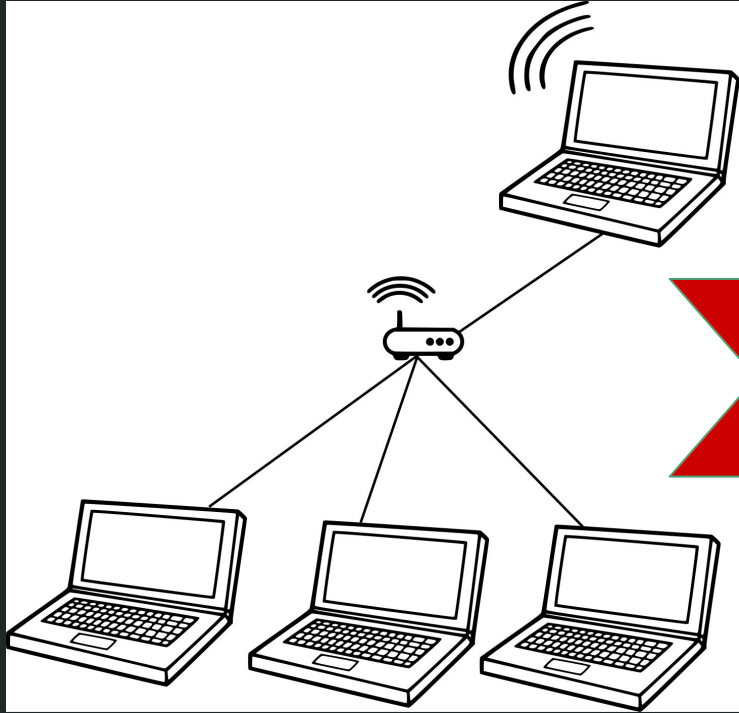


# Recreación de las prácticas de SWAP en equipos reales

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- Julián Cifuentes Jiménez
- José Álvaro Garrido López
- Alejandro Francisco Alguacil Camarero
- Alejandro Manuel do Nascimento Rodríguez

# INTRODUCCIÓN



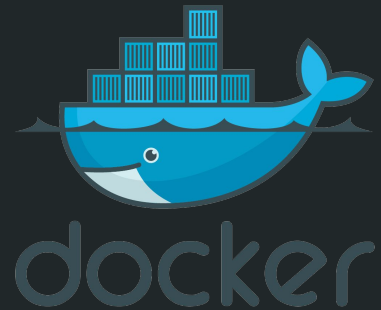
¿Qué es Docker?



docker

# Ventajas de Docker

- **Mejorar la productividad en el desarrollo de programas**
- **Estandarizar las operaciones de aplicaciones**



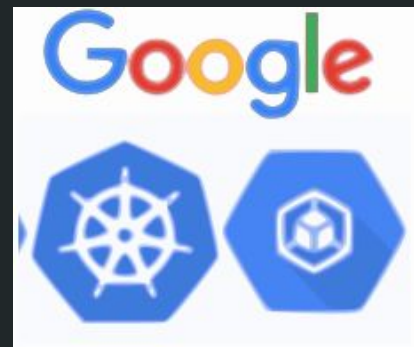
# Empresas que lo utilizan



**Hewlett Packard  
Enterprise**



*rackspace.*  
the open cloud company



**NETFLIX**



U B E R



**PayPal**



**Spotify**

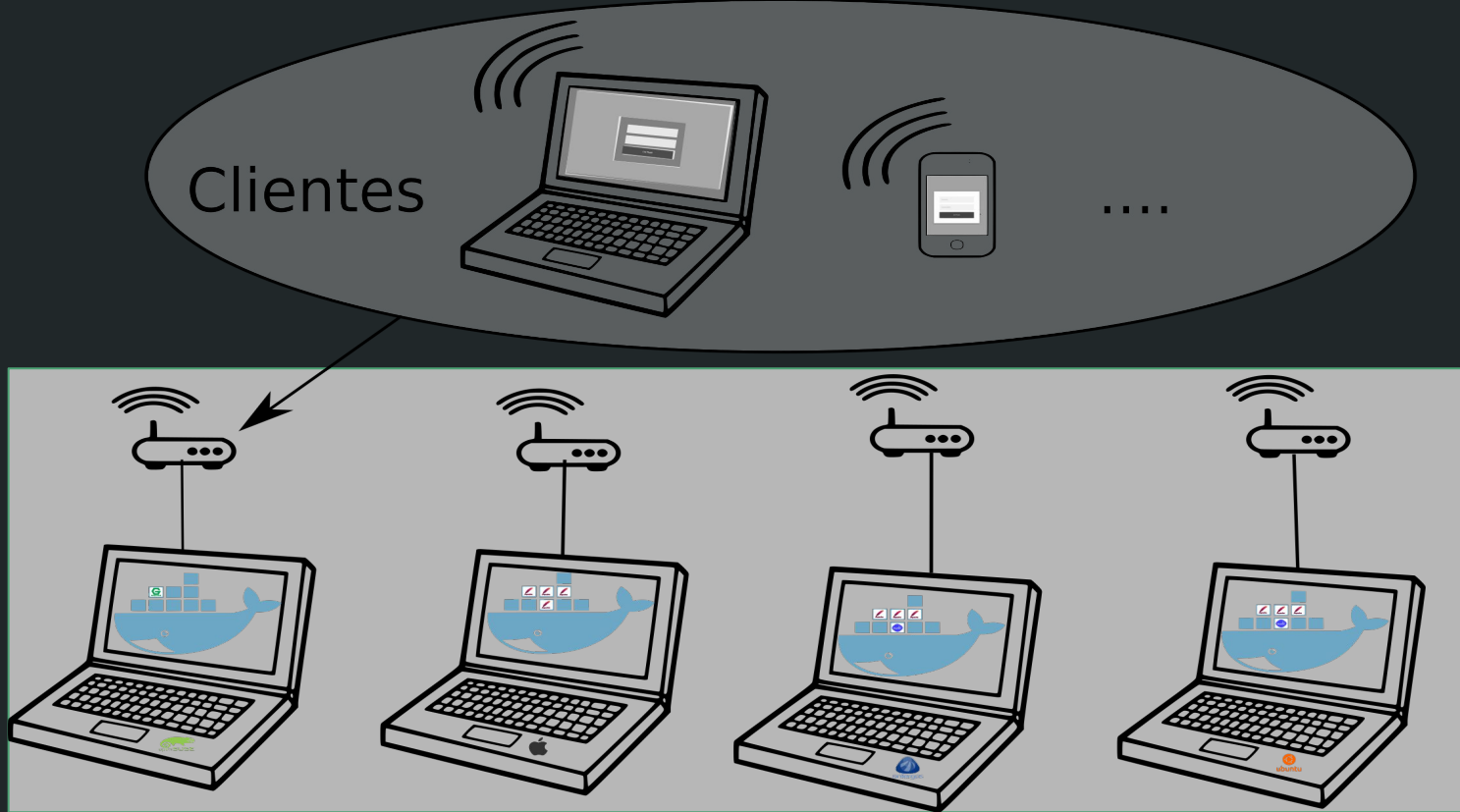
**ING**



# Empresas que lo utilizan



# Organización sistema general parte Hardware



# Detalles de configuración - Configuración DNS

no-ip

Dashboard

Dynamic DNS Free

Hostnames

Groups

Dynamic Update Client

Device Configuration Assistant

My Services

Account

Support Center

Upgrade to Enhanced

Support Use Old Site

Shopping

Search

Language

alvarospunk@hotmail.com

Hostnames

Groups

Device Configuration Assistant

Manage Hostnames

Search...

Hostname	IP / Target	Type	Expiration
alvarospunk.ddns.net <span>No Dynamic Update Detected</span>	188.127.171.96	A	Expires in 23 days
juliansito.ddns.net	79.145.169.91	A	Expires in 23 days
swap1617.ddns.net <span>No Dynamic Update Detected</span>	37.35.150.107	A	Expires in 29 days
donas11.hopto.org	88.20.75.88	A	Expires in 28 days
swap.sytes.net <span>No Dynamic Update Detected</span>	37.35.150.107	A	Expires in 28 days

Add Hostname

Service Level Free

Free Hostnames expire every 30 days. Enhanced Hostnames never expire. Upgrade to Enhanced

Hostname Count

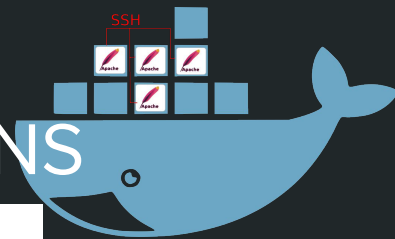
3 / 3

Buy More Hostnames

Feedback



# Detalles de configuración - configuración DNS




**ZTE**ZXHN H218N

**Status**  
**Network**  
**Security**  
**Application**  
VoIP  
DDNS  
DMZ Host  
UPnP  
UPnP Port Mapping  
Port Forwarding  
DNS Service  
QoS  
SNTP  
IGMP  
USB Storage  
DMS/DLNA  
FTP Application

Path:Application-DDNS

Logout



1.Service Name: dyndns  
no-ip

2.Custom Server: dyndns, for example, members.dyndns.org  
no-ip, for example, dynupdate.no-ip.com

3.Custom URL: dyndns, for example, /nic/update?  
no-ip, for example, /nic/update?

Enable ☐

WAN Connection 

WANConnection

Service Name 

no-ip

Custom Server 

dynupdate.no-ip.com

Custom URL 

/nic/update

Hostname 

swap1617.ddns.net

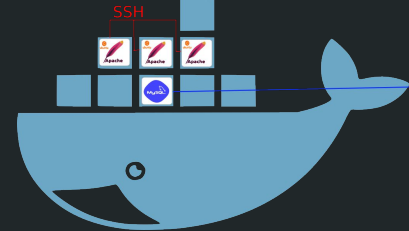
Provider Name 

alvarospunk@hotmail

Provider Password 

•••••

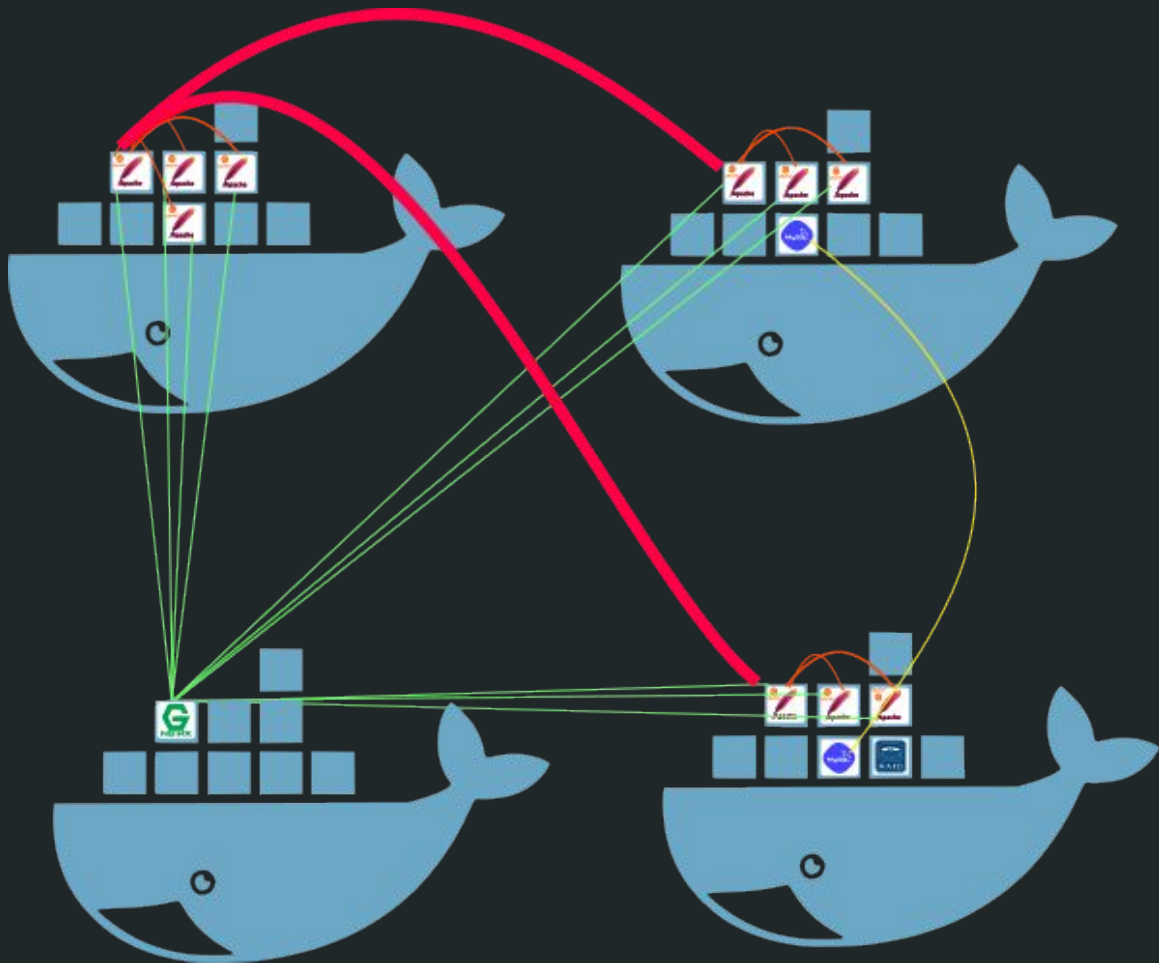
# Detalles de configuración - Abrir Puertos



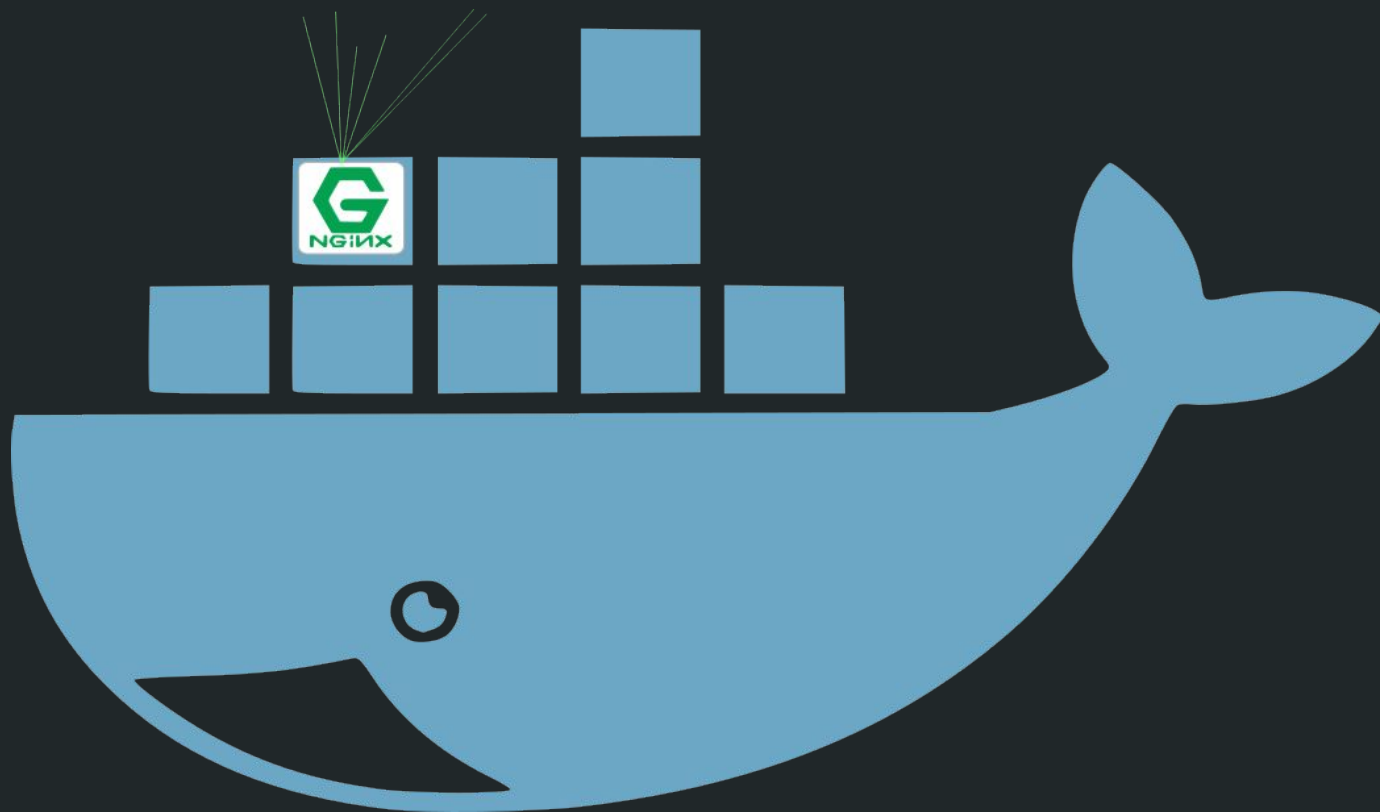
#	Active	Service Name	External Start Port	External End Port	Internal Start Port	Internal End Port	Server IP Address	Modify
1		ATHTTP	1111	1111	1111	1111	192.168.1.35	
2		SSHM1	1112	1112	1112	1112	192.168.1.35	
3		AThttps	1113	1113	1113	1113	192.168.1.35	
4		MySQL	1114	1114	1114	1114	192.168.1.35	

# Esquema general

- SSH (interno)
- SSH
- Balanceo
- MySQL



# Esquema específico





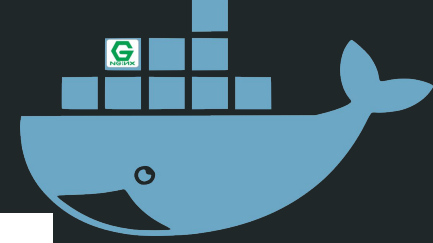
# Detalles de configuración -Balanceador

```
1. sudo docker run -d -p 80:80 -p 443:443 -p 10022:22 -i -t --name BalanceadorTrabajo nginx bash
2. upstream apaches {
3.     ip_hash;
4.     server alvarospunk.ddns.net:1217;
5.     server juliansito.ddns.net:1113;
6.     server juliansito.ddns.net:1117;
7.     server juliansito.ddns.net:1121;
8.     server donas11.hopto.org:1113;
9.     server donas11.hopto.org:1117;
10.    server donas11.hopto.org:1121;
11.    server juliansito.ddns.net:1125;
12. }
13. }
14. }
15.
16.
```



# Detalles de configuración -Balanceador

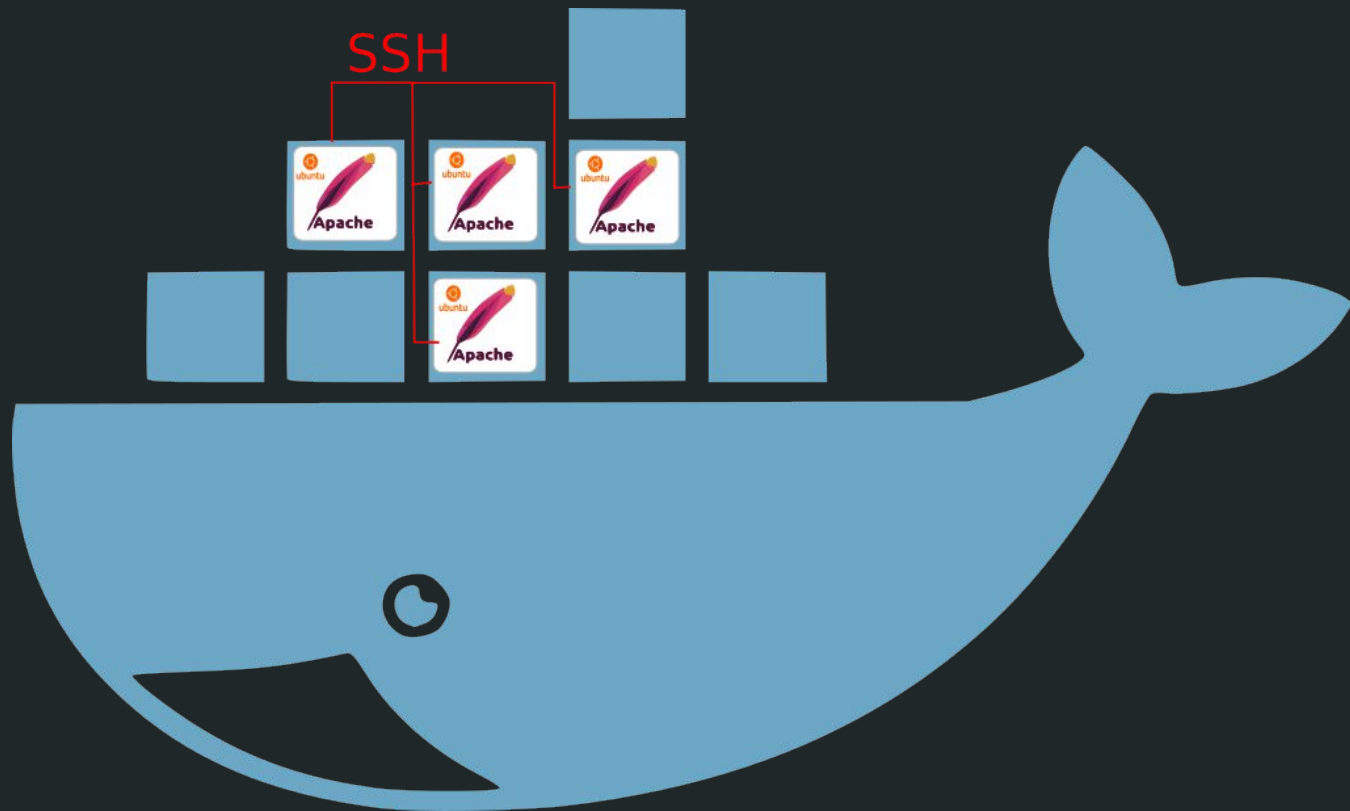
```
1.  server{
2.      listen 80;
3.      listen 443 ssl;
4.      ssl on;
5.      ssl_certificate      /tmp/apache.crt;
6.      ssl_certificate_key  /tmp/apache.key;
7.      server_name balanceador;
8.      access_log /var/log/nginx/balanceador.access.log;
9.      error_log /var/log/nginx/balanceador.error.log;
10.     root /var/www/;
11.     location /
12.     {
13.         proxy_pass https://apaches;
14.         proxy_set_header Host $host;
15.         proxy_set_header X-Real-IP $remote_addr;
16.         proxy_set_header X-Forwarded-For $proxy_add_x_forwarded_for;
17.         proxy_http_version 1.1;
18.         proxy_set_header Connection "";
19.     }
```



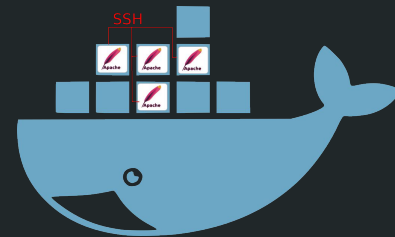
# Detalles de configuración - Abrir Puertos

Enable	Name	WAN Host Start IP Address	WAN Start Port	LAN Host Start Port	WAN Connection	Modify	Delete
	Protocol	WAN Host End IP Address	WAN End Port	LAN Host End Port	LAN Host Address		
✓	servidor		80	80	WANConnecti		
	TCP		80	80	76:17:5e:aa:35:a		
✓	ssh		22	22	WANConnecti		
	TCP AND		22	22	76:17:5e:aa:35:a		
✓	mipuerto		11111	11111	WANConnecti		
	TCP AND		11111	11111	76:17:5e:aa:35:a		
✓	https		443	443	WANConnecti		
	TCP		443	443	76:17:5e:aa:35:a		
✗	BD		3306	3306	WANConnecti		
	TCP		3306	3306	76:17:5e:aa:35:a		
✓	ssh_bala		10088	10088	WANConnecti		
	TCP		10088	10088	76:17:5e:aa:35:a		

# Esquema específico



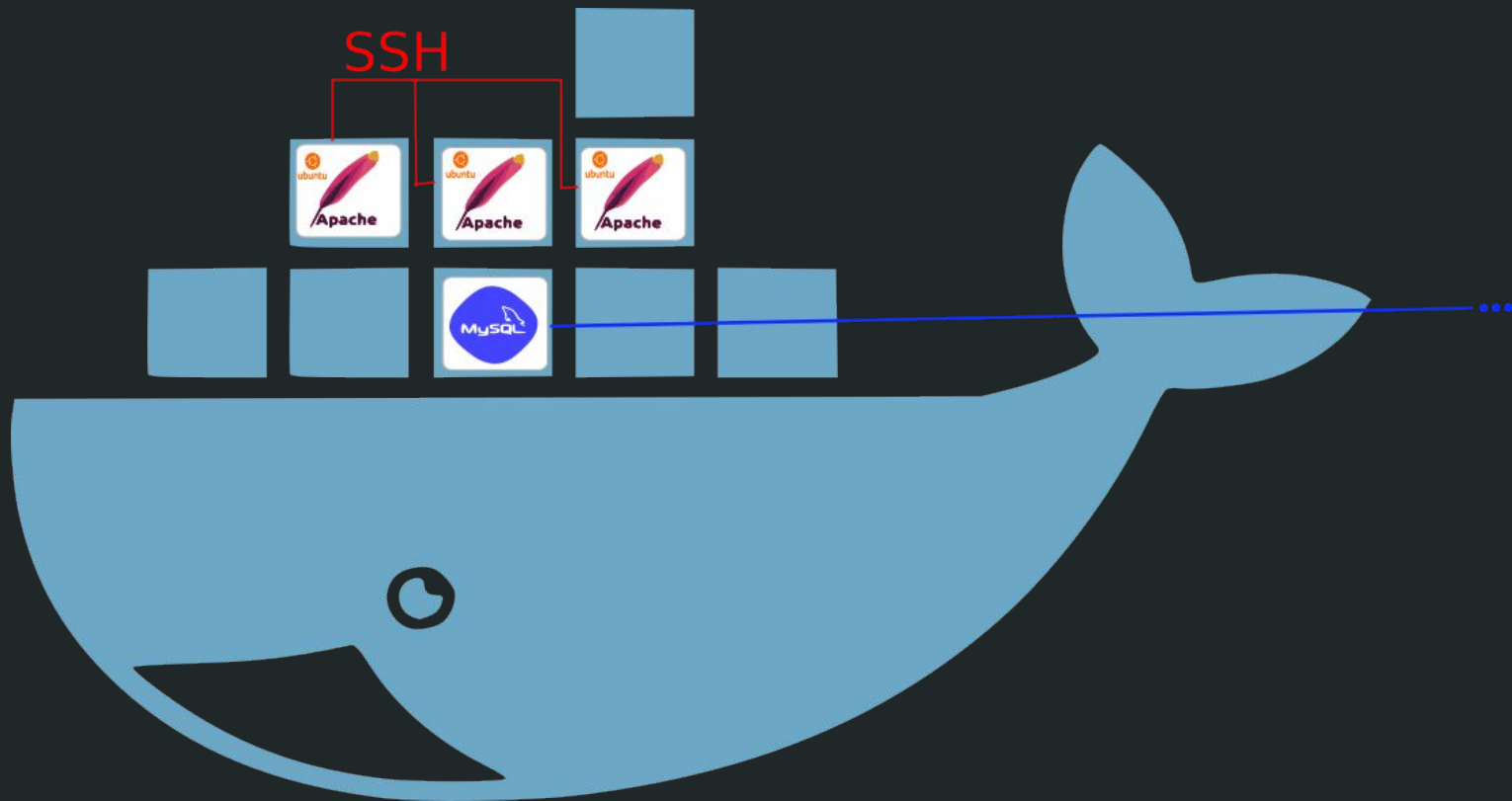


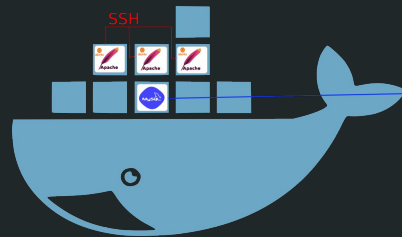


# Detalles de configuración -Servidores

1. `sudo docker run -d -p 1111:80 -p 1112:22 -p 1113:443 -p 1114:3306 -i -t --name ApacheTrabajo1 ubuntu bash`
  - a. `sudo docker start ApacheTrabajo1`
  - b. `sudo docker attach ApacheTrabajo1`
    - i. Configuración como en Prácticas
2. `sudo docker export --output=ApacheTrabajo.tar ApacheTrabajo1`
3. `sudo docker import ApacheTrabajo.tar`
4. `sudo docker images`
5. `sudo docker run -d -p 1115:80 -p 1116:22 -p 1117:443 -p 1118:3306 -i -t --name ApacheTrabajo2 ce51d2645415 bash`
6. `sudo docker run -d -p 1119:80 -p 1120:22 -p 1121:443 -p 1122:3306 -i -t --name ApacheTrabajo3 ce51d2645415 bash`
7. `sudo docker run -d -p 1123:80 -p 1124:22 -p 1125:443 -p 1126:3306 -i -t --name ApacheTrabajo4 ce51d2645415 bash`

# Esquema específico



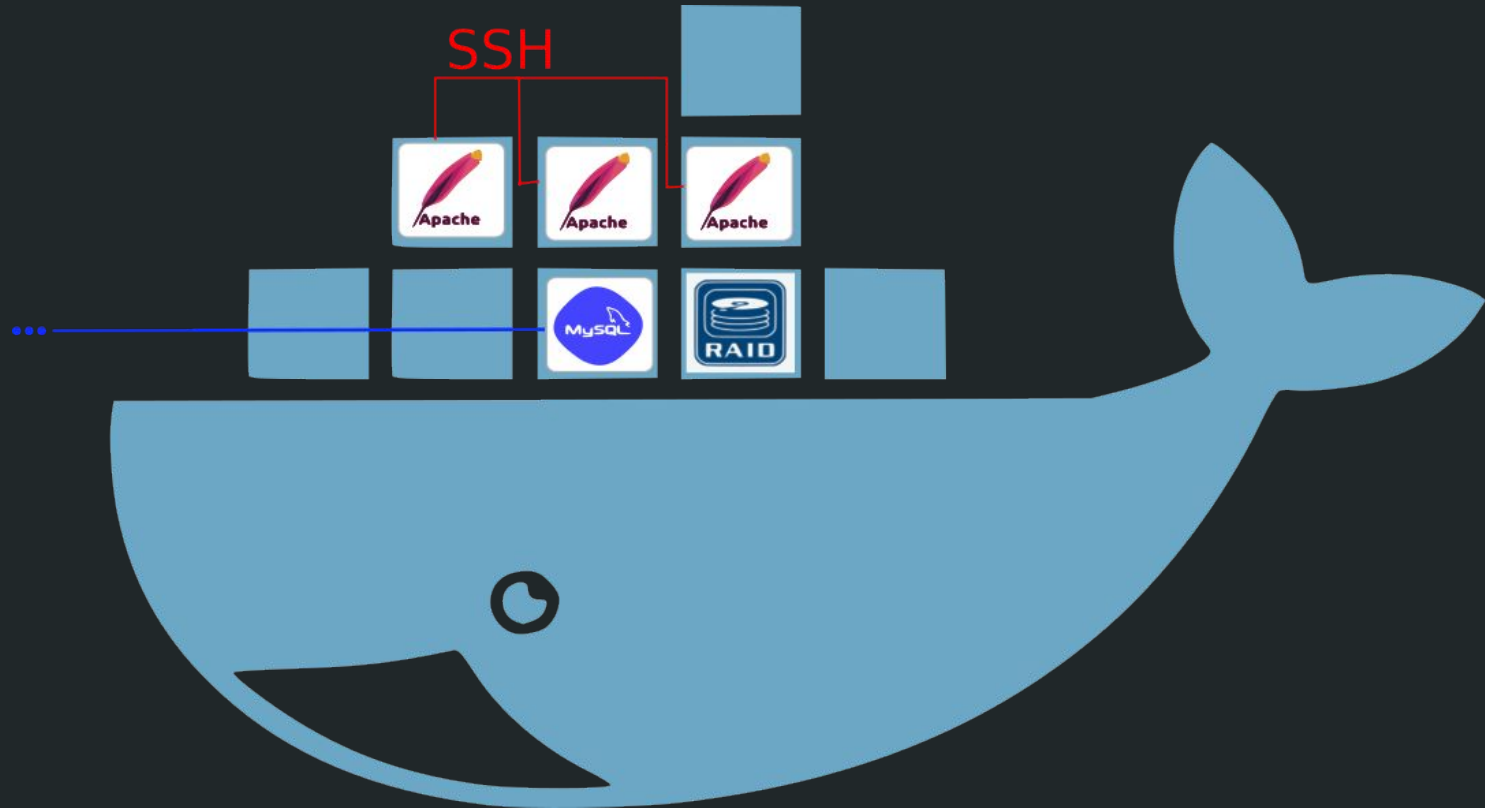


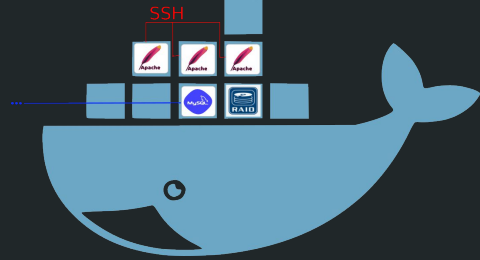
# Detalles de configuración

- Servidores
- MySQL

1. `sudo docker import ApacheTrabajo.tar`
2. `sudo docker images`
3. `sudo docker run -d -p 1111:80 -p 1112:22 -p 1113:443 -p 1114:3306 -i -t --name ApacheTrabajo ce51d2645415 bash`
4. `sudo docker run -d -p 1115:80 -p 1116:22 -p 1117:443 -p 1118:3306 -i -t --name ApacheTrabajo ce51d2645415 bash`
5. `sudo docker run -d -p 1119:80 -p 1120:22 -p 1121:443 -p 1122:3306 -i -t --name ApacheTrabajo ce51d2645415 bash`
6. `sudo docker run -d -p 10022:22 -p 3306:3306 -i -t --name BDTrabajo mysql bash`

# Esquema específico





## Detalles de configuración -

- Servidores
- MySQL
- RAID

1. `sudo docker import ApacheTrabajo.tar`
2. `sudo docker images`
3. `sudo docker run -d -p 1111:80 -p 1112:22 -p 1113:443 -p 1114:3306 -i -t --name ApacheTrabajo ce51d2645415 bash`
4. `sudo docker run -d -p 1115:80 -p 1116:22 -p 1117:443 -p 1118:3306 -i -t --name ApacheTrabajo2 ce51d2645415 bash`
5. `sudo docker run -d -p 1119:80 -p 1120:22 -p 1121:443 -p 1122:3306 -i -t --name ApacheTrabajo3 ce51d2645415 bash`
6. `sudo docker run -d -p 10022:22 -p 3306:3306 -i -t --name BDTrabajo mysql bash`
7. `sudo docker run --name=ApacheRAID --privileged -d -p 1111:80 -p 1112:443 -p 1113:22 --device /dev/sdb --device /dev/sdb2:/dev/sdc -it 11d359dad1c2 bash`

# Un pequeño test:

```
[alvarogl@alvaroglPC ~]$ ab -n 1000 -c 5 https://swap1617.ddns.net/:443
This is ApacheBench, Version 2.3 <$Revision: 1757674 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
Licensed to The Apache Software Foundation, http://www.apache.org/
```

```
Benchmarking swap1617.ddns.net (be patient)
```

```
Completed 100 requests
Completed 200 requests
Completed 300 requests
Completed 400 requests
Completed 500 requests
Completed 600 requests
Completed 700 requests
Completed 800 requests
Completed 900 requests
Completed 1000 requests
Finished 1000 requests
```

```
Server Software:      nginx/1.13.0
Server Hostname:      swap1617.ddns.net
Server Port:          443
SSL/TLS Protocol:     TLSv1.2,ECDHE-RSA-AES256-GCM-SHA384,2048,256
TLS Server Name:      swap1617.ddns.net
```

```
Document Path:        /:443
Document Length:      286 bytes
```

# Un pequeño test:

```
Concurrency Level:      5
Time taken for tests:   55.228 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      456000 bytes
HTML transferred:       286000 bytes
Requests per second:    18.11 [#/sec] (mean)
Time per request:       276.139 [ms] (mean)
Time per request:       55.228 [ms] (mean, across all concurrent requests)
Transfer rate:          8.06 [Kbytes/sec] received
```

## Connection Times (ms)

	min	mean[+/-sd]	median	max
Connect:	93	116 43.9	108	567
Processing:	123	159 59.8	146	1366
Waiting:	123	159 59.7	146	1365
Total:	222	275 78.2	254	1475

## Percentage of the requests served within a certain time (ms)

50%	254
66%	265
75%	274
80%	282
90%	312
95%	436
98%	549
99%	600
100%	1475 (longest request)