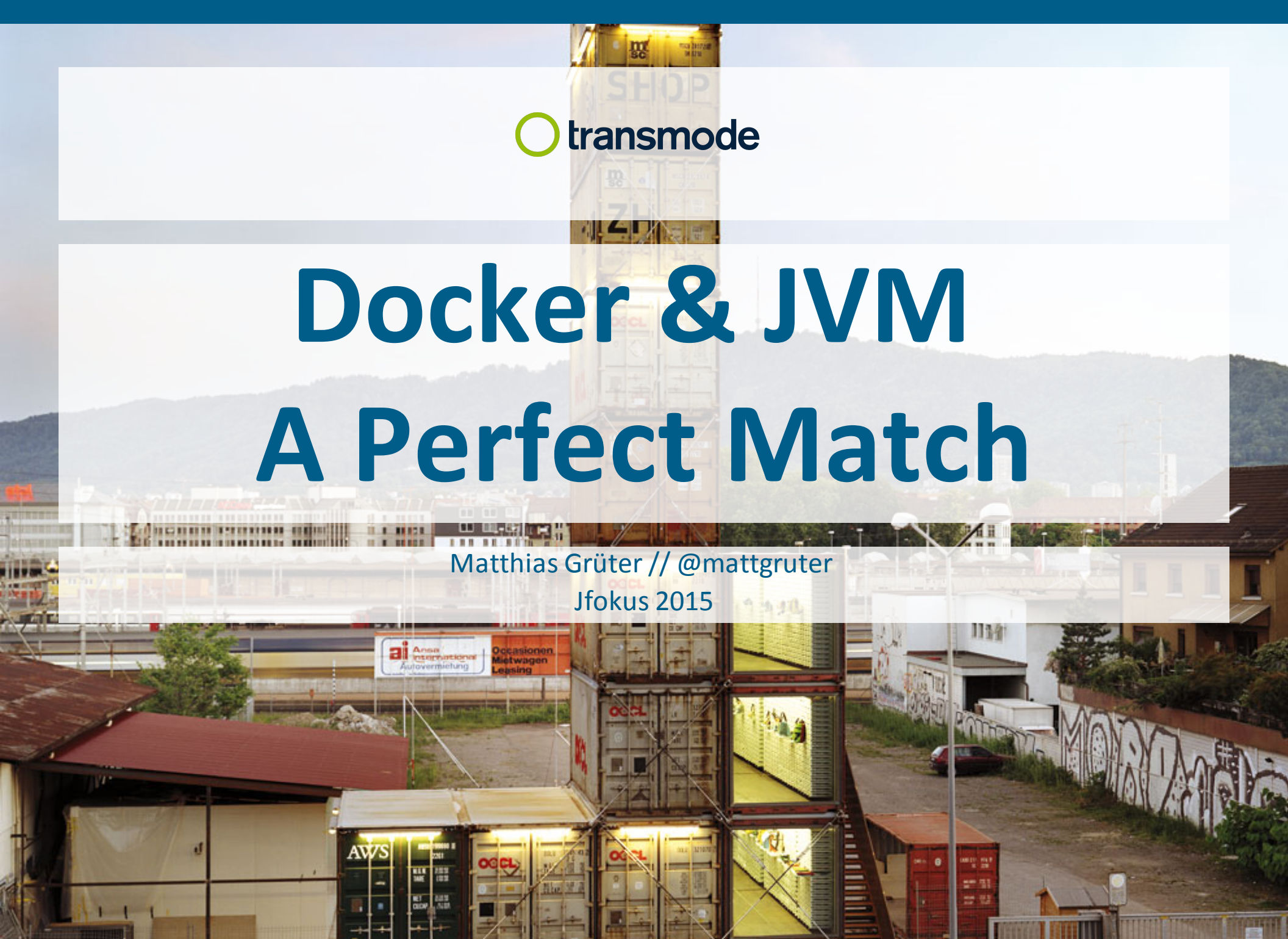




Docker & JVM

A Perfect Match

Matthias Grüter // @mattgruter
Jfokus 2015



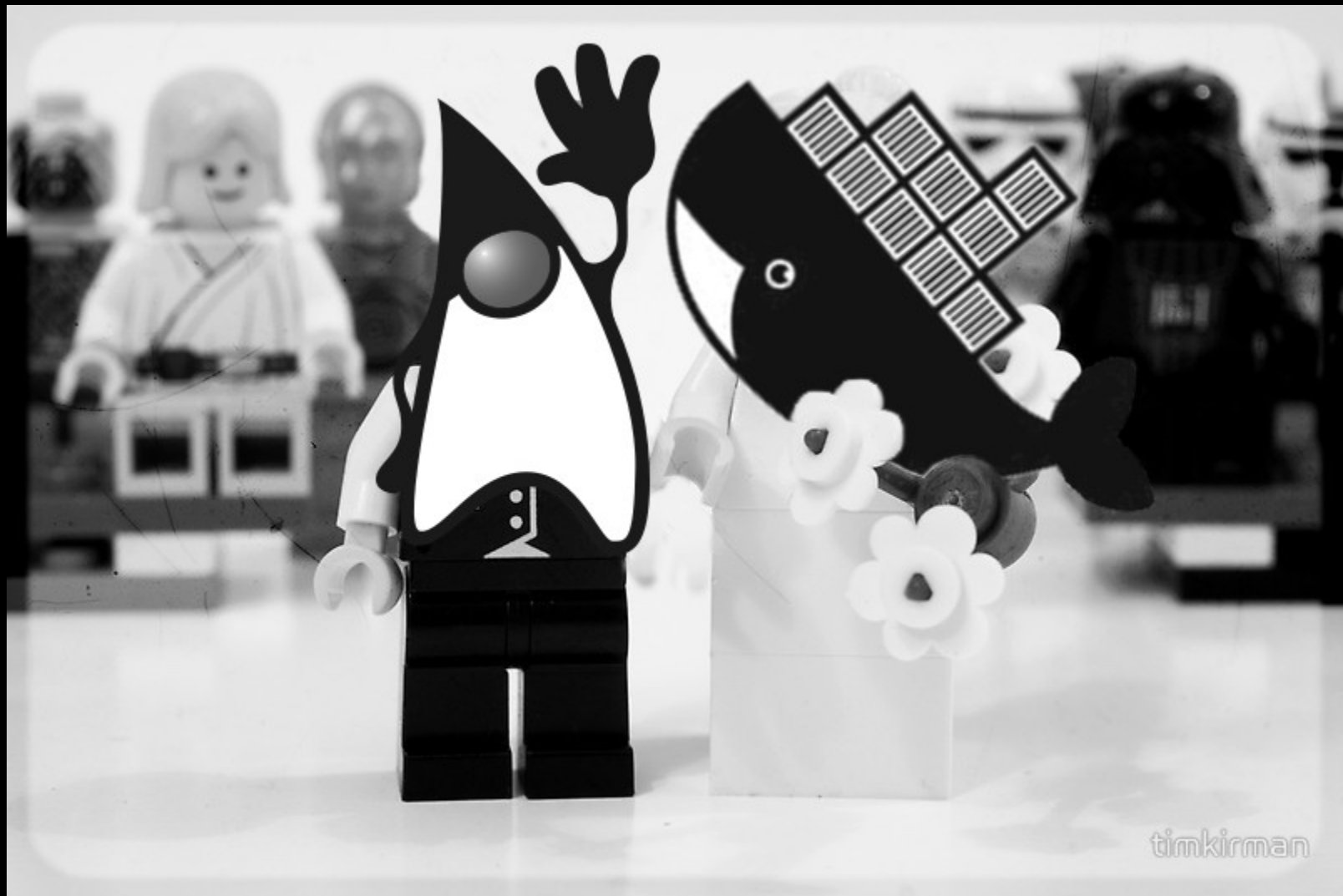
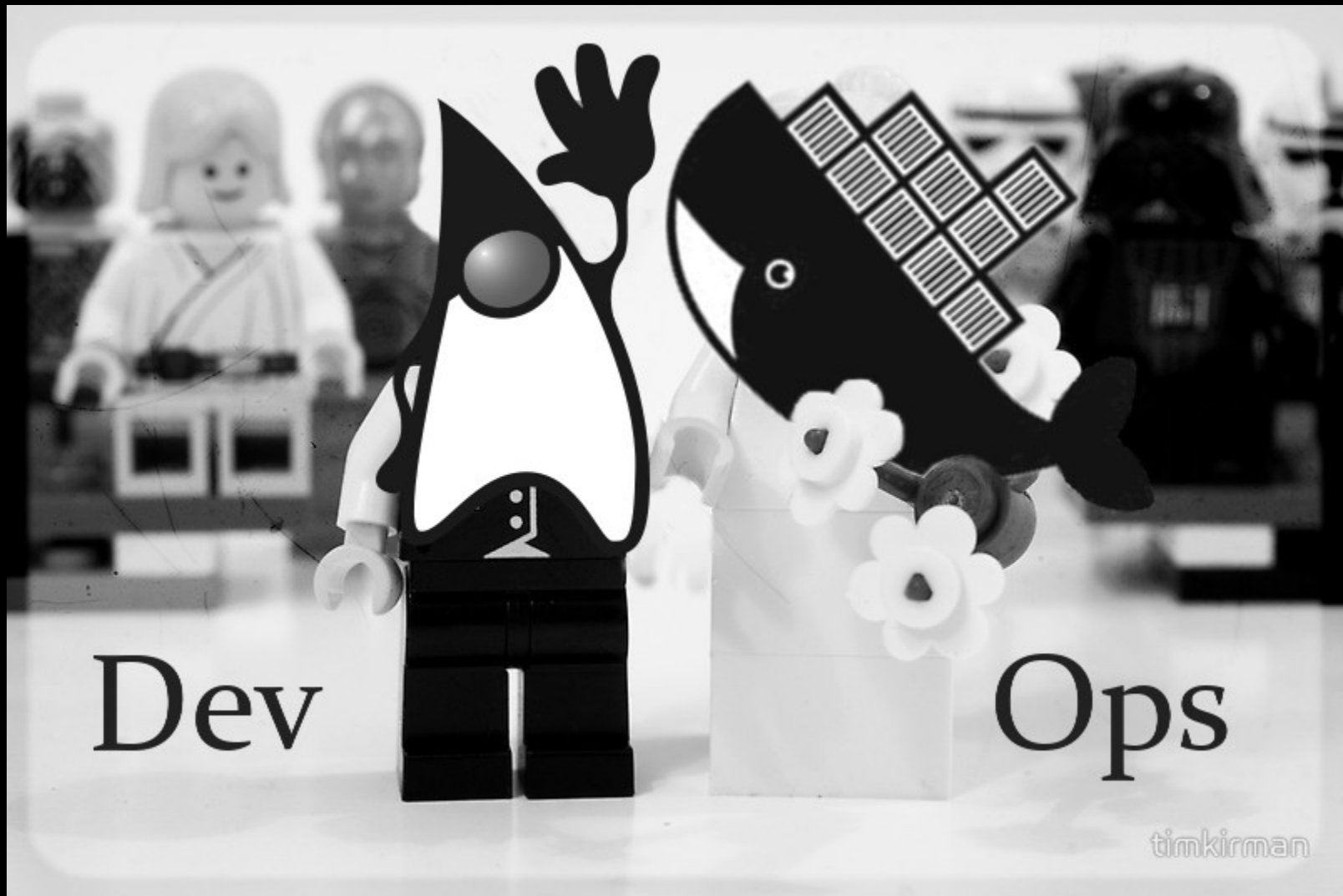


Image Credit: Tim Kirman



Dev

Ops

timkirman

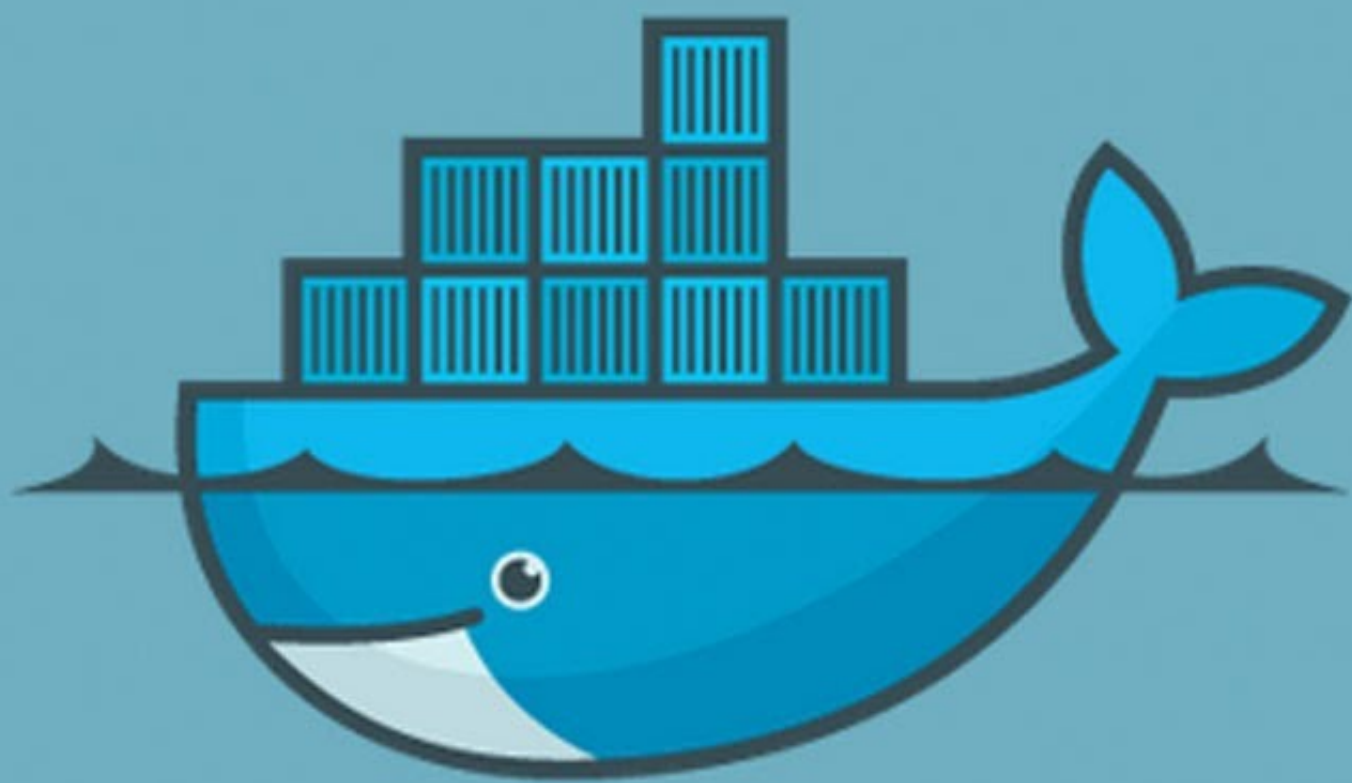
Image Credit: Tim Kirman

Your Toastmaster



Matthias Grüter





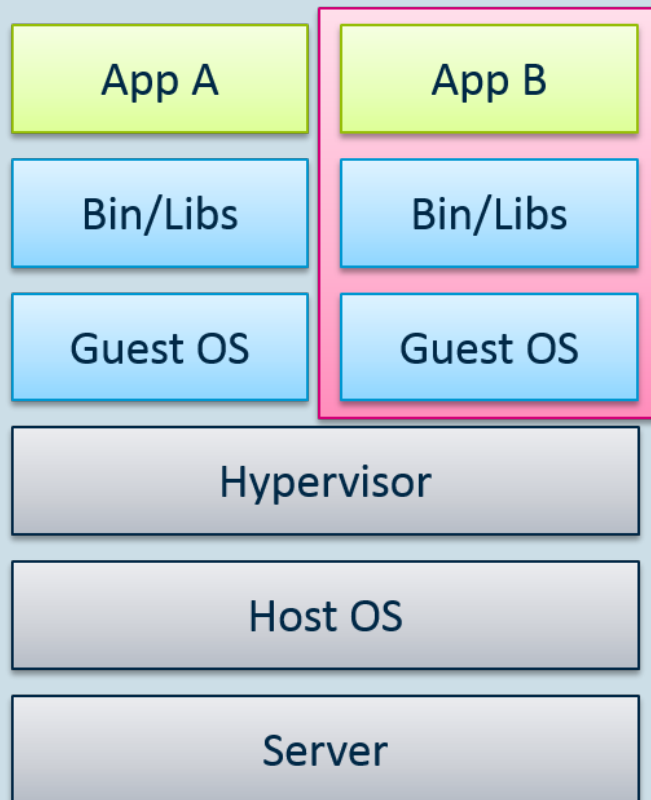
docker

CONTAINERS
& MODIFICATIONS
AUSTRALIA WIDE
containersfirst.com.au
556 991

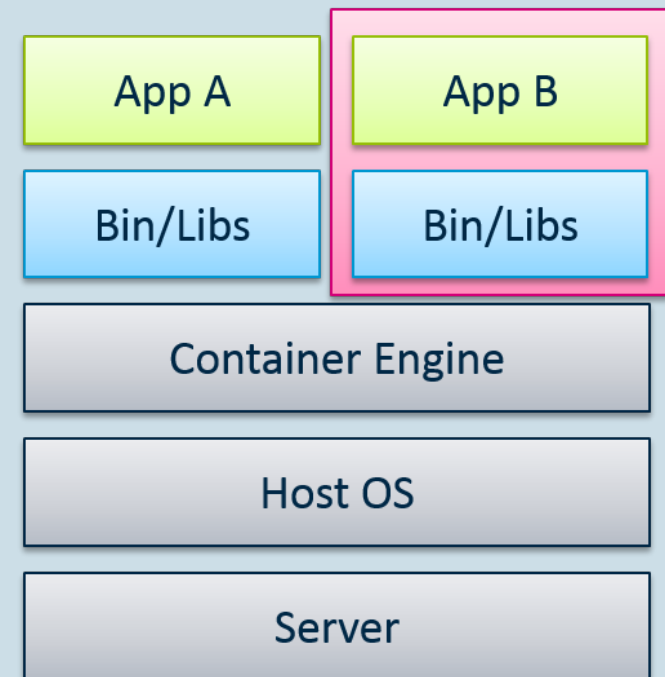
Containers

Credit: containersfirst.com.au

VM



Container





Shipping Containers



Build, Ship and Run
Any App, Anywhere



Let's create some
containers!

A photograph of a server rack filled with network equipment. The rack is densely packed with hardware, and a large number of bright yellow fiber optic cables are visible, crisscrossing the front of the units. The cables are connected to various ports on the equipment. The equipment includes several network switches and routers. One switch in the lower left has the 'Lumentis' logo. Another unit in the middle has a label that reads '1-13T'. The overall scene depicts a complex and high-capacity network environment.

Container Networking

Ports to the outside world



```
docker run -p 9000:8080 ...
```

```
Format: [hostPort]:[containerPort]
```


Container Linking

1. Database container "redis1"

```
docker run --name redis1 redis
```

2. Application container "myapp" (wants DB backend)

```
docker run --link redis1:db myapp
```

```
Format: --link [containerName]:[alias]
```

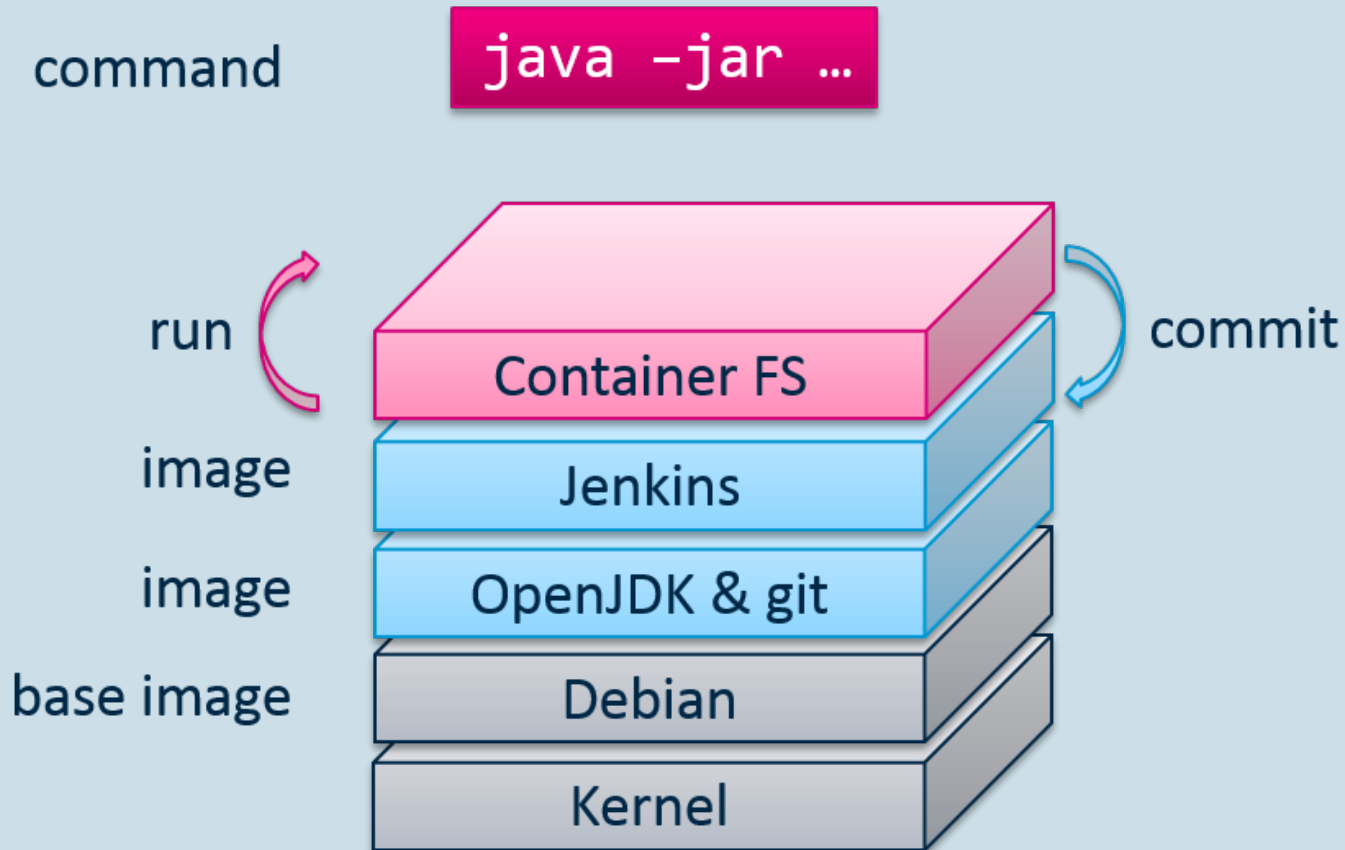


Docker Images

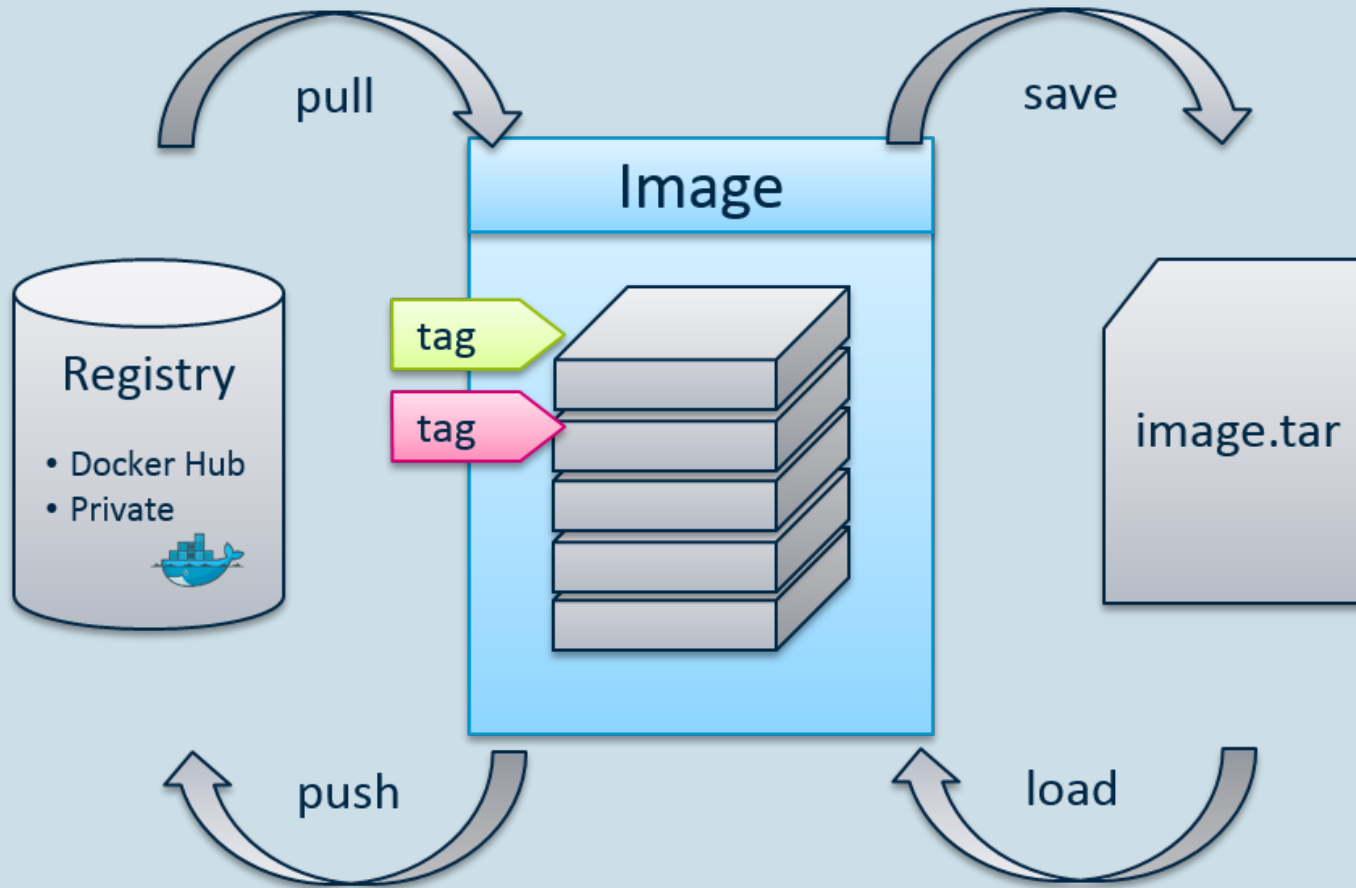
Container Blueprints

Source: homeinabox.blogspot.se

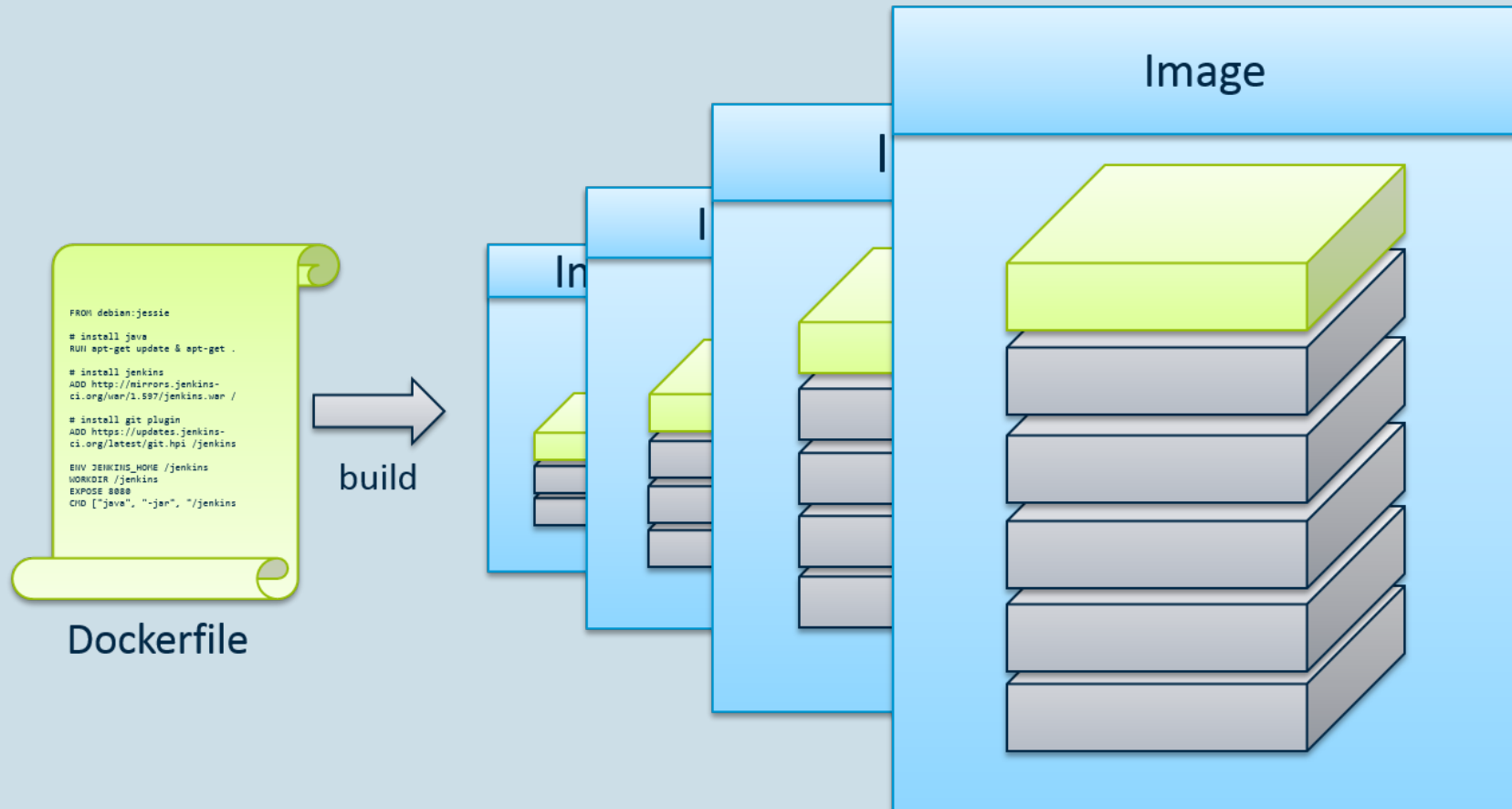
Layered Filesystems



Sharing Images



Creating Images



Example: Jenkins

```
FROM debian:jessie

# install java
RUN apt-get update && apt-get install -y openjdk-7-jre

# install jenkins
ADD http://mirrors.jenkins-ci.org/war/1.597/jenkins.war /

ENV JENKINS_HOME /jenkins
WORKDIR /jenkins
EXPOSE 8080
CMD ["java", "-jar", "/jenkins.war"]
```

Example: Jenkins

Build:

```
docker build --tag jenkins .
```

Run:

```
docker run -p 8080:8080 jenkins
```

Data Volumes

Expose:

```
docker run -v /data --name db redis
```

Access:

```
docker run --volumes-from=db rsync -r /data/ remote:/backup
```


A Perfect Match



Image credit: snorgtees.com

Docker and the JVM



Encapsulation (app + libs)
Memory management
Portability



Encapsulation (runtime)
Isolation & Containment
Portability

Docker and the JVM



Encapsulation
Sandboxing
Portability

Ecosystem

Docker API

Build system

Build/CI servers

Build repositories

...

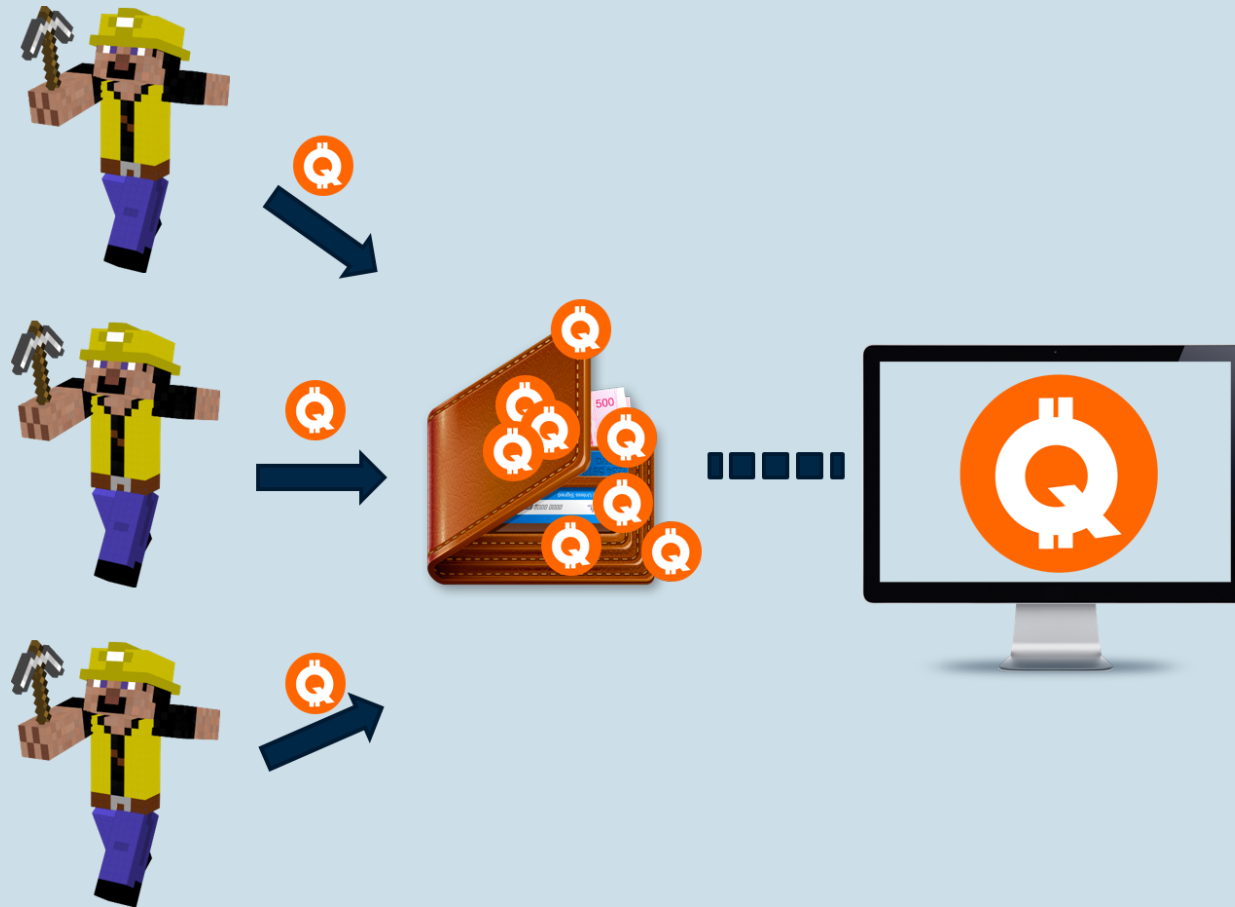


Wedding Gift

Qubit-Coins



The Grand Scheme



Webapp

Gradle

```
plugins {  
    id 'application'  
}  
  
mainClassName = 'se.qubit.webapp.Main'  
group = 'mattgruter'  
repositories { jcenter() }  
dependencies { ... }
```

Webapp

Gradle & Docker

```
plugins {  
    id 'application'  
    id 'se.transmode.docker' version '1.3'  
}  
  
mainClassName = 'se.qubit.webapp.Main'  
group = 'mattgruter'  
repositories { jcenter() }  
dependencies { ... }  
  
distDocker.dockerfile {  
    EXPOSE 8080  
}
```

Build

```
gradle distDocker
```

:-)

Deploy

Wallet (Redis)

```
docker run -d --name db redis
```

Miner

```
docker run -d --link db:db mattgruter/qubit-miner
```

Webapp

```
docker run --link db:db -p 8080:8080 mattgruter/qubit-webapp
```




Faster!

```
docker run -d --link db:db mattgruter/qubit-miner  
docker run -d --link db:db mattgruter/qubit-miner  
docker run -d --link db:db mattgruter/qubit-miner  
...
```


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Your container is *NOT a VM*

Stop treating it like one!

Corollary #1

Say no to Sshd

use volumes, volumes, volumes

... and docker exec

Corollary #2

**There can be only
one PID**

**Docker is a polyglot
tool!**

So sorry, JVM!

Docker Hub Automated Builds

Be Specific

Images are cheap, therefore ...

... build many small specific images.

Size Matters

Use small baseimages

Corollary



**Please clean
as you go**

(e.g. apt-get clean, multi-line run)

Use the cache, Luke!

Move ADD & COPY to end of Dockerfile
(they invalidate the cache)

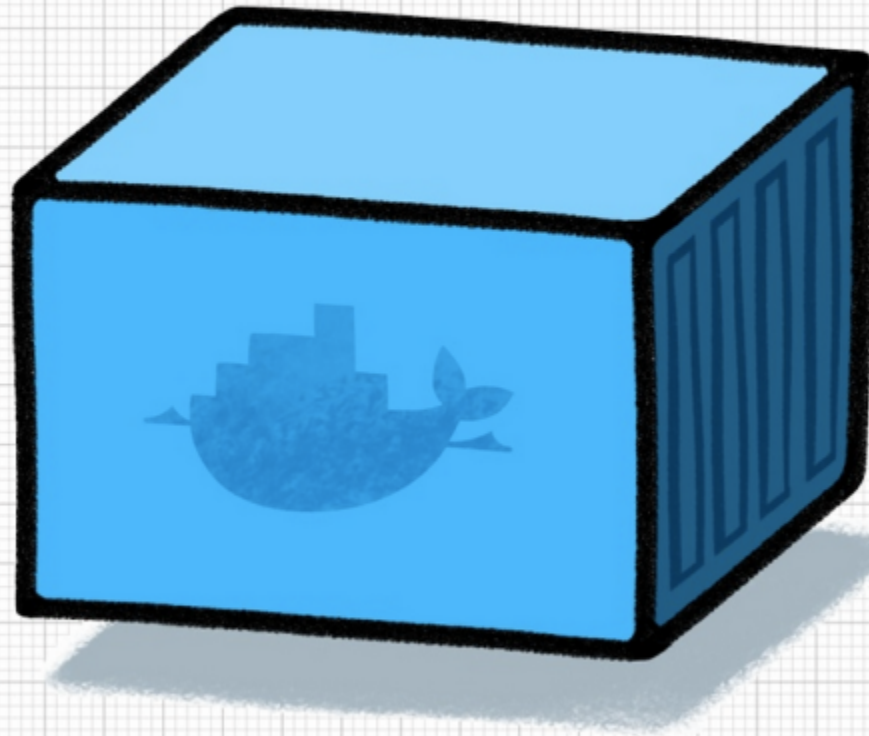
What does the future hold?



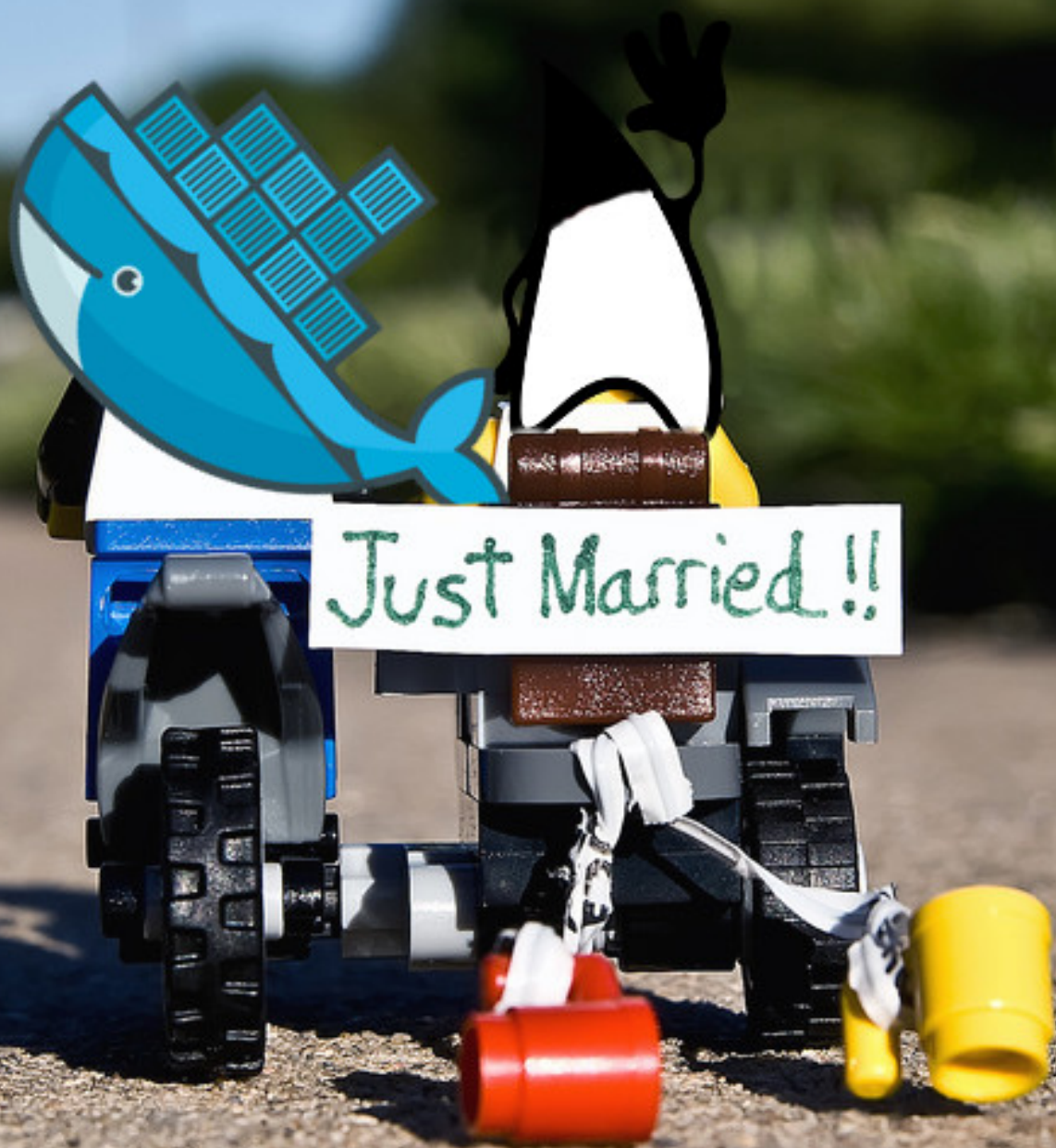


Image Credit: Tim Kirman

The real value of Docker is not technology



It's getting people to agree on something



Just Married!!