CIKLUM
EMPOWERING COLLABORATION

Microsoft

LOHIKA

Docker-compose, vagga і інші «страшні» слова

bit.ly/msp-docker

DataArt

DEVELOPEX
DEVELOPMENT EXCELLENCE

ШАГ
комп'ютерна
АКАДЕМІЯ

About me

- Work as DevOps Engineer at PDFfiller
- IT KPI (co-founder)
- Linux & Open Source enthusiast
- In love with JavaScript & Python
- Write on Bash and PHP

ROAD SHOW
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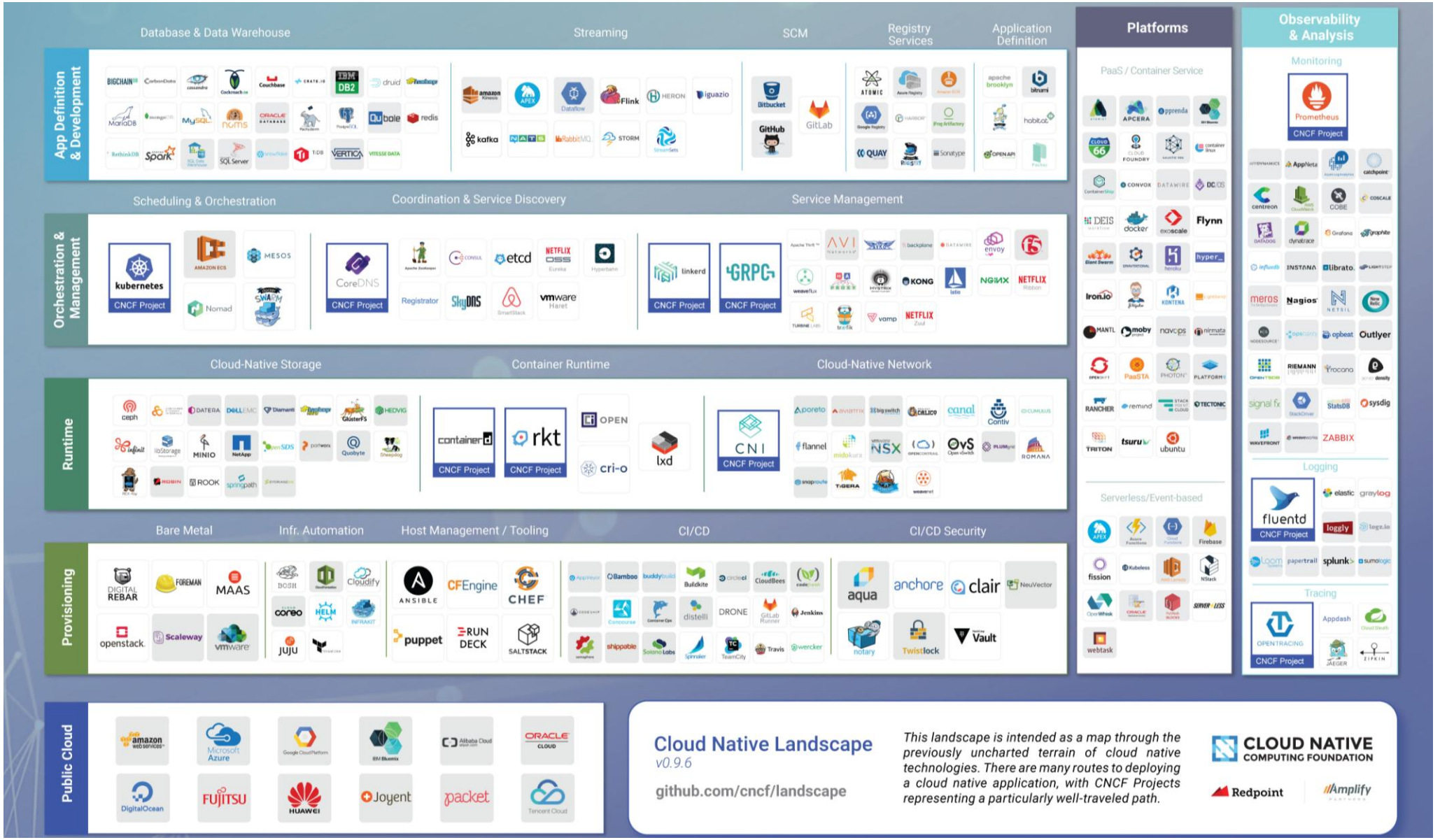
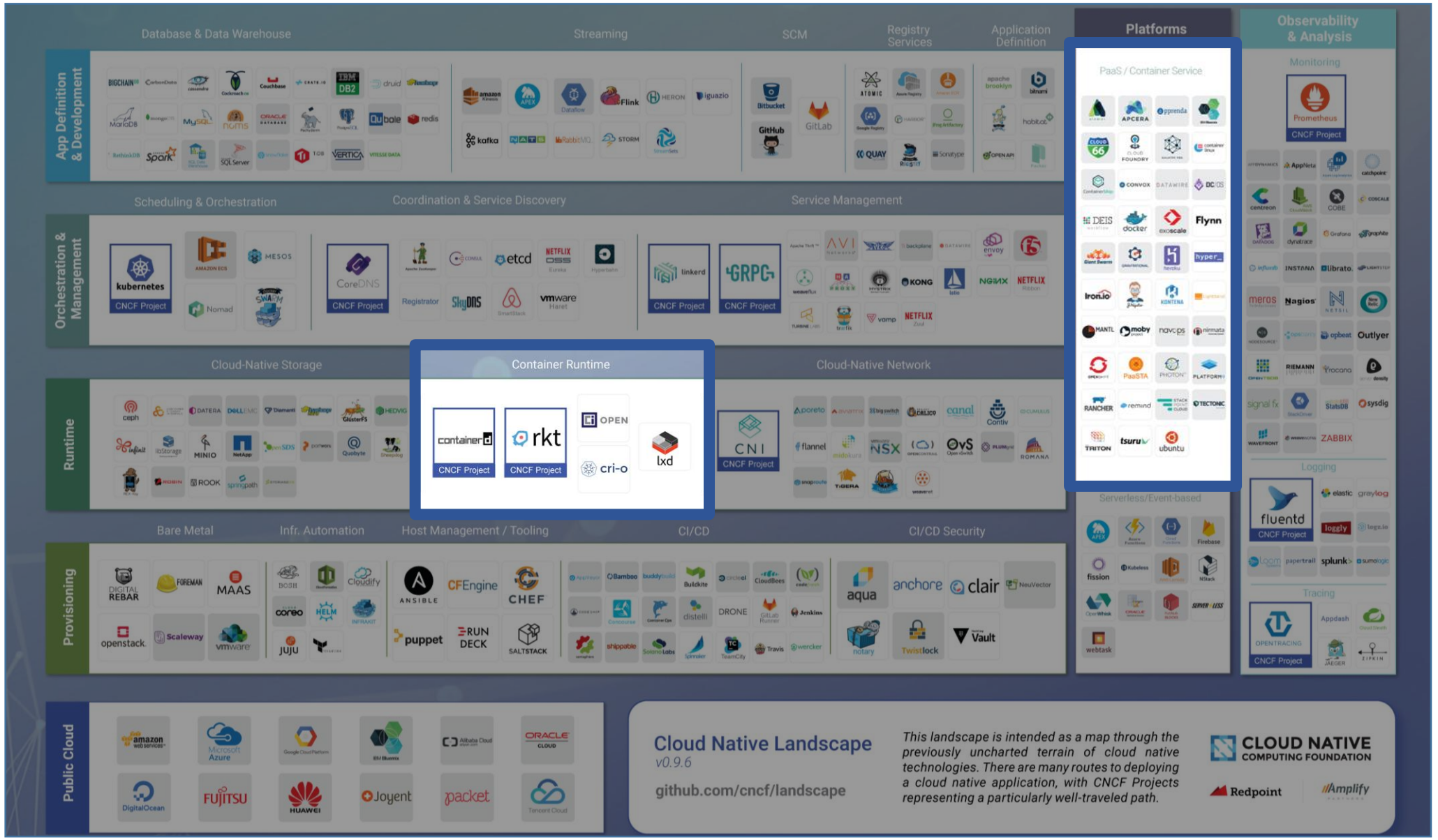
So many…



So many…



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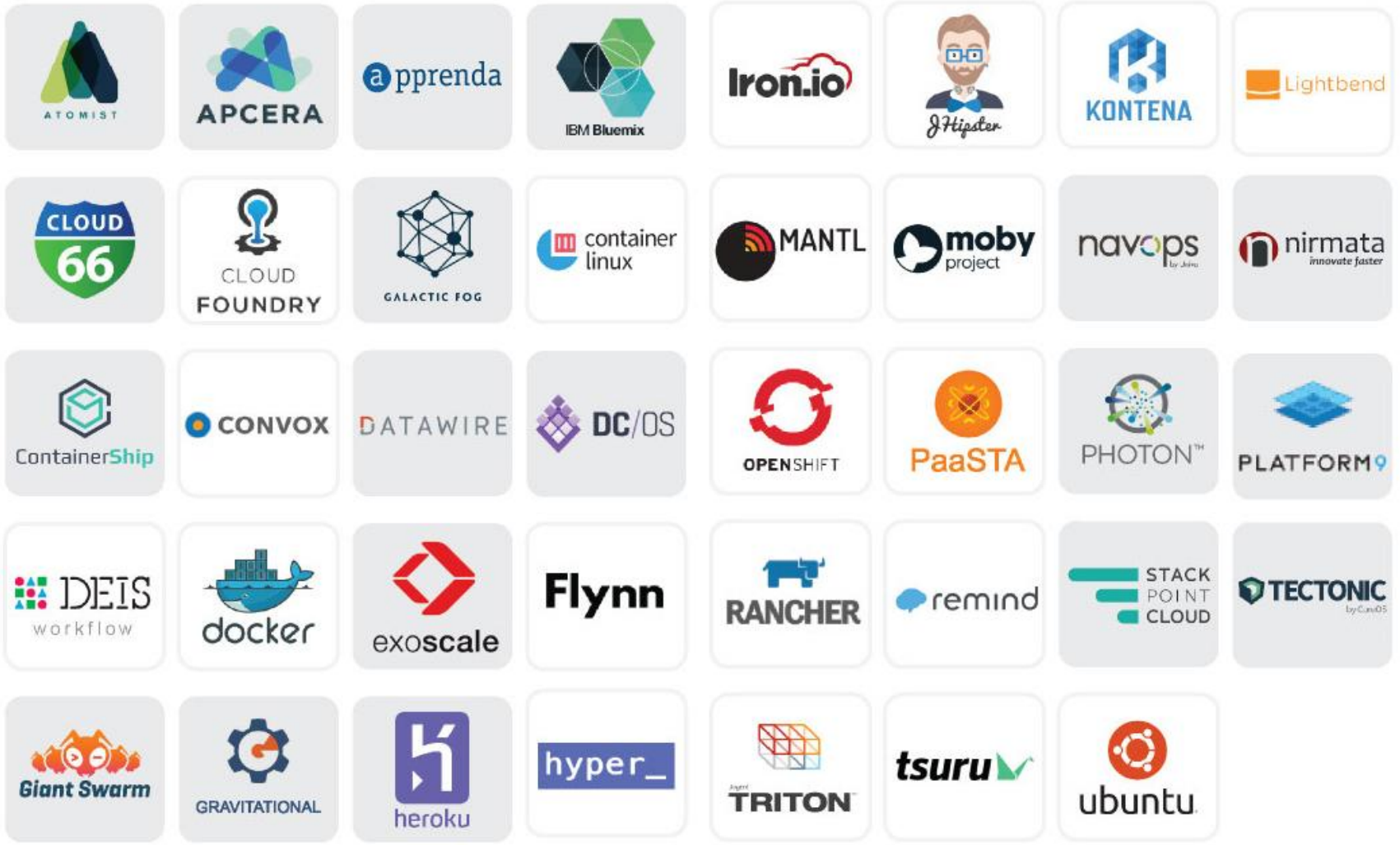
Container runtime

Container services & PaaS

PaaS / Container Service



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Just container services, which can run local

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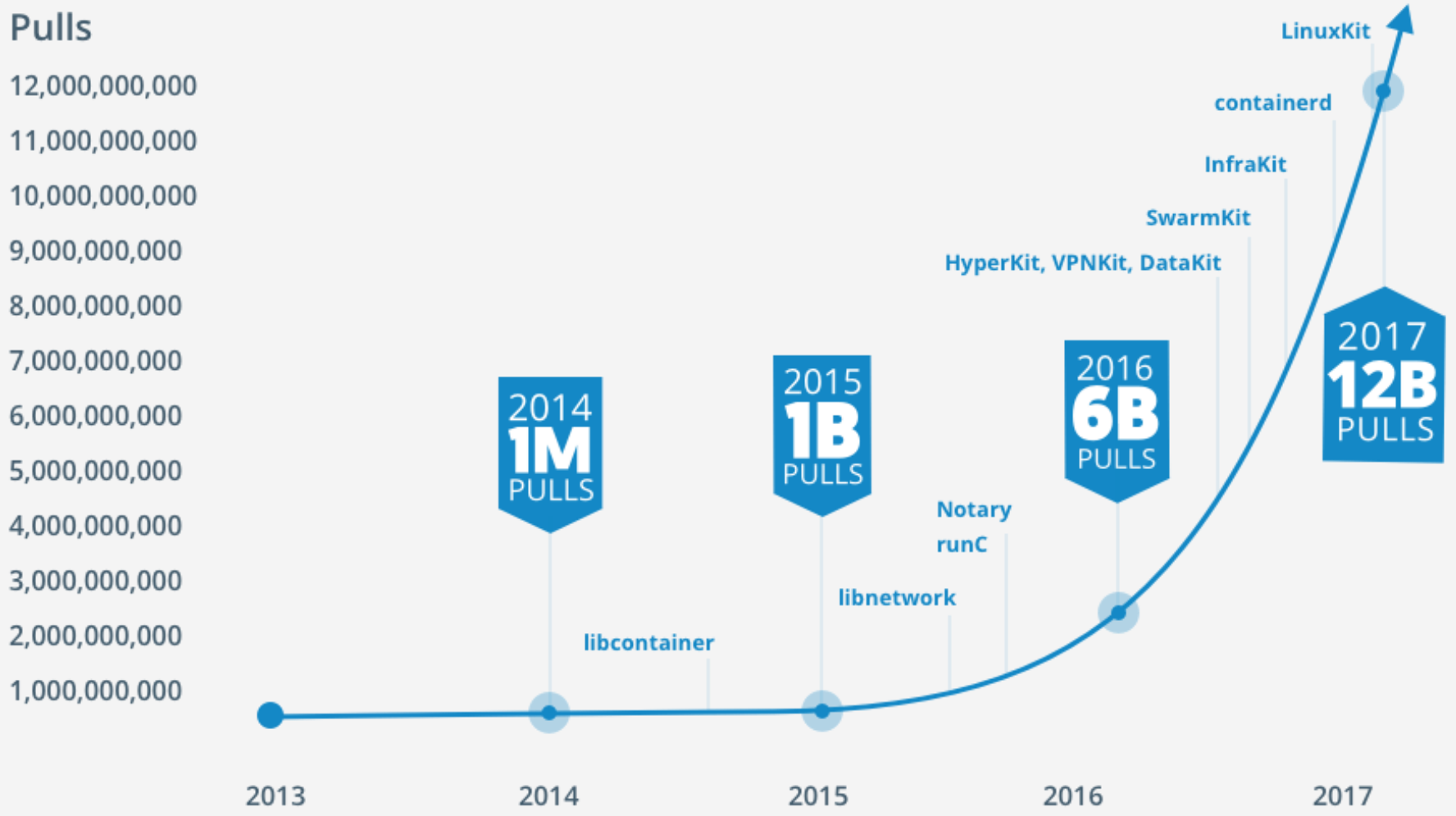
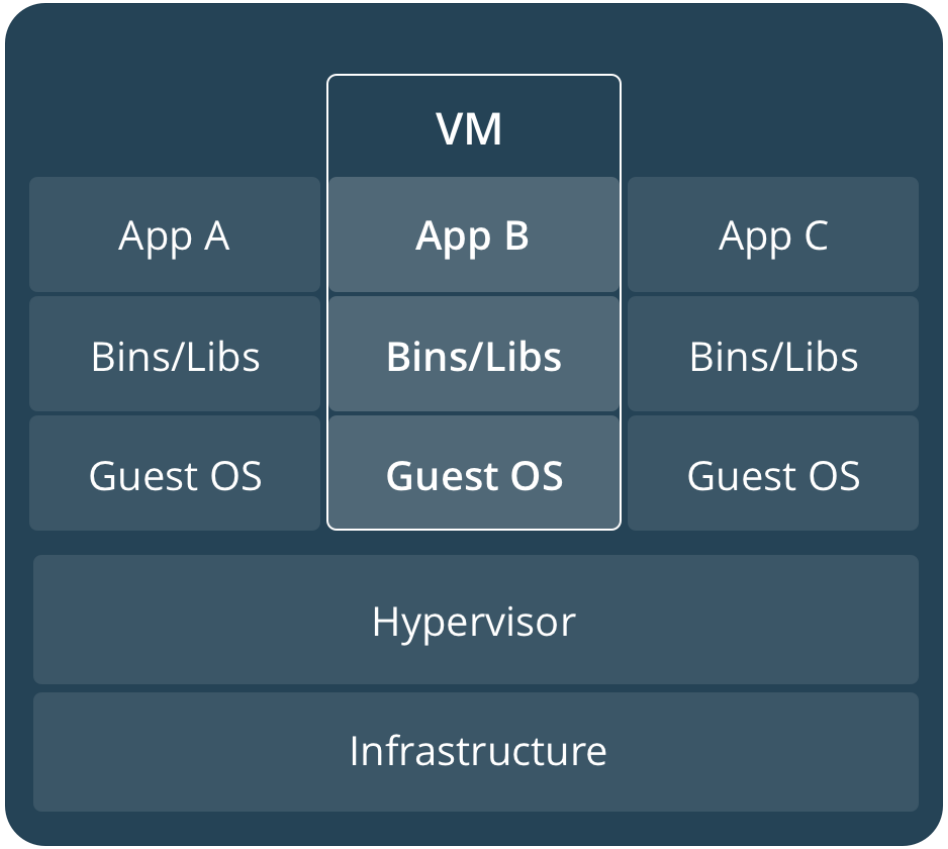
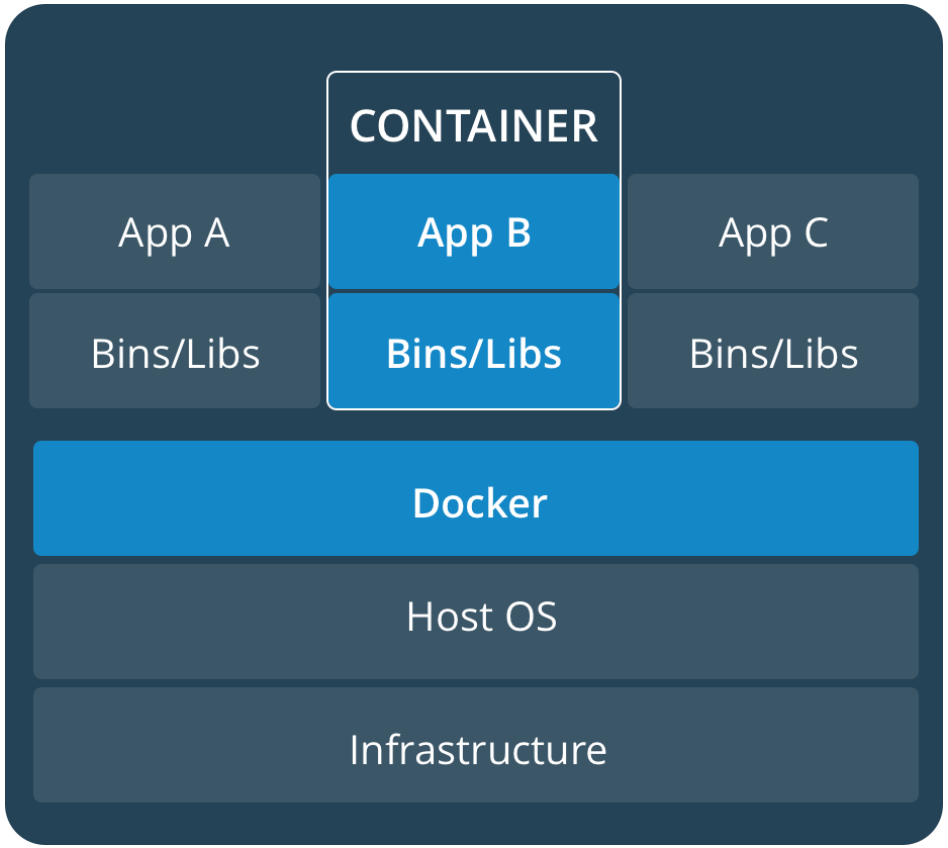
Docker

Docker Era

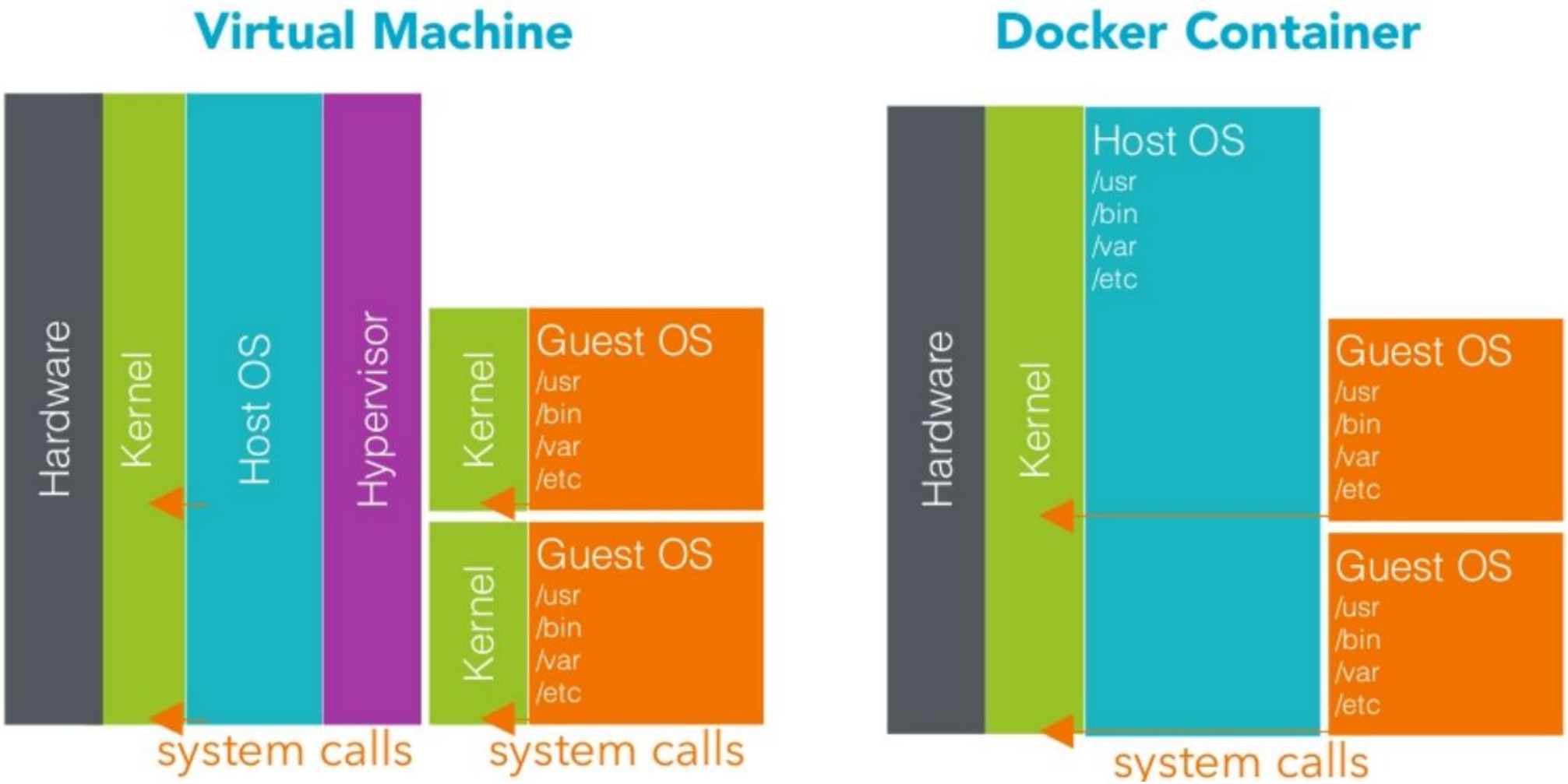


Container vs VM

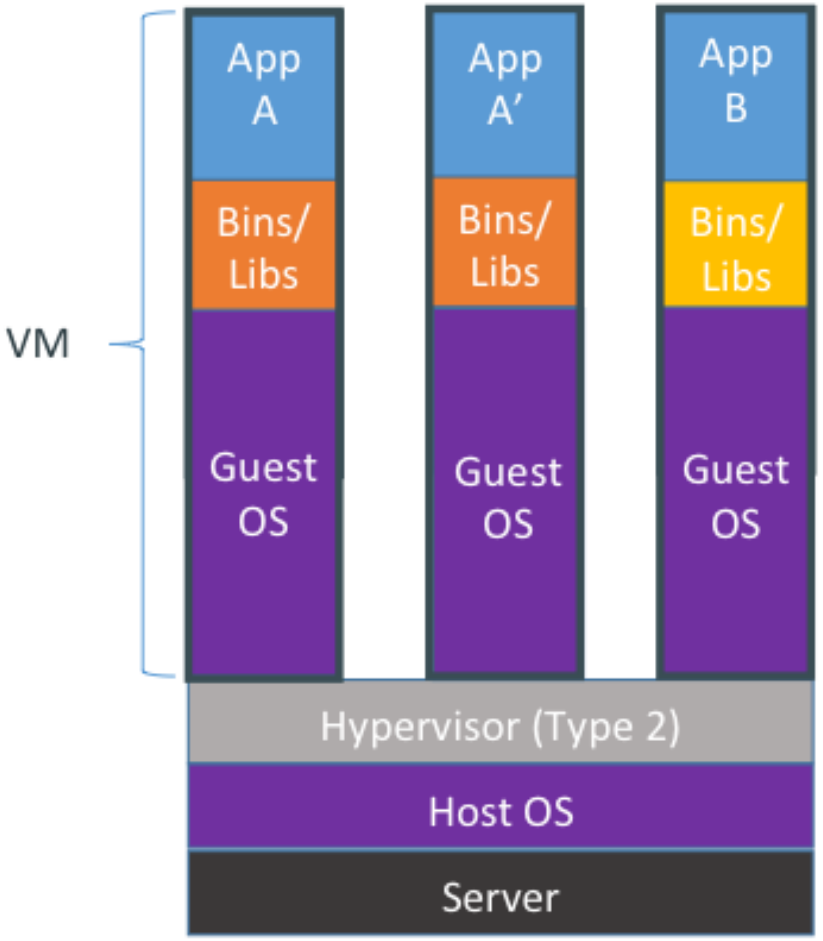




Container vs VM: Overhead

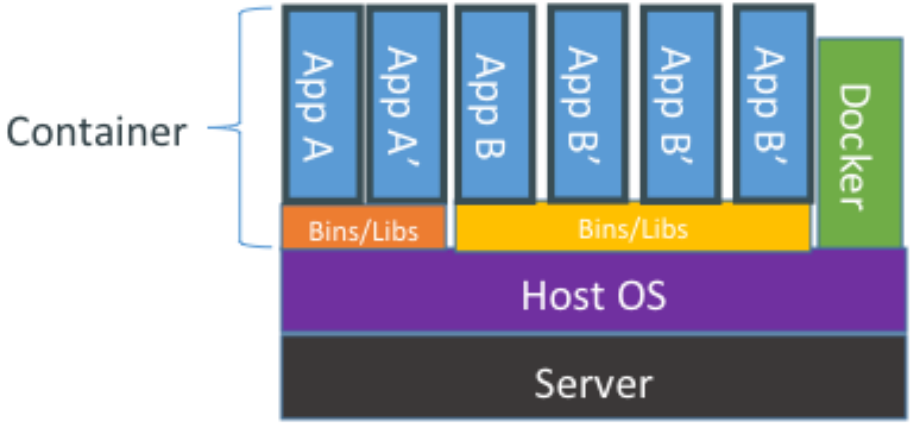


Container vs VM: Overhead [2]



Containers are isolated, but share OS and, where appropriate, bins/libraries

...result is significantly faster deployment, much less overhead, easier migration, faster restart



Container vs VM: Size

Virtual Machine

Image Size (OS Stack): **1GB**
Application Size: **100MB**

4 Running Applications: 4,4 GB

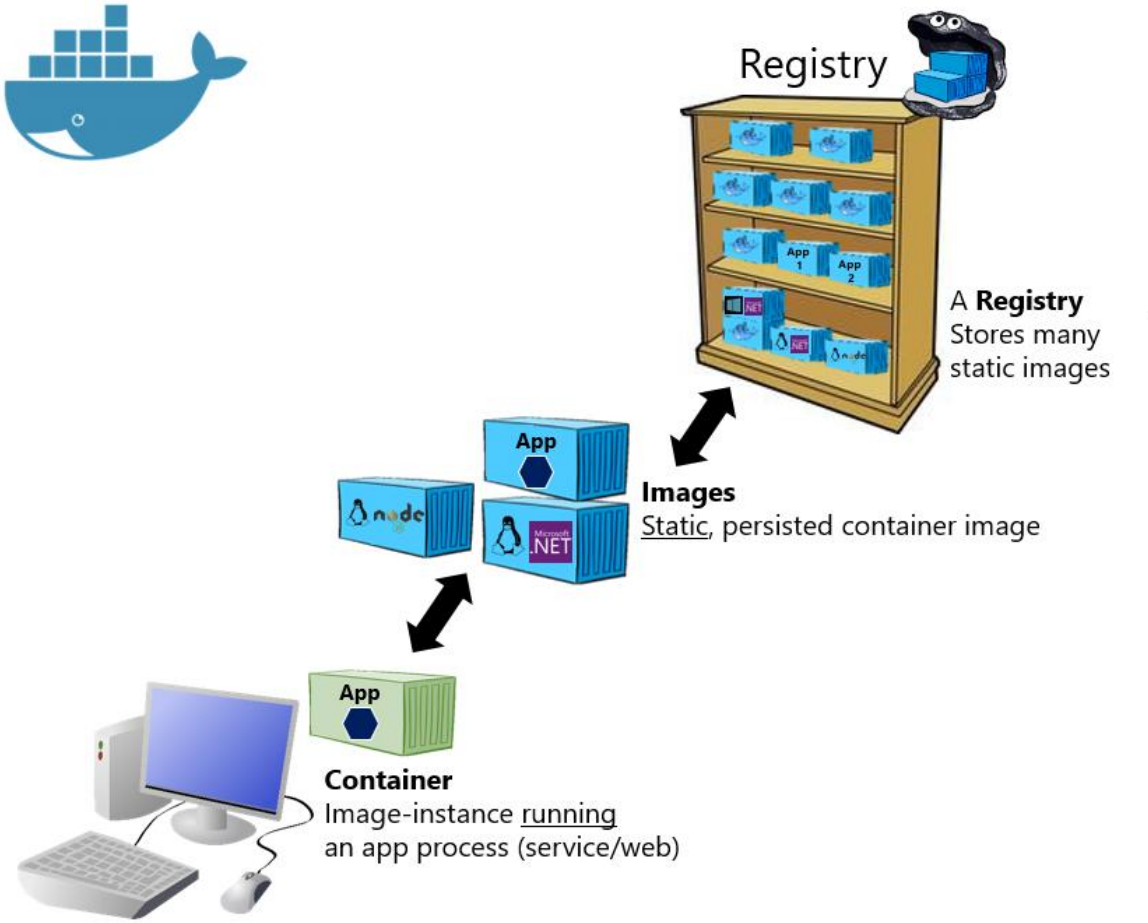
Docker Container

Image Size (OS Stack:): **1GB**
Application Size: **100MB**

4 Running Applications: 1,4 GB

Container vs VM: Perfomance

Terminology



On-premises
('n' private organizations)

- **Hosted Docker Registry**
- **Docker Trusted Registry on-prem.**

Public Cloud
(specific vendors)

- **Docker Hub Registry**
- Docker Trusted Registry on-cloud
- **Azure Container Registry**
- AWS Container Registry
- Google Container Registry
- Quay Registry
- Other Cloud

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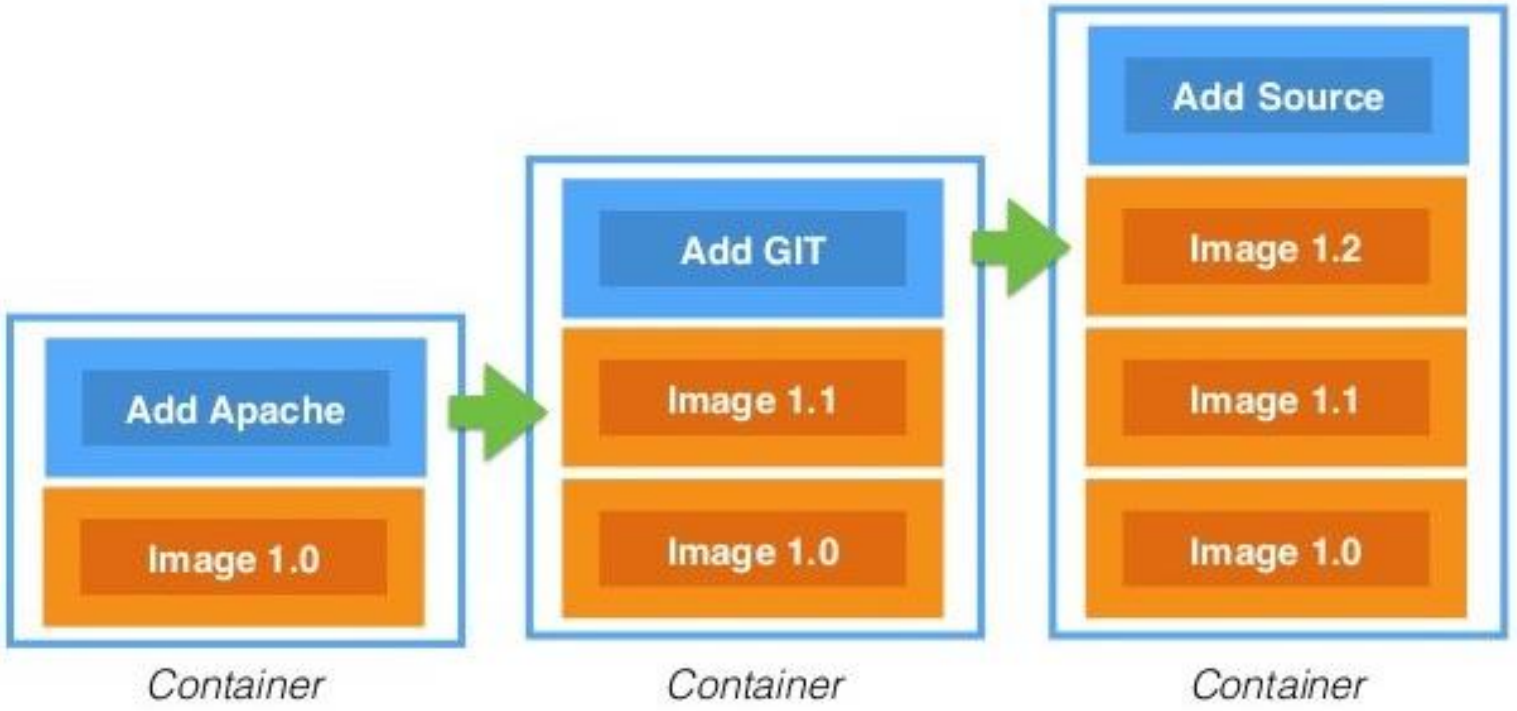
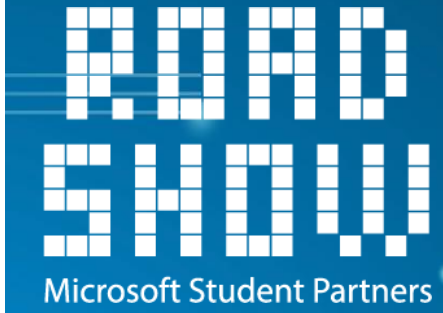
AuFS - Layered FS



Dockerfile



Dockerfile

```
1   FROM eboraas/apache:latest
2
3   LABEL maintainer="MaxymVlasov <m@il.com>"
4
5   # Add rewrite module to Apache
6   # Need for port forwarding for NodeJS
7   RUN a2enmod rewrite && service apache2 restart
8
9   # Change default Apache configuration
10  COPY 000-default.conf /etc/apache2/sites-available/000-default.conf
11  COPY ports.conf /etc/apache2/ports.conf
12
13  # Open port
14  EXPOSE 8080
15
16  # Run Apache server in background
17  CMD ["/usr/sbin/apache2ctl", "-D", "FOREGROUND"]
```

Dockerfile

```
1    ARG VERSION=latest
2    FROM busybox:${VERSION}
3
4
5    ARG VERSION
6
7    RUN echo ${VERSION} > version
```

Dockerfile

```
1   ARG VERSION=latest
2   FROM busybox:${VERSION}
3
4   ENV VERSION previous
5   ARG VERSION
6
7   RUN echo ${VERSION} > version
```

Dockerfile

```
1   ARG VERSION=latest
2   FROM busybox:${VERSION}
3
4   ARG VERSION
5   ENV VERSION=${VERSION:-0}
6
7   RUN echo ${VERSION} > version
```

Dockerfile

```
1   ARG VERSION=latest
2   FROM busybox:${VERSION}
3
4   ARG VERSION
5   ENV VERSION=${VERSION:-0}
6
7   RUN echo ${VERSION} > version
8
9   ADD http://bit.ly/raw or binary file /app/file
10  COPY . /app
```

Dockerfile

```
1    FROM busybox:latest
2
3    WORKDIR /a
4    WORKDIR b
5    WORKDIR c
6
7    RUN pwd # Output: /a/b/c
```

Dockerfile

```
1   FROM busybox:latest
2
3   WORKDIR /a
4   WORKDIR b
5   WORKDIR c
6
7   RUN pwd # Output: /a/b/c
8
9   ENTRYPOINT ["ping"]
10  CMD ["8.8.8.8"]
```

Dockerfile

```
1    FROM busybox:latest
2
3    LABEL maintainer="Maksym Vlasov <m@il.com>"
```

Dockerfile

```
1    FROM busybox:latest
2
3    LABEL maintainer="Maksym Vlasov <m@il.com>"
4
5    EXPOSE 9000 9001
```

Dockerfile

```
1   FROM busybox:latest
2
3   LABEL maintainer="Maksym Vlasov <m@il.com>"
4
5   EXPOSE 9000 9001
6
7   VOLUME ["/data"]
```

Dockerfile

```
1   FROM busybox:latest
2
3   LABEL maintainer="Maksym Vlasov <m@il.com>"
4
5   EXPOSE 9000 9001
6
7   VOLUME ["/data"]
8
9   HEALTHCHECK --interval=30s \
10              --timeout=30s \
11              --start-period=0s \
12              --retries=3 \
13    CMD wget http://localhost/ || exit 1
```

Dockerfile

```
1    FROM busybox:latest
2
3    SHELL ["/bin/sh", "-c"]
```

Dockerfile

```
1   FROM busybox:latest
2
3   SHELL ["/bin/sh", "-c"]
4
5   RUN addgroup group && \
6       adduser -D -H user -G group
7
8   USER user:group
```

Dockerfile

```
1   FROM busybox:latest
2
3   SHELL ["/bin/sh", "-c"]
4
5   RUN addgroup group && \
6       adduser -D -H user -G group
7
8   USER user:group
9
10  STOPSIGNAL 9 # SIGKILL
```

Dockerfile

```
1   FROM busybox:latest
2
3   SHELL ["/bin/sh", "-c"]
4
5   RUN addgroup group && \
6       adduser -D -H user -G group
7
8   USER user:group
9
10  STOPSIGNAL 9 # SIGKILL
11
12  ONBUILD ADD . /app/src
13  ONBUILD RUN echo "based on busybox"
```

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Docker-compose

Docker-compose.yaml

Docker-compose.yaml

```yaml
version: '3'

services:
  apache:
    image: maxymvlasov/apache-pdffiller
    ports:
      - "8080"
    volumes:
      - ./html:/var/www/
    environment:
      - VIRTUAL_HOST=0.0.0.0
      - VIRTUAL_PROTO=http
  nodejs:
    image: maxymvlasov/nodejs-pdffiller
    ports:
      - "8000:8000"
    environment:
      - "constraint:node==node-1"
  nginx:
    image: maxymvlasov/nginx-pdffiller
    ports:
      - "80:80"
    volumes:
      - /var/run/docker.sock:/tmp/docker.sock:ro
    environment:
      - VIRTUAL_PORT=8080
      - "constraint:node==node-1"
```

Docker-compose.yaml

```yaml
version: '3'

services:
  consul:
    build: ./.dev_docker_compose/consul
    network_mode: host
    restart: always
    volumes:
    - consuldb:/consul/data

volumes:
  consuldb:
    external: true
```

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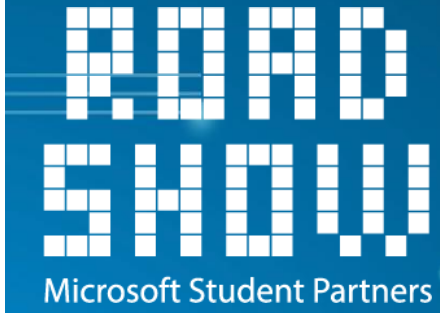
Vagga

vagga.yaml

```
1    containers:
```



vagga.yaml

```
1   containers:
2     ubuntu-consul:
```

vagga.yaml

```
1   containers:
2     ubuntu-consul:
3       setup:
4       - !Ubuntu xenial
5       - !Install [unzip, wget, ca-certificates]
```

vagga.yaml

```
1   containers:
2     ubuntu-consul:
3       setup:
4       - !Ubuntu xenial
5       - !Install [unzip, wget, ca-certificates]
6       - !Sh |
7           cd /tmp
8           wget https://releases.hashicorp.com/consul/0.8.3/consul_0.8.3_
9           unzip consul_0.8.3_linux_amd64.zip
10          cp consul /usr/bin/consul
```

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vagga.yaml

```
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vagga.yaml

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12    consul-server: !Command
13      description: Start consul in server mode
14      container: ubuntu-consul
```

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vagga.yaml

```
1   containers:
2     ubuntu-consul:
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9           unzip consul_0.8.3_linux_amd64.zip
10          cp consul /usr/bin/consul
11  commands:
12    consul-server: !Command
13      description: Start consul in server mode
14      container: ubuntu-consul
15      run: |
16          /usr/bin/consul agent -server -bootstrap-expect=1 \
17                                -data-dir=/tmp/consul -log-level=debug \
18                                -advertise=127.0.0.1
```

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Questions?

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bit.ly/msp-docker

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