Docker 101

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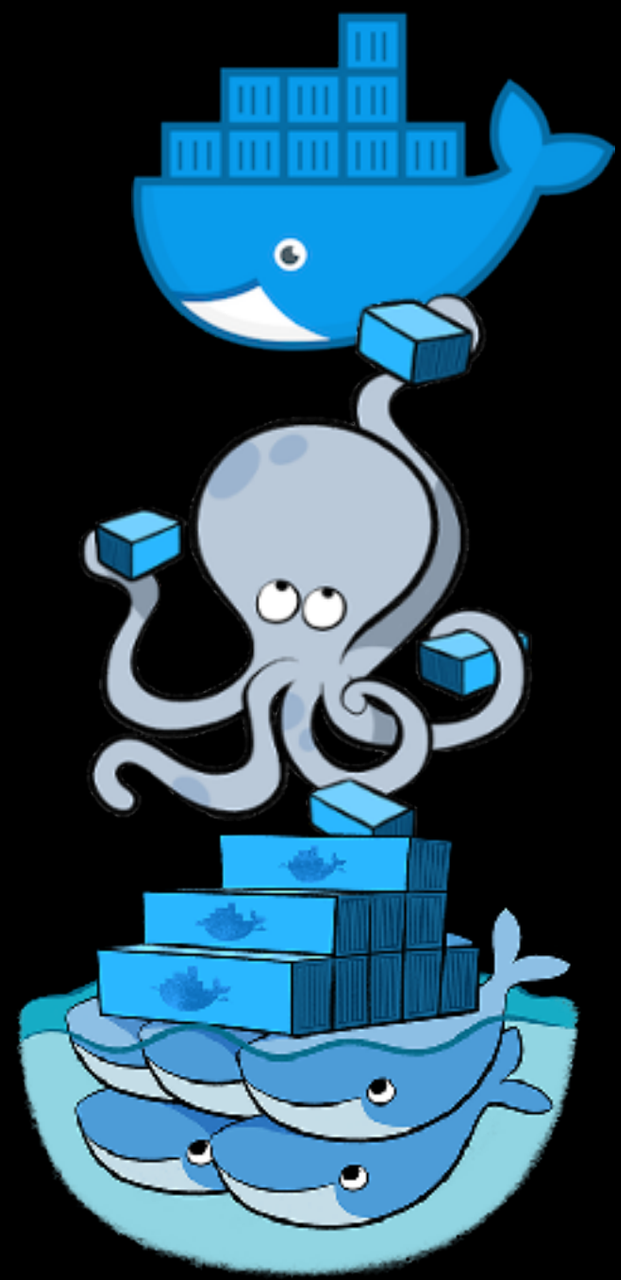
Plan

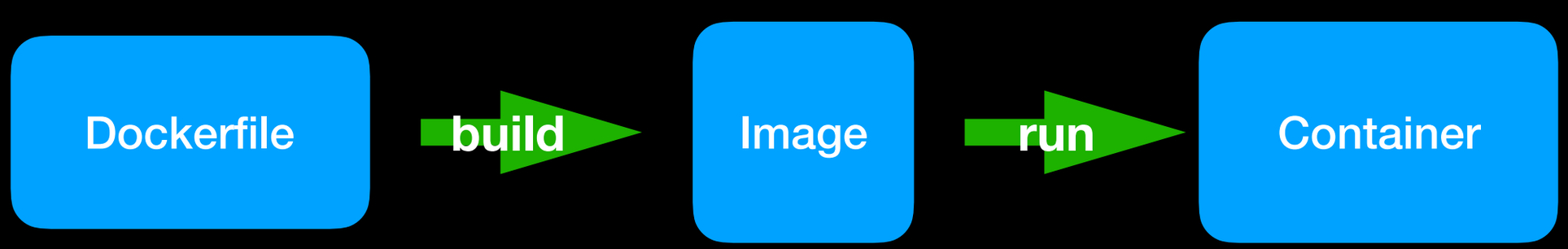
- Docker Ecosystem
- Dockerfile
- CLI
- Tips & Tricks
- Docker-compose

What is docker?

- Docker Containers
- Docker Hub
- Docker Compose
- Docker Swarm
- Docker Cloud

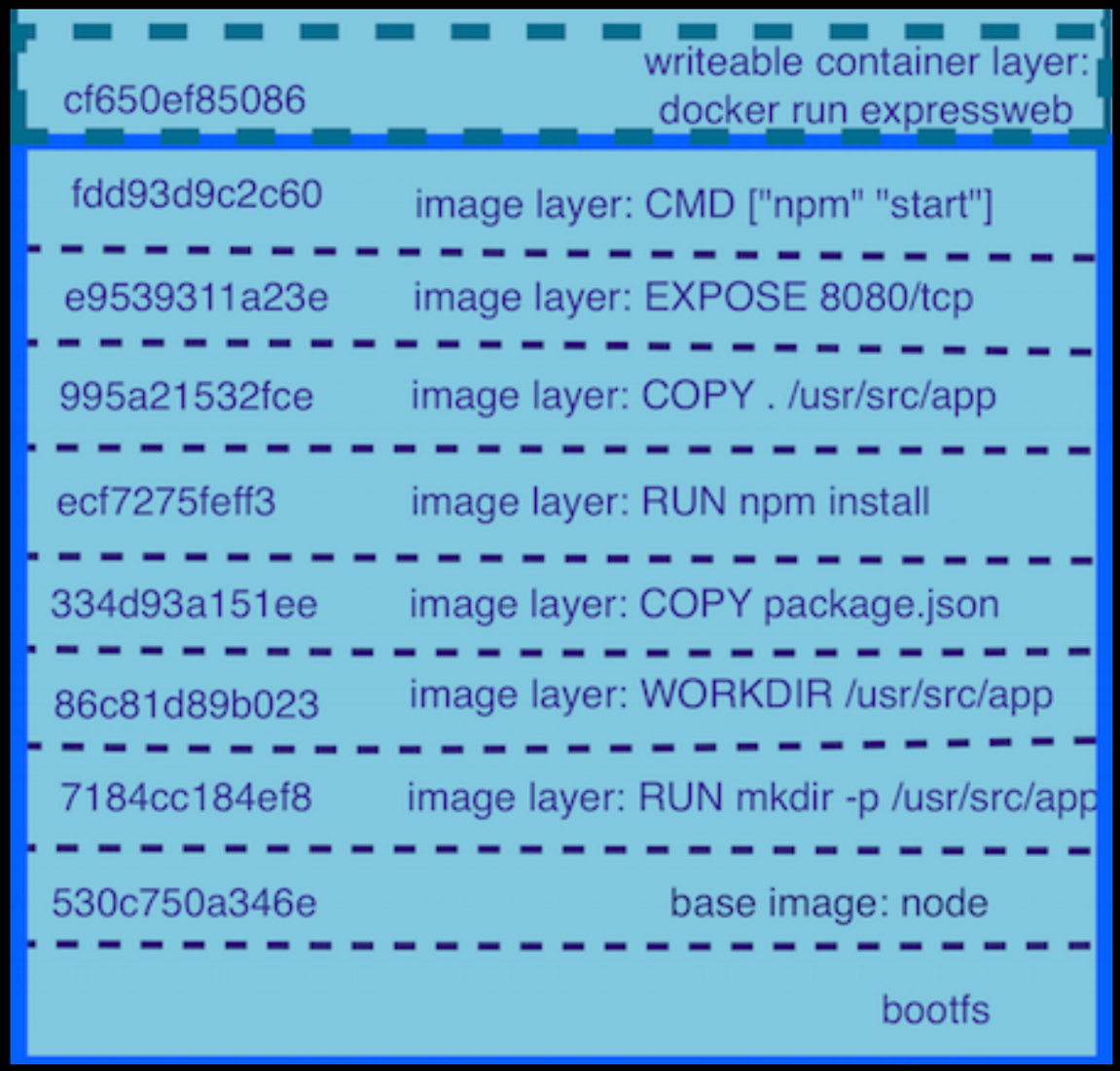


Pipeline



Dockerfile reference

- FROM
- RUN
- ENTRYPOINT / CMD
- COPY / ADD
- WORKDIR



Docker cli basic

```
docker build -t alikhil/my-image:v1 -f
Dockerfile .

docker run [-p 8080:80] [-d] alikhil/my-
image:v1
```

Logs

```
docker logs [-f] [--tail=N] cntr_id_or_name
```

```
docker logs -f nginx
```

Exec

```
docker exec [--it] cntr_name_or_id command
```

```
docker exec --it myapp bash
```

Volumes

```
docker run -v host_dir:cntr_dir image-name
```

Port forwarding

```
docker run -p <host-port>:<container-port>
image-name
```

Example stateful postgres in docker:

```
docker run -d --rm
    -v $(PWD)/data/pg:/var/lib/postgresql/data
    -e POSTGRES_PASSWORD=1234
    -e POSTGRES_USER=postgres
    -p 5432:5432
    --name pg-app postgres
```

Trick #1

Speed up builds by:
- caching layers
- use .dockerignore

```
1   FROM node:8.12
2
3   RUN mkdir app
4   WORKDIR /app
5
6   ADD package.json
7
8   RUN npm install
9
10  ADD . .
11
12  CMD ["node", 'index.js']
```

https://blog.playmoweb.com/speed-up-your-builds-with-docker-cache-bfed14c051bf

Trick #2

Decrease image size by:
- using alpine images:
- combining several RUN layers into one

https://hackernoon.com/tips-to-reduce-docker-image-sizes-876095da3b34

Trick #3

Save disk space in your host machine by:

- running containers with `--rm` argument
  - or remove them later with:

```
docker rm $(docker ps  -q -f 'status=exited')
```

  - prune old volumes `docker volume prune`
  - delete unused images - `docker rmi $(docker images -q -f “dangling=true")`

Trick #4

Docker run can become very complicated. Like this:

```
docker run -d --rm
    -v $(PWD)/data/pg:/var/lib/postgresql/data
    -e POSTGRES_PASSWORD=1234
    -e POSTGRES_USER=postgres
    -p 5432:5432
    --name pg-app postgres
```

Solution: use `docker-compose`

docker-compose

```yaml
version: '3'

services:
  redis:
    image: redis:5.0
    volumes:
      - $PWD/redis_data:/data
    ports:
      - 6379:6379

  postgres:
    image: postgres:9.6
    environment:
      - POSTGRES_USER=postgres
      - POSTGRES_PASSWORD=1234
      - POSTGRES_DB=postgres
    ports:
      - 5433:5432
    volumes:
      - $PWD/postgres_data:/var/lib/postgresql/data
```

docker-compose cli

```
docker-compose up # docker run for each service in yml file
docker-compose up svc1 svc2  # docker run for svc1 and svc2
docker-compose down # stop all services
docker-compose stop svc1 svc2 # stop svc1 and svc2

docker-compose logs [svc] [-f] [--tail=N]
docker-compose exec svc command
```

Resources

- https://www.backblaze.com/blog/vm-vs-containers/
- All used logos taken from google search