



docker

FOR

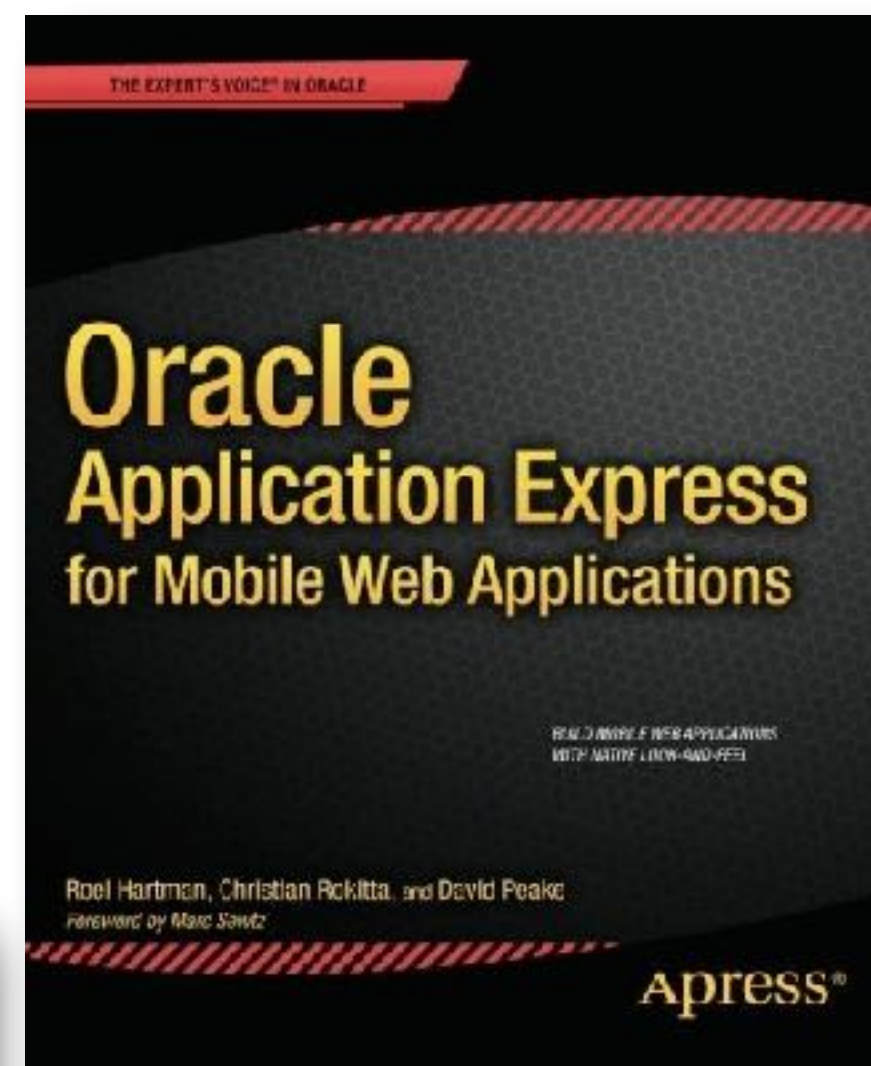
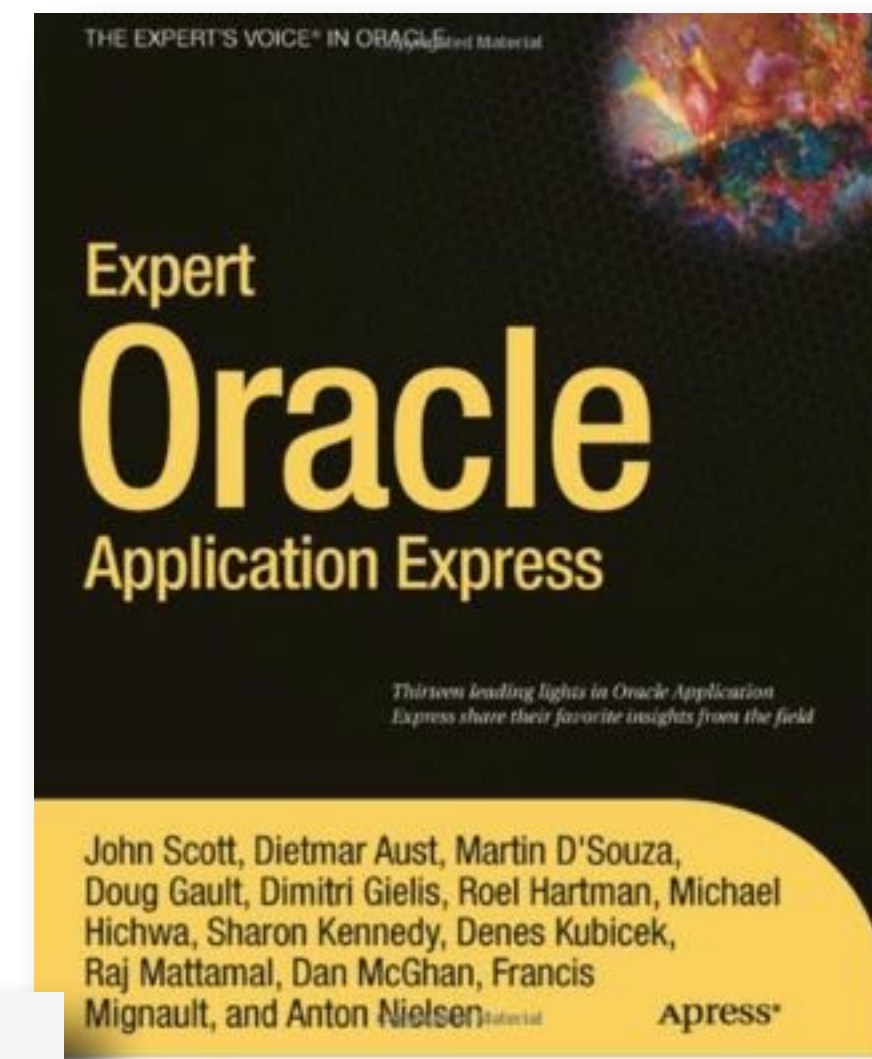
~~DUMMIES~~

DATABASE DEVELOPERS



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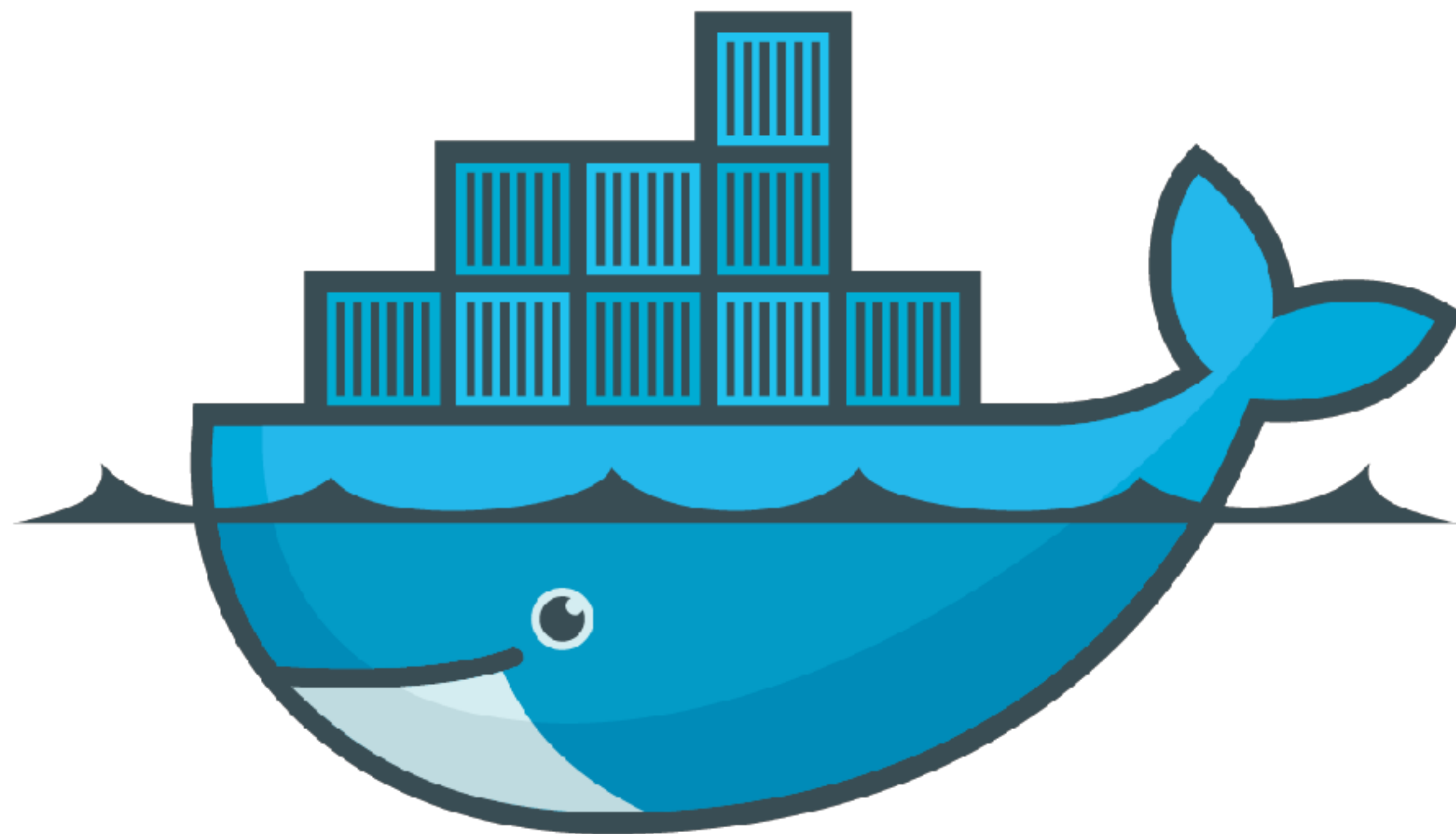
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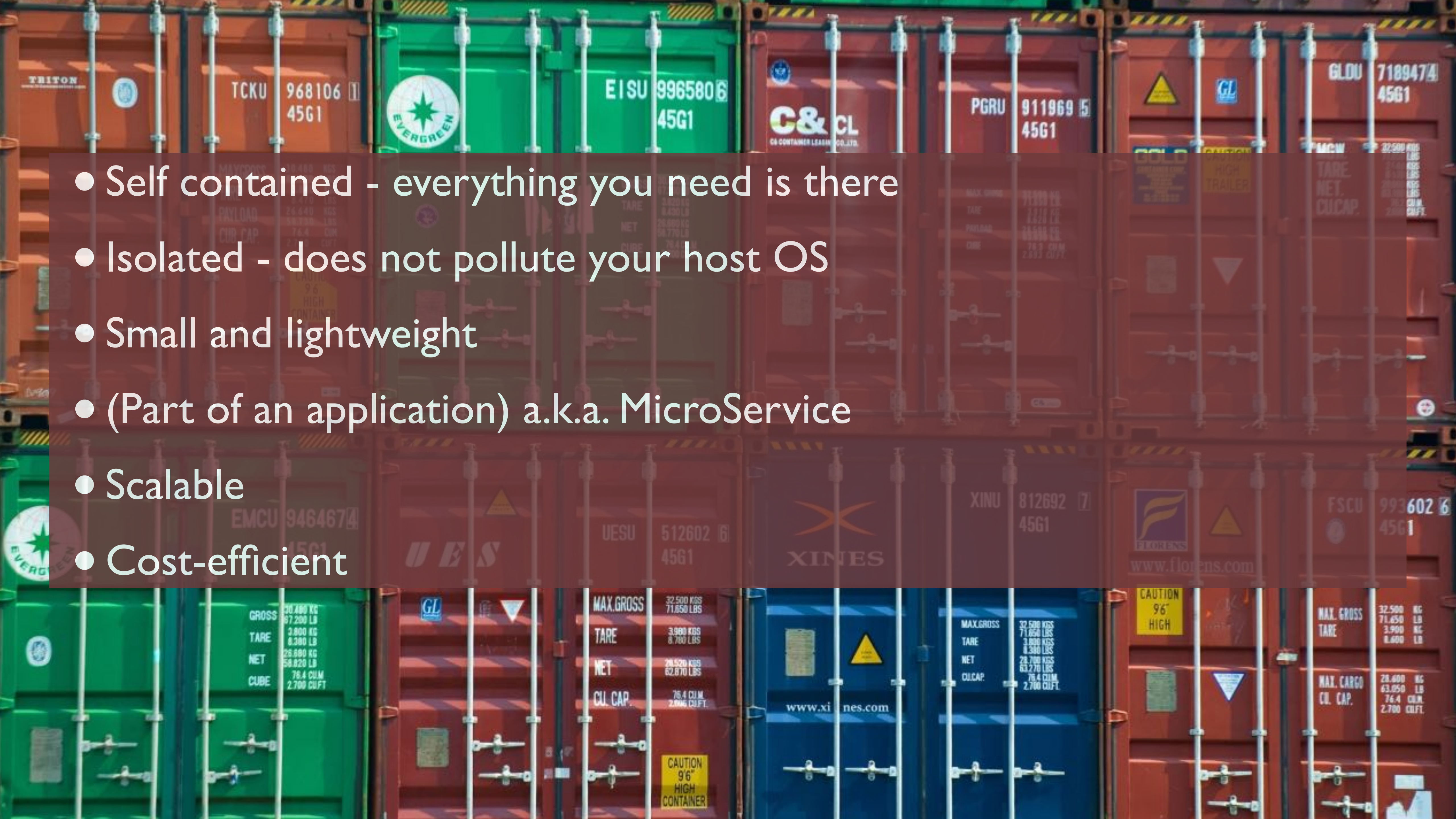
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ABSTRACTS
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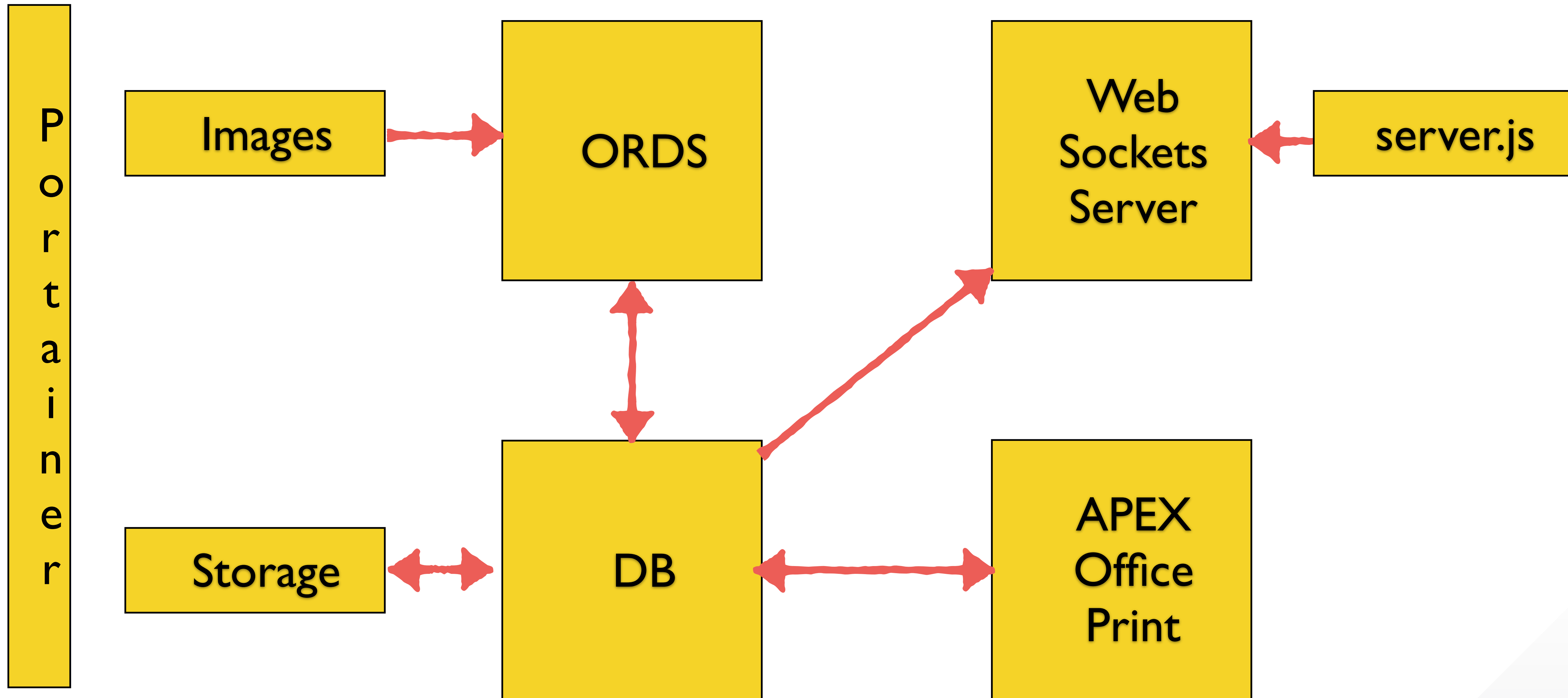


docker?

- Self contained - everything you need is there
- Isolated - does not pollute your host OS
- Small and lightweight
- (Part of an application) a.k.a. MicroService
- Scalable
- Cost-efficient



Database & ORDS & AOP & WSS in Docker



EPHEMERAL

adjective

1. lasting for a very short time

docker search mysql

docker pull mysql

```
[Roels-MBP:~ Roel$ docker pull mysql
```

```
Using default tag: latest
```

```
latest: Pulling from library/mysql
```

```
5040bd298390: Downloading [===>
```

```
] 3.145 MB/51.36 MB
```

```
55370df68315: Download complete
```

```
fad5195d69cc: Download complete
```

```
a1034a5fbbfc: Download complete
```

```
17f3570b42ae: Downloading [=====>
```

```
] 1.375 MB/10.58 MB
```

```
6bf4b16e5339: Download complete
```

```
9700c9731729: Verifying Checksum
```

```
f2fea9c5b632: Waiting
```

```
2f8101f5336d: Waiting
```

```
0dc8f8a1031a: Waiting
```

```
a1b9627588c7: Waiting
```

```
|
```

docker images

```
[Roels-MBP:~ Roel$ docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
mysql	latest	7666f75adb6b	4 weeks ago	406 MB
ubuntu	latest	f49eec89601e	5 weeks ago	129 MB
hello-world	latest	48b5124b2768	6 weeks ago	1.84 kB
apex51/ords309	latest	f12e8d7f48bb	8 weeks ago	12.7 GB
mikegcoleman/catweb	latest	c1c531094196	6 months ago	58.7 MB

BUILD-A-BEAR WORKSHOP



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dockerfile

```
FROM ubuntu:14.04
```

```
RUN apt-get update && \  
    apt-get upgrade -y && \  
    apt-get install -y nodejs
```

```
RUN ln -s /usr/bin/nodejs /usr/bin/node && \  
    apt-get install -y npm && \  
    /usr/bin/npm install websocket
```

```
EXPOSE 1337
```

```
EXPOSE 80
```

```
ENTRYPOINT ["/usr/bin/node", "/root/server.js"]
```

or ...even easier


```
FROM node
```

```
LABEL MAINTAINER Roel Hartman "roelhartman@gmail.com"
```

```
ENV REFRESHED_AT 2018-01-10
```

```
RUN npm install websocket
```

```
EXPOSE 1337
```

```
ENTRYPOINT ["node", "/usr/src/app/server.js"]
```

```
docker build -t websocketserver .
```

```
Sending build context to Docker daemon 9.216kB
Step 1/8 : FROM ubuntu:14.04
----> dc4491992653
Step 2/8 : LABEL MAINTAINER Roel Hartman "roelhartman@gmail.com"
----> Using cache
----> e1b834f7050e
Step 3/8 : ENV REFRESHED_AT 2018-02-27
----> Using cache
----> 71d1c90607ca
Step 4/8 : RUN apt-get update && apt-get upgrade -y && apt-get install -y
nodejs
----> Running in 23a641551be5
Get:1 http://security.ubuntu.com trusty-security InRelease [65.9 kB]
:
::
<tons of output>
:
:
Step 6/8 : EXPOSE 1337
----> Running in 349513076e87
Removing intermediate container 349513076e87
----> 364e9aad9e3f
Step 7/8 : EXPOSE 80
----> Running in 258c6f1c357c
Removing intermediate container 258c6f1c357c
----> 4c71d7a1b905
Step 8/8 : ENTRYPOINT ["/usr/bin/node", "/root/server.js"]
----> Running in 27ab47119751
Removing intermediate container 27ab47119751
----> 6af5429ea3af
Successfully built 6af5429ea3af
Successfully tagged websocketserver:latest
```

```
FROM tomcat:9.0
```

```
ENV TZ="GMT"
```

```
ENV APEX_CONFIG_DIR="/opt"
```

```
ENV TOMCAT_HOME="/usr/local/tomcat"
```

```
ENV DATABASE_PUBLIC_USERNAME="APEX_PUBLIC_USER"
```

```
ENV CONFIGURE_APEX="true"
```

```
ENV CONFIGURE_APEX_REST="true"
```

```
ENV CONFIGURE_ORDS="true"
```

```
COPY ords.war $TOMCAT_HOME/webapps/
```

```
RUN mkdir $TOMCAT_HOME/webapps/i
```

```
RUN java -jar $TOMCAT_HOME/webapps/ords.war configdir $APEX_CONFIG_DIR
```

```
COPY ./config_ords_and_run_catalina.sh /
```

```
RUN chmod +x /config_ords_and_run_catalina.sh
```

```
ENTRYPOINT ["/config_ords_and_run_catalina.sh"]
```

```
VOLUME ["/usr/local/tomcat/webapps/i", "/opt"]
```

```
EXPOSE 8080
```

```
CMD ["run"]
```

```
docker build -t apexgru/ords:18.2 .
```

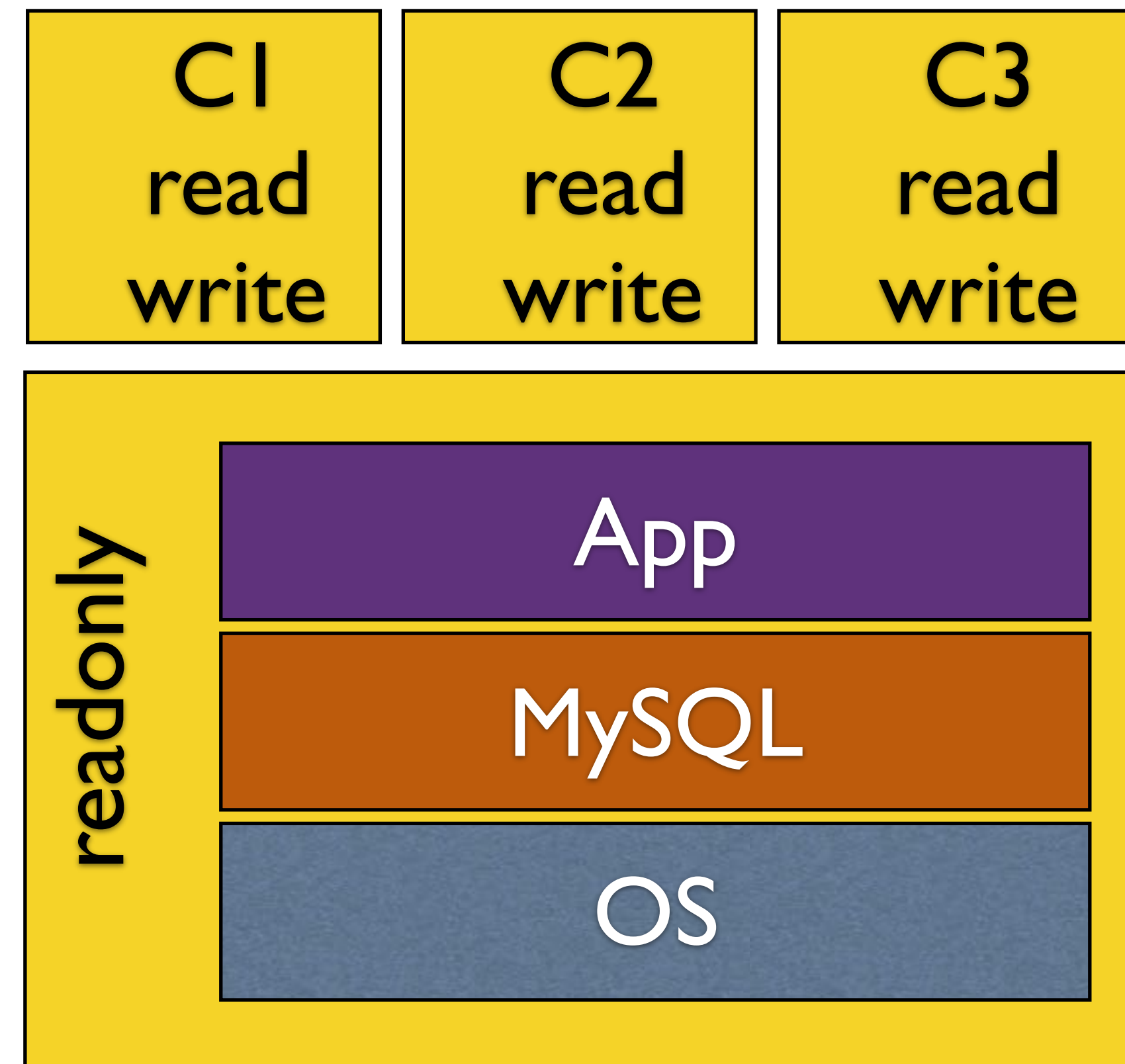
Just a few seconds later

docker images apexgru/ords

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
apexgru/ords	18.2	658083a4ba04	2 minutes ago	669MB
apexgru/ords	18.1.1	cd18d16a7a85	7 weeks ago	668MB
apexgru/ords	17.4	8b96cf1c65d8	6 months ago	673MB

docker container

- A (running) instance of an image
- Adds a read/write layer on top of the image
- Image is not cloned
- Fast & Lightweight



```
docker run -d \  
--name oracle \  
-p 1521:1521 \  
-p 5500:5500 \  
-v /Users/Roel/docker/database:/opt/oracle/oradata \  
oracle/database:12.2.0.1-ee
```



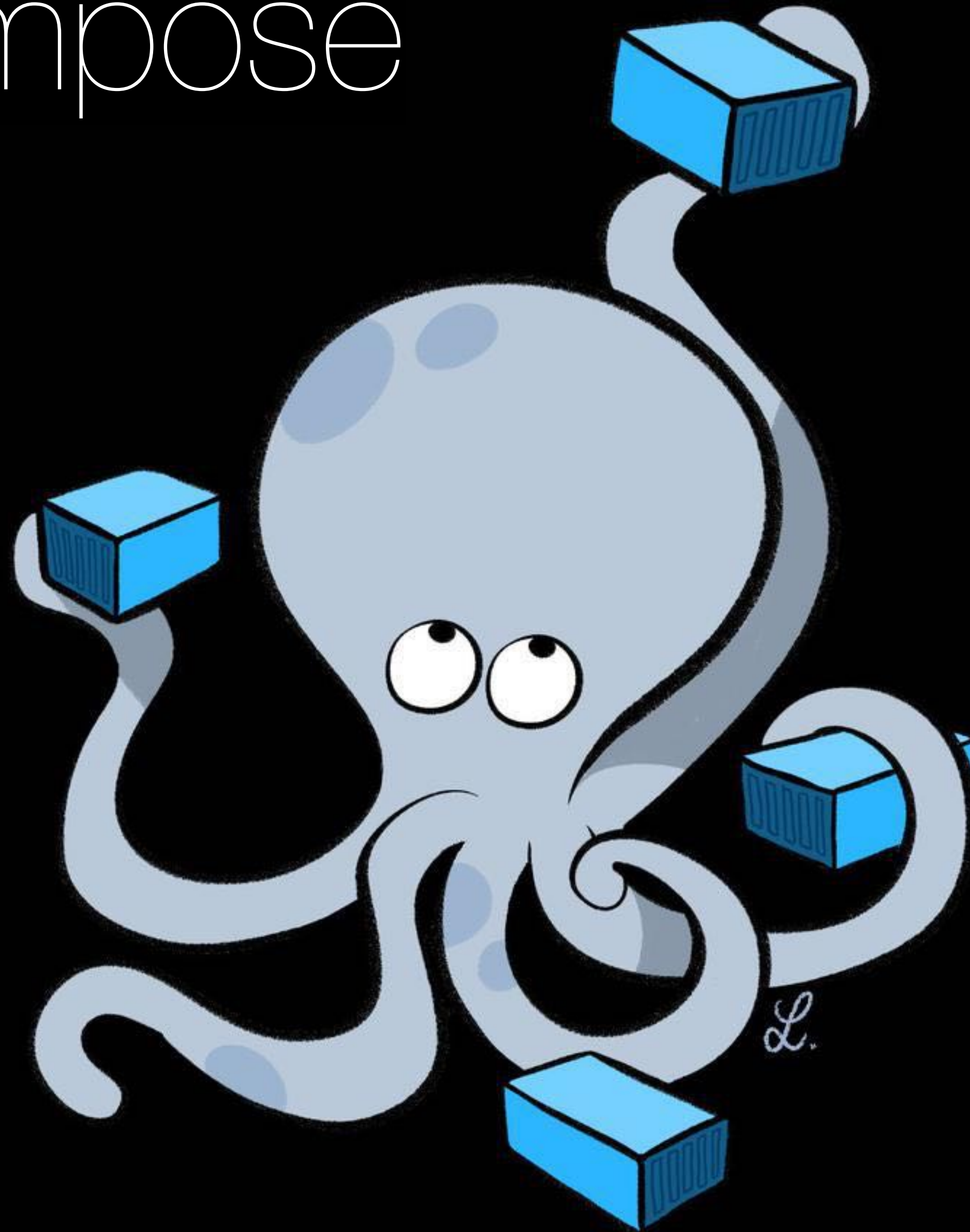
```
docker network create my_network
```

```
docker network connect my_network oracle
```

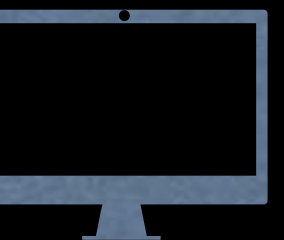
```
docker run -t -i \  
--name ords \  
--network=my_network \  
-e DATABASE_HOSTNAME="oracle" \  
-e DATABASE_PORT="1521" \  
-e DATABASE_SERVICE_NAME="ORCLPDB1" \  
-e DATABASE_PUBLIC_USER_PASS=oracle \  
-e APEX_LISTENER_PASS=oracle \  
-e APEX_REST_PASS=oracle \  
-e ORDS_PASS=oracle \  
--volume /Users/Roel/docker/apex/images:/usr/local/tomcat/webapps/i \  
-p 8080:8080 \  
apexgru/ords
```

```
docker run -d \  
--name apexofficeprint \  
--network=compose_default \  
-p 8010:8010 \  
-v /Users/Roel/docker/A0P18.1/:/apexofficeprintstartup/ \  
apexrnd/apexofficeprint:18.1 \  
--license /apexofficeprintstartup/
```

docker compose

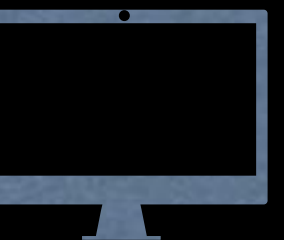


docker-compose.yml

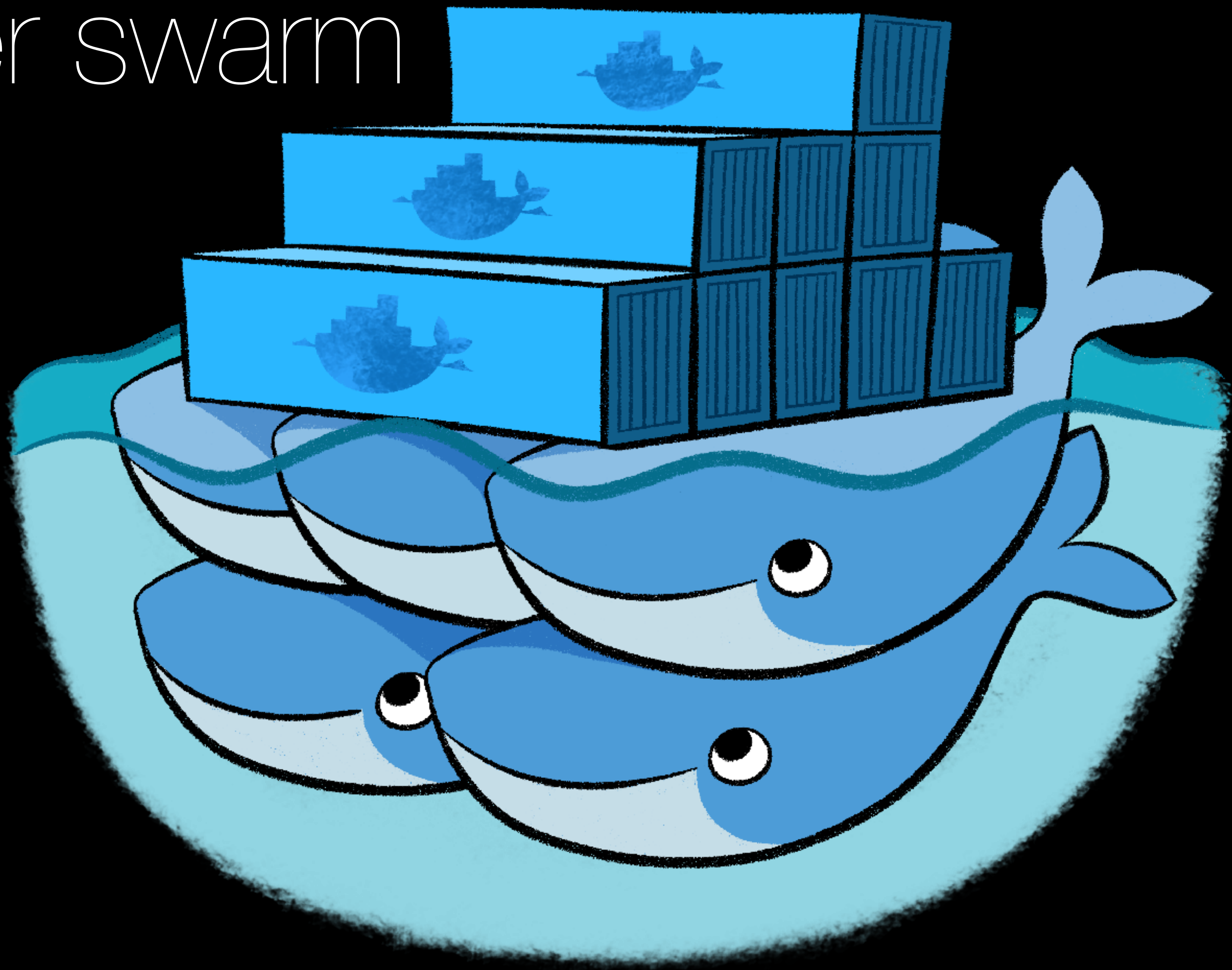


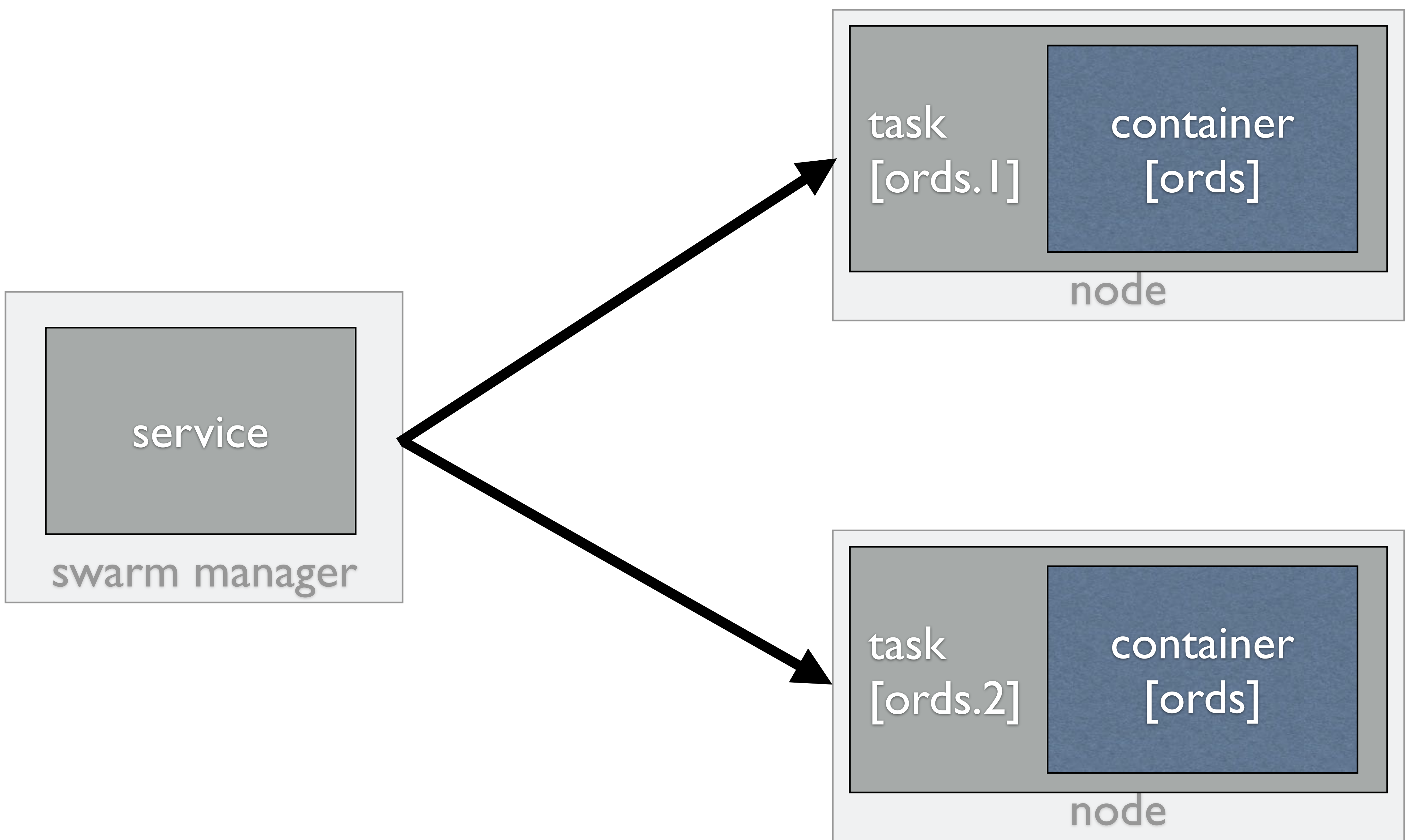
```
docker-compose up -d
```

```
docker-compose down
```



docker swarm





```
docker swarm init
```

```
docker service create \
```

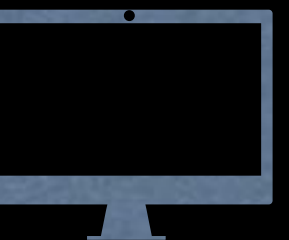
```
  -p 1339:1337 \
```

```
  --name webss \
```

```
  --mount type=bind,source=/Users/Roel/docker/websocketserver/  
app,destination=/root \
```

```
  websocketserver
```

```
docker service ps webss
```





Wachtplaats
Groot 40HQ (in 20-40)



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```
docker service scale webss=5
```

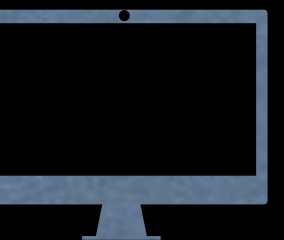
```
docker service ps webss
```

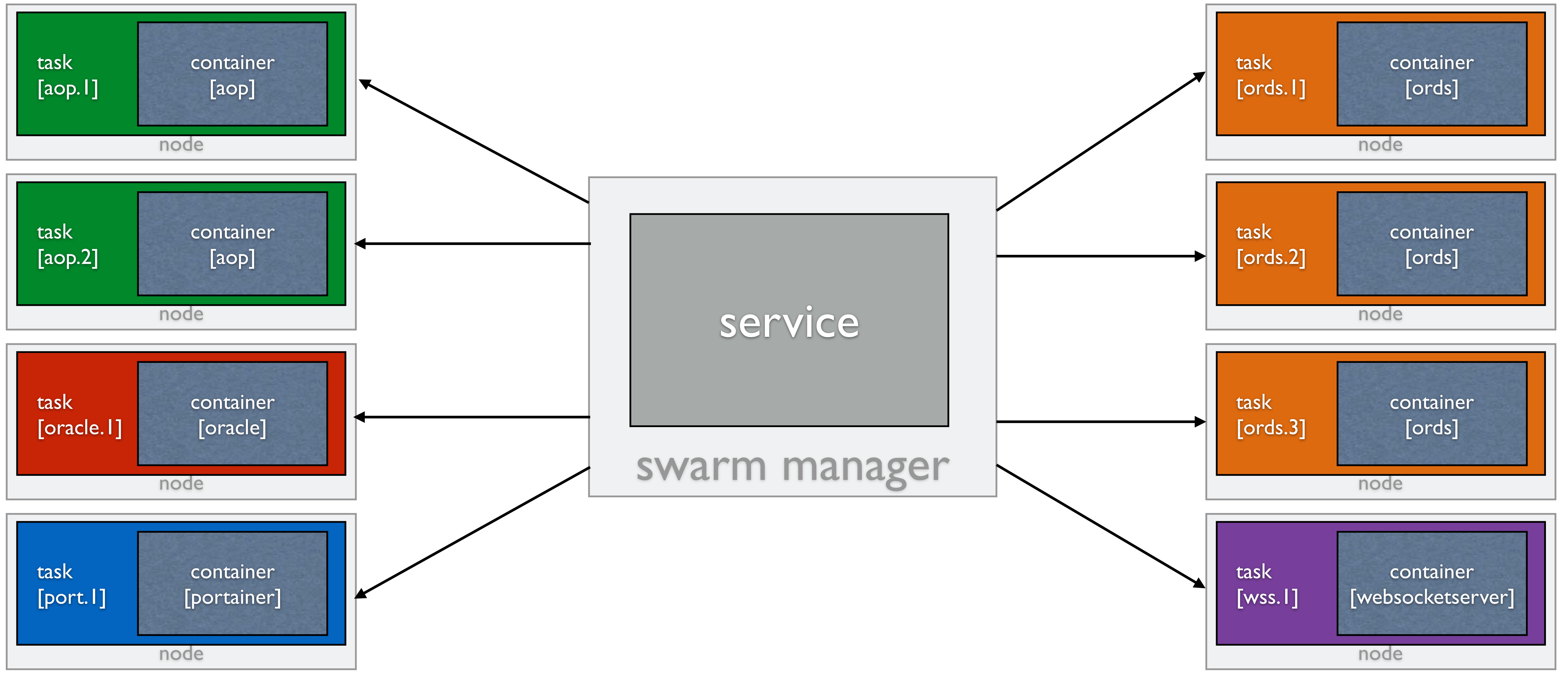
```
docker service scale webss=2
```

```
docker service ps webss
```

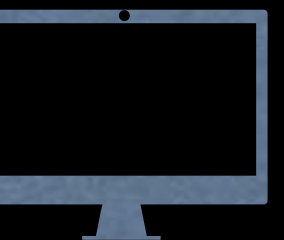
```
docker service rm webss
```

```
docker swarm leave -force
```





docker-stack.yml



```
docker swarm init
```

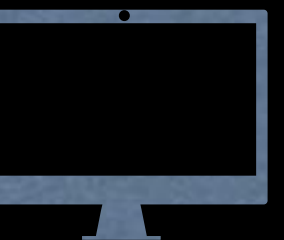
```
docker stack deploy -c docker-stack.yml apex
```

```
docker stack ls
```

```
docker stack services apex
```

```
docker stack rm apex
```

```
docker swarm leave --force
```







kubernetes

POKÉMON

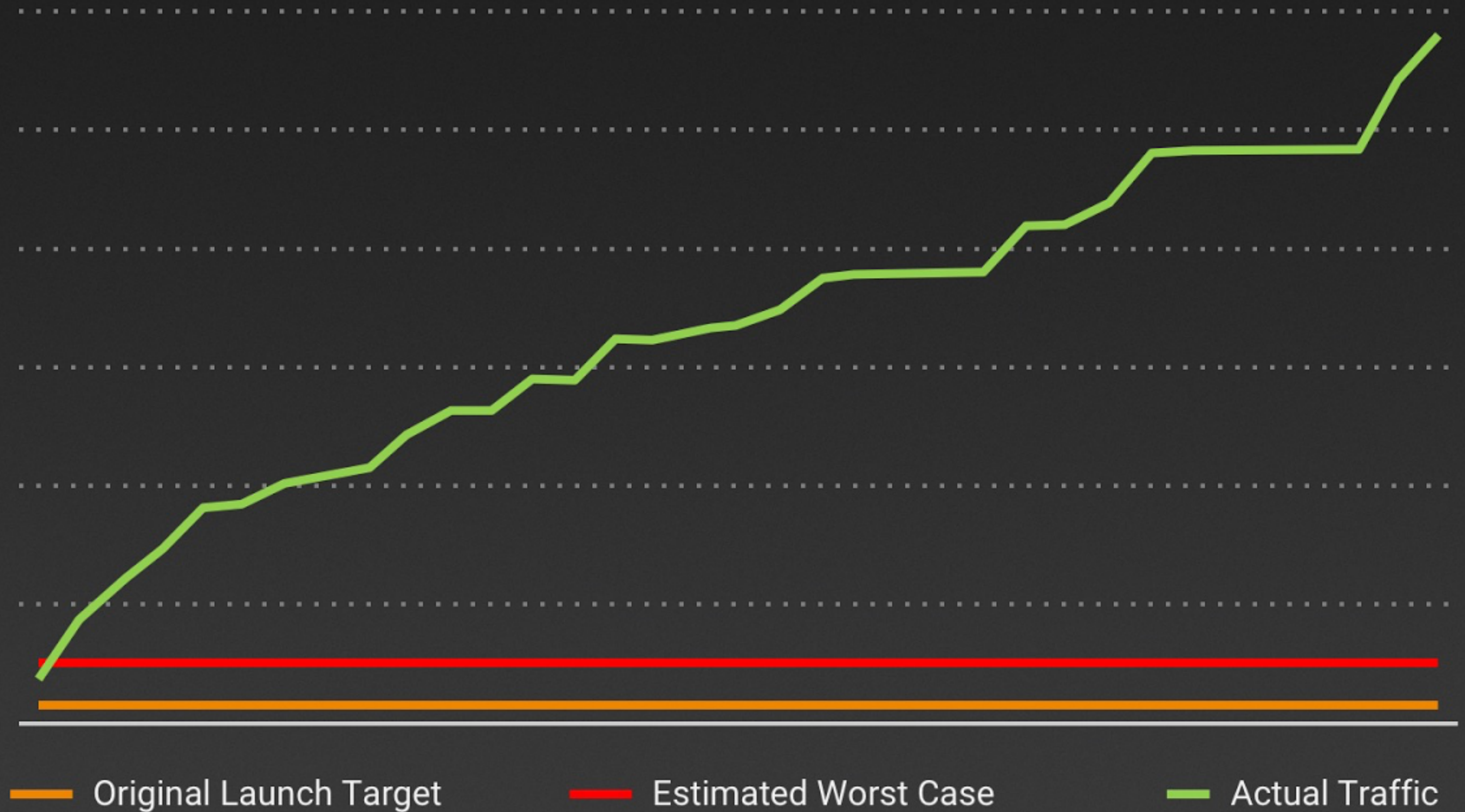


Cloud Datastore Transactions Per Second

1X
Target Traffic

5X
Worst Case Estimate

50X
Actual Traffic



Beyond being a global phenomenon, Pokémon GO is one of the most exciting examples of container-based development in the wild.

The application logic for the game runs on Google Container Engine (GKE) powered by the open source Kubernetes project.

runs everywhere

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Developer

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Q & A

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