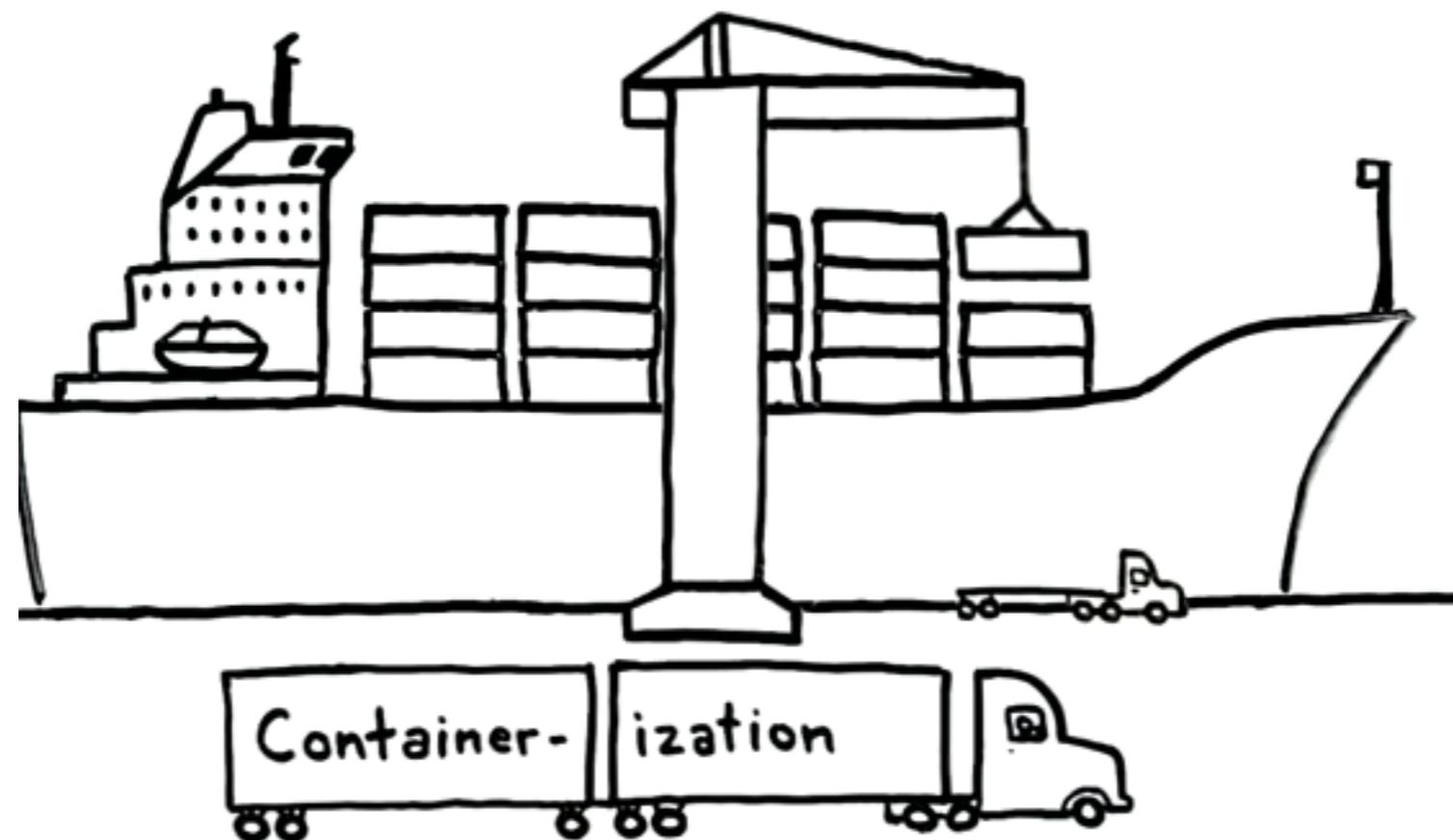
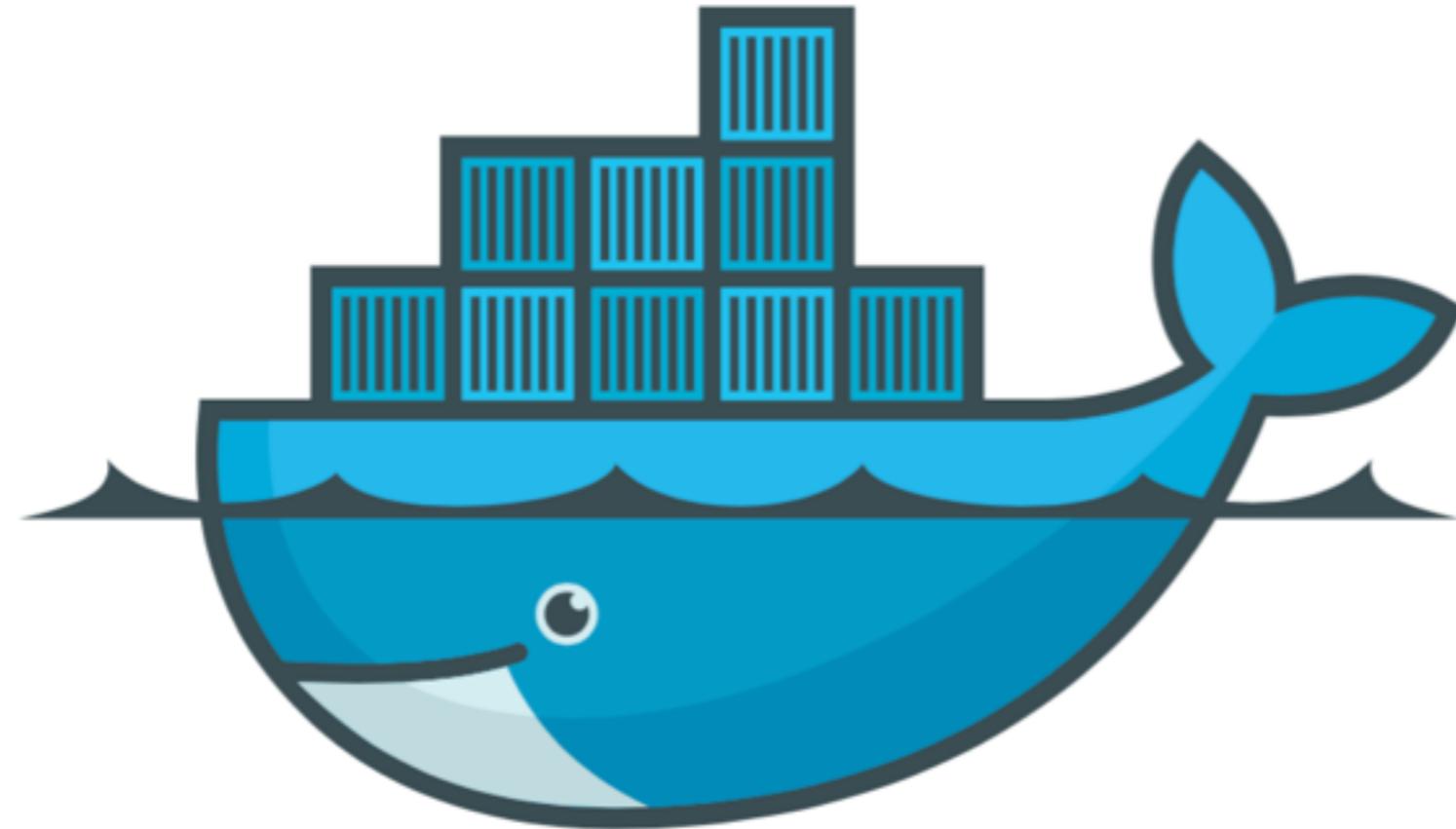


docker 101

From Developer View
somkiat.cc

Containerization





docker

Docker != Containers

Docker **manages** Containers

Docker manages Containers

Build images to run as containers

Manage applications with docker compose

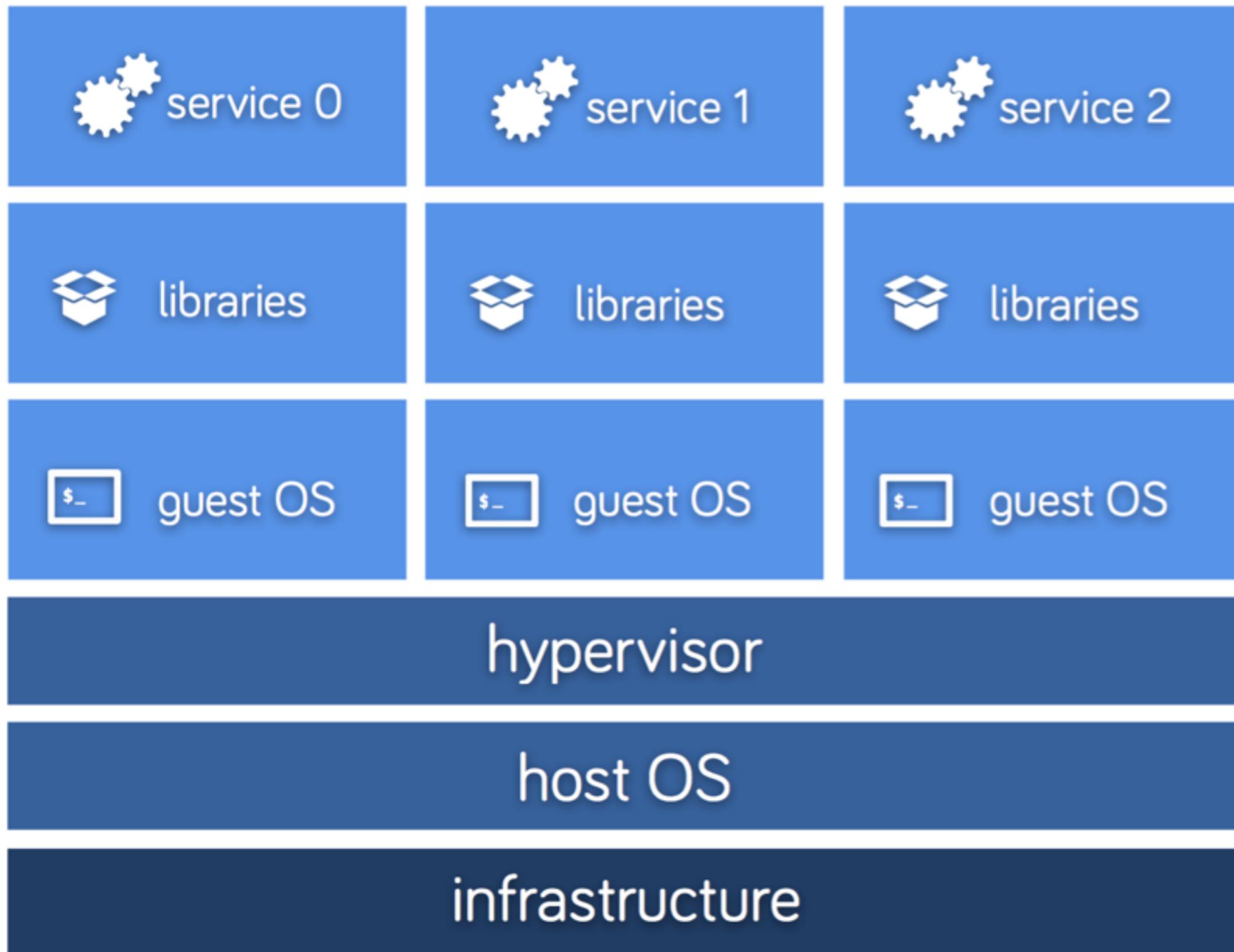
Provision machines with docker machine

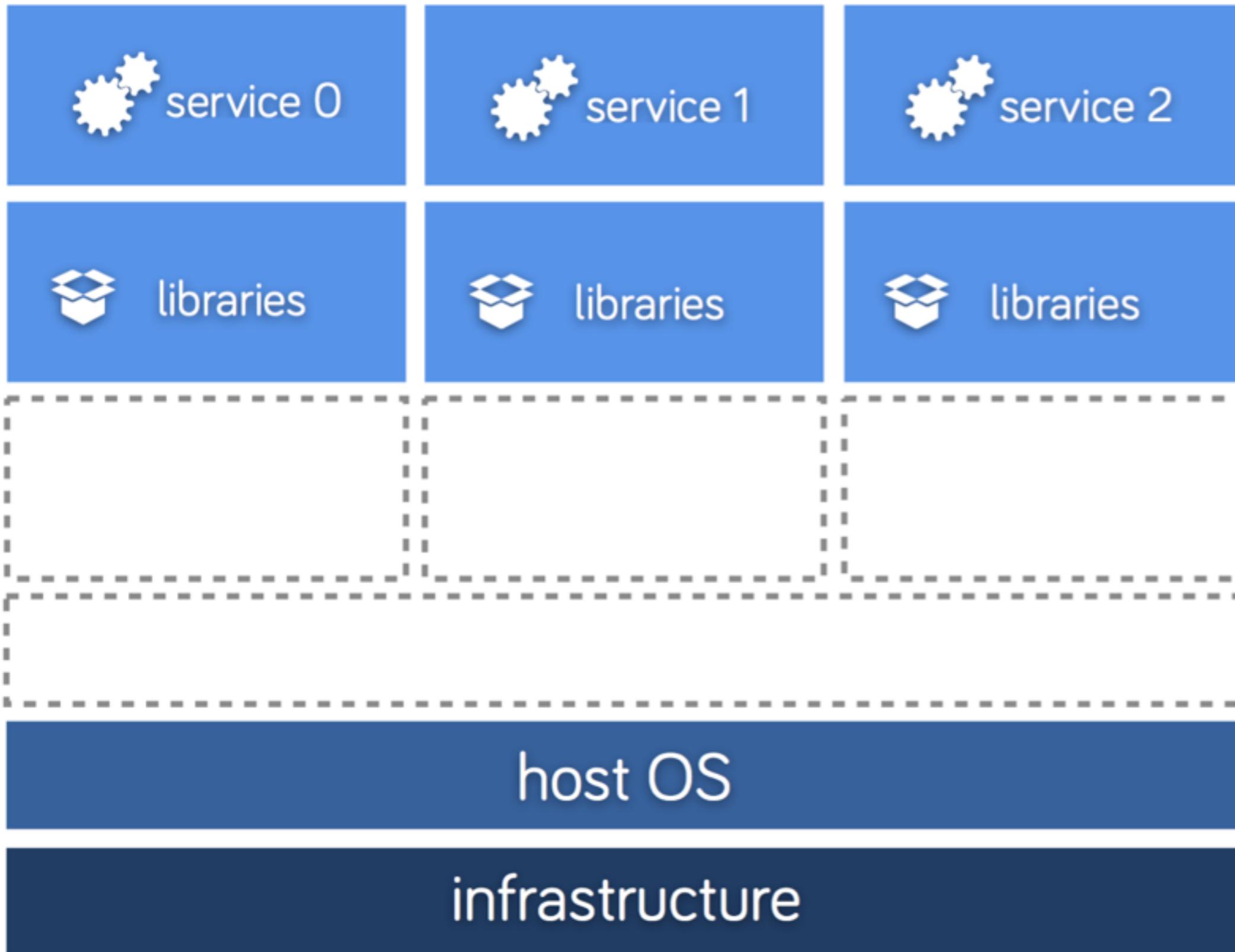
Containers

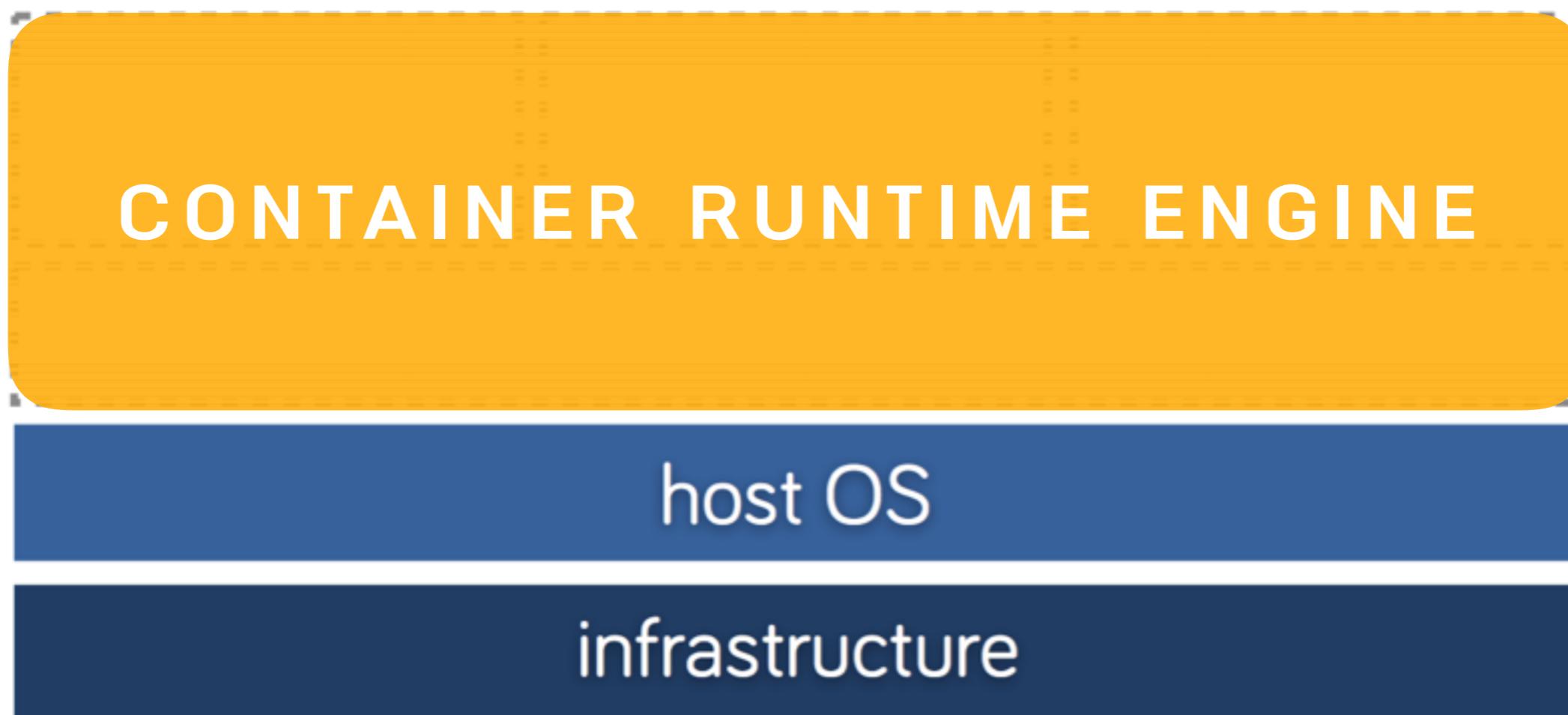
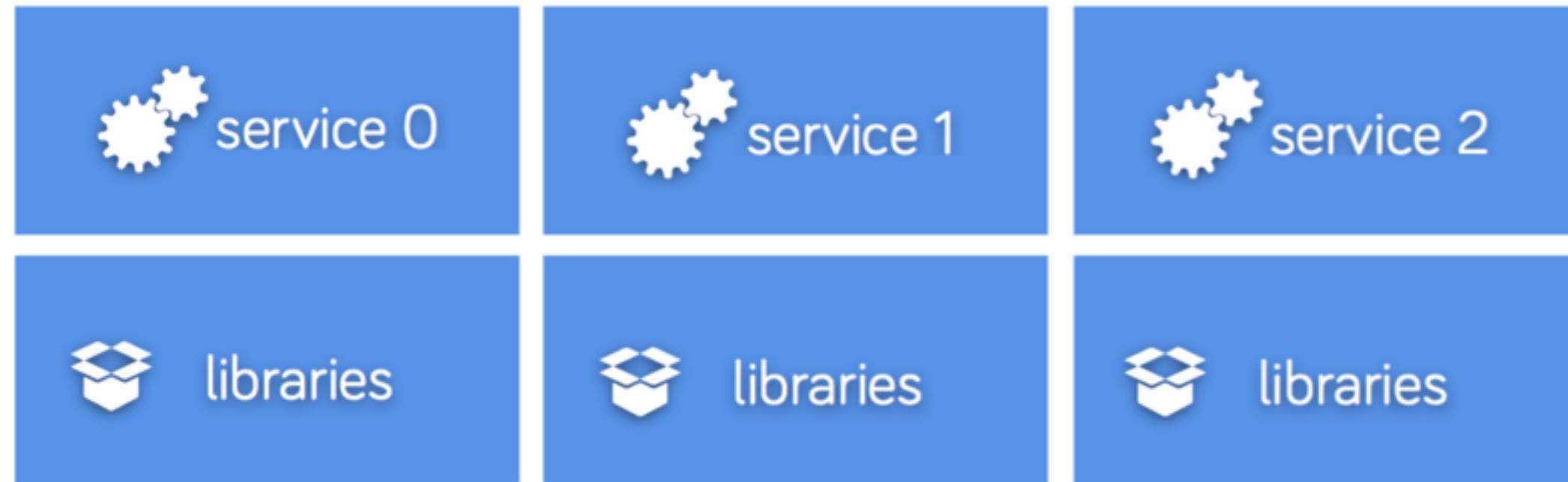
Share the kernel of host system

Isolated from other containers

Fast boot time and **Low** overhead







**Start with containers
seem more complex !!**

BUT
reduce time to run your app

BUT
less time to provisioning
and rebooting

BUT
easy to manage dependencies

BUT
use multiple language/version
without hacking or additional tools

I ❤️ Rake



maven

gradle

I ❤️ Rake

Sun



X

OS X



SUSE



FreeBSD



HP



IBM



VMWare



Apple

ORACLE

Oracle



Xen

Bundler



Windows



Linux



Fedora



CentOS



Mageia



Arch Linux



Slackware



Debian



Ubuntu



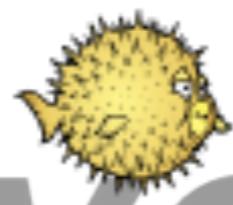
Mint



Gentoo



NetBSD



OpenBSD

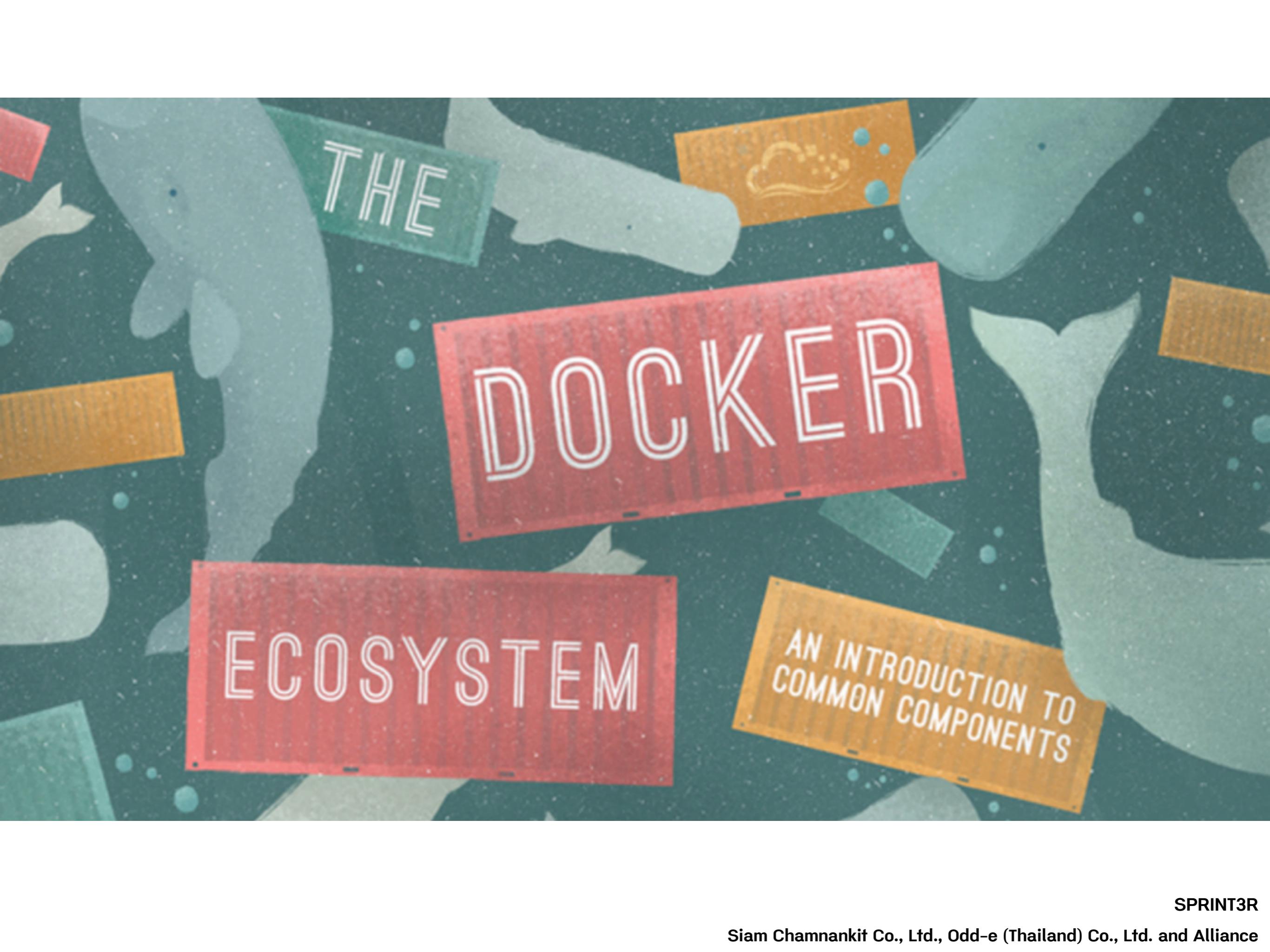
DragonFly BSD

Darwin

maven gradle

BUT
use the same OS in production

BUT
easy to deploy



THE
ECOSYSTEM

DOCKER

AN INTRODUCTION TO
COMMON COMPONENTS



Build



Ship



Run

Docker Images

Image vs Container

Image like a class

Container is a instance of class

Create my image

Create a Dockerfile

```
$docker build -t <image name> . \  
$docker images  
$docker commit  
$docker push  
$docker pull
```

Docker Hub



Explore Official Repositories

 busybox official	442 STARS	59.4 M PULLS	DETAILS
 ubuntu official	3.0 K STARS	38.1 M PULLS	DETAILS
 swarm official	122 STARS	21.5 M PULLS	DETAILS
 nginx official	2.0 K STARS	18.9 M PULLS	DETAILS
 redis official	1.5 K STARS	16.8 M PULLS	DETAILS

Docker Hub

The screenshot shows the Docker Hub homepage with a search bar, sign-up, and log-in buttons at the top. Below the header, a link to "Explore Official Repositories" is visible. A large red annotation ">> Many images" is overlaid on the repository list. The list includes the following entries:

Repository	Stars	Pulls	Details
busybox/official	442	59.4 M	> DETAILS
ubuntu/official	3.0 K	31.1 M	> DETAILS
swarm/official	122	21.5 M	> DETAILS
nginx/official	2.0 K	18.9 M	> DETAILS
redis/official	1.5 K	16.8 M	> DETAILS

Use
Docker Compose
to build

Docker Compose

Use a **Dockerfile** to define your app's env

Define services of your app in **docker-compose.yml**

Start and run with
\$docker-compose up

Dockerfile

```
1 FROM ruby:2.2.3
2 RUN apt-get update -qq && apt-get i
3 WORKDIR /var/app
4 COPY Gemfile /var/app/Gemfile
5 RUN bundle install
```

docker-compose.ml

```
1 db:
2   image: postgres
3
4 web:
5   build: .
6   ports:
7     - "3000:3000"
8   volumes:
9     - "./:/var/app"
10  working_dir: /var/app
11  command: rails s -b '0.0.0.0'
12  links:
13    - db:db
```

Web Architecture



\$docker-compose up

```
[MacBook-Pro-2:rails-app somkiat$ docker-compose up
Pulling db (postgres:latest)...
latest: Pulling from library/postgres
8b57c6bf5c36: Pull complete
ada8aa55613a: Pull complete
b3de40c730c6: Pull complete
7b8f7ba65711: Pull complete
1bb8b8636476: Pull complete
eca1007b842c: Pull complete
189c3f75d39c: Pull complete
ad45579db688: Pull complete
7c5cb7f4a1a8: Pull complete
c6770af17534: Pull complete
6b6e9868d88a: Downloading [=====>                                         ] 21.23 MB/42.82 MB
3b7eb1ffa9e2: Download complete
c8d89116b183: Download complete
6d9d81c13df4: Download complete
af366c0e9aed: Pulling fs layer
6246cbebdfe0: Download complete
b731665a3278: Download complete
7f586af960a2: Download complete
9aae83d4127f: Download complete
```

\$docker-compose up

```
---> 72336174e973
Step 2 : RUN apt-get update -qq && apt-get install -y build-essential nodejs libpq-dev && mkdir -p /var/app
    ---> Running in 76efa3075ba3
Reading package lists...
Building dependency tree...
Reading state information...
libpq-dev is already the newest version.
The following extra packages will be installed:
  dpkg-dev fakeroot libalgorithm-diff-perl libalgorithm-diff-xs-perl
  libalgorithm-merge-perl libc-ares2 libdpkg-perl libfakeroot
  libfile-fcntllock-perl libtimedate-perl libv8-3.14.5
Suggested packages:
  debian-keyring
The following NEW packages will be installed:
  build-essential dpkg-dev fakeroot libalgorithm-diff-perl
  libalgorithm-diff-xs-perl libalgorithm-merge-perl libc-ares2 libdpkg-perl
  libfakeroot libfile-fcntllock-perl libtimedate-perl libv8-3.14.5 nodejs
0 upgraded, 13 newly installed, 0 to remove and 16 not upgraded.
Need to get 4903 kB of archives.
After this operation, 12.5 MB of additional disk space will be used.
Get:1 http://security.debian.org/ jessie/updates/main libdpkg-perl all 1.17.26 [1072 kB]
Get:2 http://security.debian.org/ jessie/updates/main dpkg-dev all 1.17.26 [1545 kB]
Get:3 http://httpredir.debian.org/debian/ jessie/main libc-ares2 amd64 1.10.0-2 [76.7 kB]
Get:4 http://httpredir.debian.org/debian/ jessie/main libtimedate-perl all 2.3000-2 [42.2 kB]
```

\$docker-compose up

```
Removing intermediate container 98005244c64c
Step 5 : RUN bundle install
--> Running in c4bf91c8e778
Don't run Bundler as root. Bundler can ask for sudo if it is needed, and
installing your bundle as root will break this application for all non-root
users on this machine.
Fetching gem metadata from https://rubygems.org/.....
Fetching version metadata from https://rubygems.org/...
Fetching dependency metadata from https://rubygems.org/..
Resolving dependencies.....
Installing rake 10.5.0
Installing i18n 0.7.0
Installing json 1.8.3 with native extensions
Installing minitest 5.8.3
Installing thread_safe 0.3.5
Installing tzinfo 1.2.2
Installing activesupport 4.2.3
Installing builder 3.2.2
Installing erubis 2.7.0
Installing mini_portile2 2.0.0
Installing nokogiri 1.6.7.1 with native extensions
Installing rails-deprecated_sanitizer 1.0.3
Installing rails-dom-testing 1.0.7
Installing loofah 2.0.3
Installing rails-html-sanitizer 1.0.2
Installing actionview 4.2.3
----- 100%
```

\$docker-compose up

```
Successfully built 326594d9cf2c
Creating railsapp_web_1
Attaching to railsapp_db_1, railsapp_web_1
db_1  | The files belonging to this database system will be owned by user "postgres".
db_1  | This user must also own the server process.
db_1
db_1  | The database cluster will be initialized with locale "en_US.utf8".
db_1  | The default database encoding has accordingly been set to "UTF8".
db_1  | The default text search configuration will be set to "english".
db_1
db_1  Data page checksums are disabled.
db_1
db_1  fixing permissions on existing directory /var/lib/postgresql/data ... ok
db_1  creating subdirectories ... ok
db_1  selecting default max_connections ... 100
db_1  selecting default shared_buffers ... 128MB
db_1  selecting dynamic shared memory implementation ... posix
db_1  creating configuration files ... ok
db_1  creating template1 database in /var/lib/postgresql/data/base/1 ... ok
db_1  initializing pg_authid ... ok
db_1  initializing dependencies ... ok
db_1  creating system views ... ok
db_1  loading system objects' descriptions ... ok
db_1  creating collations ... ok
db_1  creating conversions ... ok
db_1  creating dictionaries ... ok
db_1  setting privileges on built-in objects ... ok
db_1  creating information schema ... ok
```

\$docker-compose up

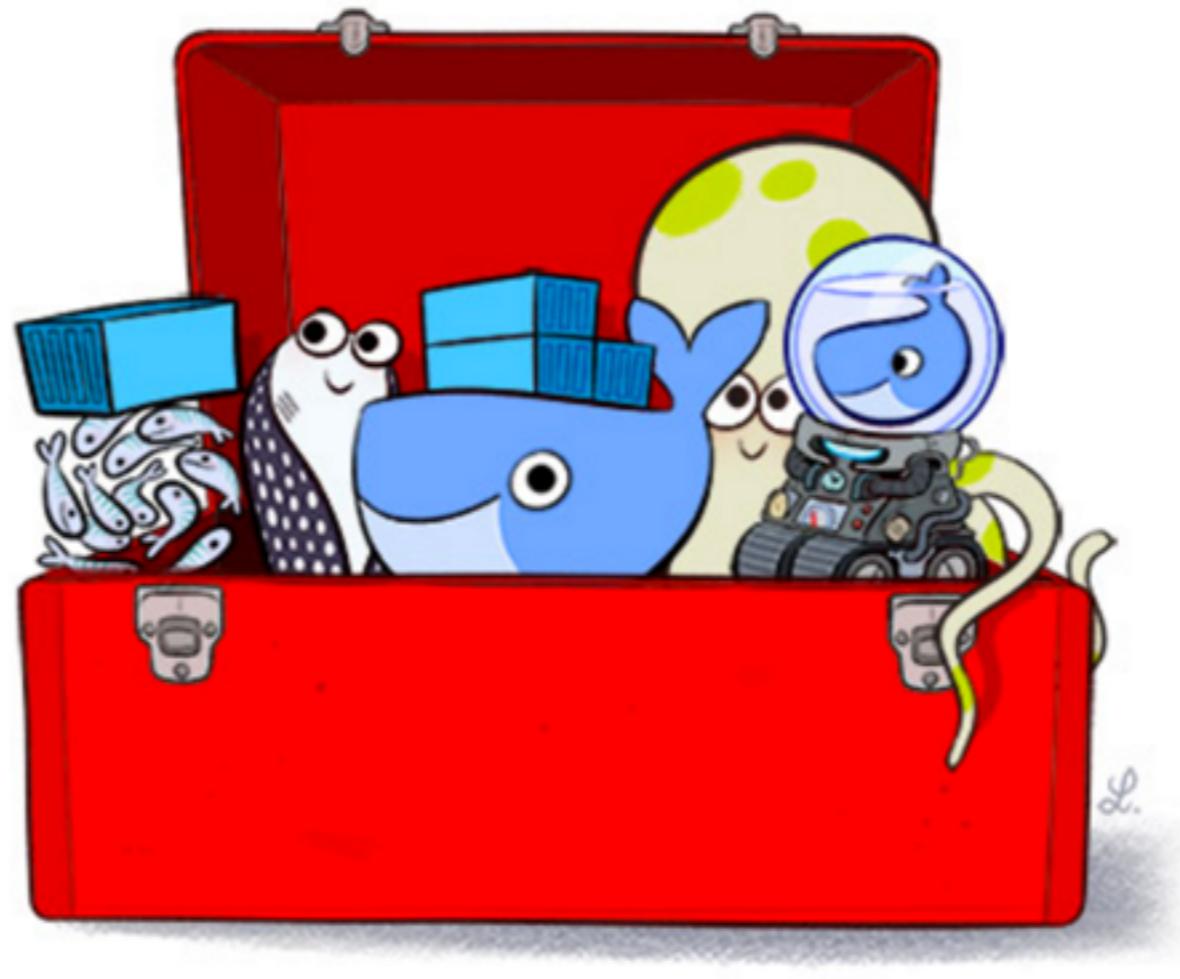
```
Starting railsapp_db_1
Starting railsapp_web_1
Attaching to railsapp_db_1, railsapp_web_1
db_1  | LOG:  database system was interrupted; last known up at 2016-01-14 06:15:28 UTC
db_1  | LOG:  database system was not properly shut down; automatic recovery in progress
db_1  | LOG:  invalid record length at 0/17096B0
db_1  | LOG:  redo is not required
db_1  | LOG:  MultiXact member wraparound protections are now enabled
db_1  | LOG:  database system is ready to accept connections
db_1  | LOG:  autovacuum launcher started
web_1 | [2016-01-14 06:15:45] INFO  WEBrick 1.3.1
web_1 | [2016-01-14 06:15:45] INFO  ruby 2.2.3 (2015-08-18) [x86_64-linux]
web_1 | [2016-01-14 06:15:45] INFO  WEBrick::HTTPServer#start: pid=1 port=3000
```

Building web app with Docker

Install docker

Docker Toolbox

[Getting Started Guide \(Mac\)](#) | [Getting Started Guide \(Windows\)](#) | [Contribute to Toolbox](#)



Docker Machine



Docker Machine

Easy way to create dev & testing machine
from your local command line

\$docker-machine create <name> --driver virtualbox

Demo

Running multi-Container
with Docker compose



Demo

Running multi-Container
with Docker compose



Demo

Running multi-Container
with Docker compose



My Goals

Run web app in a container

Developer can ::

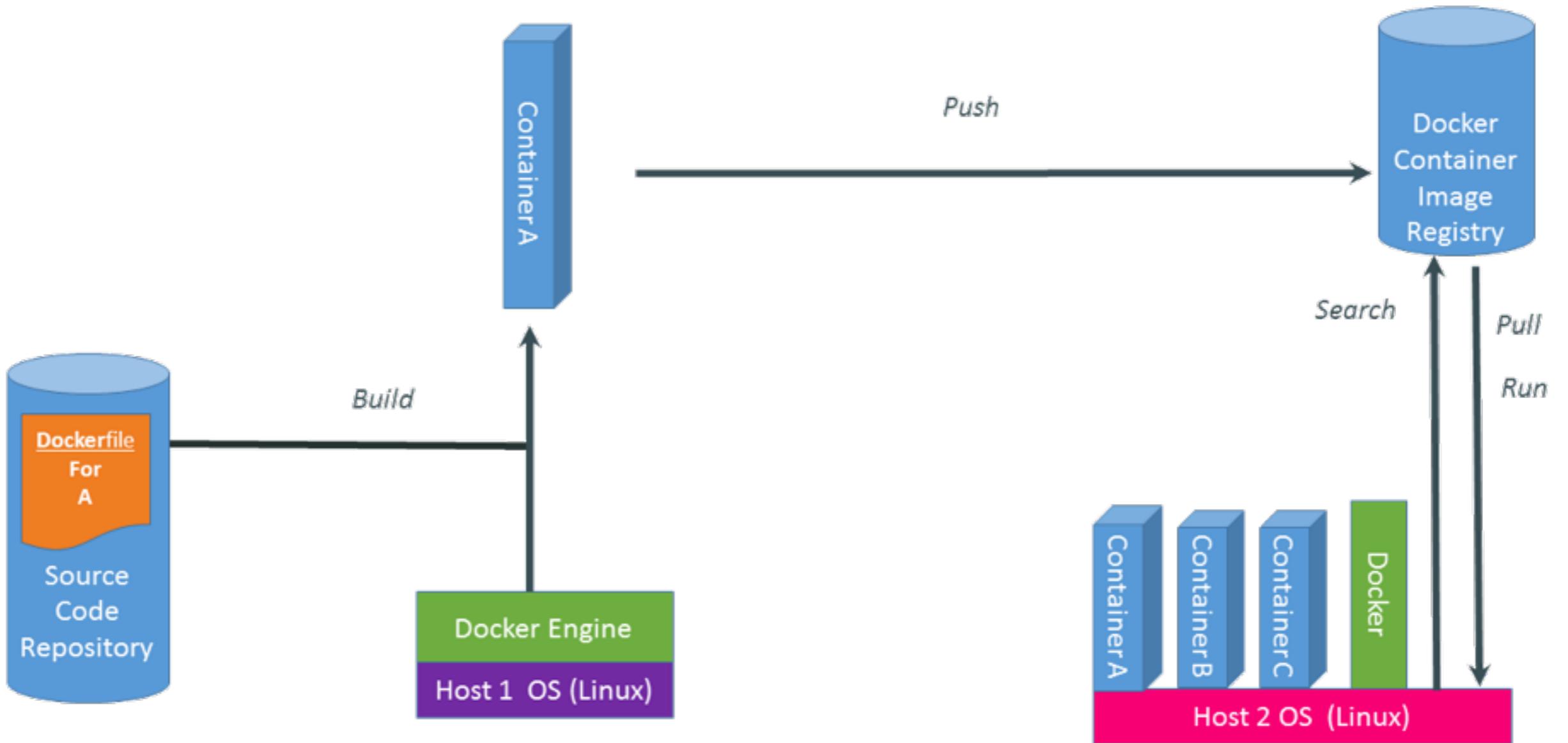
- open app in browser
- modify in a local and see the changes
- focus on software development

Docker Compose

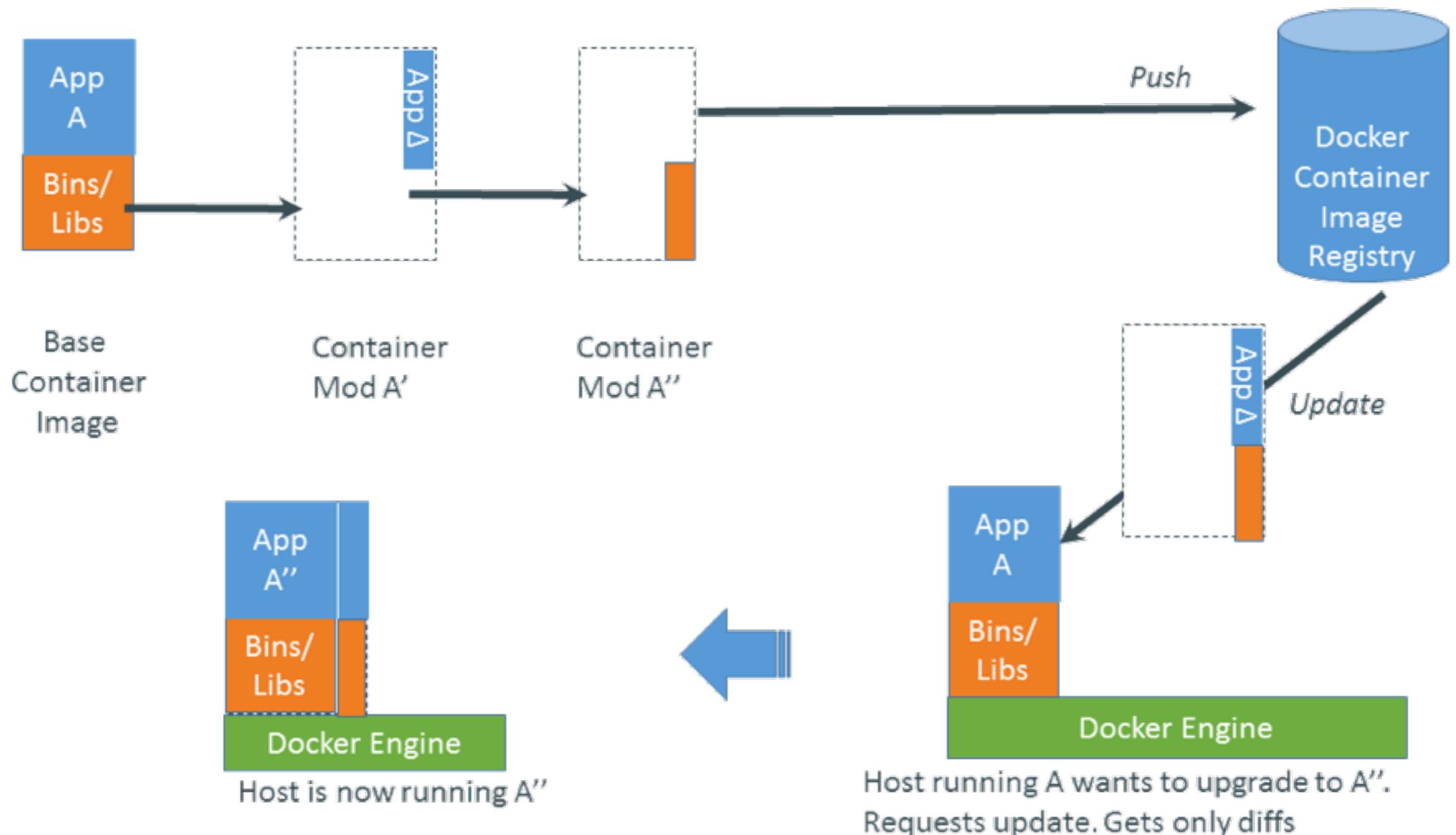
Makes it easy

Demo time

Docker System



Change/Update



Incremental Development





SPRINT3R

Siam Chamnankit Co., Ltd., Odd-e (Thailand) Co., Ltd. and Alliance



Docker expert
exp 3-5 years



Docker expert
exp 3-5 years

Docker released 2013 !!

Resources

https://github.com/up1/docker_101