Operating System (OS)

Lec13 : Docker

충북대학교

강병호 (지능로봇공학과)

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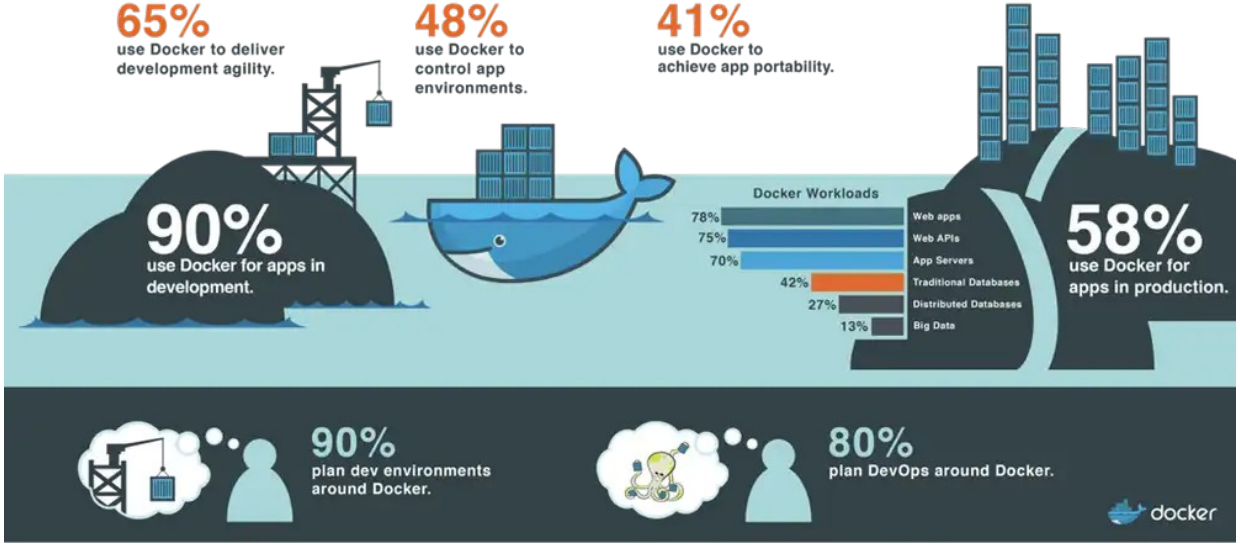
01
docker

History

- 2013 년 3 월 Pycon Conference 에서 Solomon Hykes Docker 소개

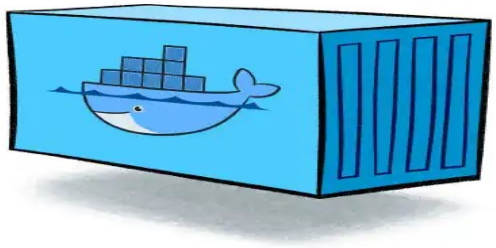


Docker 란

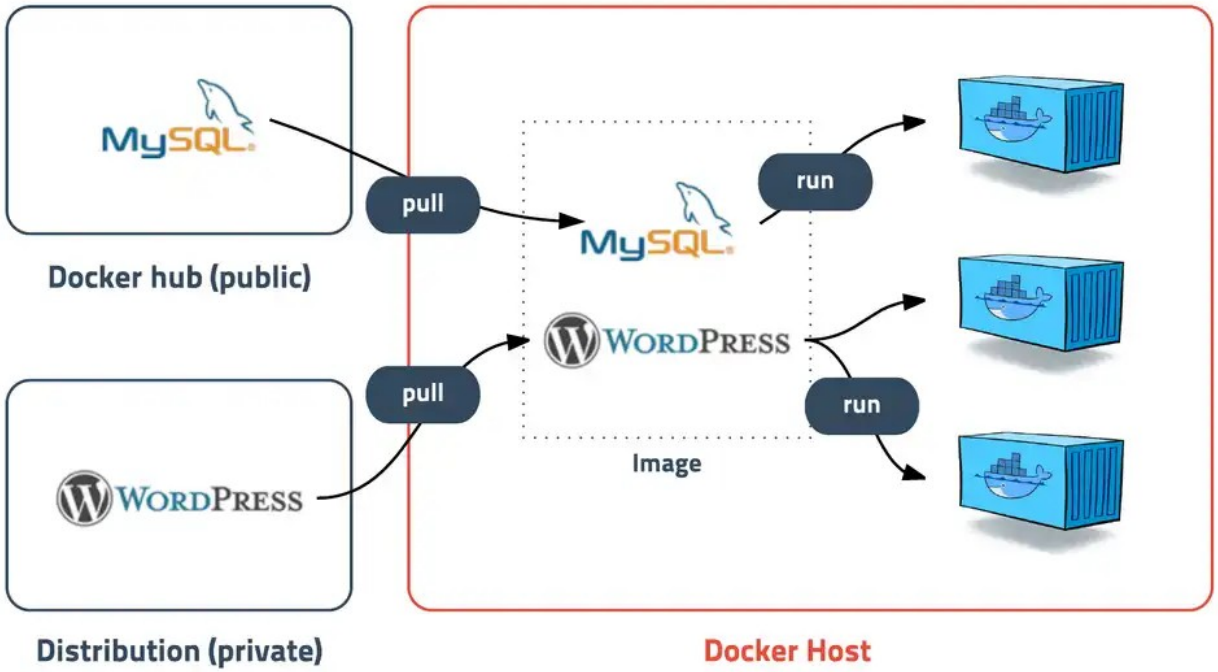
- 컨테이너

  격리된 공간에서 프로세스가 동작하는 기술

컨테이너 기반의 오픈소스 가상화 플랫폼

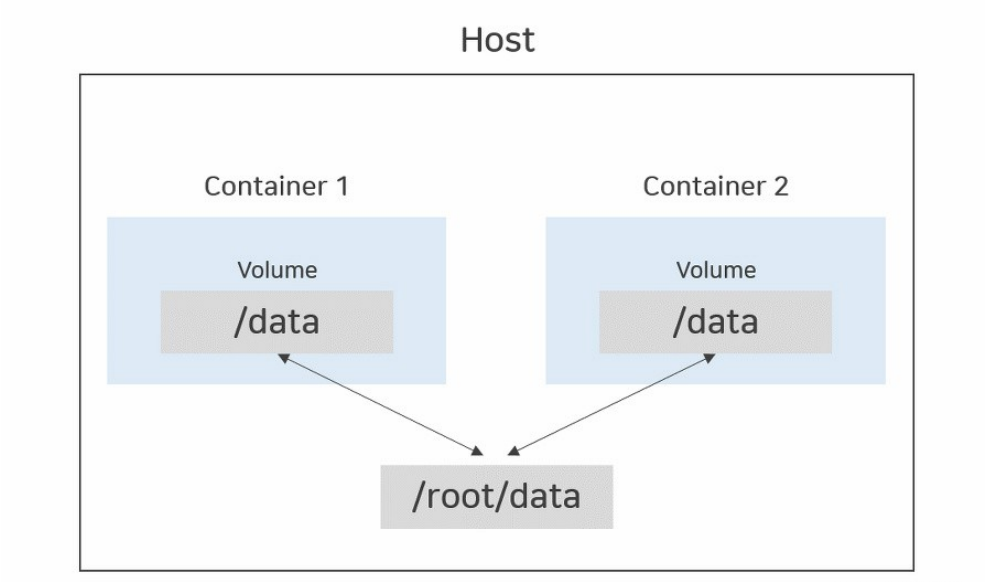


Docker Image



Docker 특징

- Volume



02
실습

Install docker

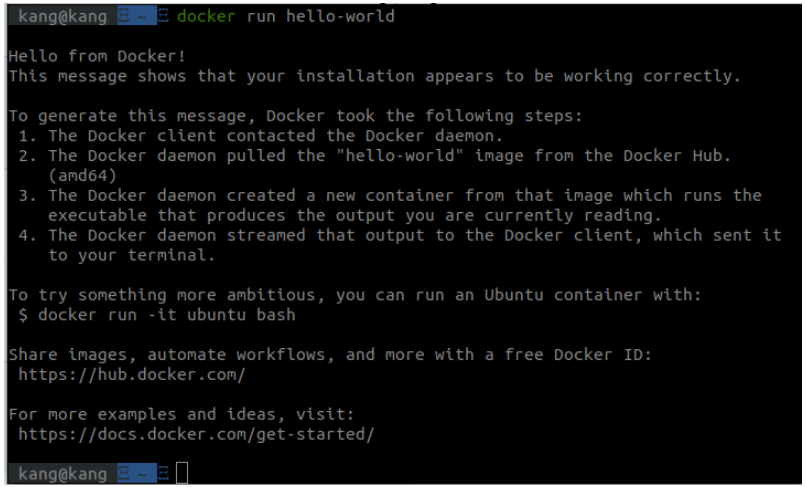
```
# Add Docker's official GPG key:
sudo apt-get update
sudo apt-get install ca-certificates curl
sudo install -m 0755 -d /etc/apt/keyrings
sudo curl -fsSL https://download.docker.com/linux/ubuntu/gpg -o
/etc/apt/keyrings/docker.asc
sudo chmod a+r /etc/apt/keyrings/docker.asc

# Add the repository to Apt sources:
echo \
  "deb [arch=$(dpkg --print-architecture)
signed-by=/etc/apt/keyrings/docker.asc]
https://download.docker.com/linux/ubuntu \
  $(. /etc/os-release && echo "$VERSION_CODENAME") stable" | \
  sudo tee /etc/apt/sources.list.d/docker.list > /dev/null
sudo apt-get update
```

Install docker

```
sudo apt-get install docker-ce docker-ce-cli containerd.io docker-buildx-plugin docker-compose-plugin
```

```
sudo docker run hello-world
```



sudo 없이 도커 사용하기

```
sudo groupadd docker

#option 1
sudo usermod -aG docker ${user}
#option 2
sudo gpasswd -a $USER docker

sudo service docker restart

logout

docker run hello-world
```

nvidia - docker

```
distribution=$(. /etc/os-release;echo $ID$VERSION_ID) \
   && curl -s -L https://nvidia.github.io/nvidia-docker/gpgkey | sudo apt-key
add - \
   && curl -s -L https://nvidia.github.io/nvidia-docker/$distribution/nvidia-
docker.list | sudo tee /etc/apt/sources.list.d/nvidia-docker.list

sudo apt-get update
sudo apt-get install -y nvidia-docker2

sudo systemctl restart docker
```

docker

- pull : dockerhub 에서 이미지를 다운받을 때

```
docker (image) pull [OPTIONS] NAME[:TAG|@DIGEST]
```

- push: dockerhub 에 이미지를 업로드 할 때

```
docker (image) push [OPTIONS] NAME[:TAG]
```

- commit: 현재 container 상태를 이미지로 저장할 때

```
docker (container) commit [OPTIONS] CONTAINER [REPOSITORY[:TAG]]
```

docker

- stop : container 를 정지시킬때

```
docker (container) stop [OPTIONS] CONTAINER [CONTAINER...]
```

- rm : container 를 삭제시킬때

```
docker (container) rm [OPTIONS] CONTAINER [CONTAINER...]
```

- rmi : 이미지를 삭제시킬때

```
docker image rm [OPTIONS] IMAGE [IMAGE...]
docker rmi IMAGE [IMAGE...]
```

docker

- start : 중지된 컨테이너를 실행시킬 때

```
docker (container) start [OPTIONS] CONTAINER [CONTAINER...]
```

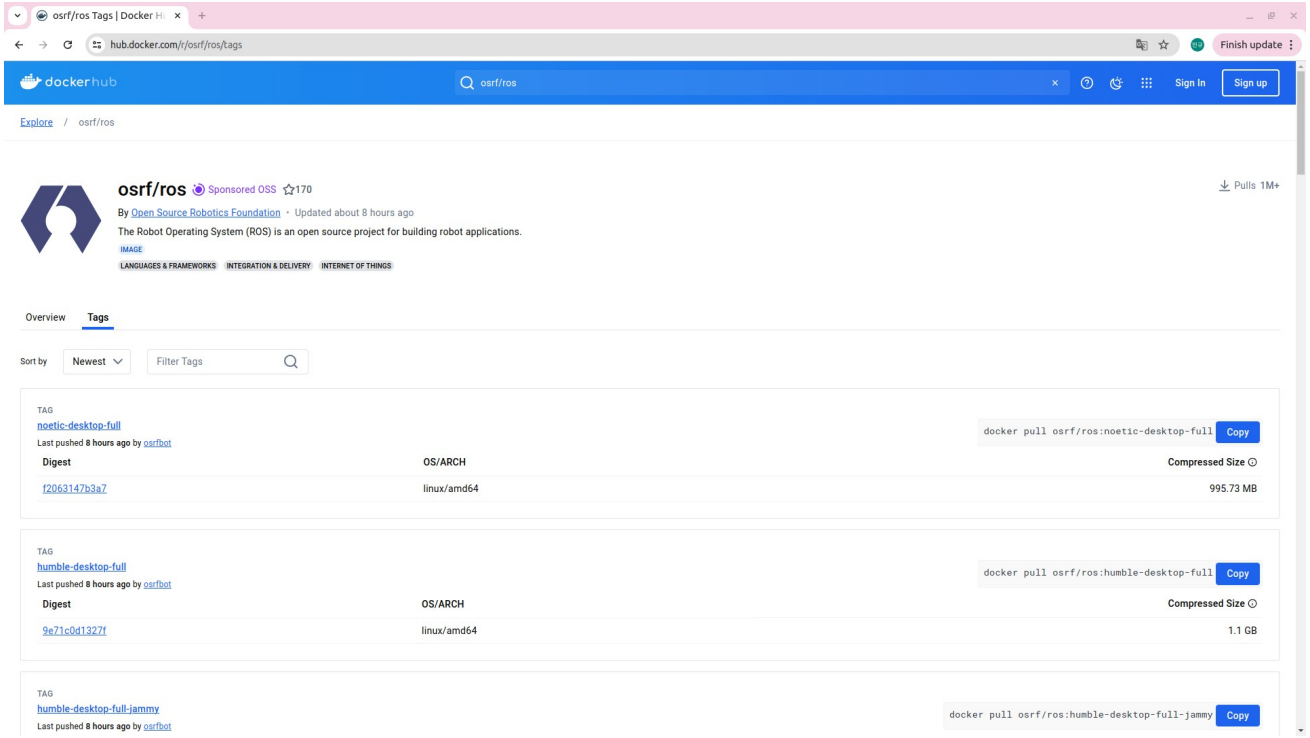
- run : 도커 이미지를 컨테이너로 만들 때

```
docker (container) run [OPTIONS] IMAGE [COMMAND] [ARG...]
```

- exec : 도커 컨테이너에 명령을 실행 할 때

```
docker (container) exec [OPTIONS] CONTAINER COMMAND [ARG...]
```

Dockerhub


osrf/ros Tags | Docker H
hub.docker.com/r/osrf/ros/tags
Finish update
docker hub
osrf/ros
Sign In
Sign up
Explore / osrf/ros
osrf/ros
Sponsored OSS
170
By Open Source Robotics Foundation • Updated about 8 hours ago
The Robot Operating System (ROS) is an open source project for building robot applications.
IMAGE
LANGUAGES & FRAMEWORKS
INTEGRATION & DELIVERY
INTERNET OF THINGS
Pulls 1M+
Overview
Tags
Sort by
Newest
Filter Tags
TAG
noetic-desktop-full
Last pushed 8 hours ago by osrfbot
docker pull osrf/ros:noetic-desktop-full
Copy
Digest
OS/ARCH
Compressed Size
f2063147b3a7
linux/amd64
995.73 MB
TAG
humble-desktop-full
Last pushed 8 hours ago by osrfbot
docker pull osrf/ros:humble-desktop-full
Copy
Digest
OS/ARCH
Compressed Size
9e71c0d1327f
linux/amd64
1.1 GB
TAG
humble-desktop-full-jammy
Last pushed 8 hours ago by osrfbot
docker pull osrf/ros:humble-desktop-full-jammy
Copy

Docker

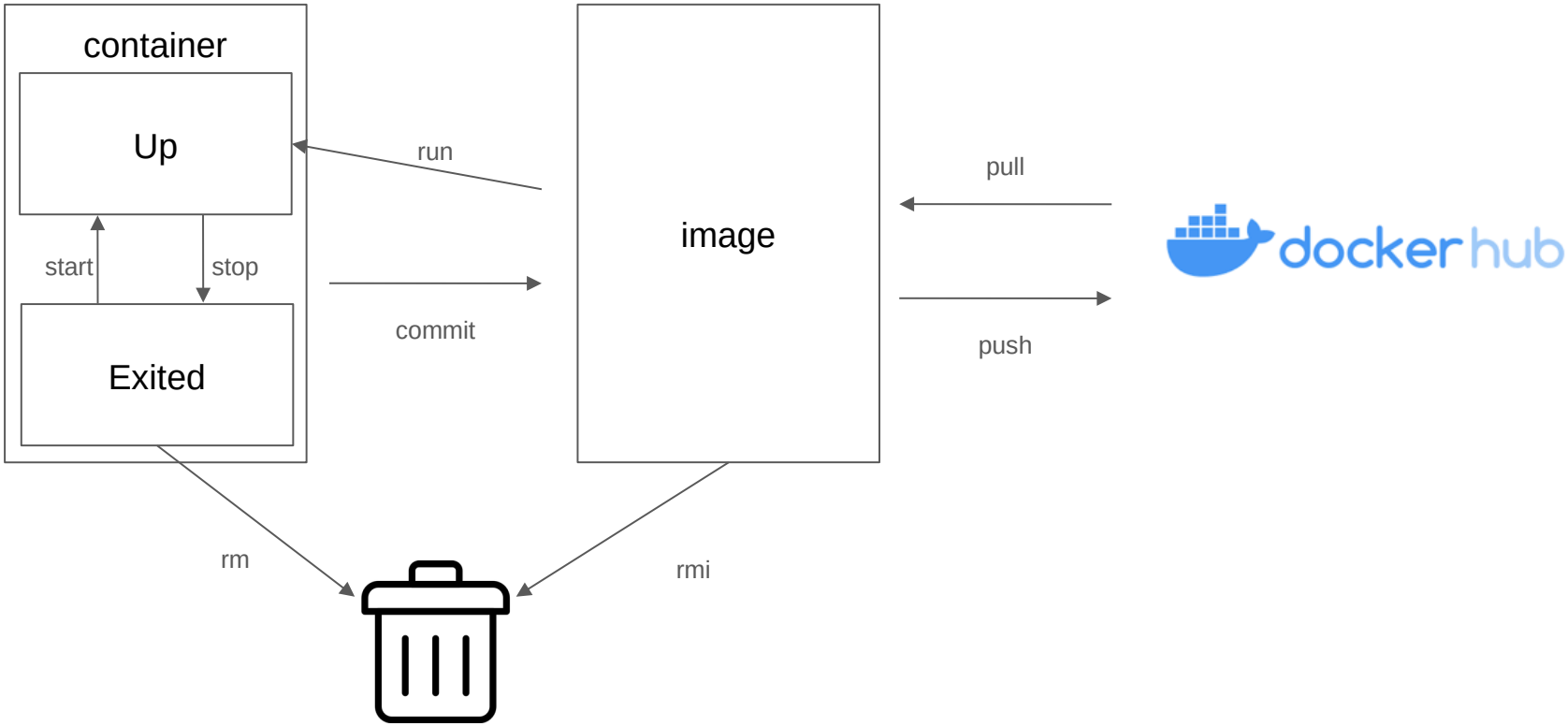
```
docker pull osrf/ros:humble-desktop-jammy
```

```
docker run -it –name  □□  osrf/ros:humble-desktop-jammy
```

Docker script

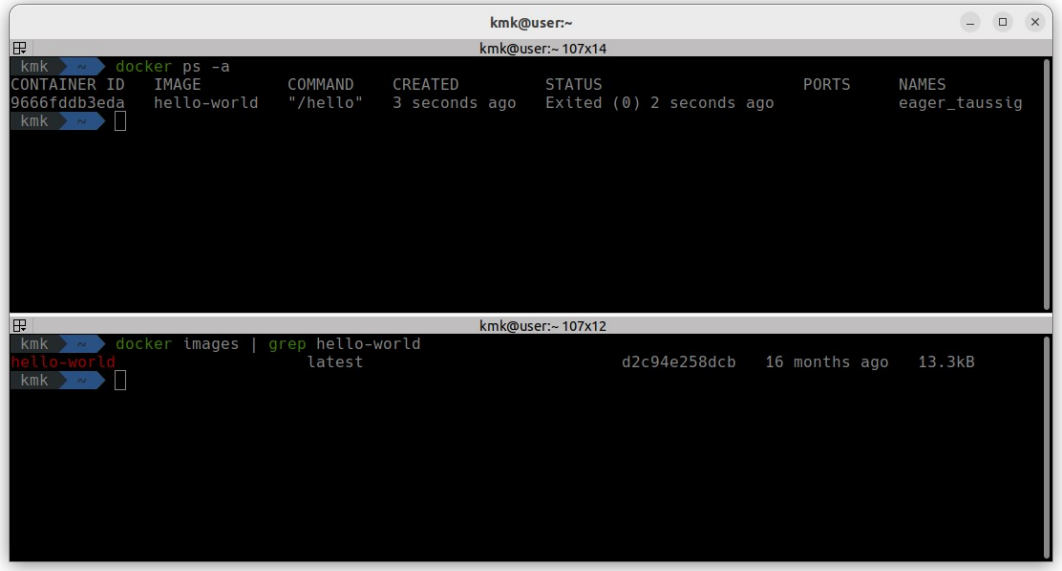
```
docker run --gpus all -it --privileged \
-e DISPLAY=$DISPLAY \
--env="QT_X11_NO_MITSHM=1" \
-e NVIDIA_DRIVER_CAPABILITIES=all \
-v /tmp/.X11-unix:/tmp/.X11-unix \
-v /dev:/dev:rw \
-u user \
-w /home/user \
--hostname $(hostname) \
--network host \
--name container_name image_name:tag command
```

Docker


container
Up
start
stop
Exited
run
commit
image
pull
push
dockerhub
rm
rmi

Docker

- ps -a : 컨테이너 목록을 확인
- images : 이미지 목록을 확인



Docker user

```
useradd --shell /bin/bash -u 1001 -c "" -m user && usermod -a -G dialout user
```