

Lego - Bash - Docker

@justb4 - De Grote Geo Show - ep. 16

<https://tv.osgeo.nl/episode/episode-0016/>

YouTube: <https://youtu.be/iOililAorD4?t=3518>

Workshop additions: March 12, 2025

Tikken - Klikken?

Niet Of-Of - maar **En-En**

Het gaat om

Productiviteit

en

Zelfredzaamheid

Boodschap

Investeer in jezelf!

Leer

Bash

Leer

Docker

Bash?

“opdrachtregelprogramma”

Unix/Linux “Shell”

Mac OSX: in “Terminal”

Linux: standaard

Windows: nu ook via Ubuntu! (next)

Historie:

sh

AT&T Unix - Bourne Shell

bsh

GNU/Linux: Bourne Again Shell

bash

Bash hier als overkoepelend begrip.



Ubuntu

Canonical Group Limited • [Developer tools](#) > [Utilities](#)

Ubuntu on Windows allows you to use Ubuntu Terminal and run Ubuntu command line utilities including bash, ssh, git, apt and many more.

[More](#)



Free

[Get](#)

[See System Requirements](#)

Overview System Requirements Related

Available on



Description

Ubuntu on Windows allows you to use Ubuntu Terminal and run Ubuntu command line utilities including bash, ssh, git, apt and many more.

Waarom?

Lego!!



Leggo!!



<https://www.utrechtcentral.com/uncategorized/lego-world-2018-at-jaarbeurs-18230/>

Bouwblokken

“Componenten”

Bash

“Kleine Lego-stenen”

“Composing programs from smaller programs to accomplish a desired task”

Docker

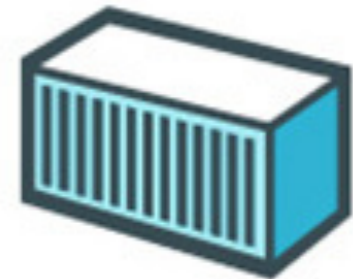
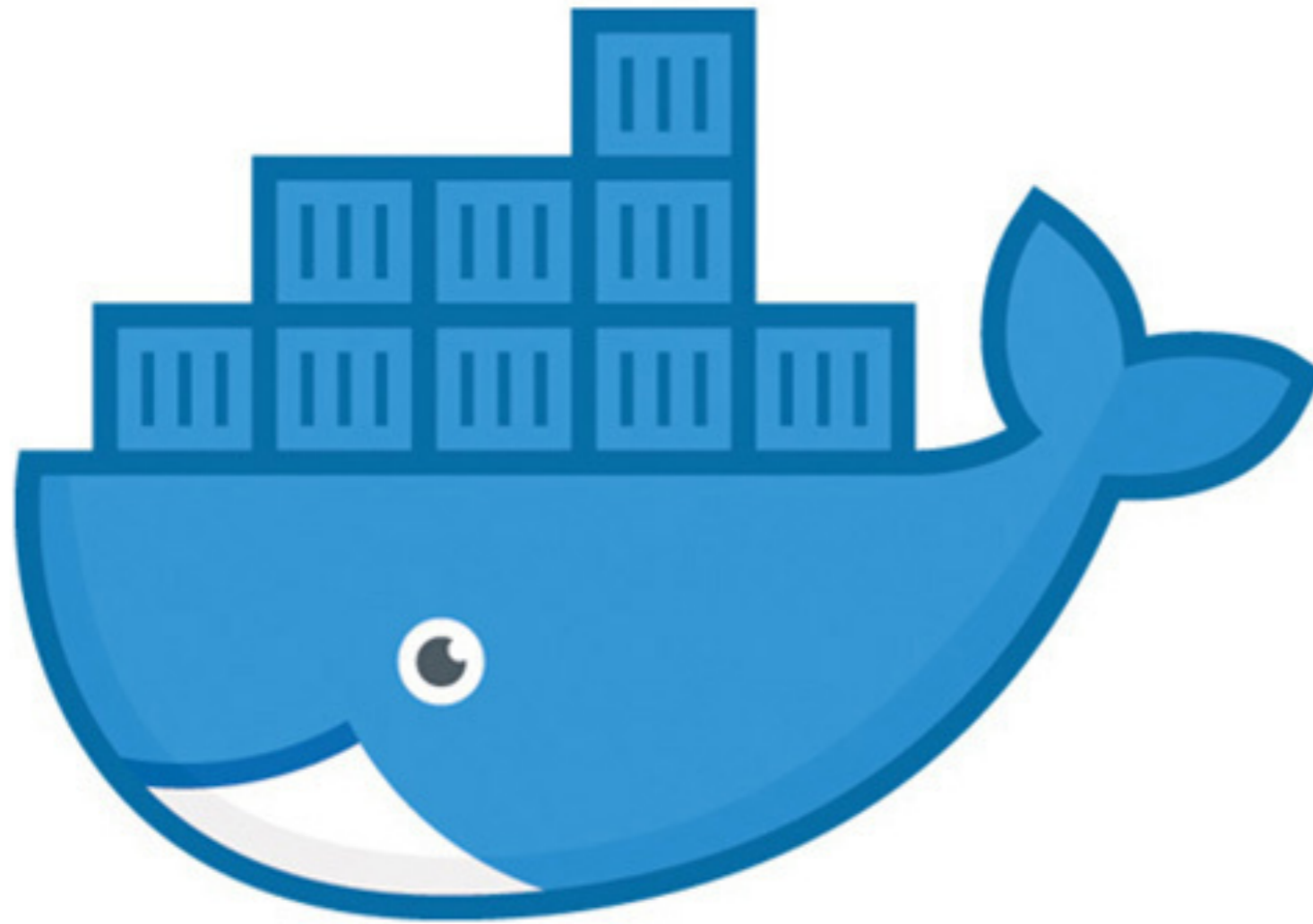
“Grote Lego-stenen”

“Composing systems from, single-service-components a.k.a. Containers”

Bash

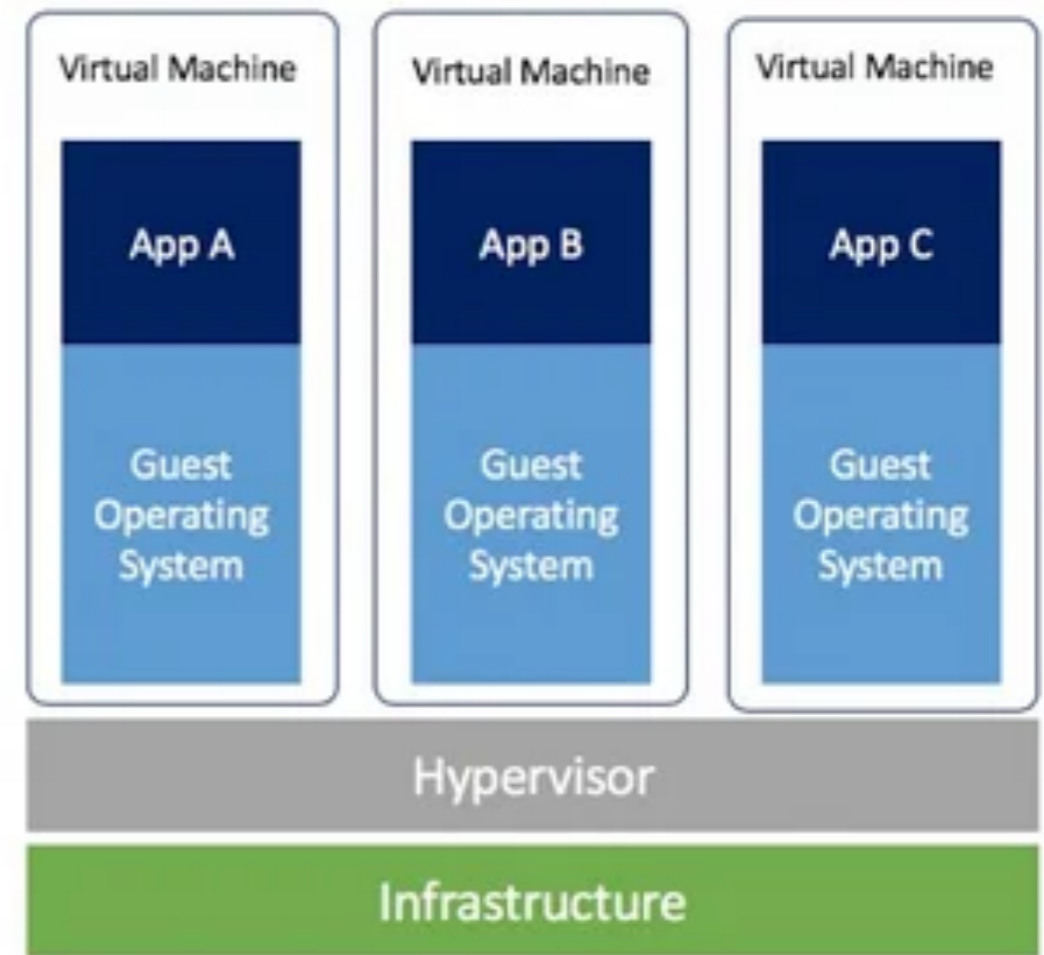
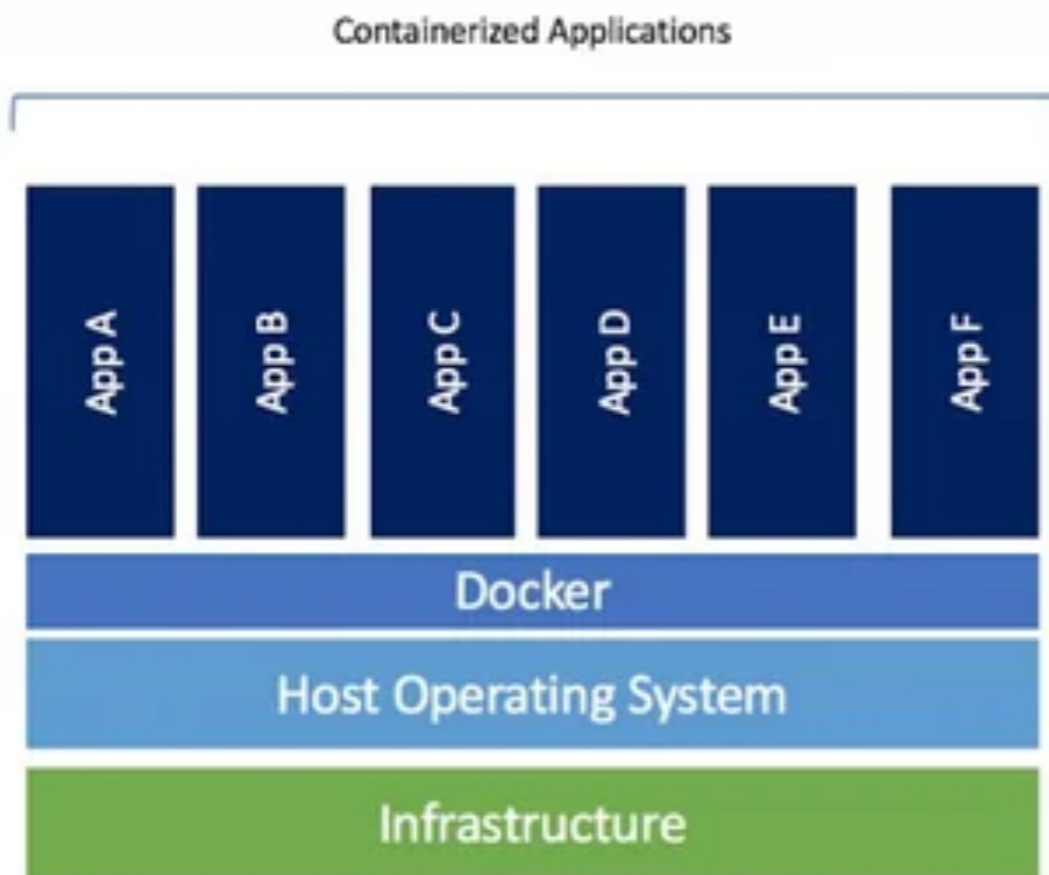
```
bash — fadmin@GFAB: ~/git/services/etl — -bash — 84x32
just@nusa:~/bagdemo/bash$ pwd
/Users/just/bagdemo/bash
just@nusa:~/bagdemo/bash$ echo "hallo geo"
hallo geo
just@nusa:~/bagdemo/bash$ echo "hallo geo" > hallo.txt
just@nusa:~/bagdemo/bash$ cat hallo.txt
hallo geo
just@nusa:~/bagdemo/bash$ cp hallo.txt hallo2.txt
just@nusa:~/bagdemo/bash$ ls
hallo.txt  hallo2.txt
just@nusa:~/bagdemo/bash$ cat hallo.txt hallo2.txt > hallohallo.txt
just@nusa:~/bagdemo/bash$ cat hallohallo.txt
hallo geo
hallo geo
just@nusa:~/bagdemo/bash$ rm hallo2.txt hallohallo.txt
just@nusa:~/bagdemo/bash$ ls
hallo.txt
just@nusa:~/bagdemo/bash$ who
just      console  Apr  8 11:43
just      ttys000  Apr  8 12:01
just      ttys001  Apr  8 12:53
just@nusa:~/bagdemo/bash$ cat hallo.txt | wc
  1      2     10
just@nusa:~/bagdemo/bash$ cat hallo.txt | wc -c
10
just@nusa:~/bagdemo/bash$ who am i
just      ttys001  Apr  8 12:53
just@nusa:~/bagdemo/bash$ docker --version
Docker version 19.03.13, build 4484c46d9d
just@nusa:~/bagdemo/bash$
```

Docker



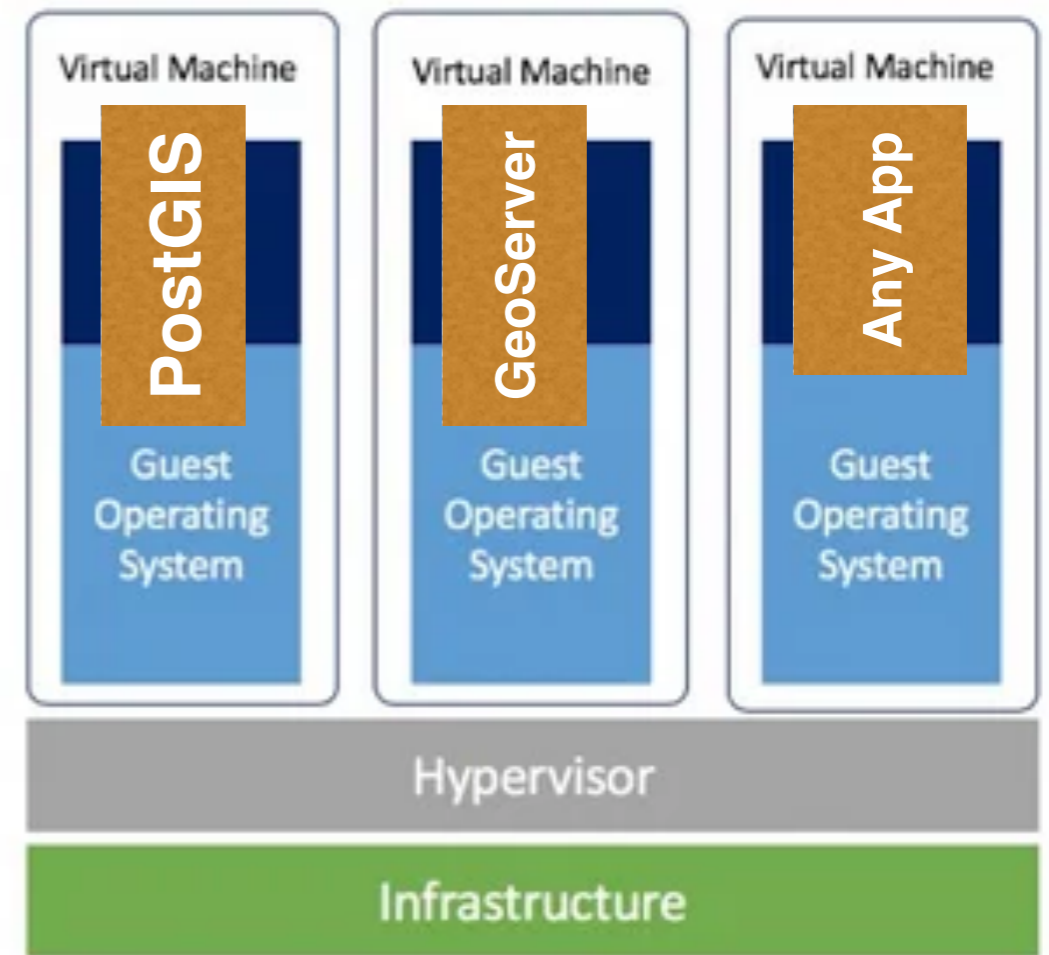
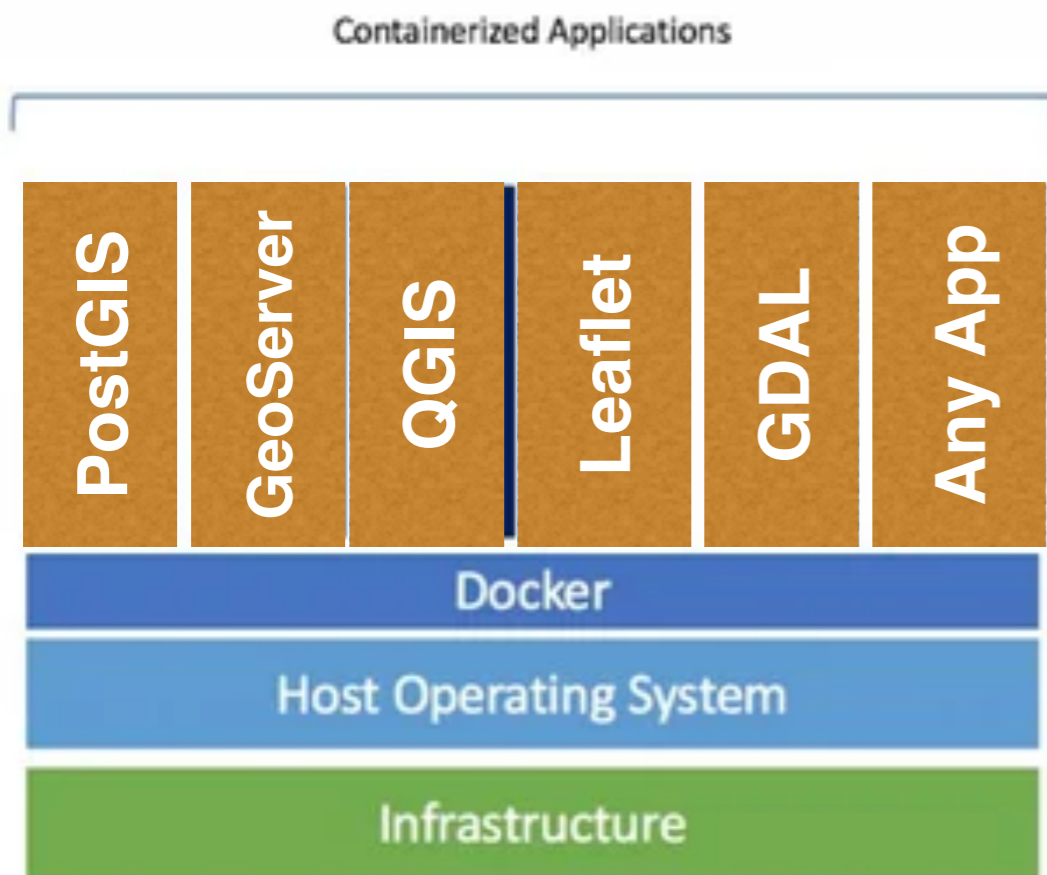
<https://www.signifytechnology.com/>

Docker vs Virtual Machines



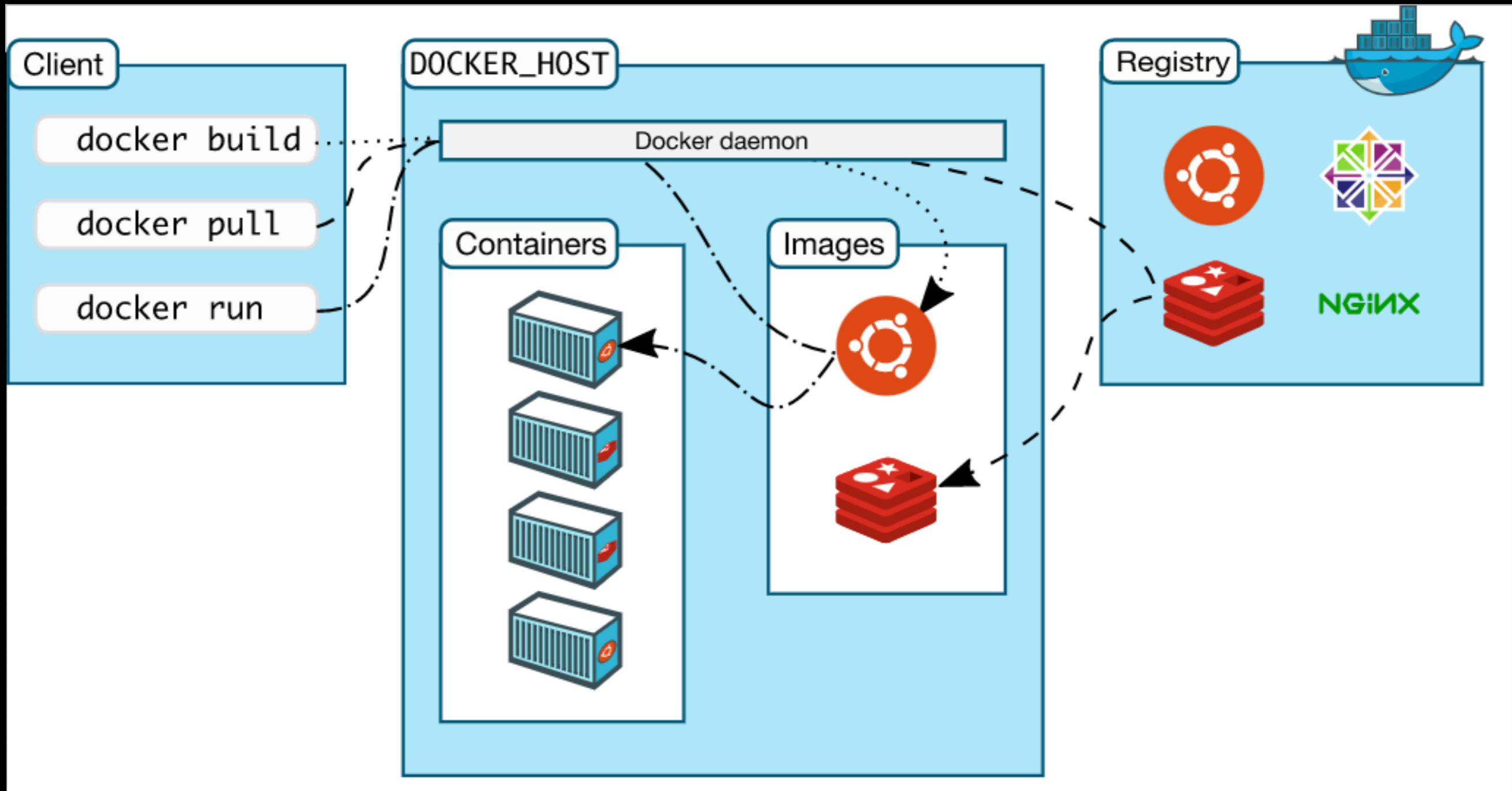
<https://www.sdxcentral.com/cloud/containers/definitions/what-is-docker-container/>

Geo met Docker



<https://www.sdxcentral.com/cloud/containers/definitions/what-is-docker-container/>

Docker



<https://docs.docker.com/get-started/overview/>

Demo!!

The screenshot shows the QGIS desktop environment. The main map area displays a residential neighborhood with a red building highlighted. The Layers panel on the left shows two layers: 'pand' and 'brtachtergrondkaart'. The Identify Results panel on the right shows the following data for the selected feature:

Feature	Value
pand [4]	
fid	5140
(Derived)	
(Actions)	
fid	5140
oorspronkelijkBouwjaar	1970
identificatie	NL.IMBAG.Pand.0221100...
status	Pand in gebruik (niet inge...
geconstateerd	false
documentDatum	2018-07-12
documentNummer	2018OMG0031
voorkomenIdentificatie	3
beginGeldigheid	2018-07-12
eindGeldigheid	2019-11-19
tijdstipRegistratie	2018-07-16 09:45:58
eindRegistratie	2019-11-19 12:50:23
tijdstipnactief	NULL
tijdstipRegistratieLV	2018-07-16 10:00:41
tijdstipEindRegistratieLV	2019-11-19 12:50:47
tijdstipnactiefLV	NULL
tijdstipNietBagLV	NULL
fid	5141
fid	5138
fid	5139

The status bar at the bottom shows the following information: Coordinate 206248,447198, Scale 1:4579, Magnifier 100%, Rotation 0,0°, Render, and EPSG:28992.

Demo - Referentie

Werkmappen maken

```
mkdir work  
mkdir work/in  
mkdir work/out
```

Data ophalen

```
curl -o work/in/bag.zip https://data.nlextract.nl/beta/bagv2/doesburg/BAGGEM0221L-15092020.zip
```

Data uitpakken

```
cd work/in  
unzip bag.zip  
unzip 0221GEM15092020.zip  
unzip 0221PND15092020.zip
```

Opschonen

```
rm *.zip Leveringsdocument-BAG-Extract.xml
```

Terug naar start map

```
cd -
```

Docker!!

```
docker images  
docker pull ghcr.io/osgeo/gdal:ubuntu-small-latest  
docker images  
docker run --rm ghcr.io/osgeo/gdal:ubuntu-small-latest ogr2ogr --version  
docker run --rm -v $(pwd)/work:/work ghcr.io/osgeo/gdal:ubuntu-small-latest ogr2ogr -f GPKG /work/out/pand.gpkg /work/in
```

Panden in QGIS (Doesburg)

```
open -a QGIS work/out/pand.gpkg
```

Oefeningen - Basis

Docker Installeren

Zie <https://geopython.github.io/geopython-workshop/docker/>

Windows: <https://docs.docker.com/desktop/setup/install/windows-install/>

Linux: <https://docs.docker.com/desktop/setup/install/linux/>

nginx webserver draaien

```
docker pull nginx:stable-alpine
```

```
docker images
```

```
docker run --help
```

```
docker run --rm --name nginx nginx:stable-alpine
```

```
# in andere terminal
```

```
docker ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
afbe96a4cdb2	nginx:stable-alpine	"/docker-entrypoint..."	42 seconds ago	Up 41 seconds	80/tcp	nginx

```
docker stop
```

```
# Publish a container's port(s) to the host (port mapping)
```

```
docker run -p 8000:80 --rm --name nginx nginx:stable-alpine
```

```
# open URL: http://localhost:8000/
```

```
# Publish a "website" with volume mapping, NB altijd hele pad naar lokale map
```

```
mkdir www
```

```
echo "Hallo Website" > www/index.html
```

```
docker run -p 8000:80 -v $(pwd)/www:/usr/share/nginx/html --rm --name nginx nginx:stable-alpine
```

```
# Run in background ('detached')
```

```
docker run -d -p 8000:80 -v $(pwd)/www:/usr/share/nginx/html --rm --name nginx nginx:stable-alpine
```

```
docker ps
```

```
# 'inloggen' in container (in Alpine containers 'ash' ipv 'bash) - uitloggen met CTRL-D
```

```
docker exec -it nginx /bin/ash
```

```
cat /usr/share/nginx/html/index.html
```

```
# probeer de GDAL/OGR demo (vorige slide) nu uit
```

Oefeningen - Geo Services - PostGIS

```
# PostGIS
Zie Docker Hub, Docker Image repo: https://hub.docker.com/r/postgis/postgis
Alpine: kleine images
# installeer
docker pull postgis/postgis:17-3.5-alpine
# draaien - minimaal wachtwoord nodig voor 'postgres' DB
docker run -d --rm --name postgis -e POSTGRES_PASSWORD=gis -e POSTGRES_DB=gis -e POSTGRES_USER=gis
                                         postgis/postgis:17-3.5-alpine

# psql in container voor db 'gis'
docker exec -it postgis psql -U gis -W -d gis

# GeoPackage laden - nu met port mapping
docker run -p 5433:5432 -d --rm --name postgis -e POSTGRES_PASSWORD=gis -e POSTGRES_DB=gis -e POSTGRES_USER=gis
postgis/postgis:17-3.5-alpine
ogr2ogr -f "PostgreSQL" -t_srs "EPSG:28992" PG:"host=localhost user=gis dbname=gis password=gis port=5433" pand.gpkg
# Data bekijken
docker exec -it postgis psql -U gis -W -d gis
select * from pand limit 10;
# alleen: bij stoppen postgis container is de database ook weg -> Docker Volumes
# Maar ook teveel parameters nodig, en we willen meer services zoals PGAdmin4 daarom Docker Compose files gebruiken
```

Oefeningen - Geo Services met Docker Compose

```
# maak een bestand docker-compose.yml met deze inhoud
services:
```

```
  postgis:
    image: postgis/postgis:17-3.5-alpine

    container_name: postgis

    ports:
      - "5433:5432"

    environment:
      - POSTGRES_HOST=postgis
      - POSTGRES_PORT=5432
      - POSTGRES_DB=gis
      - POSTGRES_USER=gis
      - POSTGRES_PASSWORD=gis

    volumes:
      - postgis_db:/var/lib/postgresql/data
```

```
  pgadmin:

    image: dpage/pgadmin4:9.1

    container_name: pgadmin

    ports:
      - "8000:80"

    environment:
      - PGADMIN_DEFAULT_EMAIL=gis@gis.com
      - PGADMIN_DEFAULT_PASSWORD=gis

    volumes:
      - postgis_pgadmin:/var/lib/pgadmin
```

```
volumes:
  postgis_db:
  postgis_pgadmin:
```

```
# dan alle services starten en data laden
```

```
docker compose up -d
```

```
ogr2ogr -f "PostgreSQL" -t_srs "EPSG:28992" PG:"host=localhost user=gis dbname=gis password=gis port=5433" pand.gpkg
```

```
# open URL: http://localhost:8000/ voor PGAdmin4
```