

Fog Computing Course: Docker Images

Dockerfile, images, layers, Docker Hub

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03 April 2020



This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement No 815141 (DECENTER: Decentralised technologies for orchestrated Cloud-to-Edge intelligence).

This work was supported by institute for Information & communications Technology Promotion (ICTP) grant funded by the Korea government (MSIT) (No. 1711075689, Decentralised cloud technologies for edge/IoT integration in support of AI applications).



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What is a Dockerfile?

A recipe for **creating container images**. Example:

```
FROM ubuntu:latest
LABEL maintainer happycoder@ex.com
RUN apt-get update -y && \
    apt-get install -y \
    python-pip \
    python-dev \
    build-essential
COPY . /app
WORKDIR /app
RUN pip install -r requirements.txt
EXPOSE 5000
ENTRYPOINT ["python"]
CMD ["application.py"]
```

- Start from base image (often an OS image)
- Install additional packages
- Copy files and directories from the build context
- Set user & working directory
- Define exposed ports
- Define volumes
- Define health check command
- Define entrypoint



What is a Container Image?

A container image is...

- a **read-only template** used to create a container
- like a **snapshot** of a container
- is stored in a **registry**
- is **immutable**
- build up from **layers**
- **created by** the docker build command

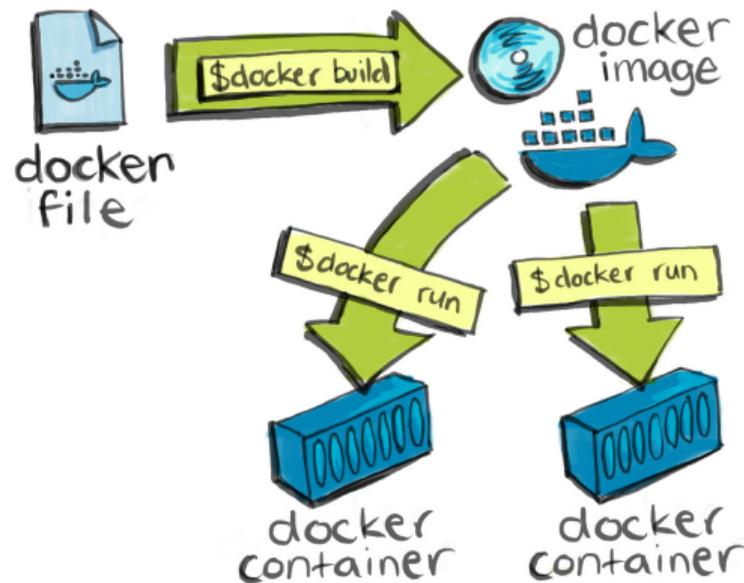


image credit: <https://cultivatehq.com/posts/docker/>

What is an Image Layer?

An image layer is...

- a **building block** of an image
- a result of **one instruction** in a Dockerfile
- **stacked** on top of other layers
- **the set of differences** from the one layer below
- the **base** one when representing an OS
- **read-only**, except for the top one
- a **thin R/W container layer** if on the top
- usually **downloaded from the registry** in parallel with others
- a **compressed (tar) archive**
- **shareable** across images



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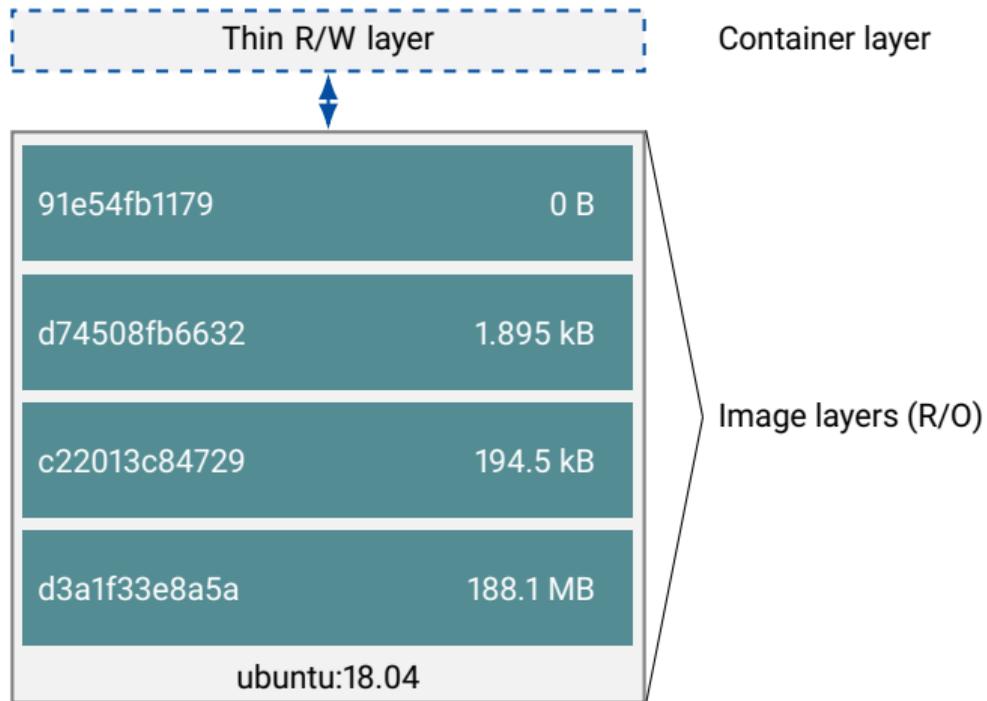
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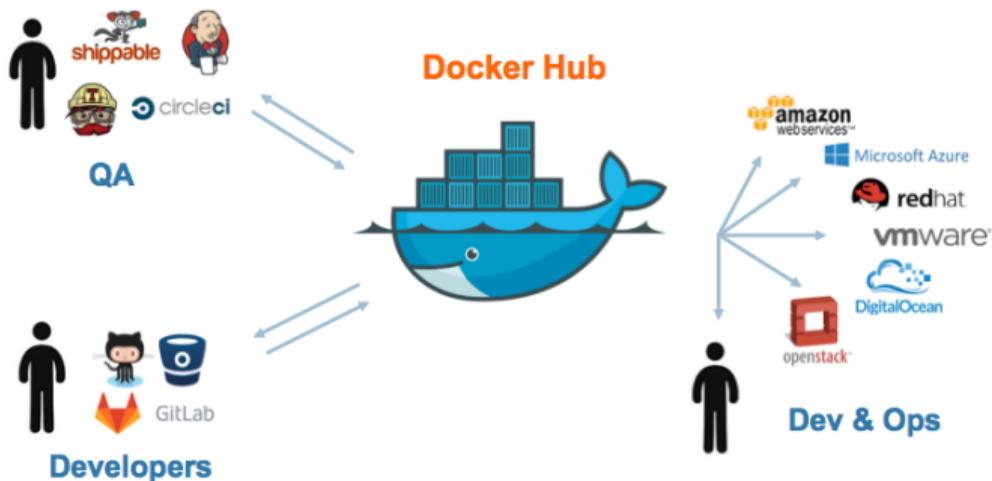
What is an Image Layer (cont'd)?

```
FROM ubuntu:18.04
COPY . /app
RUN make /app
CMD python /app/app.py
```

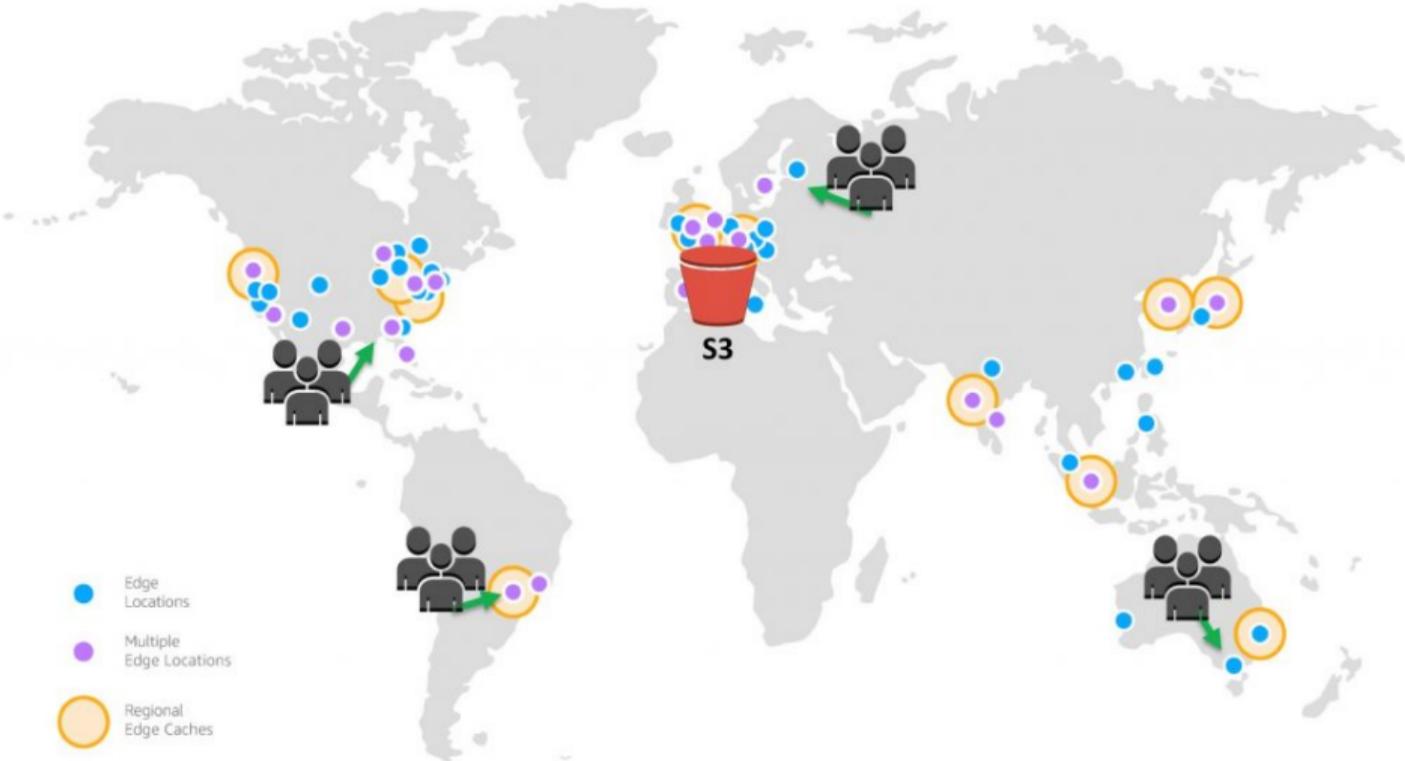


Container Image Registry

- A central place to **store** and **distribute** container **images**
- **Stores** the **layers** and the **description** of how they make up an image
- **Implements a common API** agreed upon by Docker clients



Container Image Distribution



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