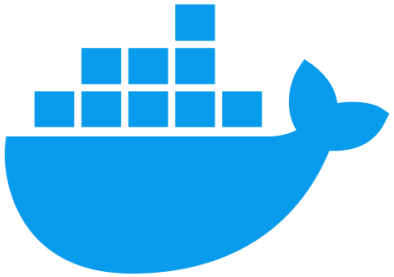
Testing Techniques

Docker



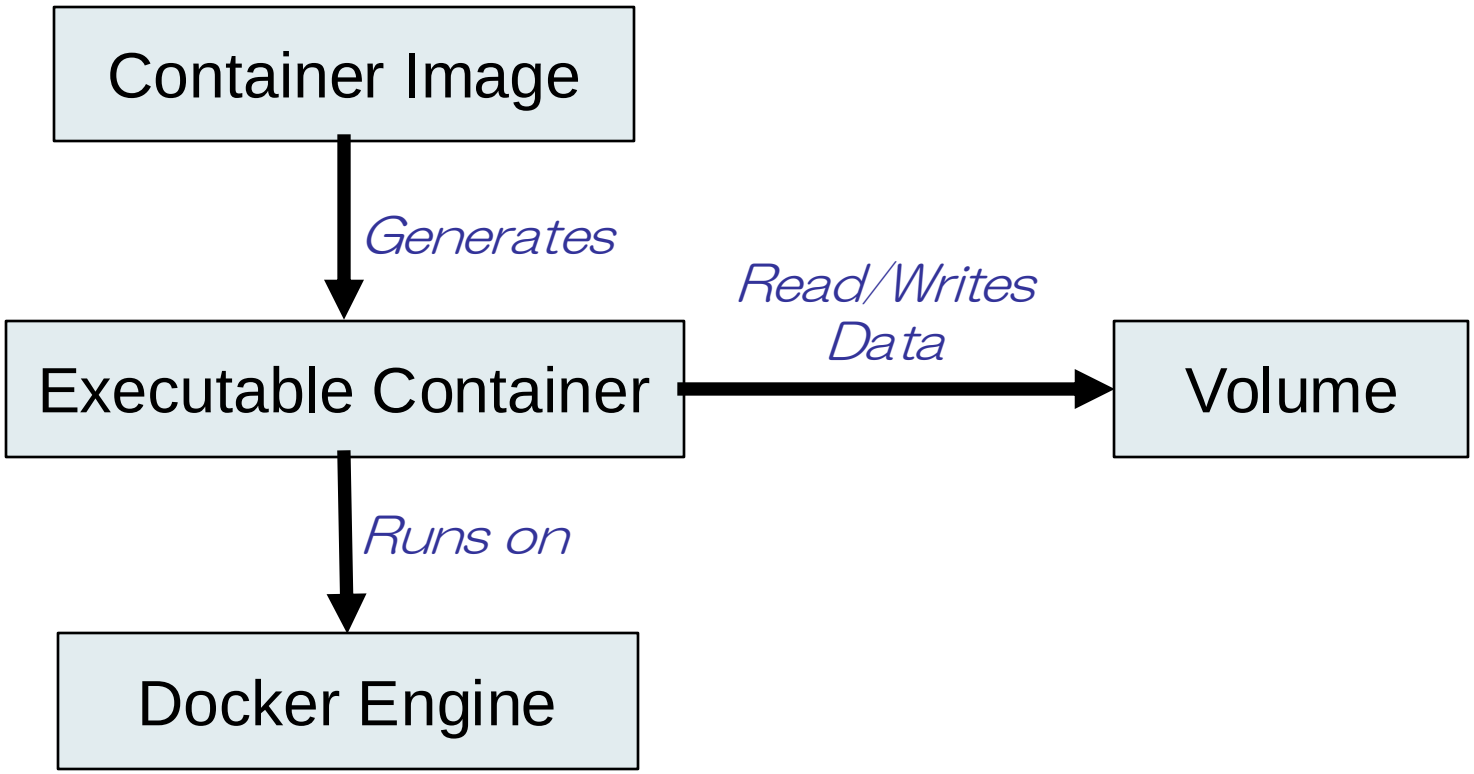
Lars van Arragon

Radboud University Nijmegen

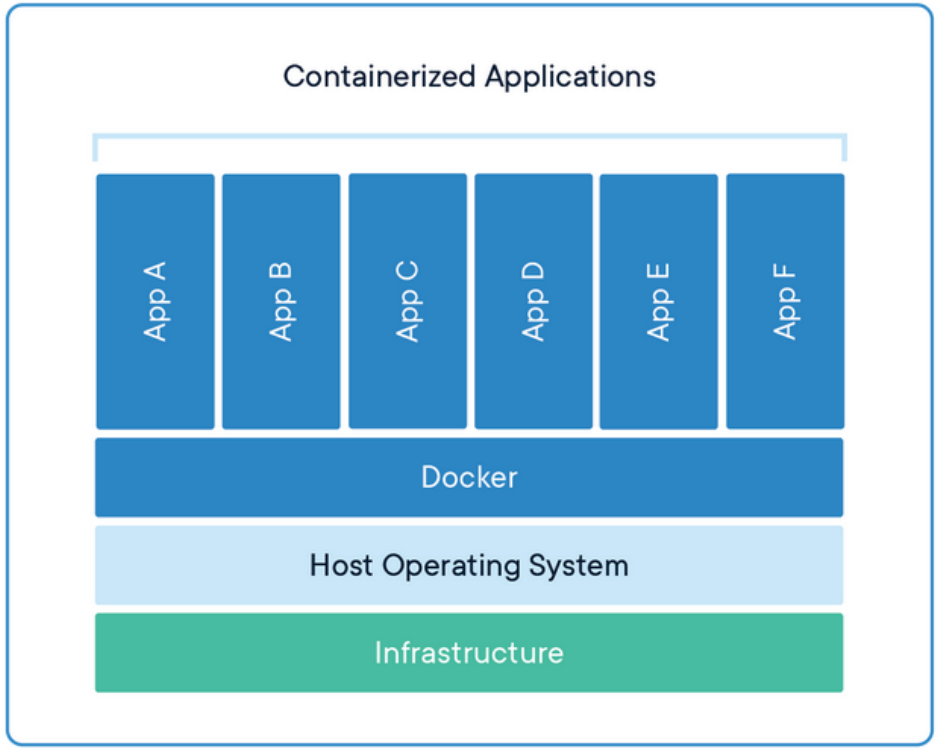
Docker Overview

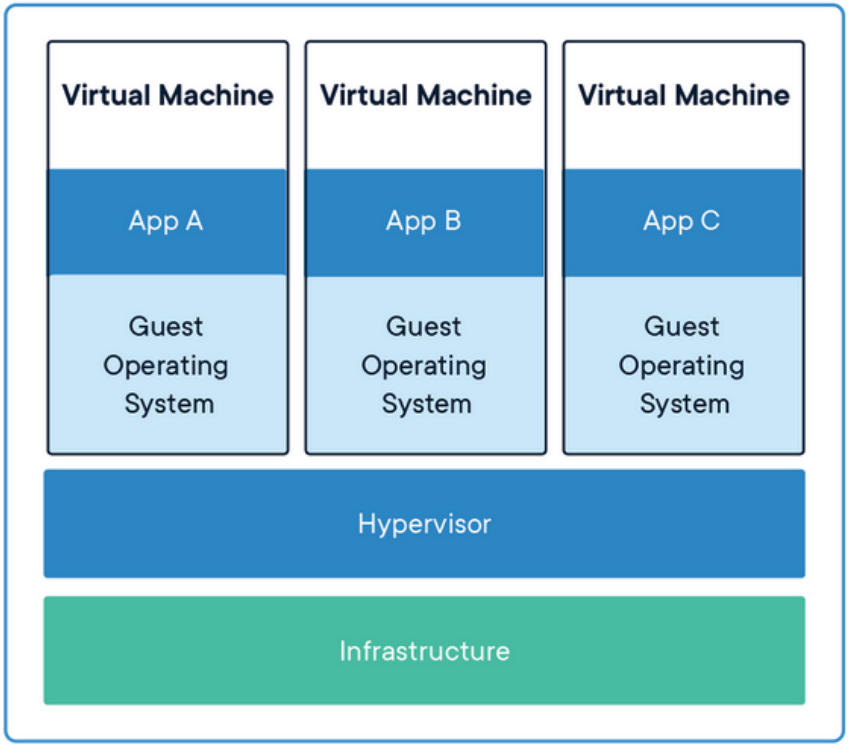
- Containers
  - Standalone, lightweight, standard unit of software
  - Includes everything needed to run a particular software
- Container Images
  - Based on a Dockerfile
  - Describe what the container looks like and needs
  - When executed, they become a container at runtime
- Volumes
  - Persistent data after container deleted, can be shared between containers
- Not “real” virtual machines
  - Further reading: https://www.docker.com/blog/containers-are-not-vms/

Docker Overview



Docker, Not A Virtual Machine

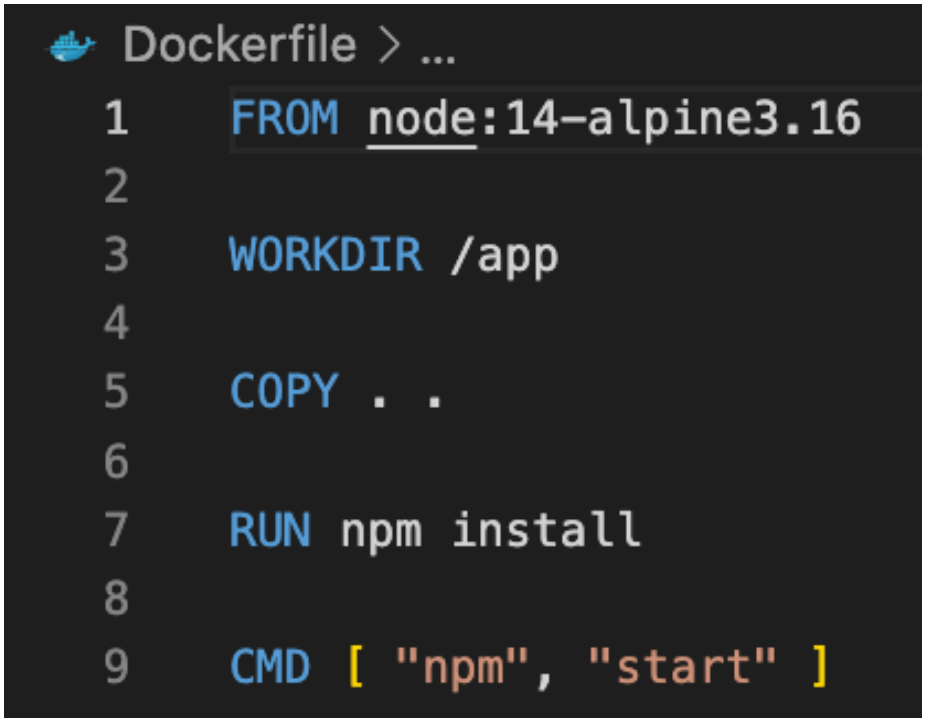




- Important to consider for your testing
  - Network traffic only goes through your own device when running server and client locally

Dockerfiles

- Dockerfiles describe how to create a specific container
- The way to share a custom container between different platform
  - https://docs.docker.com/reference/dockerfile/



- FROM describes parent image
- WORKDIR changes current directory of the container (creates if not exist)
- COPY copies files from host current directory to container current directory
- RUN runs command during image build step
- CMD runs command during exec

From: https://medium.com/@anshita.bhasin/a-step-by-step-guide-to-create-dockerfile-9e3744d38d11

Docker Compose

- More advanced control over your environment with Docker Compose
  - https://docs.docker.com/compose/intro/compose-application-model/
  - https://docs.docker.com/compose/gettingstarted/
- Use a YAML file to configure and start application services
- Requires knowledge of networks
- Can be used to deploy containers and infrastructure across multiple machines
  - https://www.baeldung.com/ops/docker-compose

Docker Installation

- Docker Desktop
  - Includes Docker Compose, Docker CLI, and basically everything you need
  - https://www.docker.com/get-started/

- No need to make an account
- Integrates with most IDEs
  - VS Code
  - IntelliJ
- You can mostly use just the desktop client to configure everything

Docker for Matrix

- Synapse has its own Docker Image
  - https://hub.docker.com/r/matrixdotorg/synapse
- Construct, Dendrite, conduwuit, and Conduit also claim to have Docker Images
  - https://github.com/matrix-construct/construct/wiki/DOCKER
  - https://github.com/matrix-org/dendrite/blob/main/Dockerfile
  - https://conduwuit.puppyirl.gay/deploying/docker.html
  - https://gitlab.com/famedly/conduit/-/blob/next/docker/ci-binaries-packaging.Dockerfile?ref_type=heads
- I have not tested these, use at your own risk

Docker for Synapse – Step-by-step

- Based on: https://hub.docker.com/r/matrixdotorg/synapse
- In Docker Desktop, create a new volume and name it
- In your command prompt, generate a valid configuration
- In Docker Desktop, change the homeserver.yaml with your preferred configurations, but specifically add:
  - enable_registration: true
  - enable_registration_without_verification: true
- In either your command prompt or Docker Desktop execute the image with the optional settings:
  - Container name
  - Bind host port 8008 to 8008
  - Bind created volume to /data

Closing Remarks

- Use of Docker is not mandatory, but it is handy
  - You are free to use your own deployment strategy
- Docker has great documentation and an active community
- Docker Desktop is not required, you can use Docker from the command line by just installing the Docker Engine
  - For example: https://docs.docker.com/engine/install/ubuntu/
  - (should also fix the “kvm is not enabled on host” issue)