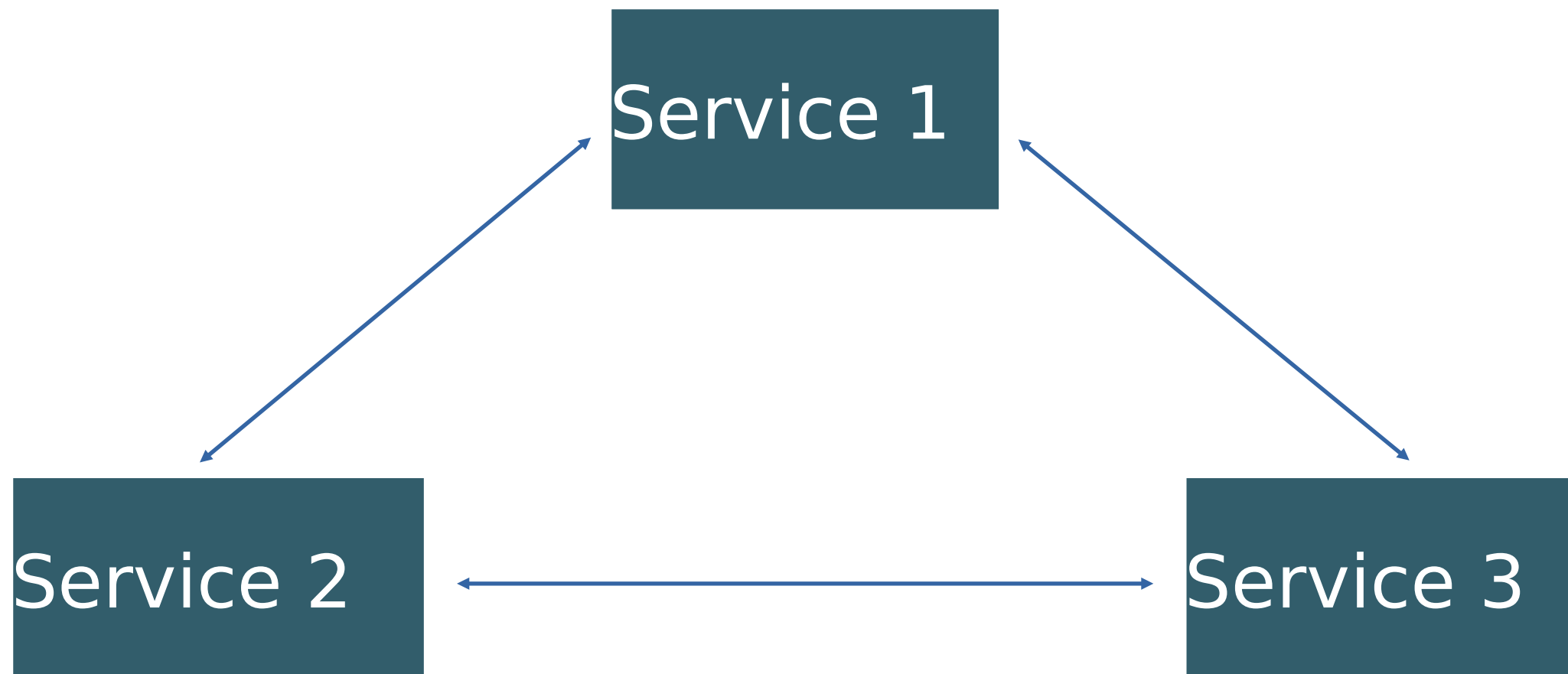# Distributed PHP Microservices using Docker infrastructure
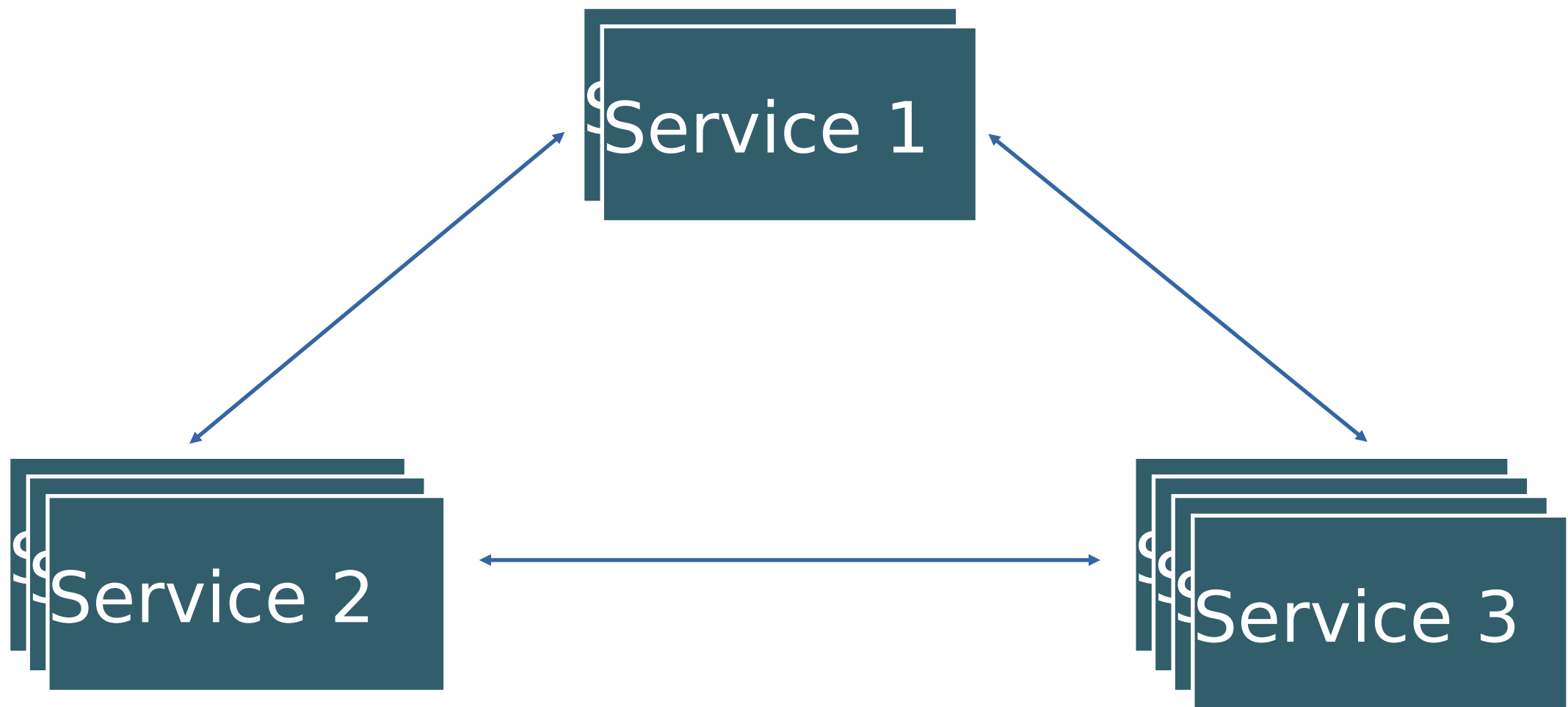
by Alexey Petrov
alexhelkar@gmail.com

Distributed Systems

Distributed Systems

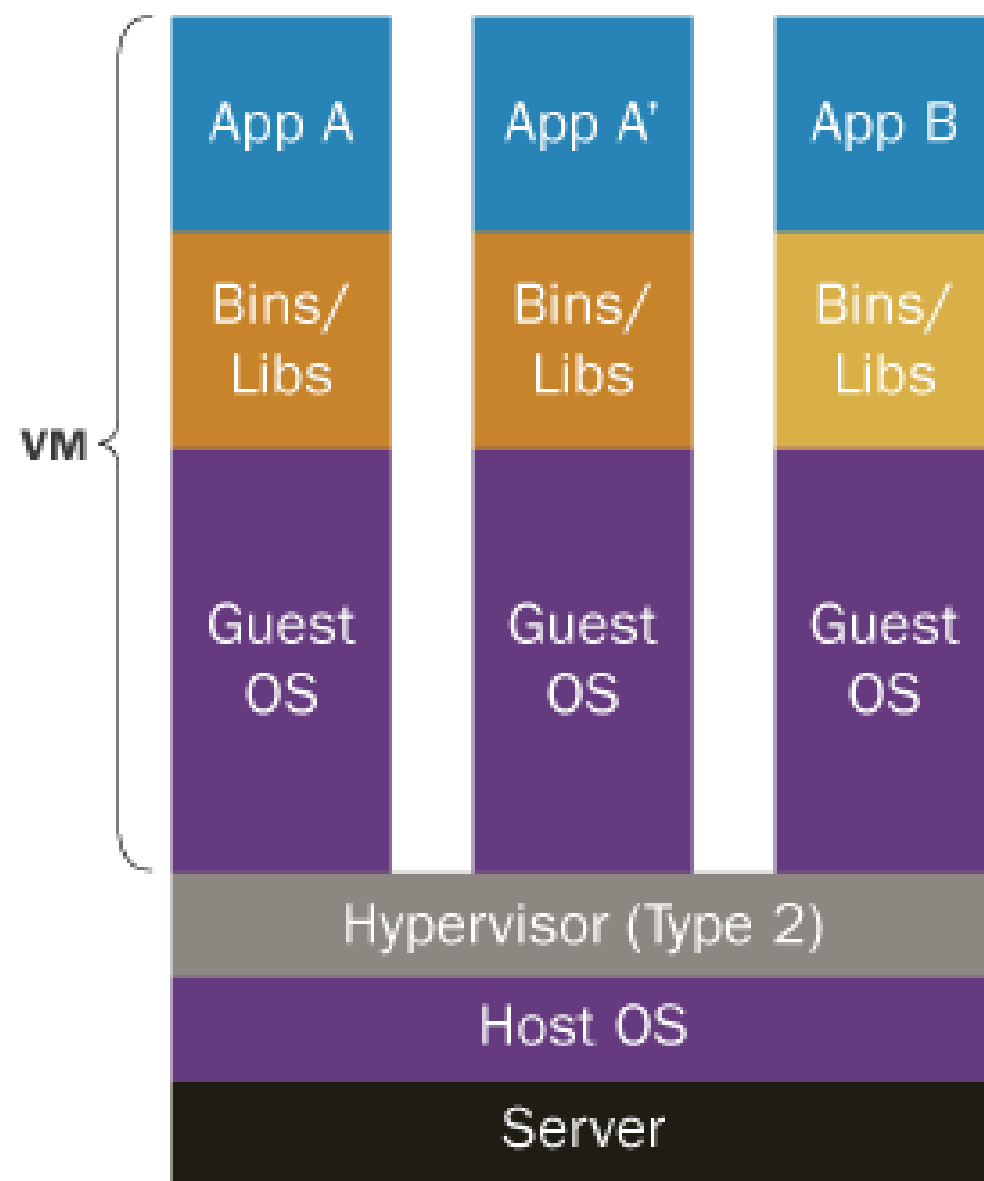# Fallacies of distributed computing

- **The network is reliable.**

- **Latency is zero.**

- **Bandwidth is infinite.**

- **The network is secure.**

- **Topology doesn't change.**

- **There is one administrator.**

- **Transport cost is zero.**

- **The network is homogeneous.**

Cloud Providers

Virtual Machines vs Containers
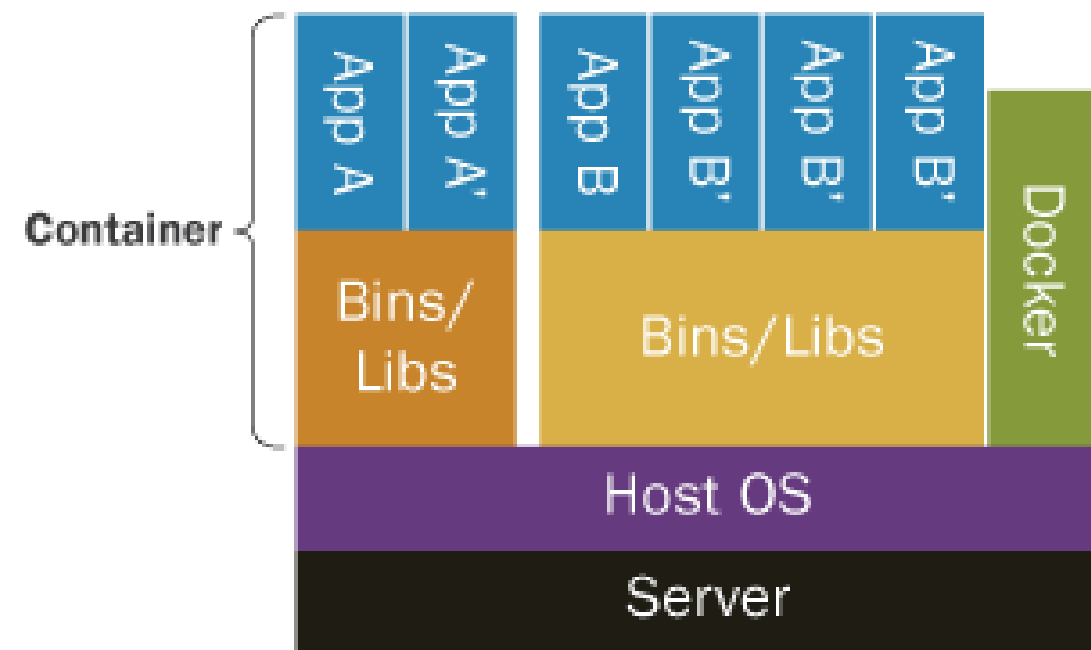
Docker

BUILD

SHIP

RUN

Docker - Build

- docker **run** -ti ubuntu bash

- apt-get install <**packets**>

- docker **commit** <containerId> <imagename>

- docker **run** <imagename>

- docker **tag** <imagename> <user/image>

- docker **push** <user/image>

Docker - Build - Dockerfile

FROM ubuntu

RUN \
  add-apt-repository -y ppa:nginx/stable && \
  apt-get update && \
  apt-get install -y nginx && \
  rm -rf /var/lib/apt/lists/* && \
  echo "\ndaemon off;" >> /etc/nginx/nginx.conf && \
  chown -R www-data:www-data /var/lib/nginx

EXPOSE 80, 3306

docker build -t <user>/<image>

Docker

BUILD

SHIP

RUN

Docker - Ship

docker push
docker pull

https://hub.docker.com/
OR

private registry

Docker

BUILD

SHIP
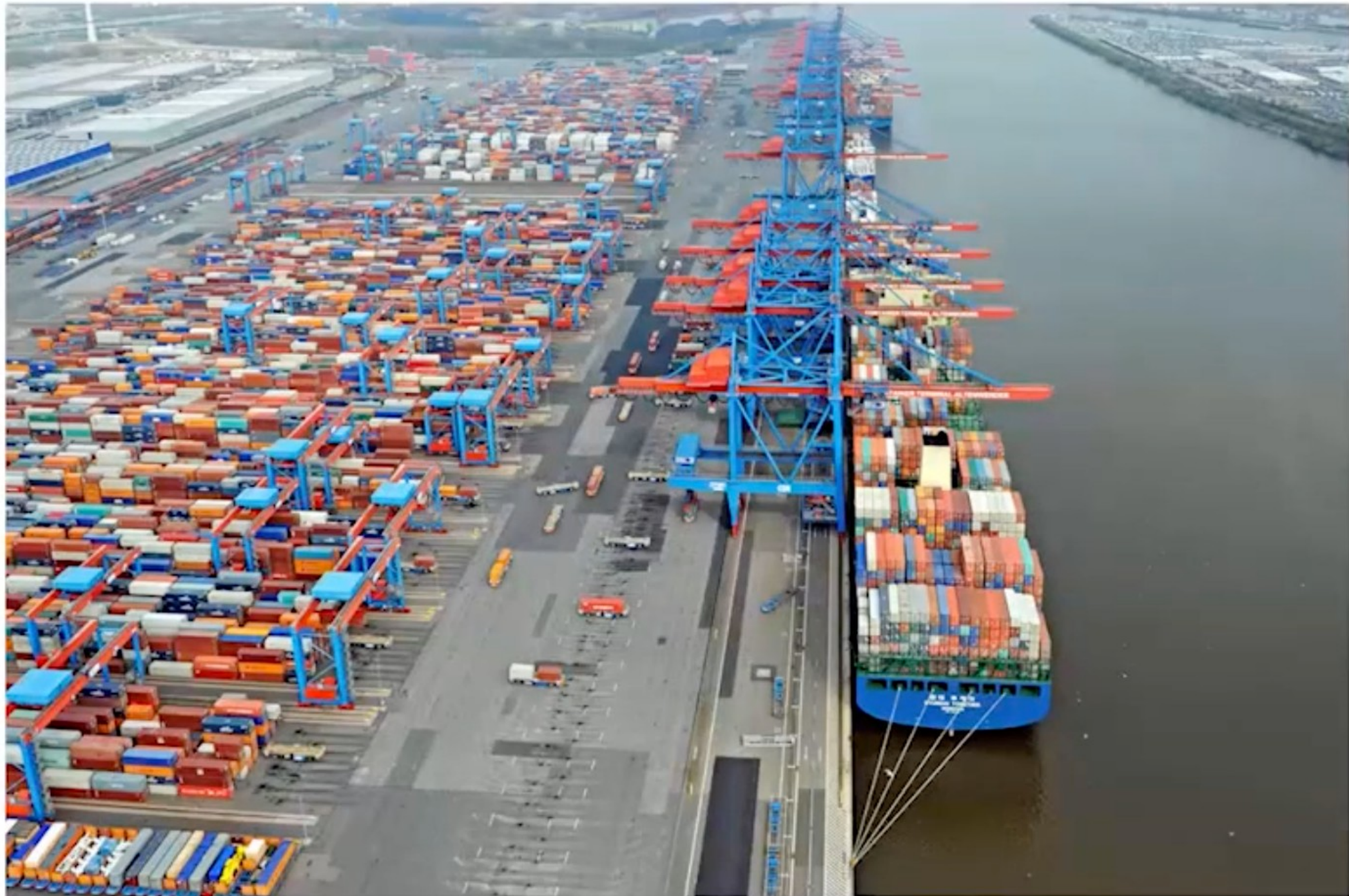
RUN

Docker

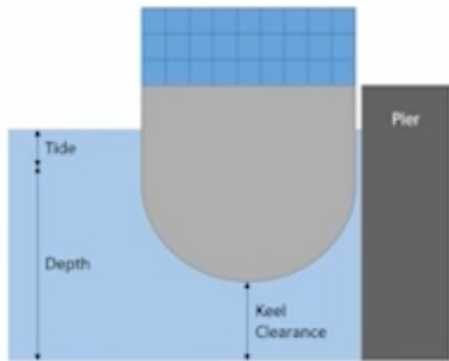docker run <image_id>

Before containers approach

Containers approach

Containers approach

Containers approach

Ansible

HOSTS

PLAYBOOKS

TASKS

ROLES

Ansible - Host File

hosts

[webservers]
10.0.1.11
10.0.1.12

[appservers]
10.0.1.13
10.0.1.13

Ansible

HOSTS

PLAYBOOKS

TASKS

ROLES

Ansible Playbooks

```
hosts: webservers
sudo: True
tasks:
   - name: install nginx
     apt: name=nginx update_cache=yes

   - name: copy nginx config file
     copy: src=files/nginx.conf dest=/etc/nginx/sites-available/default

   - name: enable configuration
     file: >
         dest=/etc/nginx/sites-enabled/default
         src=/etc/nginx/sites-available/default
         state=link

   - name: copy index.html
     template: src=templates/index.html.j2 dest=/usr/share/nginx/html/index.html
mode=0644

   - name: restart nginx
     service: name=nginx state=restarted
```

Ansible

HOSTS

PLAYBOOKS

TASKS

ROLES

Ansible Playbooks

```
- name: install nginx
  apt: name=nginx update_cache=yes

 - name: copy nginx config file
  copy: src=files/nginx.conf dest=/etc/nginx/sites-available/default

 - name: enable configuration
  file: >
     dest=/etc/nginx/sites-enabled/default
     src=/etc/nginx/sites-available/default
     state=link

- name: copy index.html
  template:
     src: templates/index.html.j2
     dest: /usr/share/nginx/html/index.html
     mode: 0644
```

Ansible

HOSTS

PLAYBOOKS

TASKS

ROLES

Ansible - Host File

hosts

[webservers]
10.0.1.11
10.0.1.12

[appservers]
10.0.1.13
10.0.1.13

Run playbook with ansible

ansible-playbook -i hosts playbook_name.yml

Ansible + Docker

```yaml
- name: application container
  docker:
    name: my application
    image: someuser/appimage
    state: reloaded
    pull: always
    links:
        - "myredis:aliasedredis"
    ports:
        - "8080:9000"
        - "127.0.0.1:8081:9001/udp"
    env:
        SECRET_KEY: ssssh
```

Ansible + Docker

```
- name: application container
  docker:
      name: my application
      image: someuser/appimage
      state: reloaded
      pull: always
      links:
          - "myredis:aliasedredis"
      ports:
          - "8080:9000"
          - "127.0.0.1:8081:9001/udp"
      env:
          SECRET_KEY: ssssh
```

Questions?