Introduction to Docker

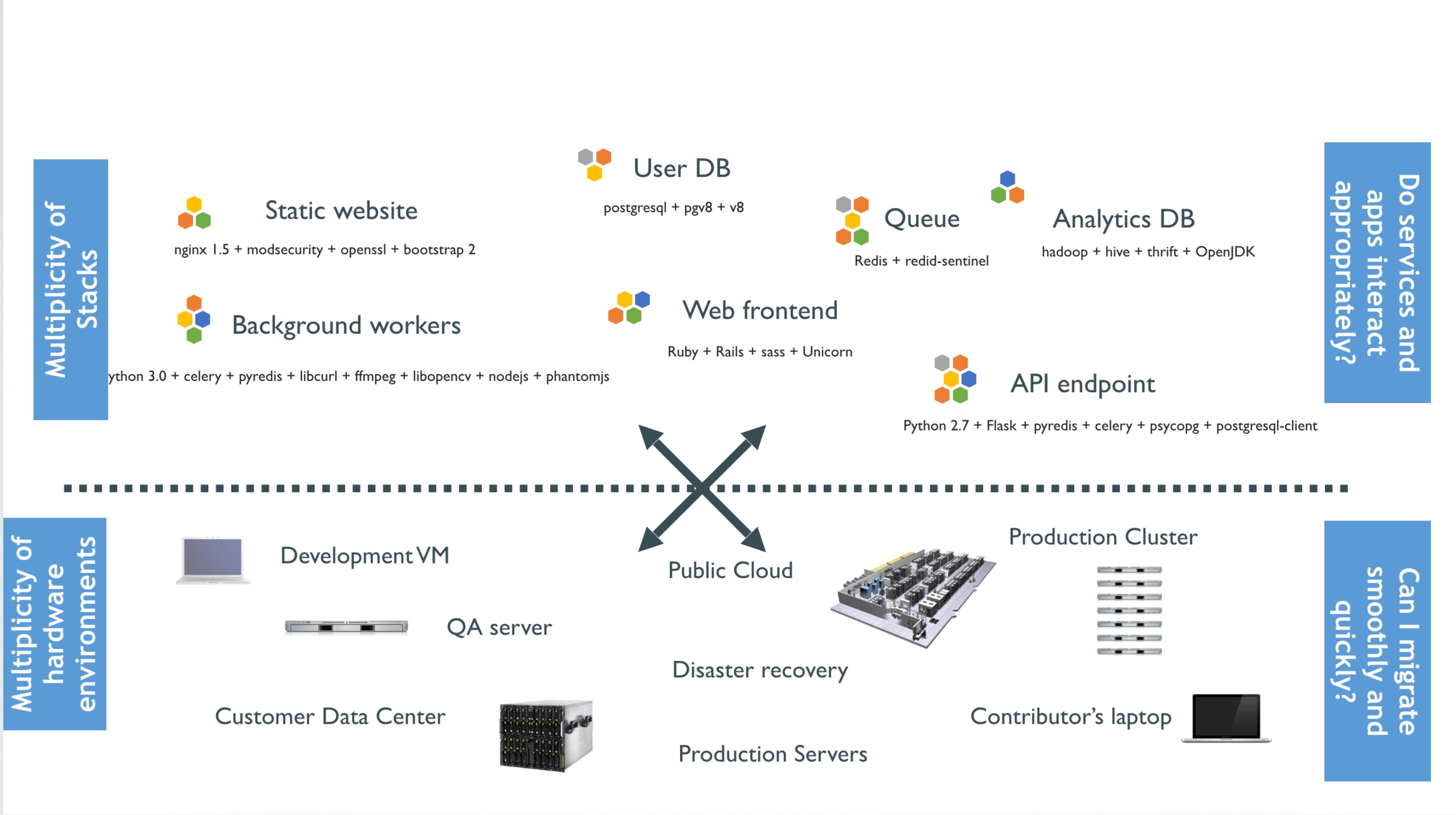
Build, Ship, and Run Any App, Anywhere

2 Μαρτίου 2017

in https://www.linkedin.com/in/apostolosnamlis

GitHub https://github.com/Silot

Key Technical Challenges



Multiplicity of Stacks

Static website

nginx 1.5 + modsecurity + openssl + bootstrap 2

Background workers

ython 3.0 + celery + pyredis + libcurl + ffmpeg + libopencv + nodejs + phantomjs

User DB

postgresql + pgv8 + v8

Web frontend

Ruby + Rails + sass + Unicorn

Queue

Redis + redid-sentinel

Analytics DB

hadoop + hive + thrift + OpenJDK

API endpoint

Python 2.7 + Flask + pyredis + celery + psycopg + postgresql-client

Do services and apps interact appropriately?

Multiplicity of hardware environments

Development VM

QA server

Customer Data Center

Public Cloud

Disaster recovery

Production Servers

Production Cluster

Contributor's laptop

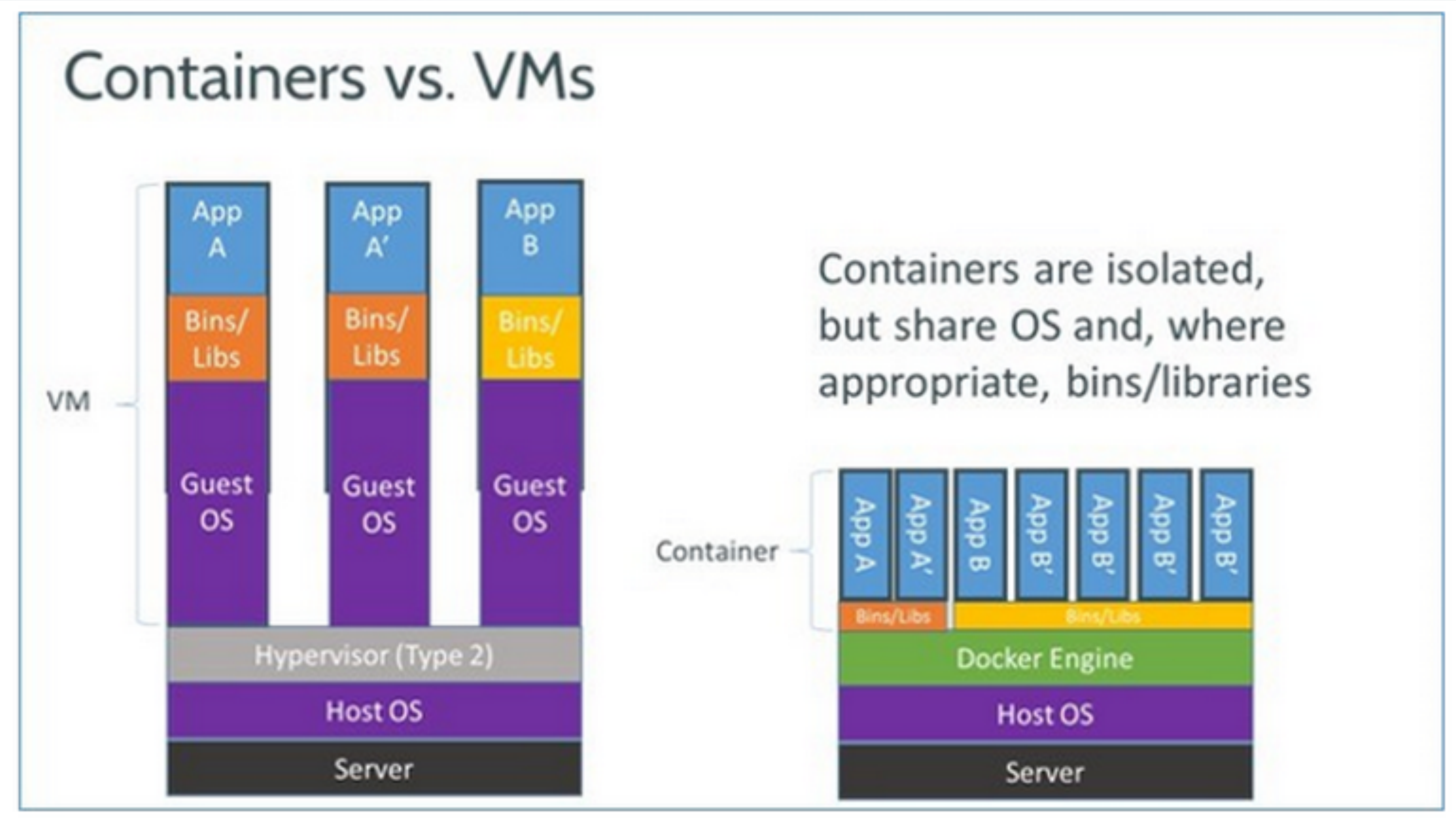
Can I migrate smoothly and quickly?

docker

Based On Linux Containers

Operating System level virtualization for running multiple isolated Linux systems using a single Linux kernel.

LXC provides virtual environment that has its own process and network space, instead of creating a full-fledged virtual machine.



Containers vs. VMs

Containers are isolated, but share OS and, where appropriate, bins/libraries

Docker's Architecture

Core

- The Docker client → user communication with docker daemon
- The Docker daemon → Docker engine runs on a host machine

Workflow

- Docker images.
- Docker containers.
- Docker registries.
- Dockerfile

docker

Docker Benefits

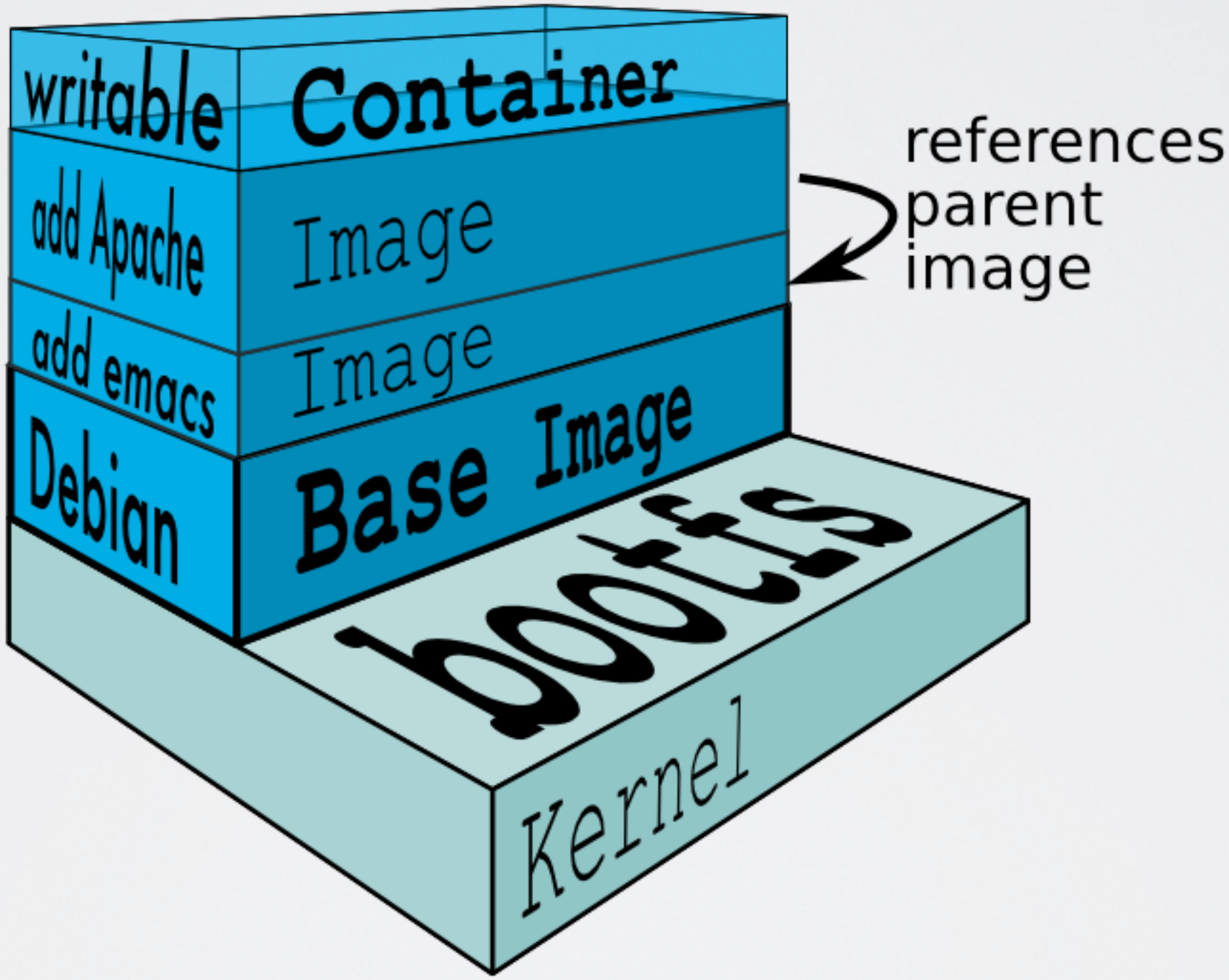
☑ Scalability

☑ Portability

☑ Development

☑ Density

Container



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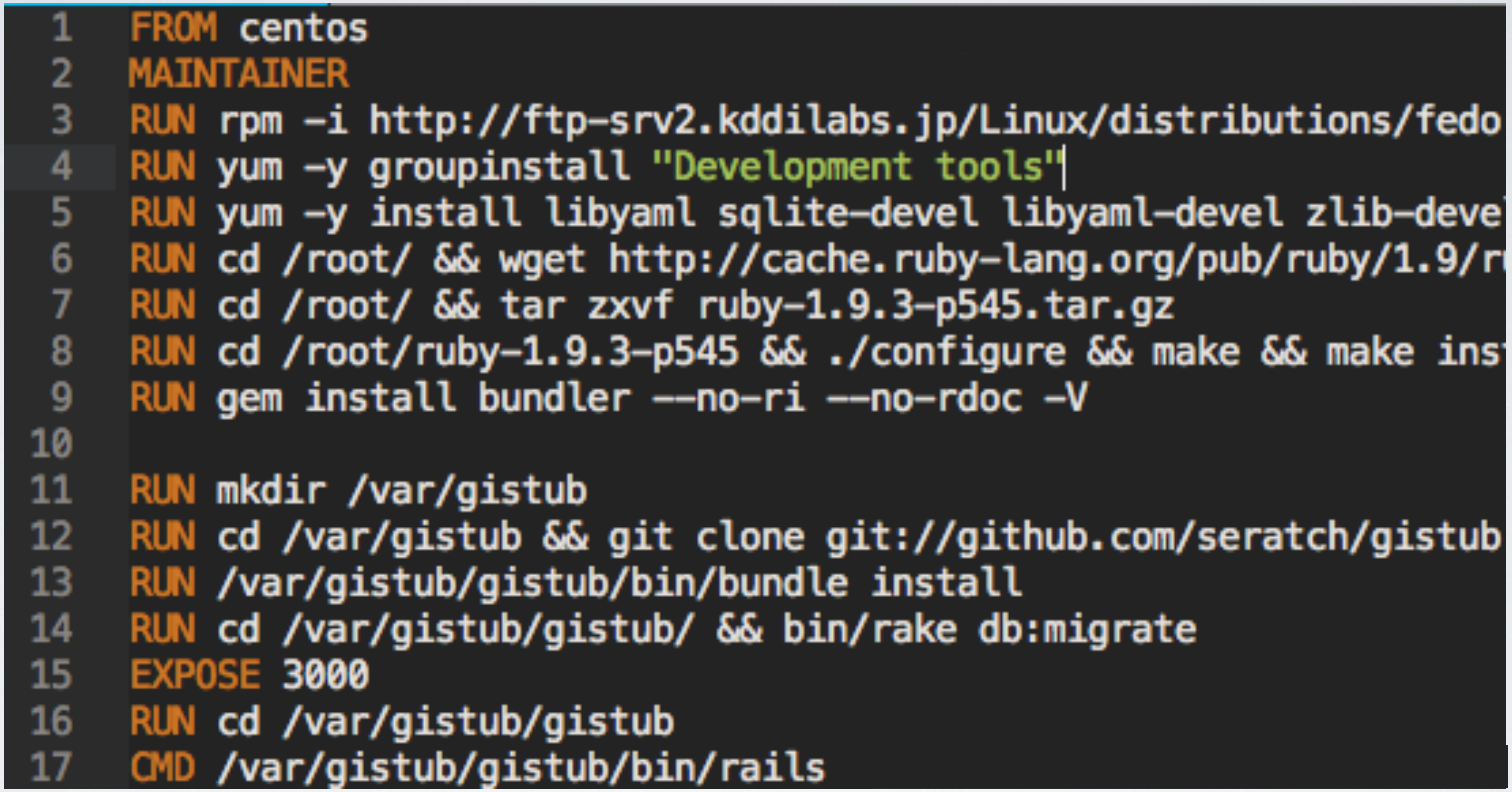
Dockerfile



```
FROM centos
MAINTAINER
RUN rpm -i http://ftp-srv2.kddilabs.jp/Linux/distributions/fedo
RUN yum -y groupinstall "Development tools"
RUN yum -y install libyaml sqlite-devel libyaml-devel zlib-deve
RUN cd /root/ && wget http://cache.ruby-lang.org/pub/ruby/1.9/r
RUN cd /root/ && tar zxvf ruby-1.9.3-p545.tar.gz
RUN cd /root/ruby-1.9.3-p545 && ./configure && make && make ins
RUN gem install bundler --no-ri --no-rdoc -V

RUN mkdir /var/gistub
RUN cd /var/gistub && git clone git://github.com/seratch/gistub
RUN /var/gistub/gistub/bin/bundle install
RUN cd /var/gistub/gistub/ && bin/rake db:migrate
EXPOSE 3000
RUN cd /var/gistub/gistub
CMD /var/gistub/gistub/bin/rails
```

Docker Hub

Registry

A cloud-based registry service responsible for hosting and distributing images → Docker Hub.

Repository

A collection of related images.

Tag

An alphanumeric identifier attached to images within a repository (e.g., 14.04 or stable).

provides :

- Image Repositories
- Automated Builds
- Webhooks
- Organizations
- GitHub and Bitbucket Integration

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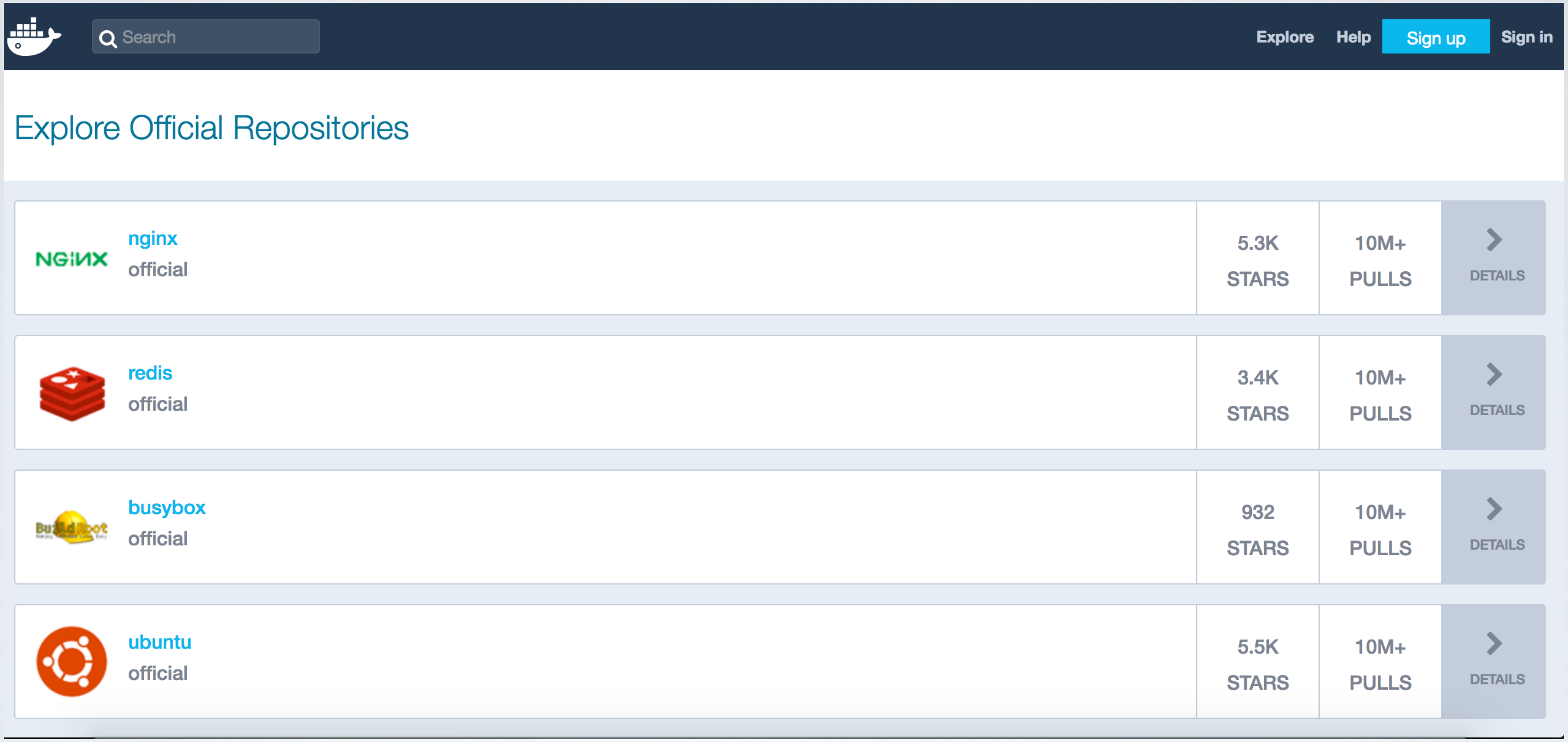
Docker Hub



Explore Official Repositories

nginx official	5.3K STARS	10M+ PULLS	DETAILS
redis official	3.4K STARS	10M+ PULLS	DETAILS
busybox official	932 STARS	10M+ PULLS	DETAILS
ubuntu official	5.5K STARS	10M+ PULLS	DETAILS

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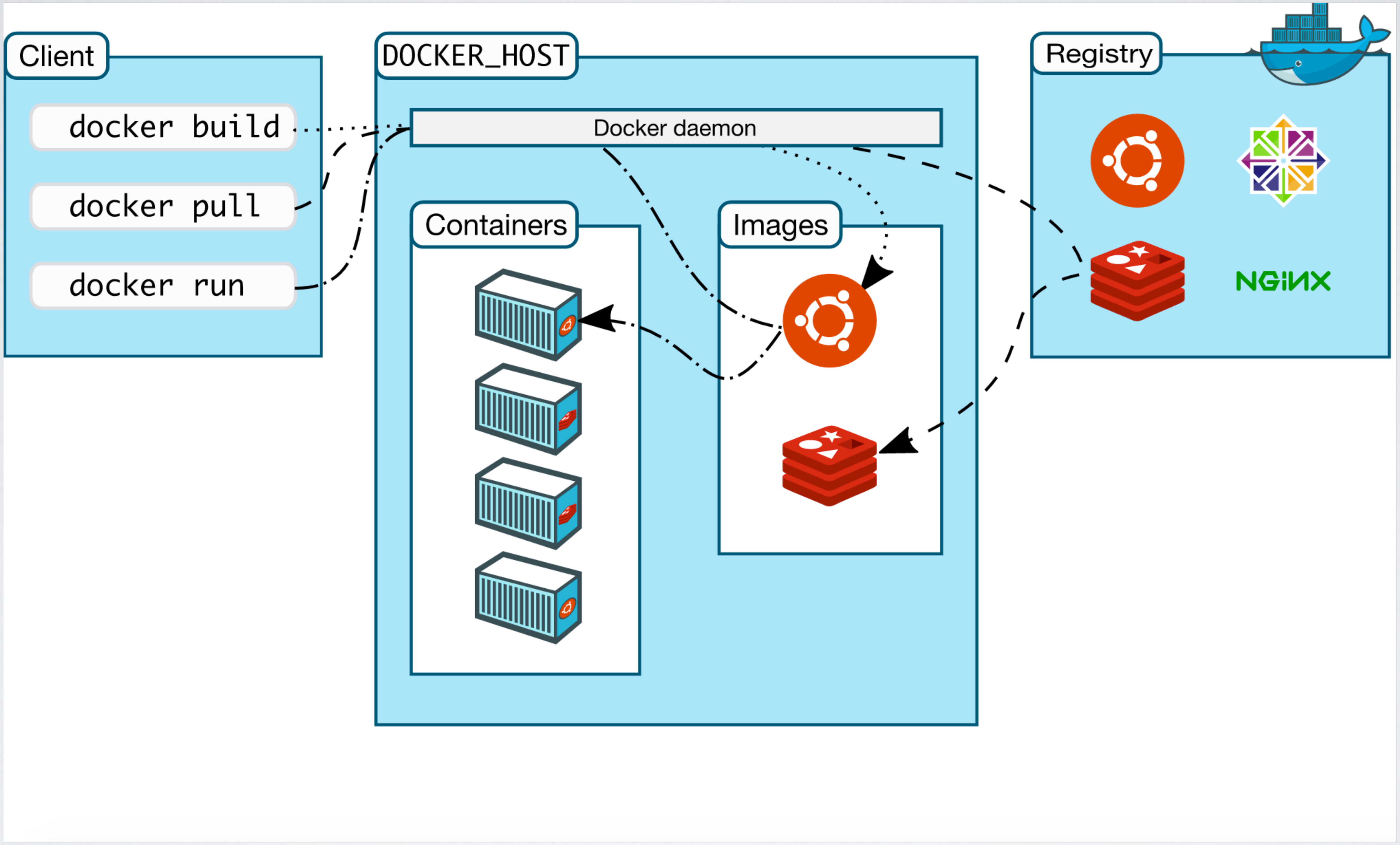
Docker Overview



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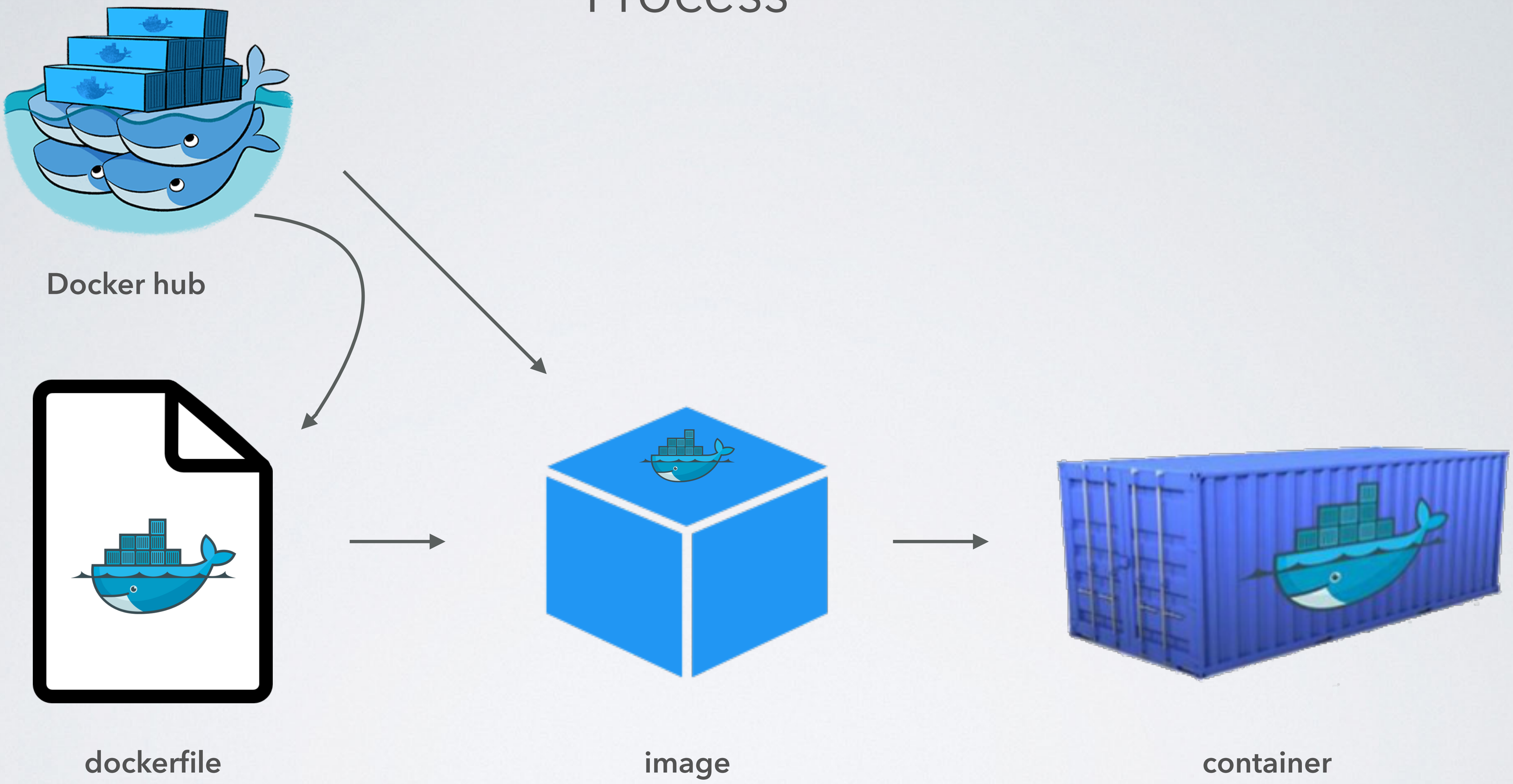
Process



Docker hub

dockerfile

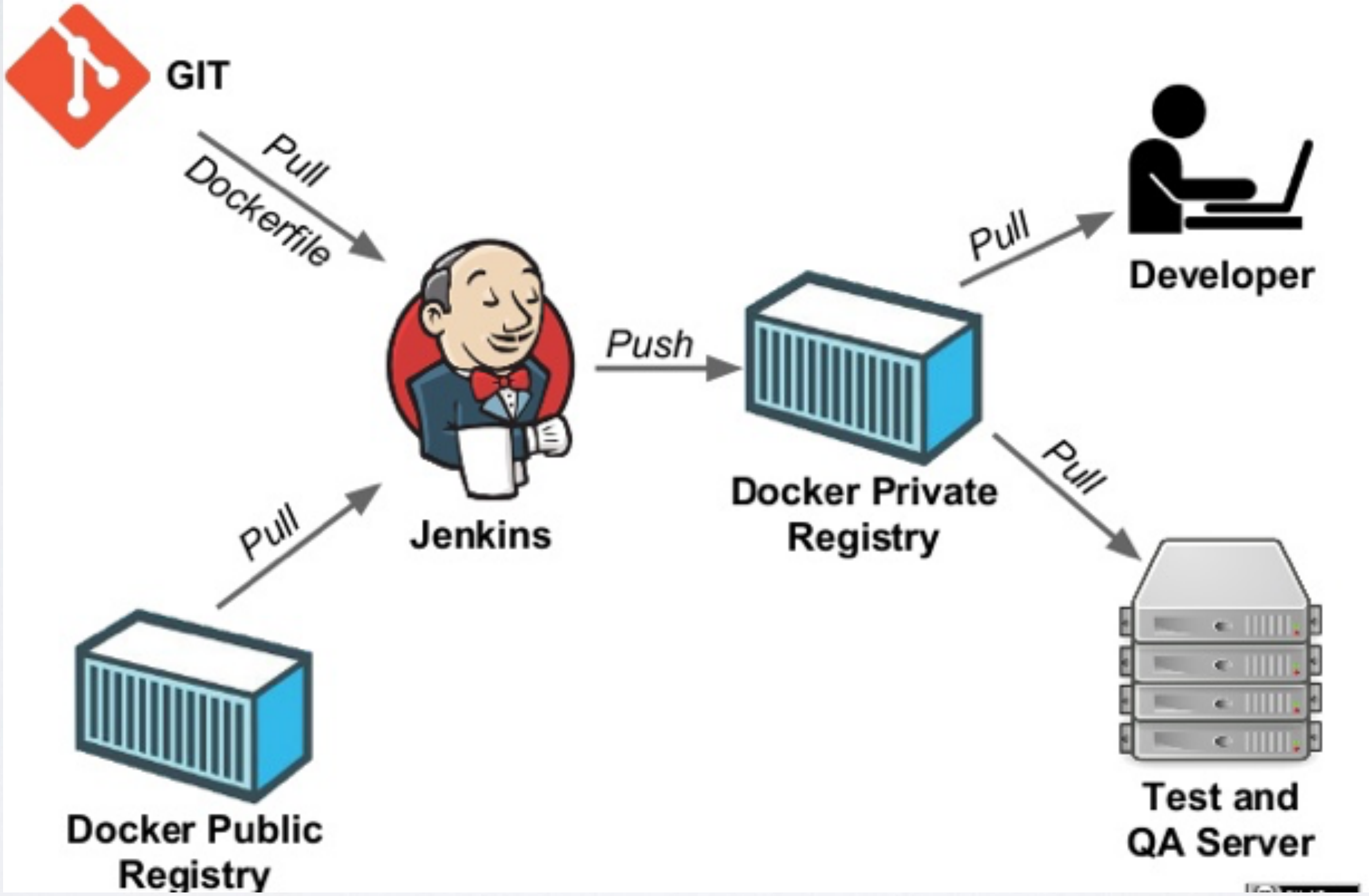
image

container

Who is Docker for?

- Developers
- System Administrators
- DevOps

Continuous Delivery



Support and Integration

Operating systems :	Any distribution with a 2.6.32+ kernel
OpenStack :	NOVA ,Glance, Horizon,Havana
Private PaaS :	OpenShift, Solum (Rackspace, OpenStack)
Public PaaS :	Deis, Voxoz, Cocaine (Yandex), Baidu PaaS
Public IaaS :	Native support in Rackspace, Digital Ocean, AMI,AWS
DevOps Tools :	Chef, Puppet, Jenkins, Travis, Salt, Ansible
Orchestration tools :	Mesos, Heat, Shipyard & others purpose built for Docker

Docker in Production

Paxata	PayPal	rightmove	SA Home Loans
sage	shopify	swisscom	JGI JOINT GENOME INSTITUTE DEPARTMENT OF ENERGY
The Washington Post	UBER	SCHIBSTED MEDIA GROUP	Yandex

splunk>	amadeus	lyft	VARIAN medical systems
ebay	EURECOM Sophia Antipolis	Expedia	FAIRFLY
GE Appliances	GILT	GROUPON	grubHub happy eating

doubledutch	badoo	BBC NEWS	bleacher report
SKA SKA AFRICA SQUARE KILOMETRE ARRAY	B	BUSINESS INSIDER	Spotify
yelp	CORNELL UNIVERSITY FOUNDED A.D. 1865	DASSAULT SYSTEMES	ADP

healthdirect	illumina	INDIANA UNIVERSITY	ING
intuit	MetLife	ModCloth	Nerdalize
New Relic.	The New York Times	ORBITZ	OXFORD UNIVERSITY PRESS

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Want to Learn More?

- www.docker.io
  - → Documentation
  - → Getting started (tutorial, installation, guide, etc)
  - → Introductory whitepaper
- Github: dotcloud/docker
- IRC: freenode #docker
- Google Group: docker-user
- Twitter: @docker
- Meetups: www.docker.io/meetups
- dockercon 2017

Demo

GitHub https://github.com/Silot

pull the image

```
docker pull nginx:1.10.1-alpine
```

Running your first container

```
docker run --name my-nginx -p 80:80 nginx:1.10.1-alpine
```

Check http://localhost **now the server is up**

list for runtime containers

```
docker ps
```

stop the container

```
docker stop my-nginx
```

start the container

```
docker start my-nginx to
```

remove the container

```
docker rm my-nginx
```

docker

Demo

See the logs

```
docker logs my-nginx
```

Leave logs open in terminal

```
docker logs -f my-nginx
```

Executing commands in a running container

```
docker exec -ti my-nginx /bin/sh
```

Mount code file and run

```
docker run -name my-nginx -d -p 80:80
-v /Users/theUserName/Development/docker/src:/usr/share/nginx/html:ro nginx:1.10.1-alpine
```

Create dockerfile

```
touch dockerfile
```

Open file and write

```
FROM nginx:1.10.1-alpine
MAINTAINER me@example.com
COPY ./index.html  /etc/nginx/index.html
```

Build the image

```
docker build -t zip-nginx:1.0
```

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END

GitHub	https://github.com/Silot
in	https://www.linkedin.com/in/apostolosnamlis
Meetup	https://www.meetup.com/Serrai-Software-Development-Meetup
docker	https://www.docker.com
#	@tolis

Thank You

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