

# VIRTUALIZACIÓN BASADA EN CONTAINERS CON DOCKER

Seminario de Desarrollo de Software - Casa Central

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MOTIVACIÓN



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django web frontend	?	?	?	?	?	?
node.js async API	?	?	?	?	?	?
background workers	?	?	?	?	?	?
SQL database	?	?	?	?	?	?
distributed DB, big data	?	?	?	?	?	?
message queue	?	?	?	?	?	?
	my laptop	your laptop	QA	staging	prod on cloud VM	prod on bare metal

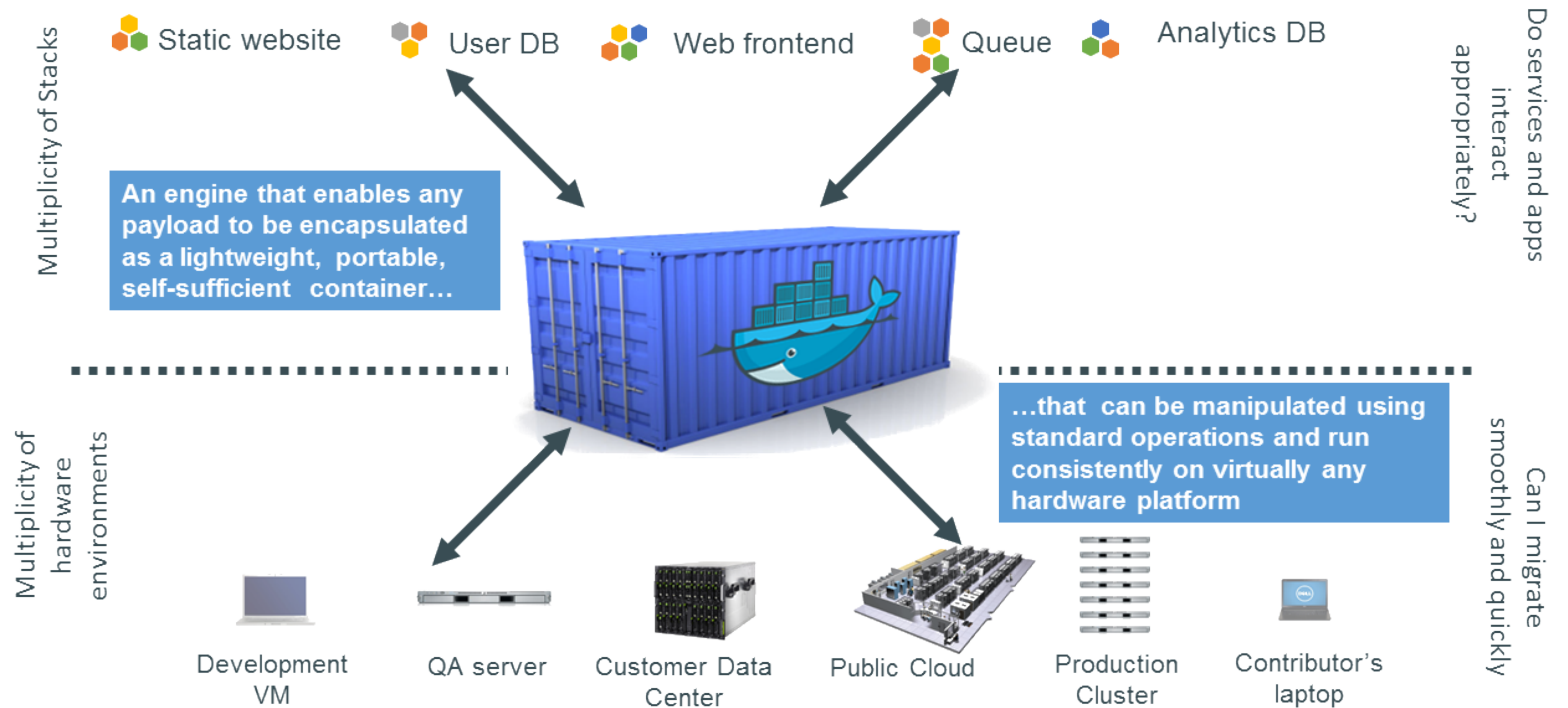


	Static website							
	Web frontend							
	Background workers							
	User DB							
	Analytics DB							
	Queue							
		Development VM	QA Server	Single Prod Server	Onsite Cluster	Public Cloud	Contributor's laptop	Customer Servers



Source: docker.com





# Docker

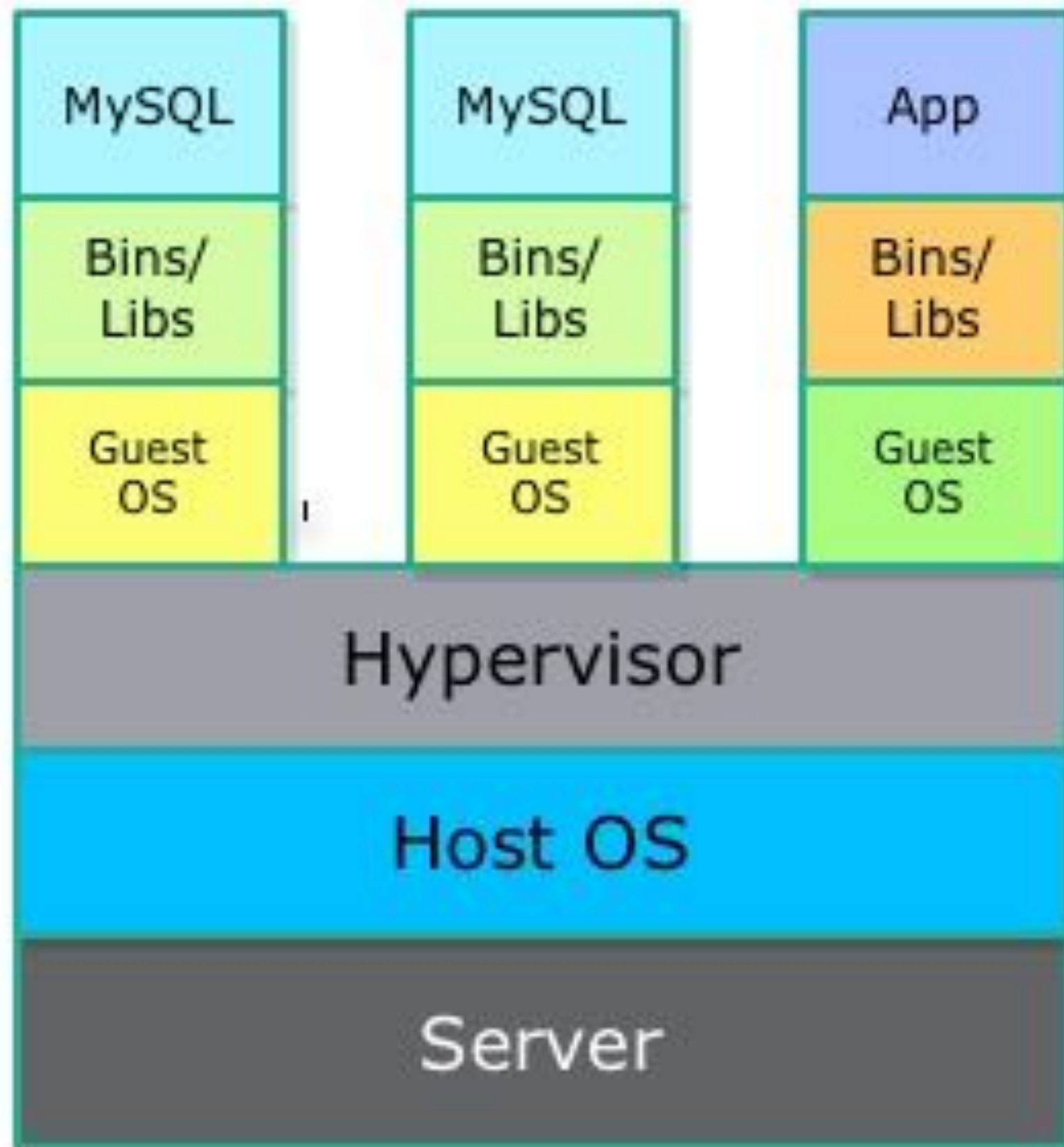
- Docker es un proyecto open-source
- Utiliza la tecnología de los containers
- Para “construir, migrar y correr aplicaciones distribuidas”



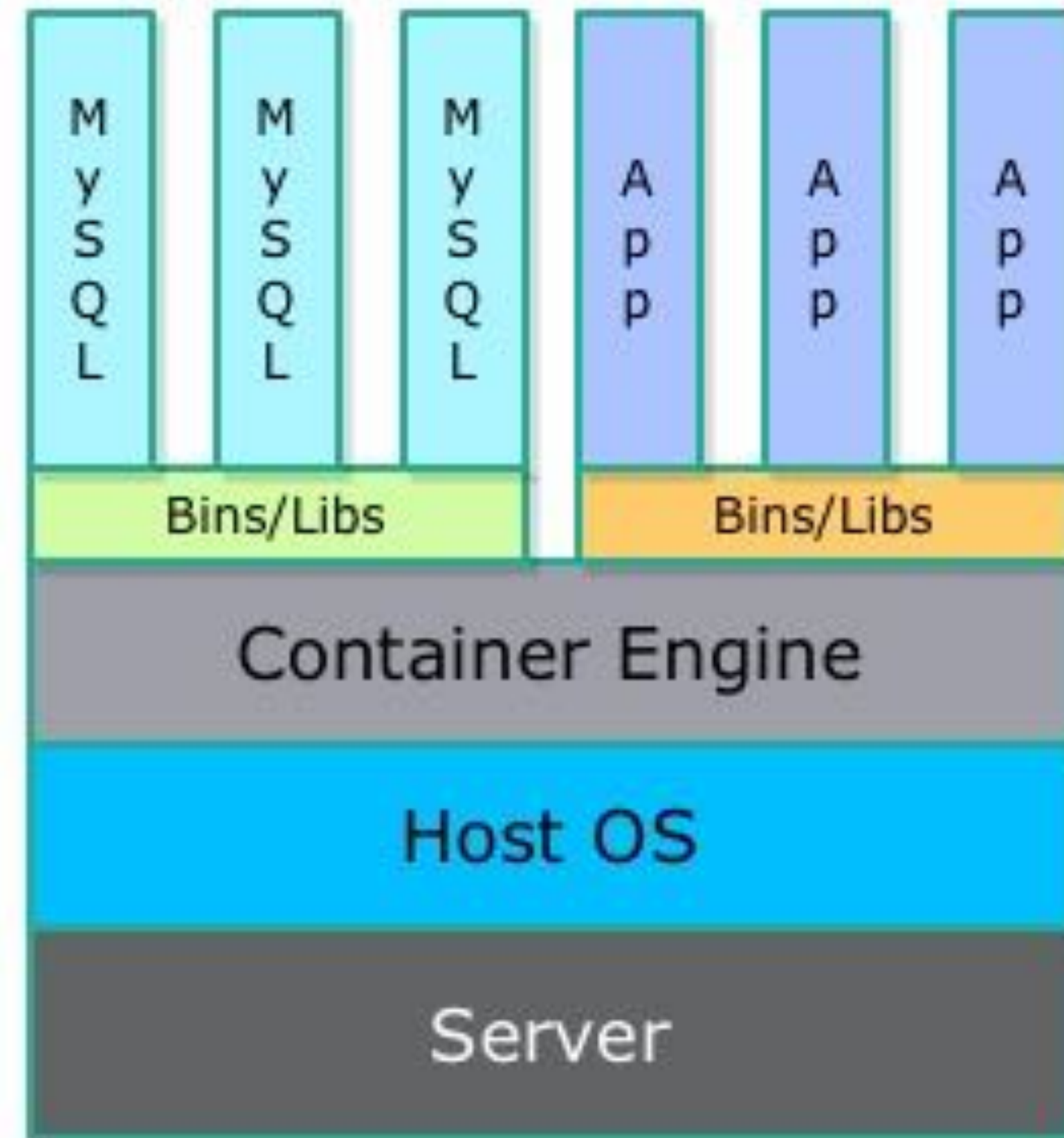
# ¿Qué son los containers?

- Desde lejos, **parecen** ser como VM.
- Puedo instalar aplicaciones,
- Red, filesystem, etc.
- Pero son **ambientes virtuales livianos**, rápidos de iniciar (boot en ms), fácil de migrar, reproducibles y aislados.

## Virtual Machines



## Containers



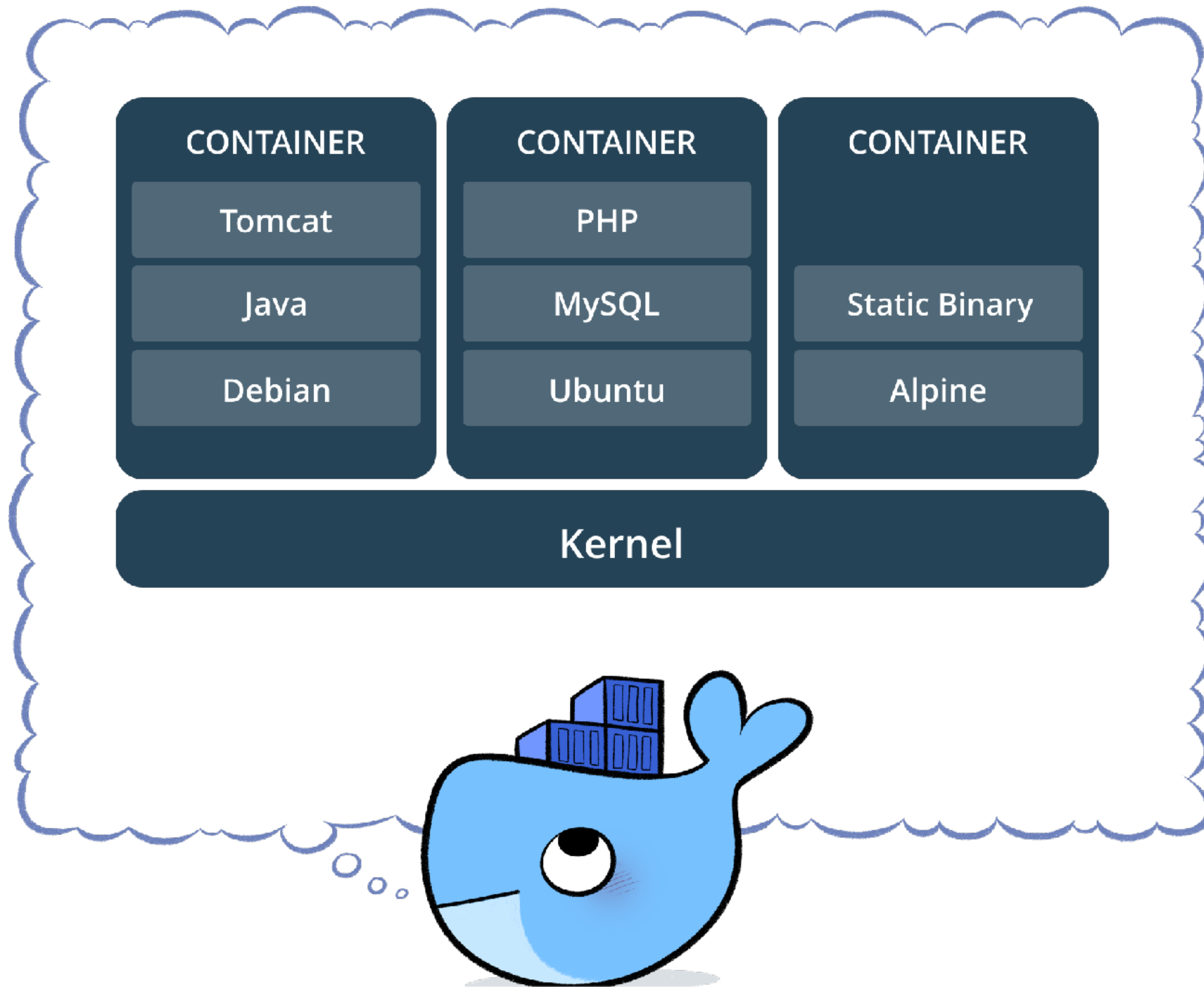
¿QUÉ NECESITO PARA  
CONSTRUIR UNA VM?

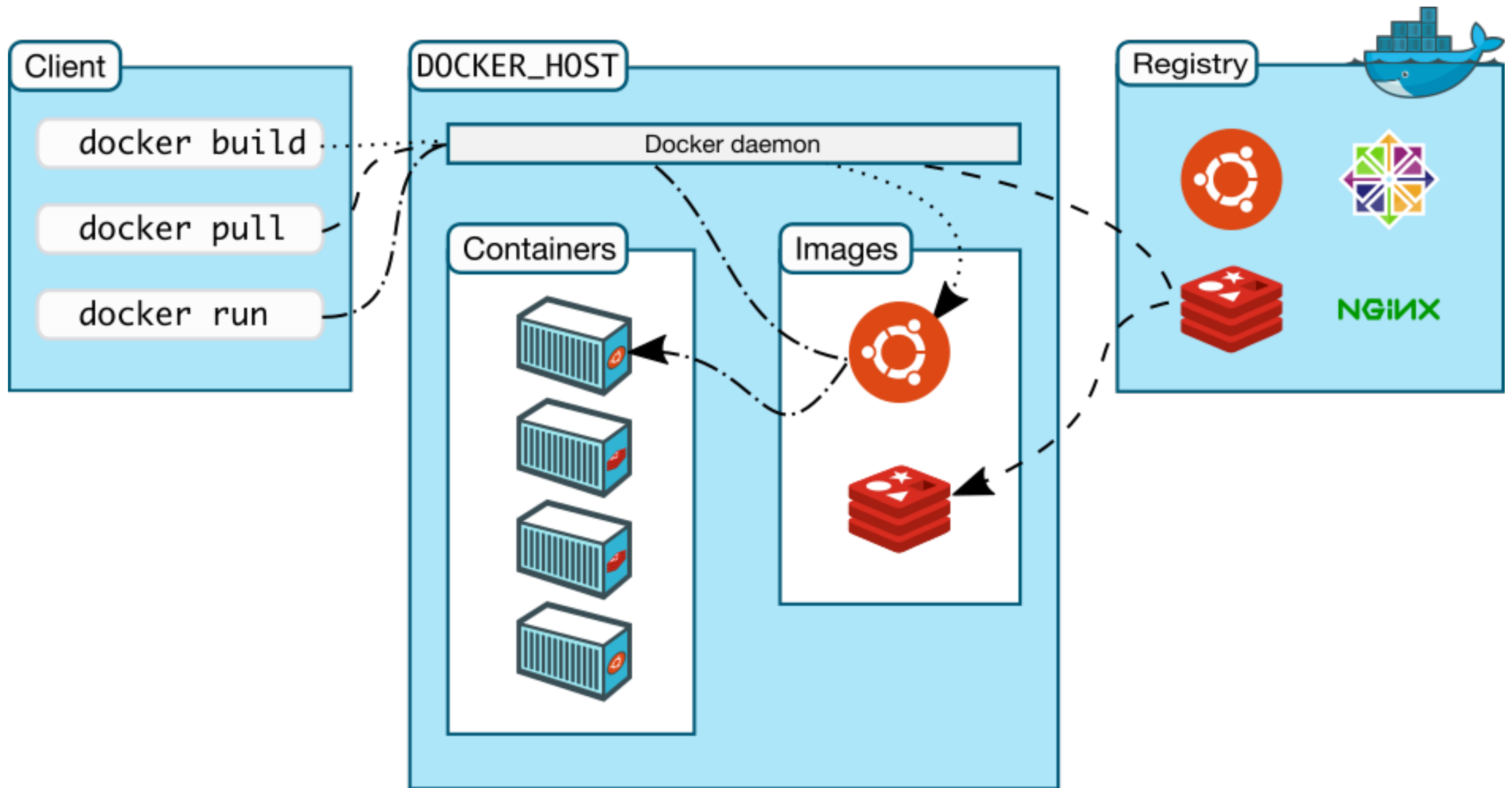
¿QUÉ NECESITO PARA  
CONSTRUIR UN CONTAINER?



# Las imágenes en Docker

- Template **read-only** se obtienen
  - **Repositorio** público o privado
  - Construidas por **Dockerfile**
- Son usadas para construir Docker Containers.  
Los cambios realizados se hacen a través de capas.





```
FROM dockerfile/ubuntu
MAINTAINER Maximiliano Osorio
```

```
# Install Nginx.
```

```
RUN \
    add-apt-repository -y ppa:nginx/stable && \
    apt-get update && \
    apt-get install -y nginx && \
    rm -rf /var/lib/apt/lists/* && \
    echo "\ndaemon off;" >> /etc/nginx/nginx.conf && \
    chown -R www-data:www-data /var/lib/nginx
```

```
# Define mountable directories.
```

```
VOLUME ["/etc/nginx/sites-enabled", "/etc/nginx/certs", "/etc/nginx/conf.d", "/var/log/nginx", "/var/www/html"]
```

```
# Define working directory.
```

```
WORKDIR /etc/nginx
```

```
# Define default command.
```

```
CMD ["nginx"]
```

```
# Expose ports.
```







```
EXPOSE 80
```

```
EXPOSE 443
```



## Repositories (24924)

All

	<b>nginx</b> official	7.3K STARS	10M+ PULLS	<a href="#">&gt;</a> DETAILS
	<b>jwilder/nginx-proxy</b> public   automated build	1.2K STARS	10M+ PULLS	<a href="#">&gt;</a> DETAILS
	<b>jrcs/letsencrypt-nginx-proxy-companion</b> public   automated build	251 STARS	10M+ PULLS	<a href="#">&gt;</a> DETAILS
	<b>richarvey/nginx-php-fpm</b> public   automated build	473 STARS	1M+ PULLS	<a href="#">&gt;</a> DETAILS
	<b>nginxdemos/nginx-ingress</b> public	7 STARS	1M+ PULLS	<a href="#">&gt;</a> DETAILS
	<b>bitnami/nginx</b> public   automated build	39 STARS	500K+ PULLS	<a href="#">&gt;</a> DETAILS



nginx  
official

7.3K  
STARS

10M+  
PULLS

>  
DETAILS



Last pushed: 5 days ago

Short Description

Official build of Nginx.

Docker Pull Command



```
docker pull nginx
```

Full Description

Supported tags and respective `Dockerfile` links

- `1.13.6`, `mainline`, `1`, `1.13`, `latest` ([mainline/stretch/Dockerfile](#))
- `1.13.6-perl`, `mainline-perl`, `1-perl`, `1.13-perl`, `perl` ([mainline/stretch-perl/Dockerfile](#))
- `1.13.6-alpine`, `mainline-alpine`, `1-alpine`, `1.13-alpine`, `alpine`  
([mainline/alpine/Dockerfile](#))
- `1.13.6-alpine-perl`, `mainline-alpine-perl`, `1-alpine-perl`, `1.13-alpine-perl`,  
`alpine-perl` ([mainline/alpine-perl/Dockerfile](#))
- `1.12.2`, `stable`, `1.12` ([stable/stretch/Dockerfile](#))
- `1.12.2-perl`, `stable-perl`, `1.12-perl` ([stable/stretch-perl/Dockerfile](#))
- `1.12.2-alpine`, `stable-alpine`, `1.12-alpine` ([stable/alpine/Dockerfile](#))
- `1.12.2-alpine-perl`, `stable-alpine-perl`, `1.12-alpine-perl` ([stable/alpine-perl/Dockerfile](#))



Last pushed: 5 days ago

Short Description

Official build

Full Description

Supported

- 1.13.6 , mainline , 1 , 1.13 , latest ([mainline/stretch/Dockerfile](#))
- 1.13.6-perl , mainline-perl , 1-perl , 1.13-perl , perl ([mainline/stretch-perl/Dockerfile](#))
- 1.13.6-alpine , mainline-alpine , 1-alpine , 1.13-alpine , alpine ([mainline/alpine/Dockerfile](#))
- 1.13.6-alpine-perl , mainline-alpine-perl , 1-alpine-perl , 1.13-alpine-perl , alpine-perl ([mainline/alpine-perl/Dockerfile](#))
- 1.12.2 , stable , 1.12 ([stable/stretch/Dockerfile](#))
- 1.12.2-perl , stable-perl , 1.12-perl ([stable/stretch-perl/Dockerfile](#))
- 1.12.2-alpine , stable-alpine , 1.12-alpine ([stable/alpine/Dockerfile](#))
- 1.12.2-alpine-perl , stable-alpine-perl , 1.12-alpine-perl ([stable/alpine-perl/Dockerfile](#))

Docker Pull Command



Short Description

Official build of Nginx.



## Supported

- 1.13.6 , ma
- 1.13.6-perl
- 1.13.6-alp  
([mainline/alpine](#))
- 1.13.6-alp  
alpine-perl ([mainline/alpine-perl/Dockerfile](#))
- 1.12.2 , stable , 1.12 ([stable/stretch/Dockerfile](#))
- 1.12.2-perl , stable-perl , 1.12-perl ([stable/stretch-perl/Dockerfile](#))
- 1.12.2-alpine , stable-alpine , 1.12-alpine ([stable/alpine/Dockerfile](#))
- 1.12.2-alpine-perl , stable-alpine-perl , 1.12-alpine-perl ([stable/alpine-perl/Dockerfile](#))

## Full Description

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- 1.13.6-alpine , mainline-alpine , 1-alpine , 1.13-alpine , alpine  
([mainline/alpine/Dockerfile](#))
- 1.13.6-alpine-perl , mainline-alpine-perl , 1-alpine-perl , 1.13-alpine-perl ,  
alpine-perl ([mainline/alpine-perl/Dockerfile](#))
- 1.12.2 , stable , 1.12 ([stable/stretch/Dockerfile](#))
- 1.12.2-perl , stable-perl , 1.12-perl ([stable/stretch-perl/Dockerfile](#))
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## Short Description

Official build of Nginx.

## Full Description

## Supported tags and manifests

- `1.13.6`, `mainline`, `1.13.6-perl`, `mainline-perl`, `1-perl`, `1.13-perl`, `perl` ([mainline/stretch-perl/Dockerfile](#))
- `1.13.6-alpine`, `mainline-alpine`, `1-alpine`, `1.13-alpine`, `alpine` ([mainline/alpine/Dockerfile](#))
- `1.13.6-alpine-perl`, `mainline-alpine-perl`, `1-alpine-perl`, `1.13-alpine-perl`, `alpine-perl` ([mainline/alpine-perl/Dockerfile](#))
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## Docker Pull Command



## Docker Pull Command



```
docker pull nginx
```

## Ejemplo de nodejs

- Construir imagen:
  - `docker build -t mosorio/node-web-app .`
- Correr el container:
- <http://localhost:49160>

```
docker-compose run web django-admin.py startproject  
composeexample .
```