
Pinterest

Accelerating development velocity of production ML systems using docker

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Pinterest is the visual discovery engine.

Mission

Help people discover and do what they love.

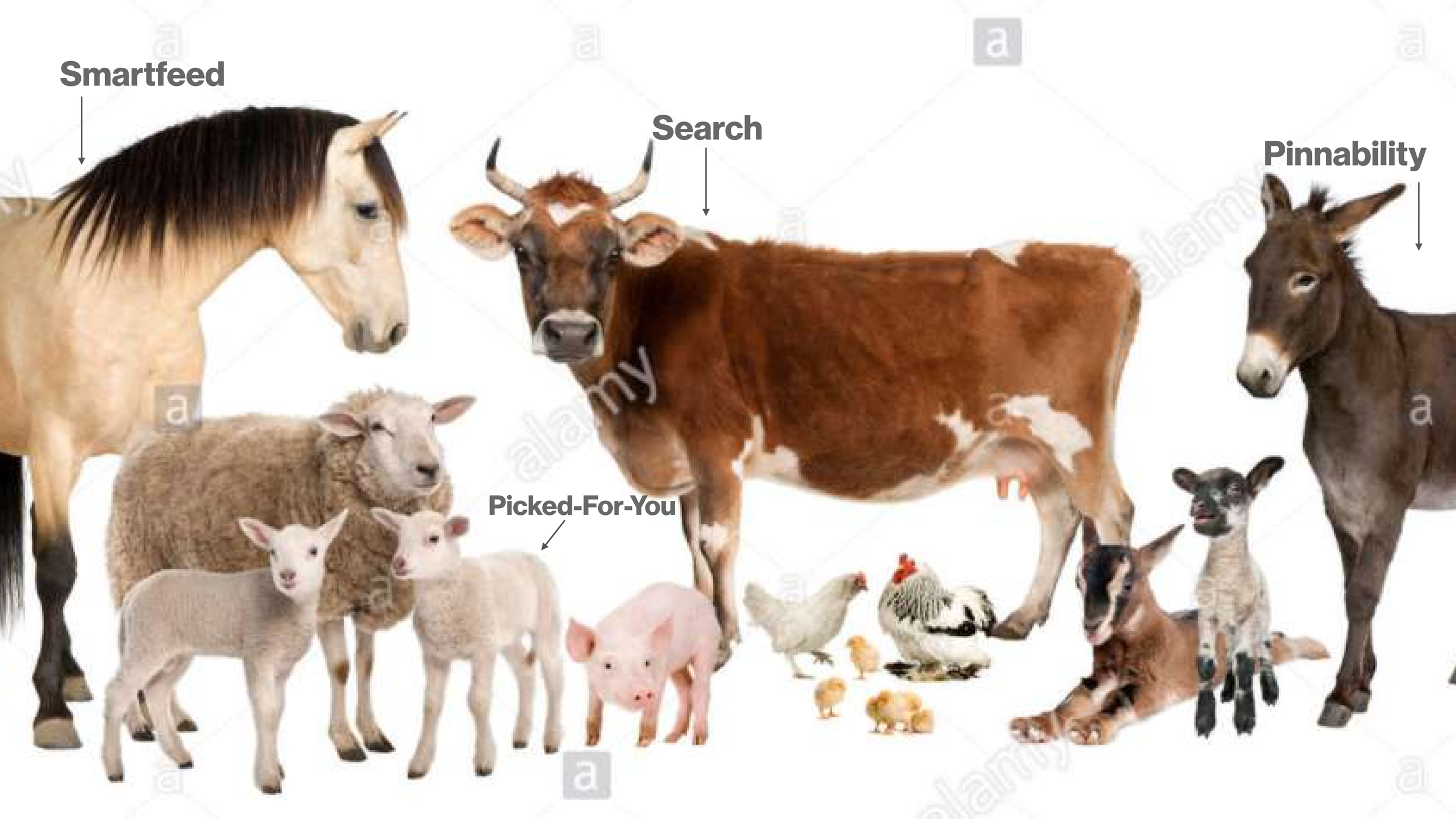
Machine learning @ Pinterest

1 Interest-based feed
2 Recommendations
3 Search
4 Ads
5 Visual Discovery

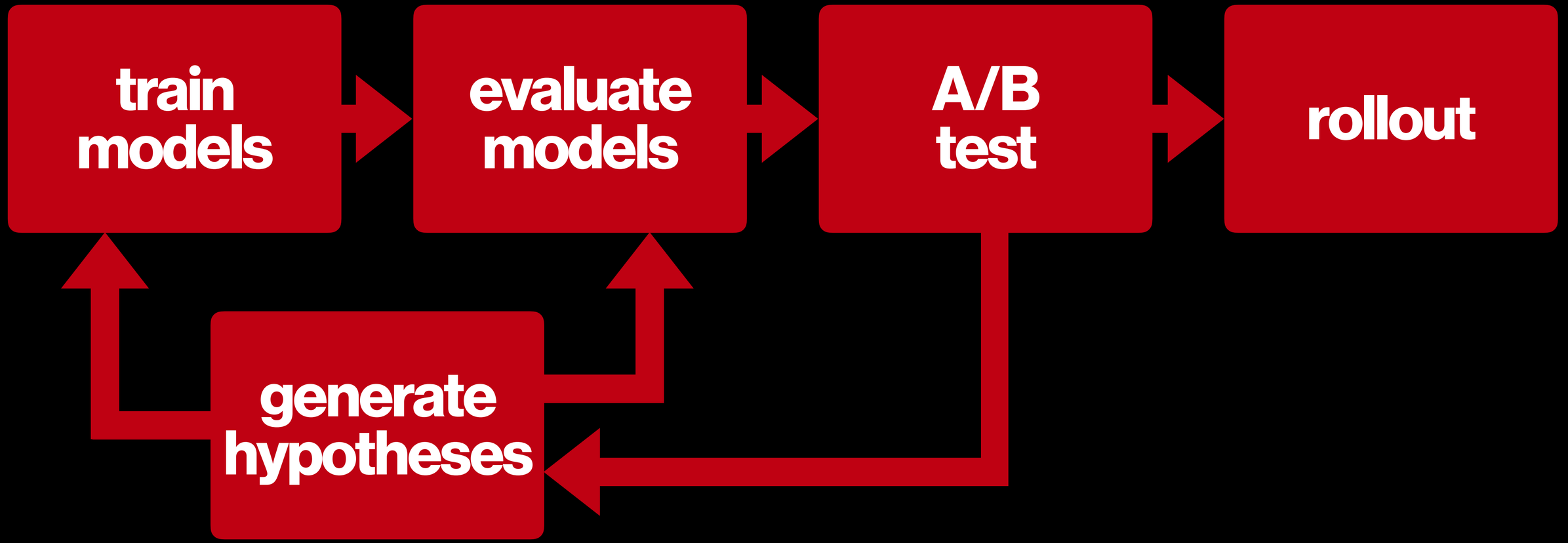
Monolith to Microservices


Monolith

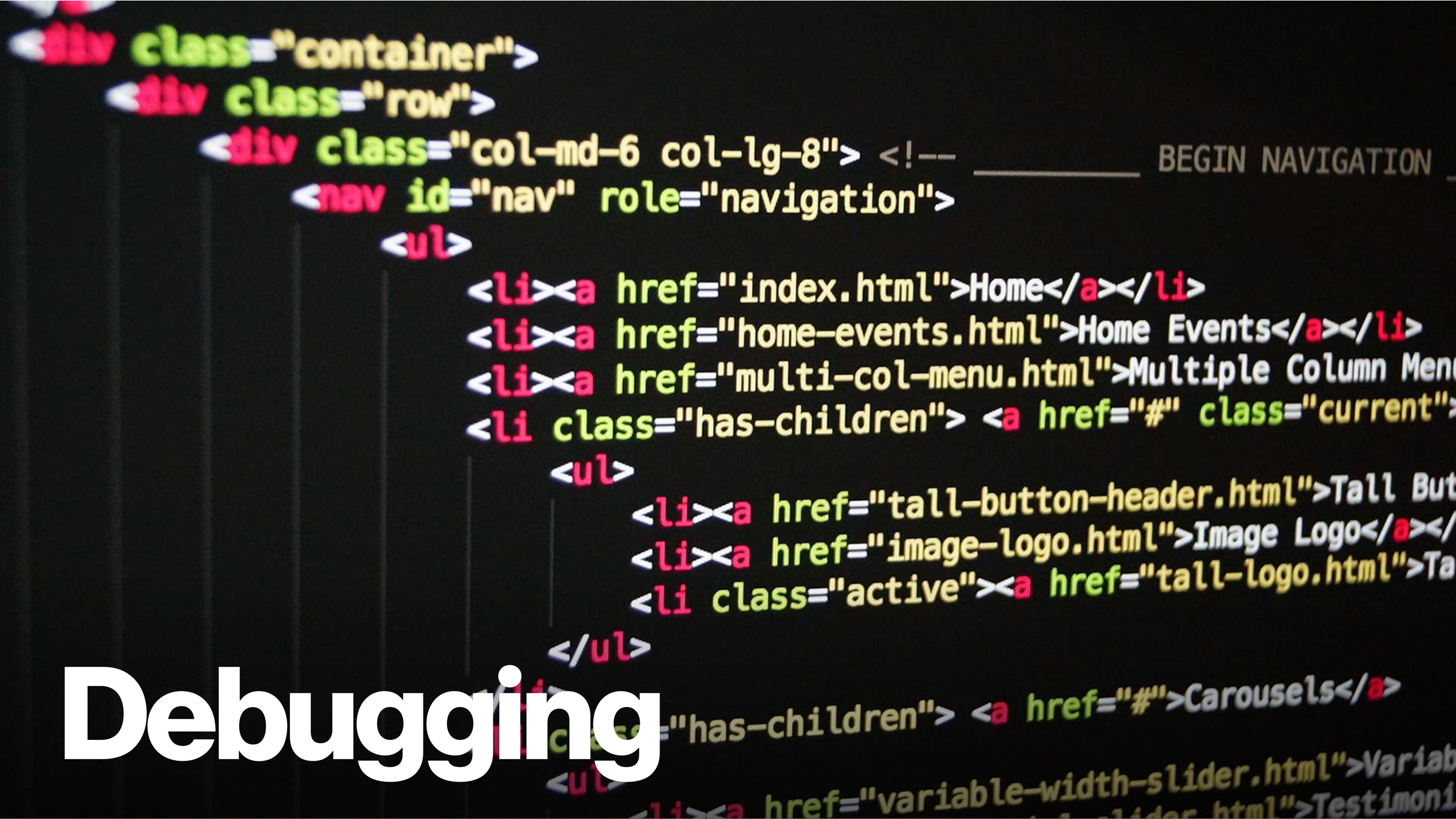
Microservices


Smartfeed
Search
Pinnability
Picked-For-You

Challenges with Microservices



Model training


Debugging


Solutions?

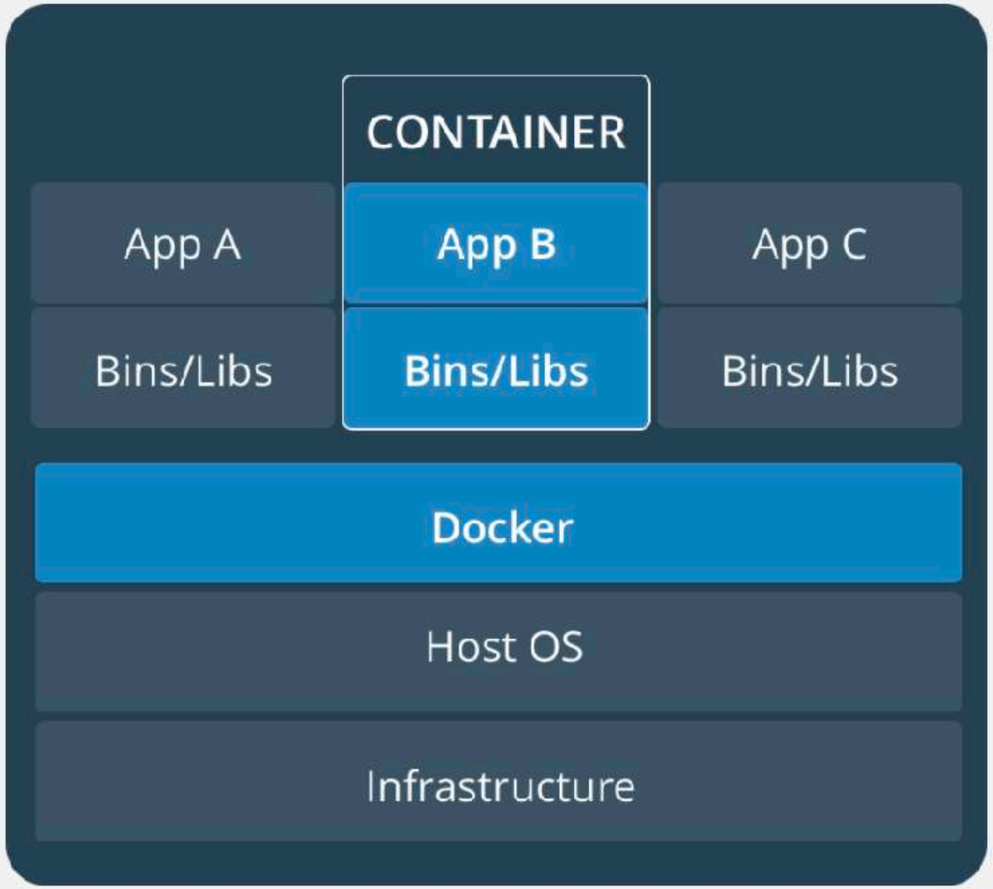
docker

What is...

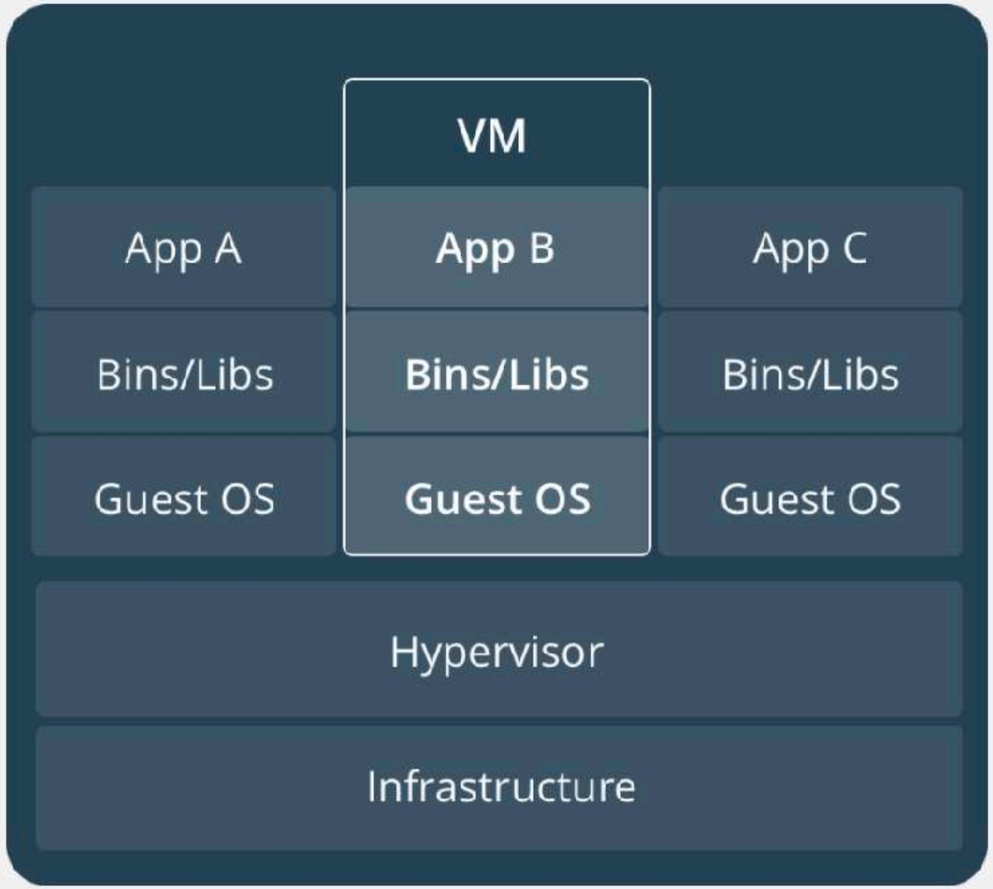
1. Bundle applications with its runtime environment

2. Similar to a virtual machine

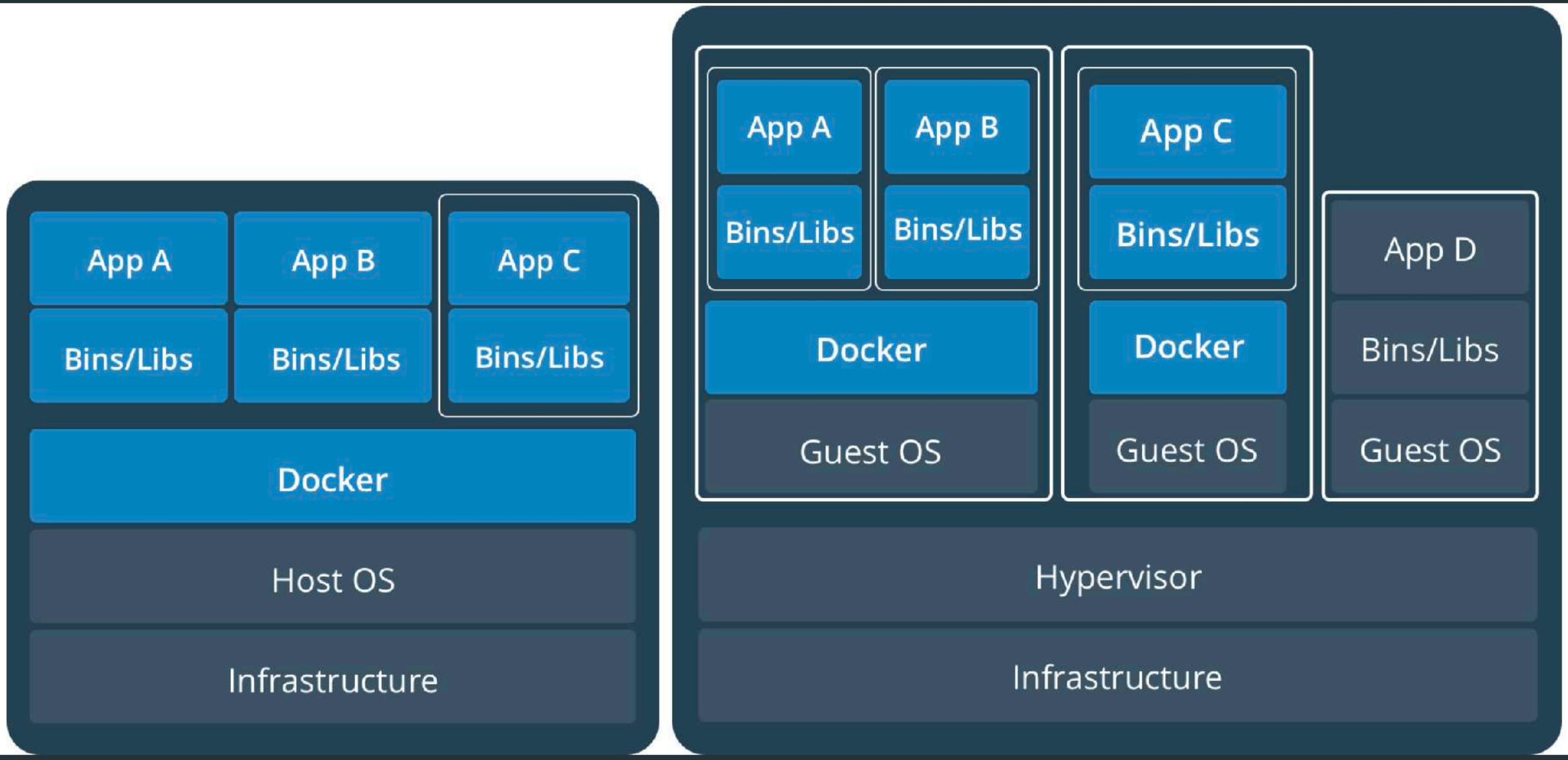
3. Runs on it own network interface



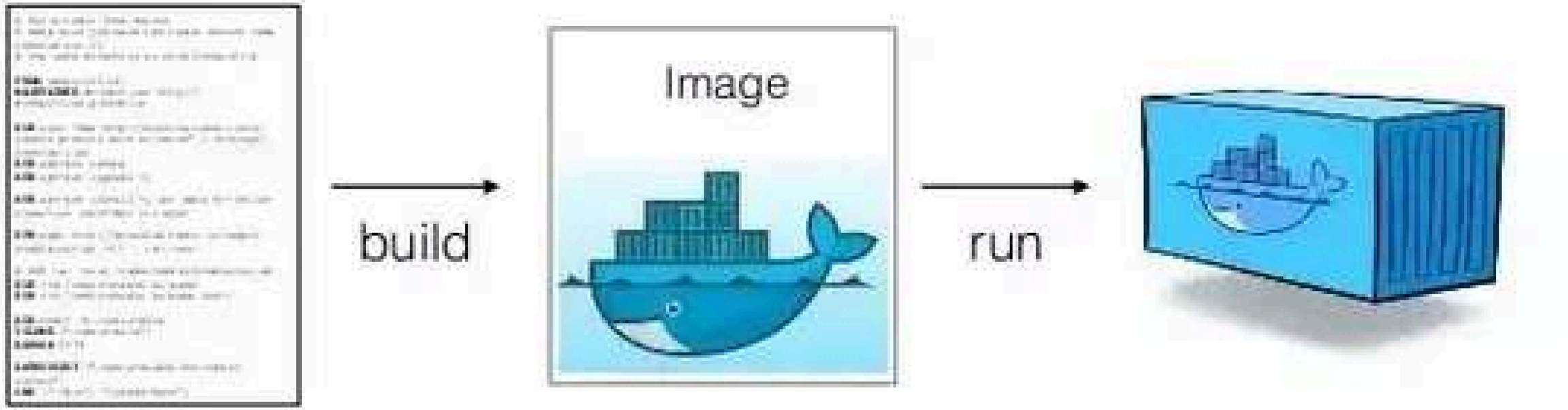
CONTAINERS



VIRTUAL MACHINES


App A
App B
App C
Bins/Libs
Bins/Libs
Bins/Libs
Docker
Host OS
Infrastructure
App A
App B
Bins/Libs
Bins/Libs
Docker
Guest OS
App C
Bins/Libs
Docker
Guest OS
App D
Bins/Libs
Guest OS
Hypervisor
Infrastructure

Single Container Docker Workflow



```
# Refer https://docs.docker.com/engine/userguide/eng-image/dockerfile_best-practices/
# for best practices maintaining this file.
# This file is used to build docker images for development purposes only.
# This file cannot be used to build docker images on production.

# Base image from https://phabricator.pinadmin.com/diffusion/BDI
FROM 998131032990.dkr.ecr.us-east-1.amazonaws.com/oracle-java8:latest

# Default environment variables required to run service, can be overridden by docker run
ENV CONFIG_FILE=config/instantpfy.test.properties \
    HEAP_SIZE=4G \
    LOG4J_CONFIG_FILE=config/log4j_instantpfy.xml \
    NEW_SIZE=2G

# Create and set current directory
WORKDIR /opt/fantasio

# Add the build artifact under /opt, can be overridden by docker build
ARG ARTIFACT_PATH=target/fantasio-0.1-SNAPSHOT-bin.tar.gz
ADD $ARTIFACT_PATH /opt/fantasio

# Default command to run service, do not override it in docker run unless have a good reason
# Use "docker logs ID" to view stdout and stderr
CMD ["scripts/run_in_container.sh"]
~
~
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```
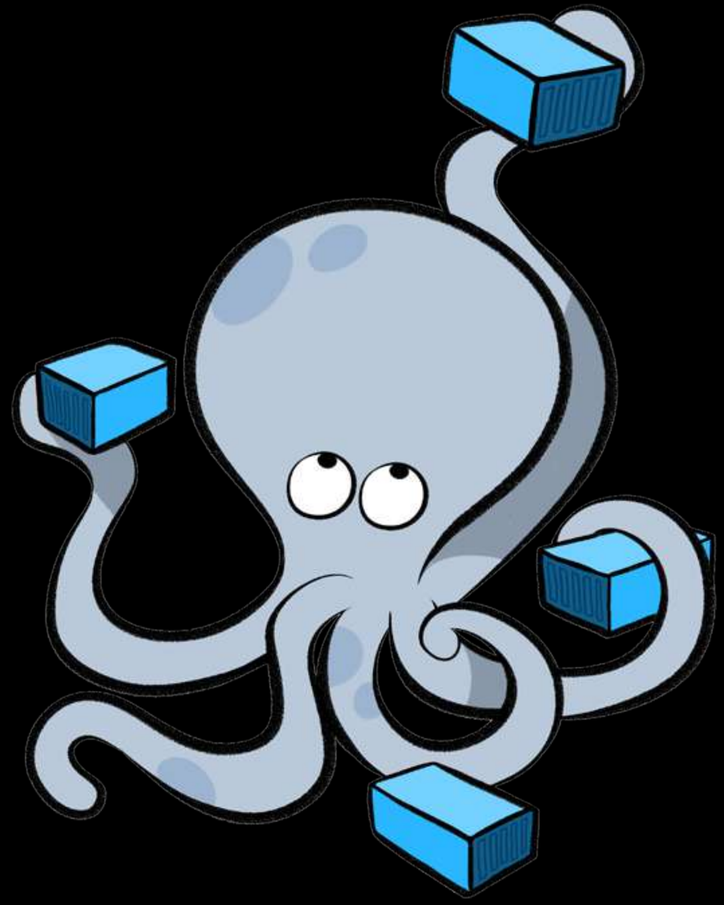

Dockerfile

Connecting services



Docker Compose

```
version: '2'
services:
  smartfeed_service:
    build:
      context: ./smartfeed
      dockerfile: Dockerfile
    ports:
      - "5002:9191"
    command: service
    container_name: smartfeed_service
    volumes:
      - "/home/{{USER}}/code/optimus/smartfeed:/var/src/smartfeed"
      - "/var/serverset:/var/serverset"
      - "/var/config:/var/config"
    environment:
      - LOG4J_CONFIG_FILE_SERVICE=config/log4j_smartfeed_service.xml
      - CONFIG_FILE_SERVICE=config/config.smartfeed_service.test.properties
      - HEAP_SIZE=4G
      - NEW_SIZE=2G

  pinacle2:
    build:
      context: ./pinacle2
      dockerfile: Dockerfile-dev
    ports:
      - "5001:8887"
    command: "bash scripts/local_test_server.sh"
    container_name: pinacle2
    volumes:
      - "/home/{{USER}}/code/optimus/pinacle2:/var/src/pinacle2"
      - "/var/serverset:/var/serverset"
      - "/var/config:/var/config"
    environment:
      - LOG4J_CONFIG_FILE=config/log4j.dev.properties
      - CONFIG_FILE=config/config_test.yaml
      - HEAP_SIZE=4G
      - NEW_SIZE=2G
      -  =/opt/pinacle2/pin e2-0.1-SNAPSHOT

  fantas :
    bui
      co ./fa
      dockerfile: Dockerfile-dev
    ports:
      - "5004:9020"
```

Docker-compose file

Demo

Anything that can go wrong will go wrong , Edward Murphy

Docker commands

1. Inspect
2. Attach
3. Exec
4. Pause, Stop, Remove
5. Top

Software Engineering Daily Podcast

Docker for micro services, Apress

Q&A

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