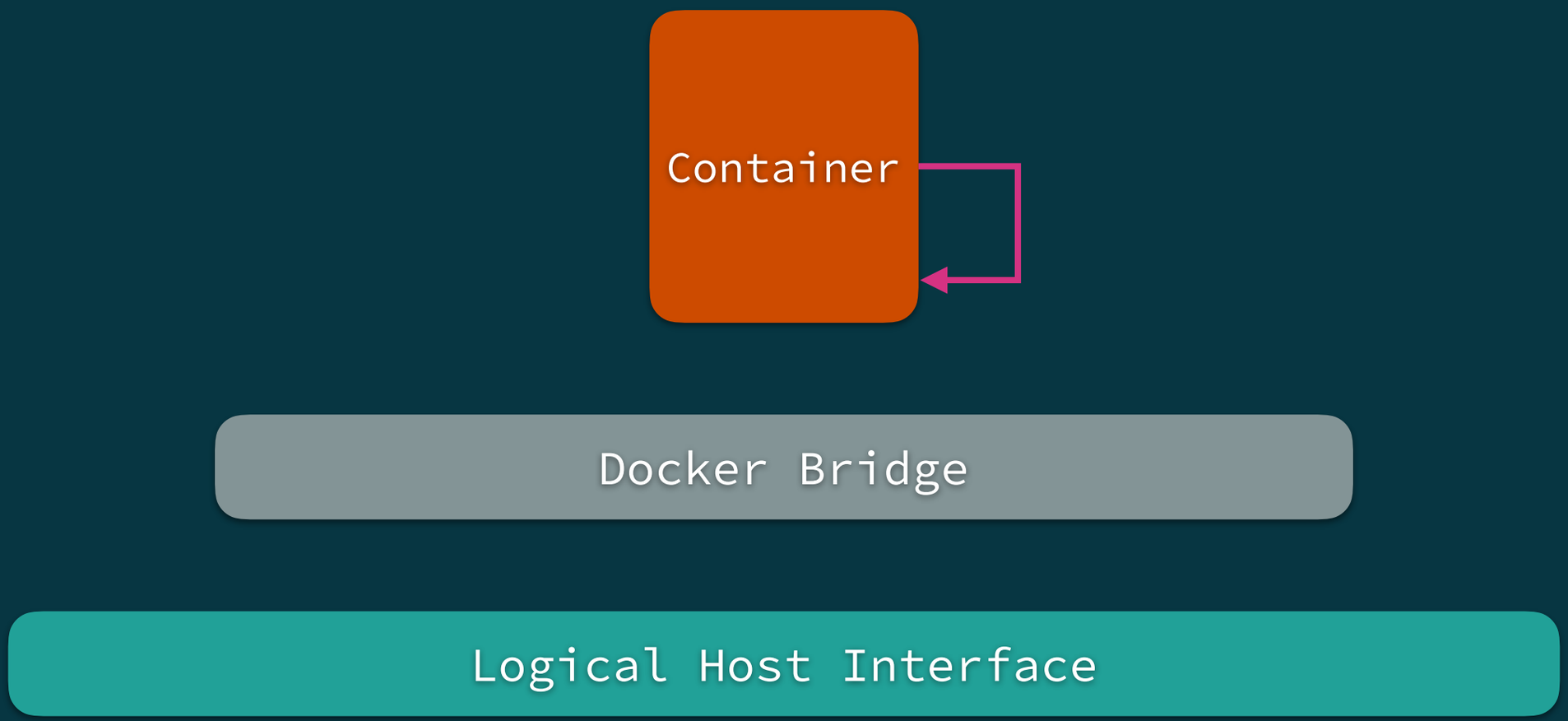
Learn More about Docker Engine

WORKFLOW

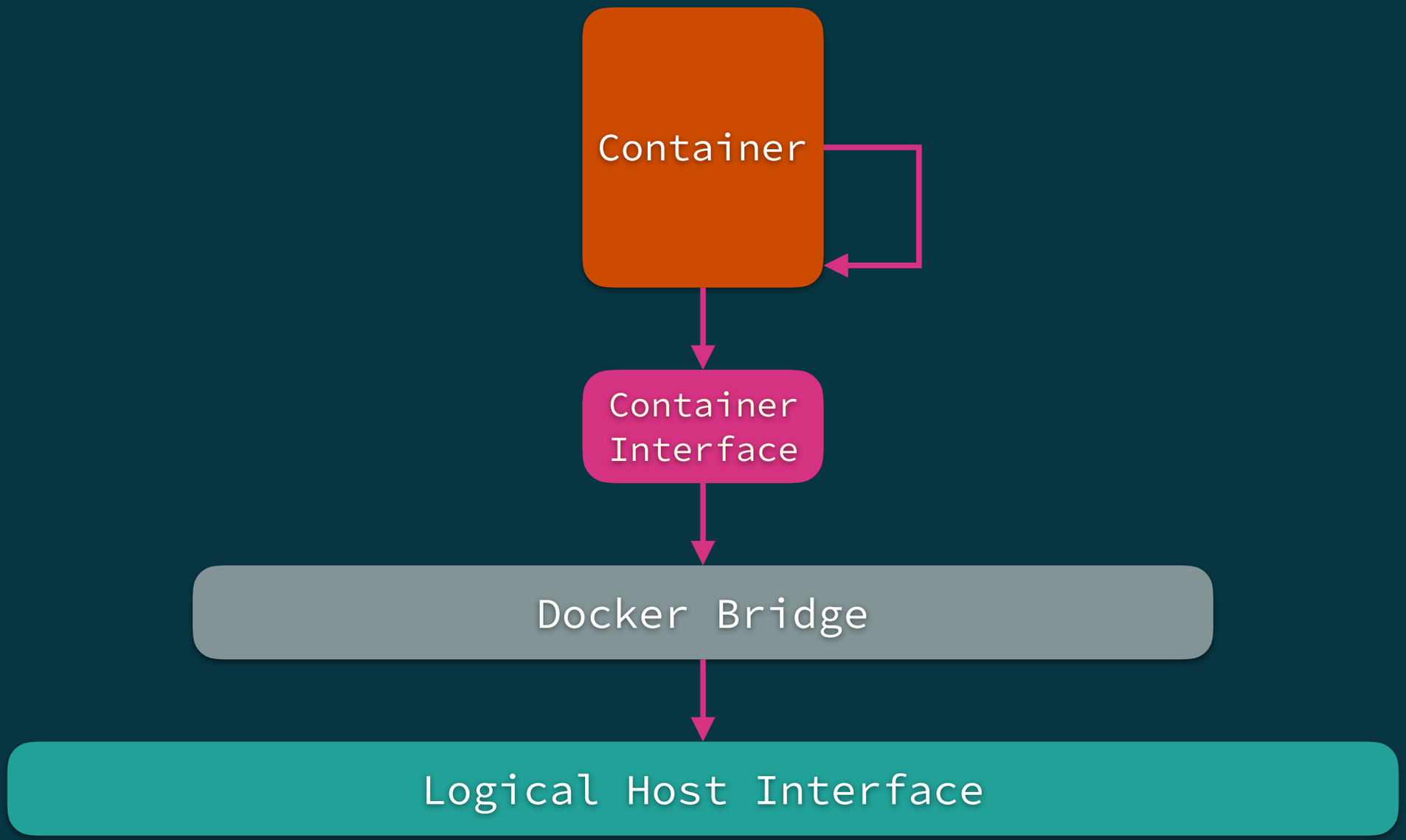

push
build
Image
Registry
pull
Dockerfile
commit
run
create
start
Container
Modifies
docker engine
client

NETWORK

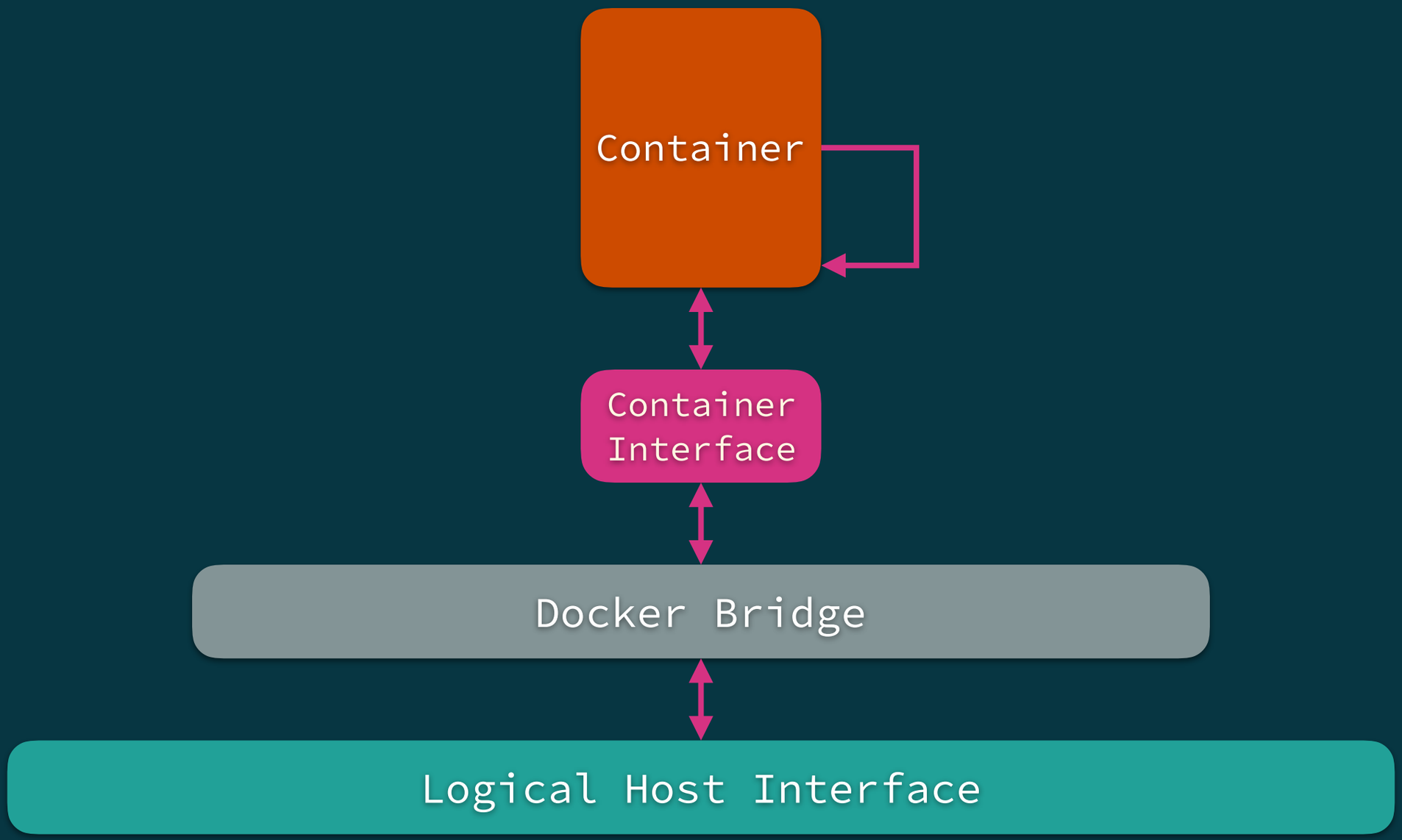
```
docker run -it --net none --rm alpine /bin/sh
```



```
docker run -it --rm alpine /bin/sh
```

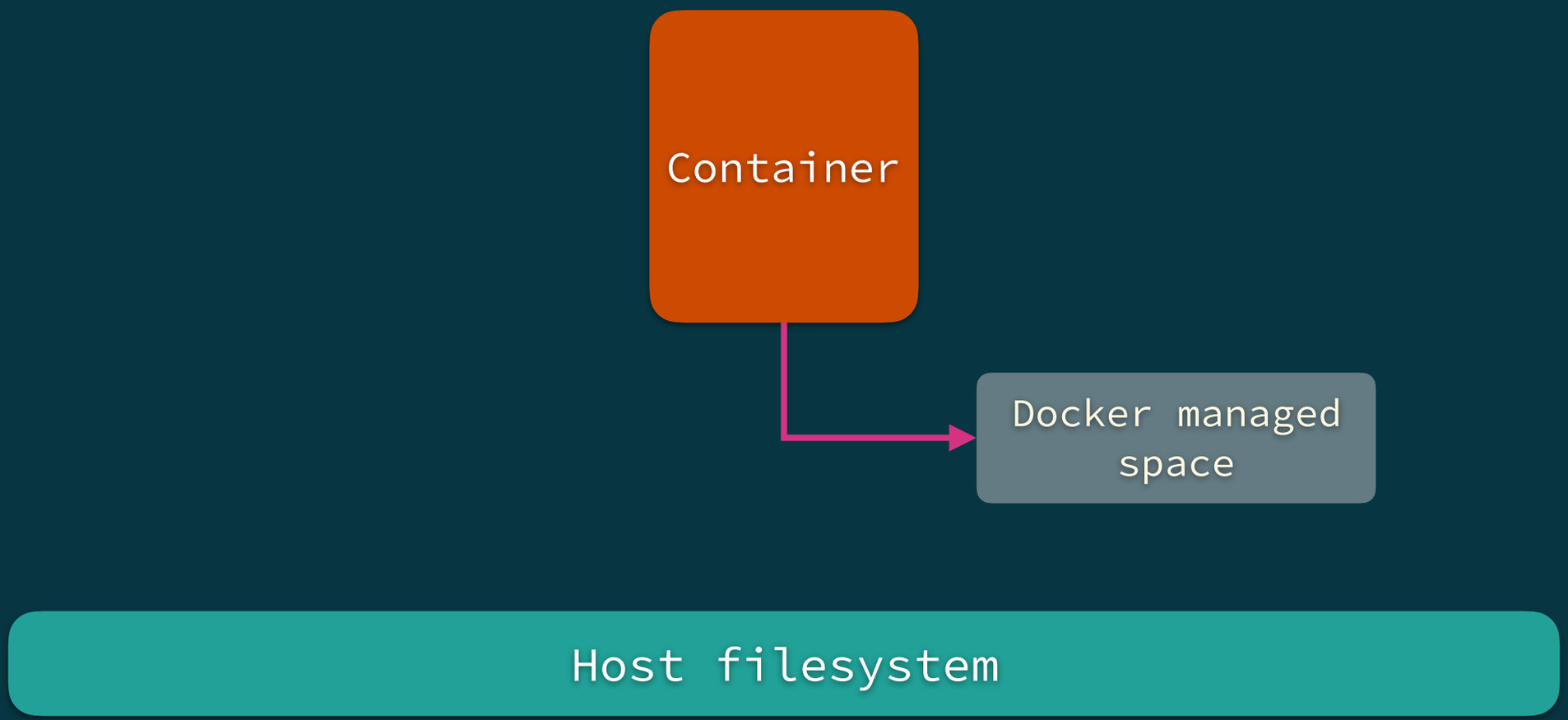


```
docker run -it --rm -p 8080:8080 alpine /bin/sh
```

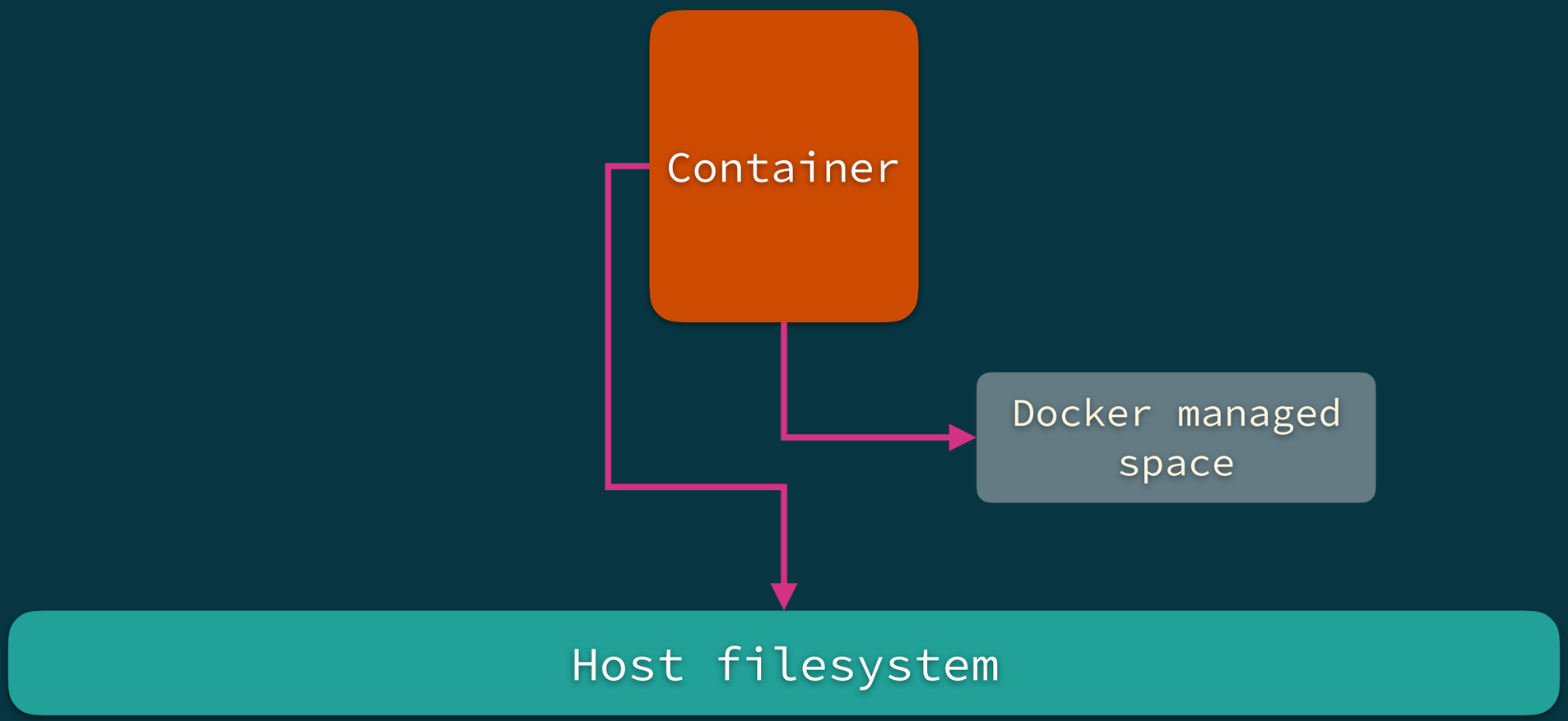


VOLUME

```
docker run -it --rm ubuntu /bin/bash
```



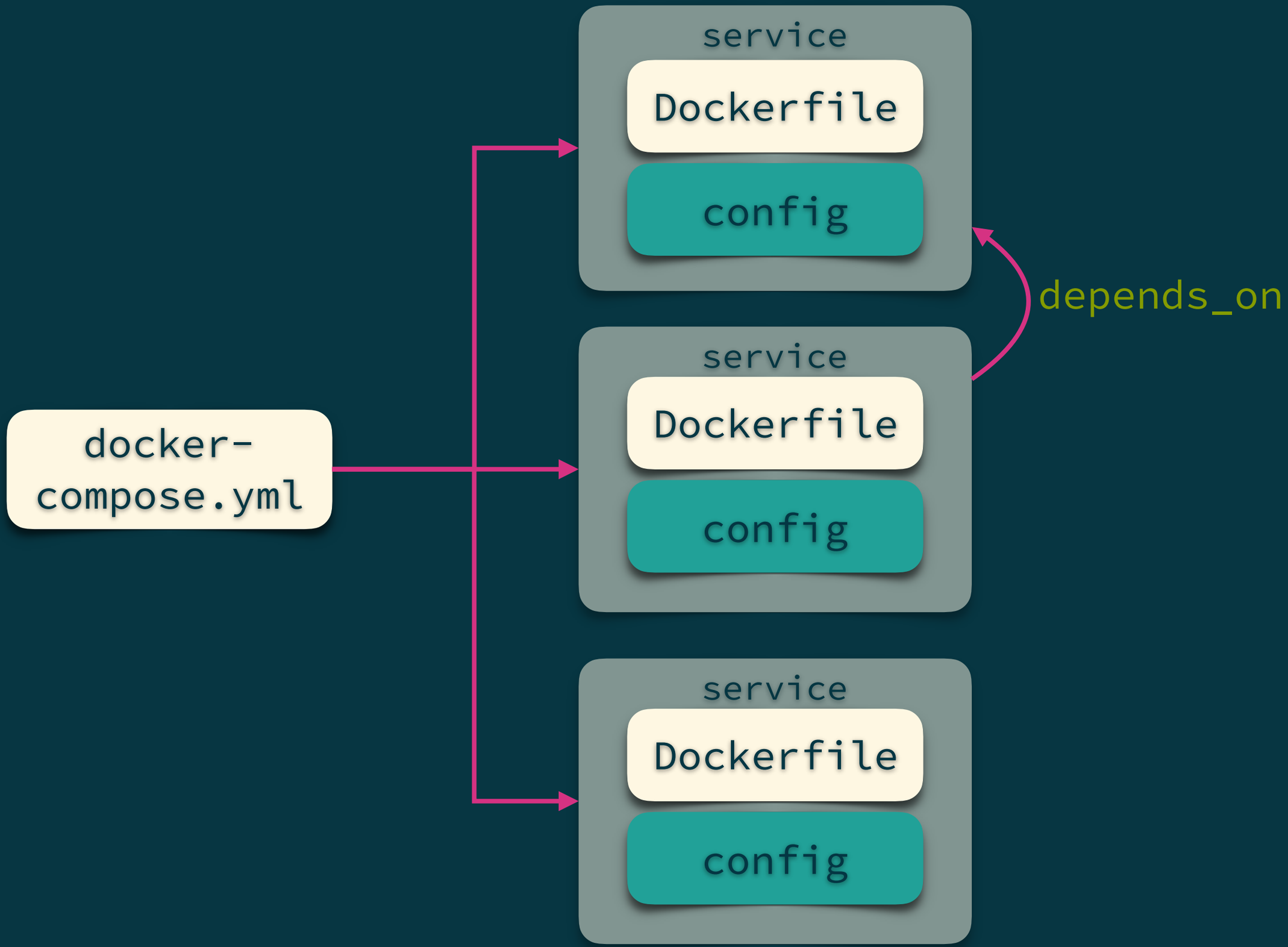
```
docker run -it -v /host/path:/tmp ubuntu /bin/bash
```



DOCKER COMPOSE

DOCKER COMPOSE

- Define multi-container applications in a single file
- Supports scaling, healing
- Single host


service
Dockerfile
config
depends_on
service
Dockerfile
config
docker-
compose.yml
service
Dockerfile
config

CONS

CONS

- Orchestration/composition tooling still rudimentary
- Native Docker implementations still buggy
- Most existing monitoring/logging are host centric, not process centric

THANKS!!

RESOURCES

- Docker in action
- Docker in practice