

Laravel, Docker, Kubernetes



Local development and deployment

Welkom

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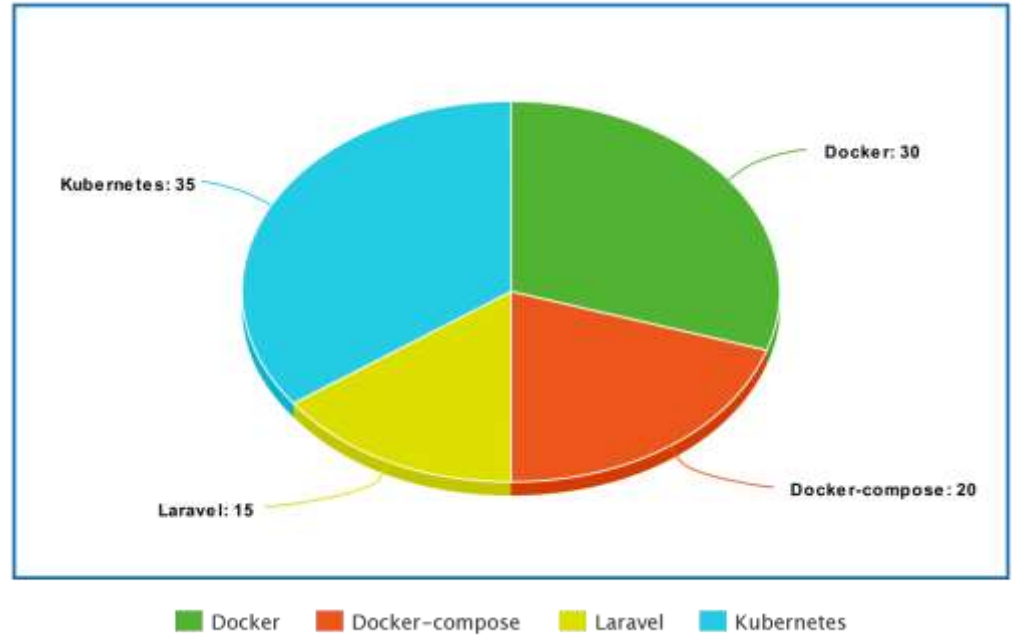
Subjects

Containers

Docker

Docker-compose

Kubernetes



meta-chart.com

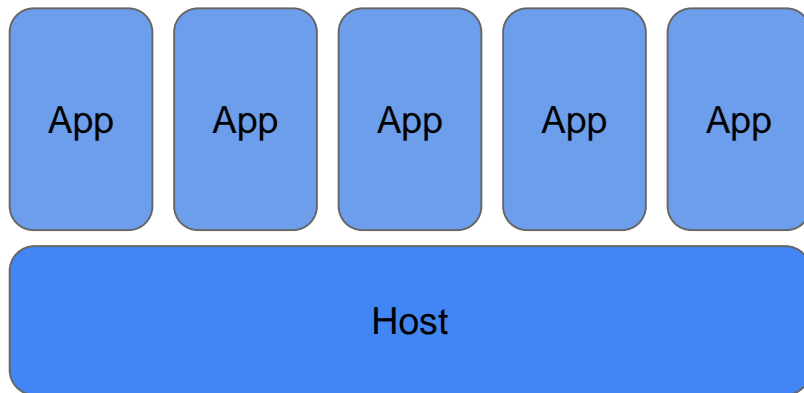
On each subject a will link back to Laravel

A step back, containers

1930-39	McLean	Concept for Containers
1955	Clifford J. Rogers	First containership is build
1966	Rotterdam	First container is load of the SS
Fairbanks		
1979	Unix v7	Introduction of chroot
2000	FreeBSD	Introduction of Jails
2001	Linux	Linux VServer, seperation of
resources		
2008	LXC	Introduction of
LinuXContainers		
2013	Docker	Introduction of Docker
2017	Kubernetes	Kubernetes is matured is open

Goal

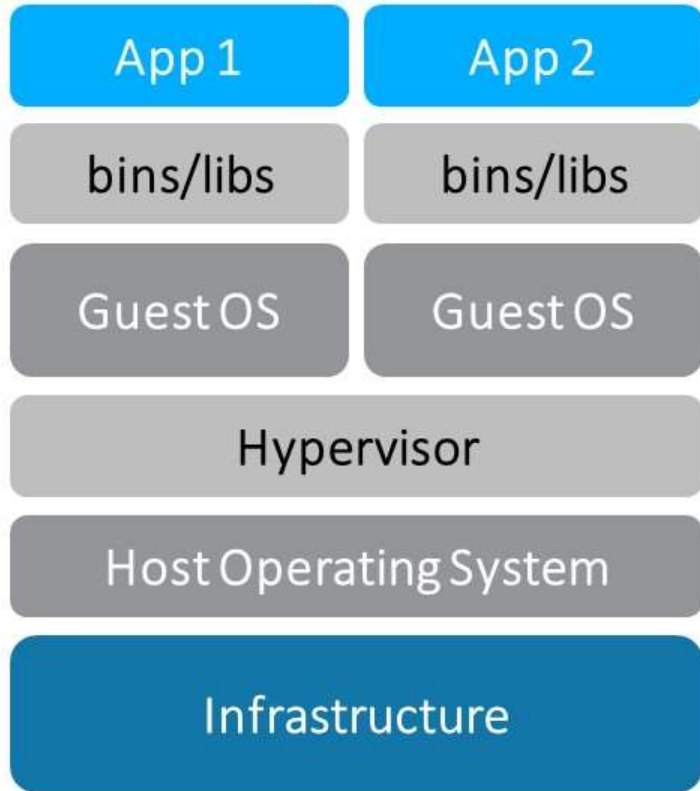
Flexibility in all layers of the deployment stack



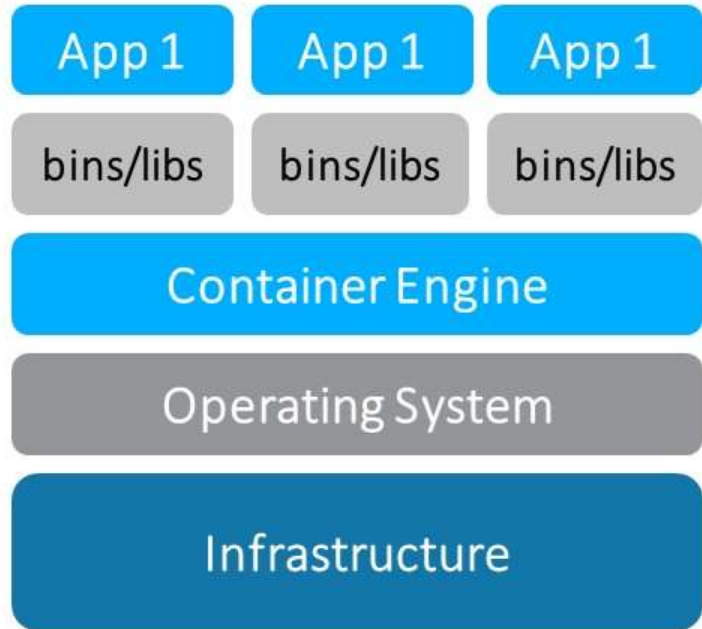
Docker

What is a container

Linux containers, contain applications in a way that keep them isolated from the host system that they run on.



Virtual Machines



Containers

Great! Lets build one

Let me explain the basic concepts

- Daemon
- Dockerfile

Dockerfile

```
FROM busybox:1.30
```

```
RUN mkdir test
```

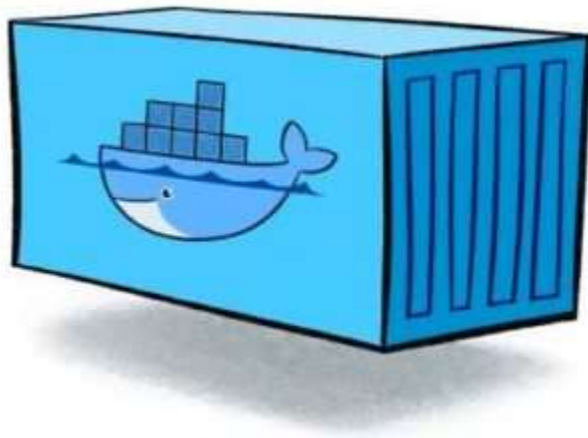
```
WORKDIR test
```

```
RUN echo 'Hello World' > hello.txt
```

```
#EXPOSE 80
```

```
#COPY . /src
```

```
CMD ["cat", "hello.txt"]
```



We can now bundle our application in to a container!

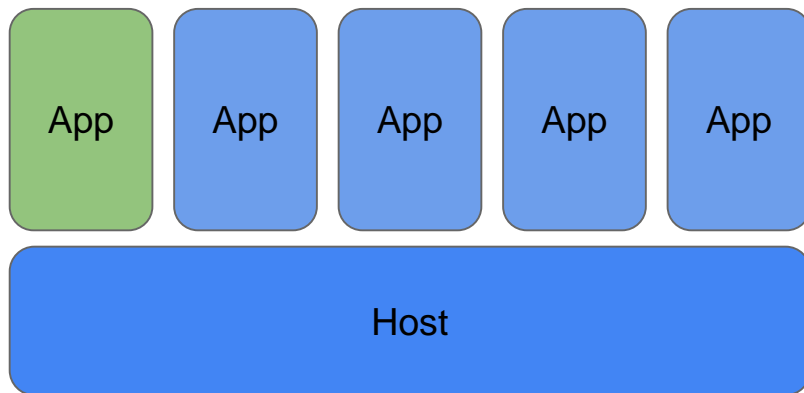
How is this used for Laravel

- PHP
- Nginx or Apache
- Database
- Cache

Bundle your application into a package

What does this look like for laravel

Goal



Docker compose

Next goal?

We want to use multiple apps at the same time and let them interact with each other.

Split up services into useful containers.

Don't reinvent the wheel all over again.

Docker registry



Docker-compose

Spinning all containers up by hand in CLI is quite tedious.
Docker compose can help you orchestrate this better.

```
docker run --name mysql -p 3306:3306 -d mysql
docker run --name php-fpm -p 9000:9000 -d php-fpm --link mysql:mysql
docker run --name docker-nginx -p 80:80 -d nginx --link php-fpm:php-fpm
tired of typing .....
```

** --link is deprecated,

How is used with Laravel?

- Spin up services you need for you current project
- Share a development environment
- Don't worry about running on which platform
- Make sure your production and dev environment are the same



docker-compose.yml

The config file of weaving containers together

example

Local development tips

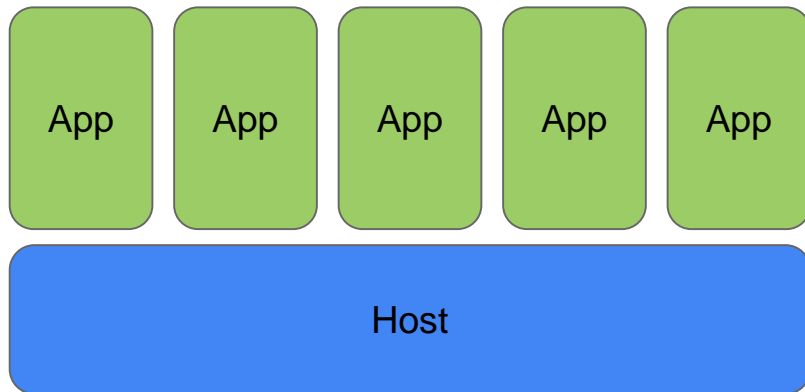
- Connecting to containers
- Running artisan commands
- File permissions

Final notes on docker compose

Don't use this in production!

Docker-compose is getting out of fashion in favor a local k8s cluster

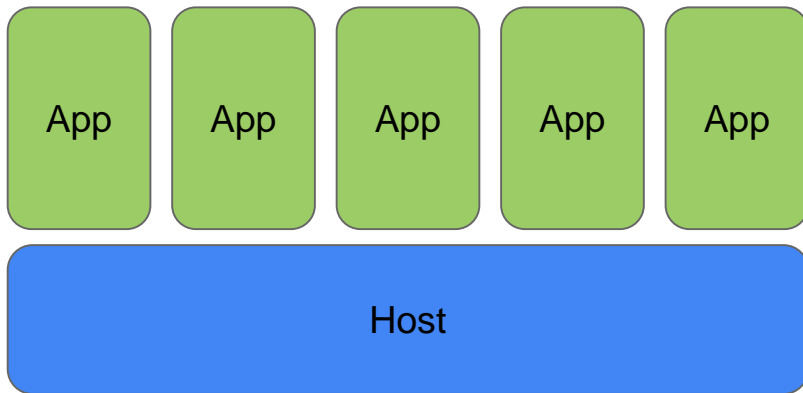
Goal



Kubernetes

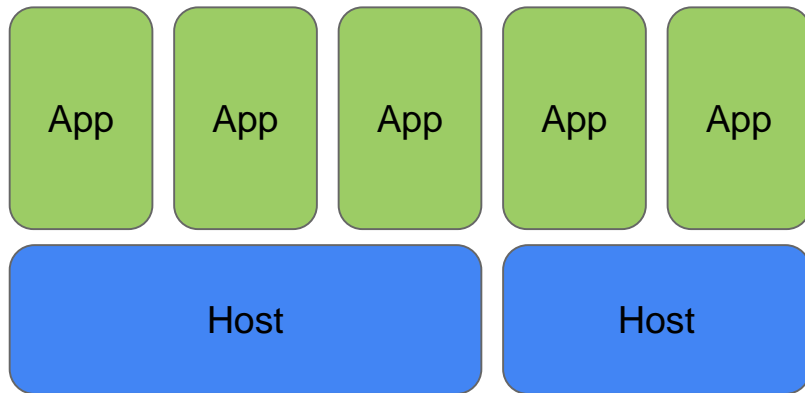
Last goal

Our resources are limited and we can't run all apps on one machine. So we need to distribute our host.



Last goal

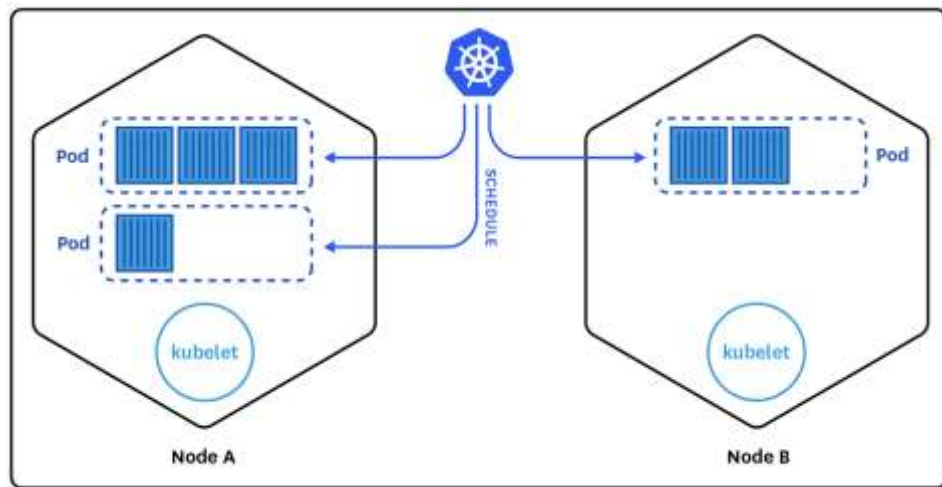
Our resources are limited and we can't run all apps on one machine. So we need to distribute our host.



What is kubernetes

“Kubernetes is a portable, extensible open-source platform for managing containerized workloads and services, that facilitates both declarative configuration and automation”

Nodes



CLUSTER

Concept in k8s

Pods - Run 1 or more containers

Deployment - Keeps pods running

Services - Used for networking inside a cluster

ConfigMap - Used for storing environment variables

Secret - Used for storing secret data (i.e. oauth-keys)

PersistentVolumeClaim - Used to allocate storage

and a lot more....

Declarative - a yaml file

```
apiVersion: v1
kind: Pod
metadata:
  name: nginx
  labels:
    name: nginx
spec:
  containers:
  - name: nginx
    image: nginx
    ports:
      - containerPort: 80
    volumeMounts:
      - mountPath: "/etc/nginx/"
        name: "nginx-conf"
  volumes:
  - name: "nginx-conf"
    secret:
      secretName: "nginx.conf"
```

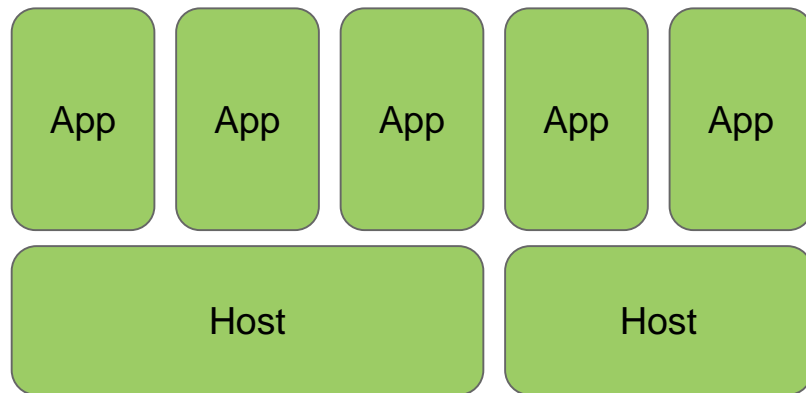
Let me show you

Spin up the application

- Nginx
- PHP-fpm
- Service

One thing to consider don't use local storage inside your application

Goal



Dedicated vs cloud clusters

- Networking and load balancing is easy in the cloud but hard in a dedicated cluster
- Storage requires extensive infrastructure (i.e. a Ceph cluster)
- Control your own hardware (add a gpu for example)
- GDPR
- Cost
- Hybrid solutions

Lets have some fun!

- Load Balancer - Main used in cloud providers to get external ip's
- Replication load - Scale up you deployment to accomodate more
- Autoscalers - Let the cluster decide when to scale up!
- Automation

Questions?

More

Helmsmen.io Rapide/Osso

- Managed dedicated clusters
- Managed cloud clusters
- Consult
- CI
- Training



Resources

I don't want to write all containers

<http://laradock.io/>

I don't know where to get started on putting my Laravel app in K8s

<https://github.com/markhilton/larakube>

Local cluster for development

<https://microk8s.io/>

Local cluster for development

<https://kubernetes.io/docs/setup/minikube/>