Docker Containers

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“Vendor lock in” with DOCKER ???

DOCKER CLIENT	DOCKER HUB
DOCKER ENGINE	DOCKER REGISTRY
DOCKER SWARM	DOCKER CLOUD
DOCKER COMPOSE	DOCKER UCP Universal Control Plane
DOCKER MACHINE	DOCKER TOOLBOX

http://blog.dennybritz.com/2015/10/01/a-brief-guide-to-the-docker-ecosystem/

Supported operating systems

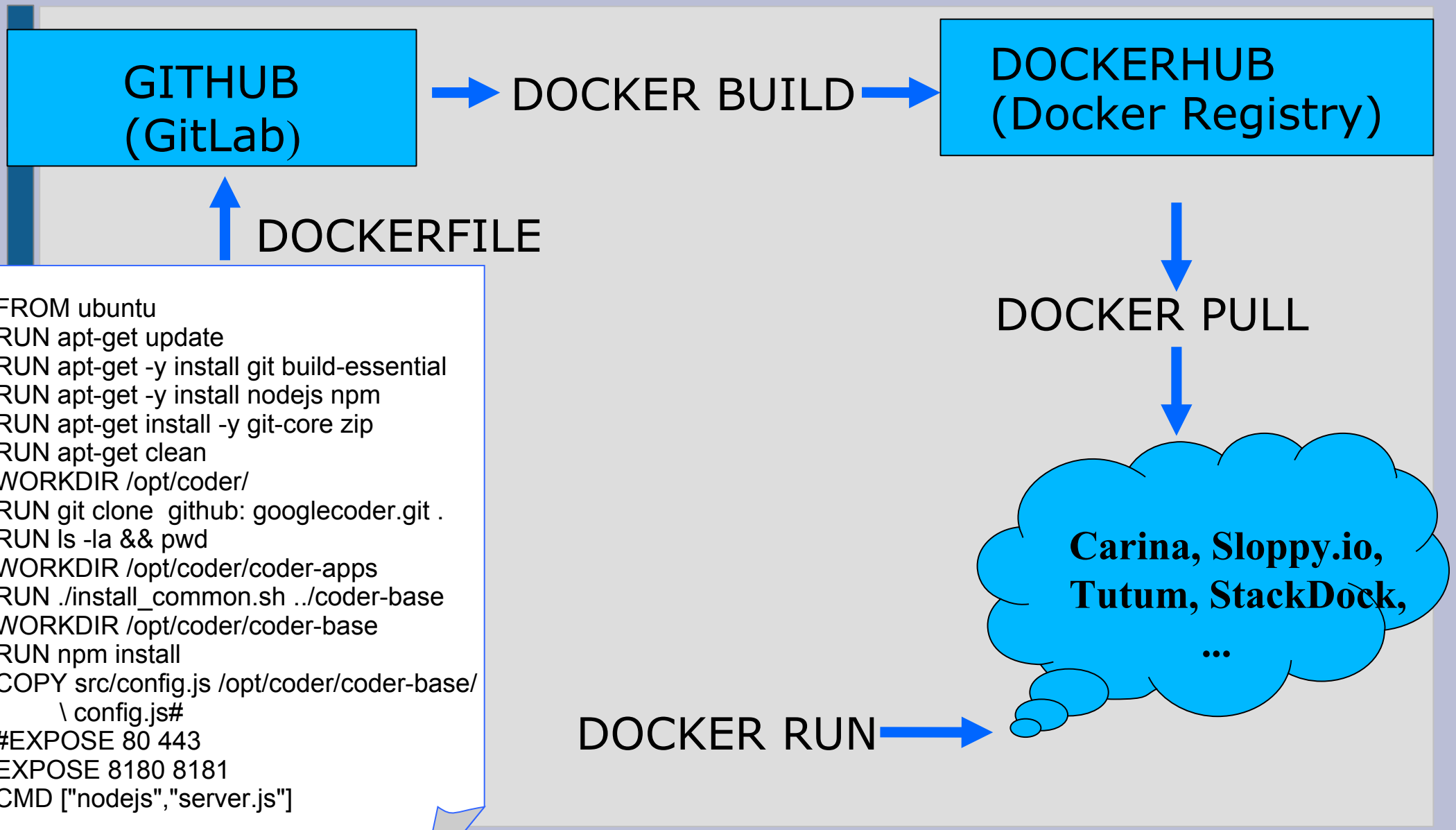
General purpose operating systems:

Amazon EC2
Arch Linux
Azure Microsoft
CentOS
CRUX Linux
Debian
Fedora
FrugalWare
Gentoo
Google Cloud
Joyent
Mac OS X
Oracle Linux
Rackspace Cloud
Red Hat Enterprise Linux
SoftLayer IBM
openSUSE and SUSE Linux
Ubuntu
Windows 20+

Container optimized operating systems:

RedHat Project Atomic
Boot2Docker
CoreOS
OSv
VMWare PhotonOS
RancherOS
Ubuntu Core 7+

Dockerization of applications



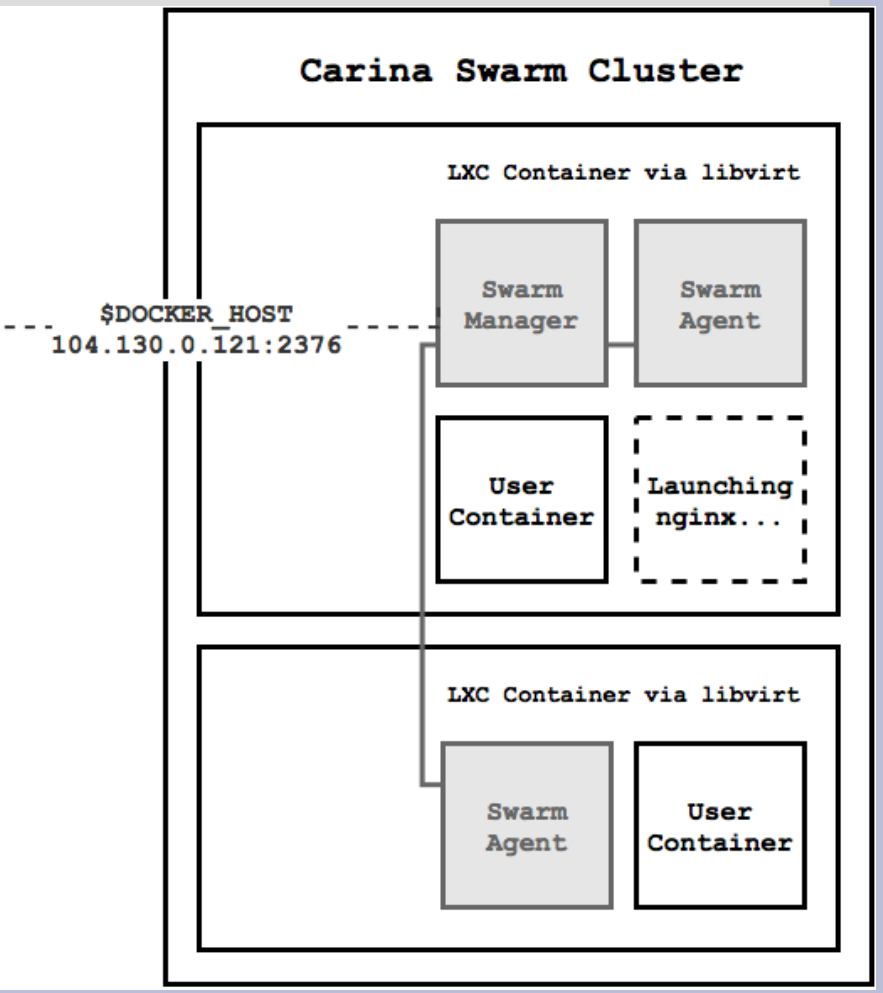

```
FROM ubuntu
RUN apt-get update
RUN apt-get -y install git build-essential
RUN apt-get -y install nodejs npm
RUN apt-get install -y git-core zip
RUN apt-get clean
WORKDIR /opt/coder/
RUN git clone  github: googlecoder.git .
RUN ls -la && pwd
WORKDIR /opt/coder/coder-apps
RUN ./install_common.sh ../coder-base
WORKDIR /opt/coder/coder-base
RUN npm install
COPY src/config.js /opt/coder/coder-base/
        \ config.js#
#EXPOSE 80 443
EXPOSE 8180 8181
CMD ["nodejs","server.js"]
```

Are Docker Containers cloud neutral?

IaaS (Infrastructure as a Service)
e.g.: DigitalOcean droplets: Ubuntu, Fedora, Debian, CoreOS, Centos

CaaS (Container as a Service)
e.g.: RackSpace: CARINA

```
$ eval "$( carina env mycluster )"
$ echo $DOCKER_HOST
tcp://104.130.0.121:2376
$ docker run nginx
```



If the demo fails you can swim with:

GoogleCoder in a Container at DigitalOcean:

https://188.166.34.228:7443/

Password: SInog32016

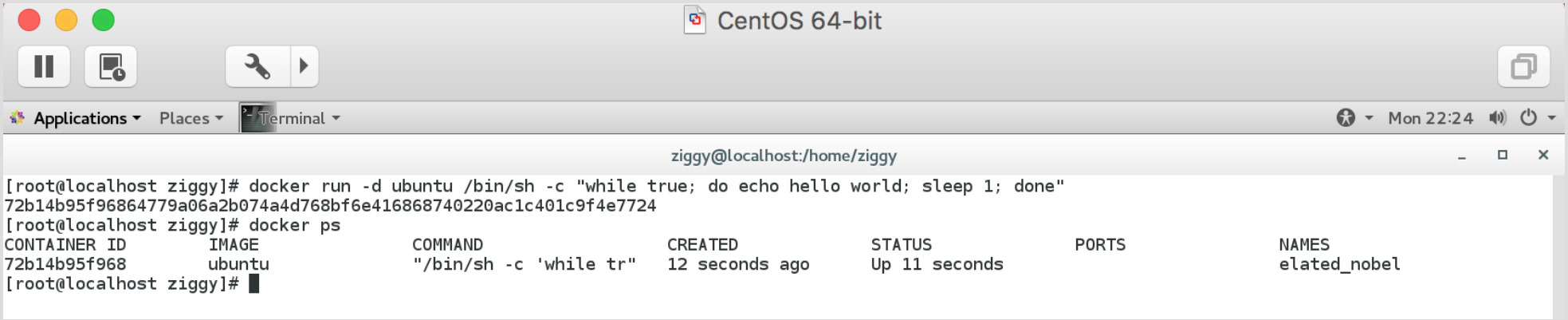
Demonstration

Example 1

- Target: Create a container that runs as a deamon and a command that print Hello World on screen every second
- In this example we will use
  - docker run; runs the container
  - -d; flag runs the container in the background
  - ubuntu; is the image you would like to run
  - docker logs; looks inside the container
- Finally we specify a command to run:
  - /bin/sh -c "while true; do echo hello world; sleep 1; done”

Example 1: docker run

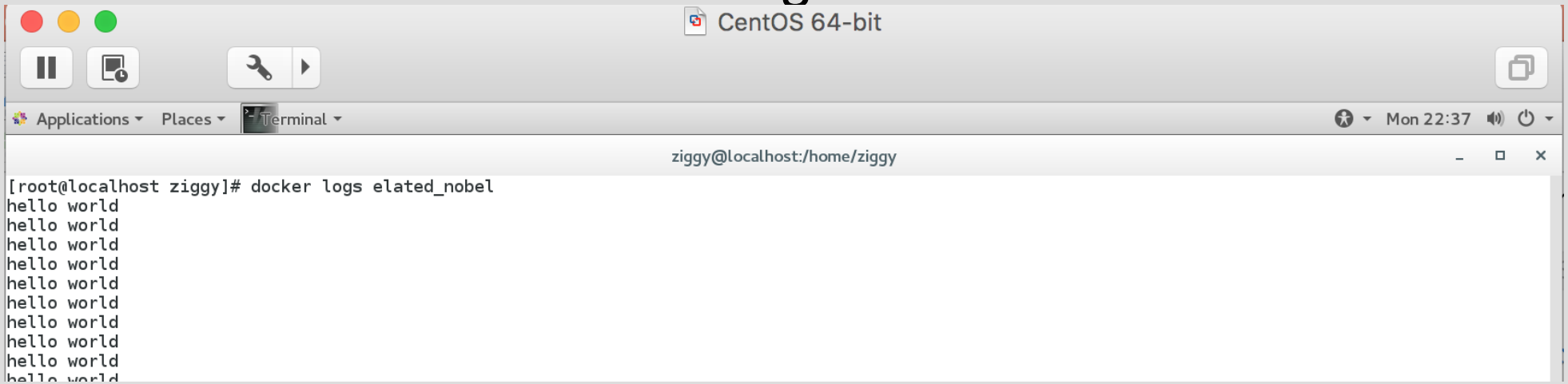
- docker run -d ubuntu /bin/sh -c "while true; do echo hello world; sleep 1; done”



- This long string “72b14b95f96864779a06a2b...” is called a container ID
- docker ps command queries the Docker daemon for information about all the containers.

Example 1: docker logs

- To see what is going on inside the container we will use the docker logs command



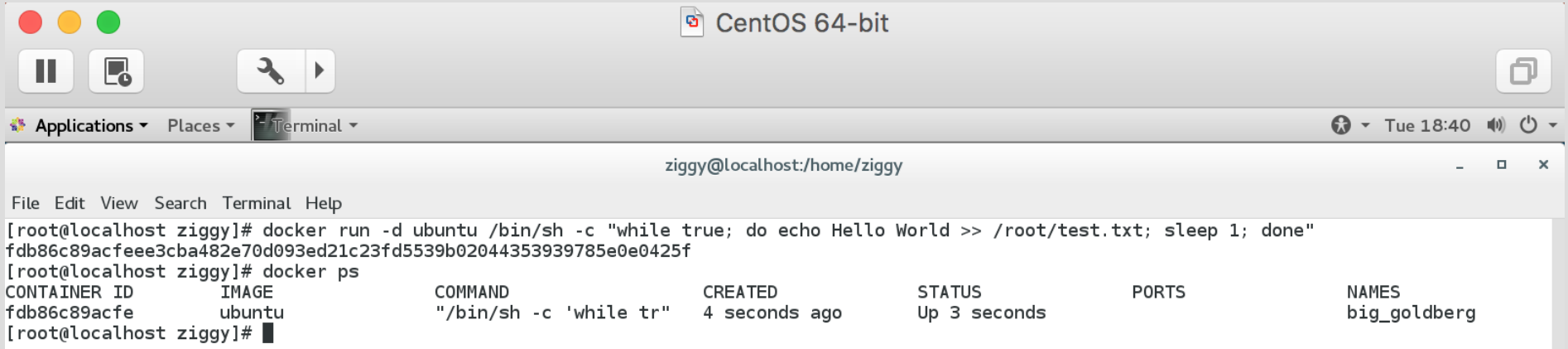
- docker stop command tells Docker to politely stop the running container and returns the name of the container it stopped “elated_nobel”

Example 2

- Target: Create a container that runs as a deamon and a command that print Hello World every second and write it in a specific file
- In this example we will use next commands
  - docker run; runs the container
  - -d; flag runs the container in the background
  - ubuntu; is the image you would like to run
  - docker exec; runs a new command in a running container
- Finally we specify a command to run an write result in a file

Example 2: docker run

- docker run -d ubuntu /bin/sh -c "while true; do echo Hello World >> /root/test.txt; sleep 1; done"



- This long string “fdb86c89acfeee3cba482e70…” is called a containerID
- docker ps command queries the Docker daemon for information about all the containers.

Example 2: docker exec

- With command docker exec we run a new command in a running container

CentOS 64-bit

Applications Places Terminal Tue 18:56

ziggy@localhost:/home/ziggy

File Edit View Search Terminal Help

```
[root@localhost ziggy]# docker ps
CONTAINER ID        IMAGE               COMMAND                  CREATED             STATUS              PORTS               NAMES
fdb86c89acfe        ubuntu              "/bin/sh -c 'while tr"   15 minutes ago      Up 15 minutes                           big_goldberg
[root@localhost ziggy]# docker exec -it fdb86c89acfe bash
root@fdb86c89acfe:/# ls
bin  boot  dev  etc  home  lib  lib64  media  mnt  opt  proc  root  run  sbin  srv  sys  tmp  usr  var
root@fdb86c89acfe:/# top
TERM environment variable not set.
root@fdb86c89acfe:/#
```

- We set TERM environment variable in running container

CentOS 64-bit

Applications Places Terminal Tue 18:58

ziggy@localhost:/home/ziggy

File Edit View Search Terminal Help

```
[root@localhost ziggy]# docker exec -it fdb86c89acfe bash
root@fdb86c89acfe:/# export TERM=linux
root@fdb86c89acfe:/# top
```

Example 3: docker commit

- Target: update a container created from an image with specific file and commit the results to an image
- In this example we will use next command
  - docker commit; create a new image from a container's changes

CentOS 64-bit

Applications Places Terminal Mon 23:59

ziggy@localhost:/home/ziggy

```
[root@localhost ziggy]# docker run -d ubuntu /bin/touch /root/krneki.txt
f5de9e15f2a7602c6fc054a95842ba7cbda612eb9b4b65454d8b26433bef7804
[root@localhost ziggy]# docker ps -a
CONTAINER ID        IMAGE               COMMAND                  CREATED             STATUS                      PORTS               NAMES
f5de9e15f2a7        ubuntu              "/bin/touch /root/krn"   9 seconds ago       Exited (0) 8 seconds ago                        jolly_curie
[root@localhost ziggy]# docker commit f5de9e15f2a7 ubuntu
sha256:e1f0e7ea00b8e5576c7ec443953eff2a0985be0dff016e30952ecde8cf14a830
[root@localhost ziggy]# docker run ubuntu /bin/ls /root/
krneki.txt
[root@localhost ziggy]# docker ps -a
CONTAINER ID        IMAGE               COMMAND                  CREATED              STATUS                          PORTS               NAMES
467e061190ec        ubuntu              "/bin/ls /root/"         16 seconds ago       Exited (0) 15 seconds ago                           amazing_dubin
sky
f5de9e15f2a7        2fa927b5cdd3        "/bin/touch /root/krn"   About a minute ago   Exited (0) About a minute ago                       jolly_curie
[root@localhost ziggy]#
```

Example 4

- Target: Install aplication Google Coder
- In this example we will use next commands
  - docker pull; pull an image or a repository from the registry
  - docker images; list images
- Finally we check our application in browser

Example 4: docker pull

- We will use image from ambrom/ambro-gc repository on dockerhub

CentOS 64-bit

Applications Places Terminal Tue 00:43

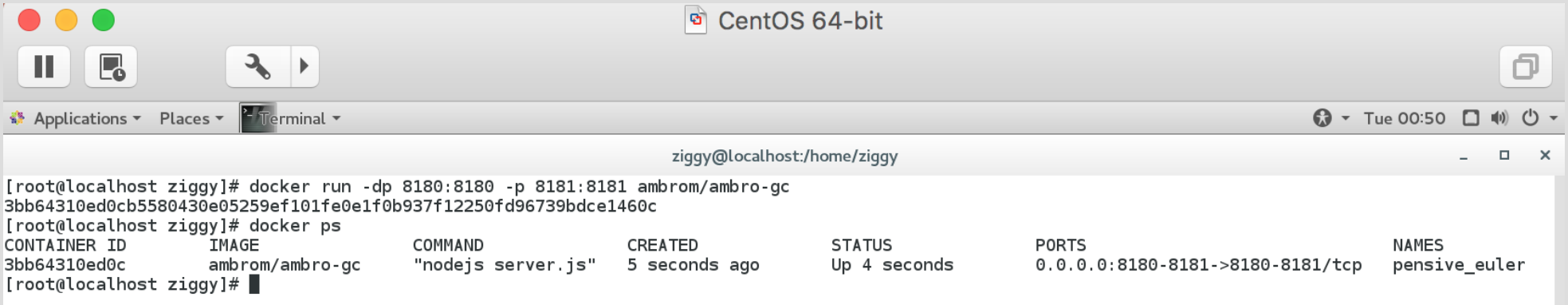
ziggy@localhost:/home/ziggy

```
[root@localhost ziggy]# docker pull ambrom/ambro-gc
Using default tag: latest
latest: Pulling from ambrom/ambro-gc

72b39c1d4615: Pull complete
46a2d5ede4a6: Pull complete
d7caf6e91ad4: Pull complete
c7ac9f284354: Pull complete
a3ed95caeb02: Pull complete
34c616d65681: Pull complete
b5817a0be70e: Pull complete
e86cc6a6aba4: Pull complete
96df172b271e: Pull complete
a3c9f24cb71f: Pull complete
9df399d952c1: Pull complete
e00e3772ef94: Pull complete
8cf1244f1777: Pull complete
385994367178: Pull complete
Digest: sha256:ca4d6c530ee5cdc9feb0f43b5cf2dab917ed8cd9f0bc73d767909f9a358322b0
Status: Downloaded newer image for ambrom/ambro-gc:latest
[root@localhost ziggy]#
```

Example 4: docker run

- With command docker run we will run our application, but we have to specify ports “8180 and 8181”



- We will open the browser and check if application is alive and responsible

Primer 4: test aplikacije

- https://localhost:8181