Hands-On Docker and Kubernetes

- Part1: Introduction to Docker and Installation, Docker commands
- Part2: Docker file and its related commands
- Part3: Volumes, network, docker compose

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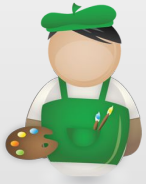
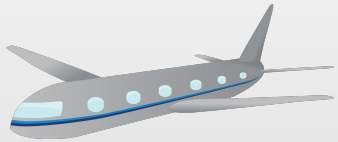
Dockerization :Part 1

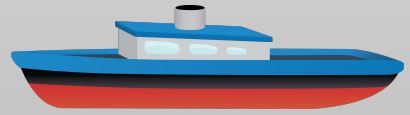
- Issue with normal shipping
- Problems before Docker
- How Docker solve the problem
- What is Docker?
- General work-flow of Docker
- Installation of Docker
- Running “Hello World” and “Centos” image with various commands

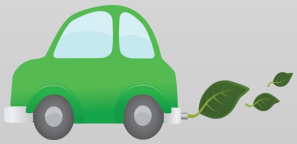
Issue with normal shipping

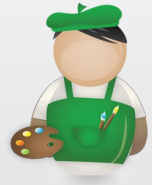


Different packaging for different transport mode

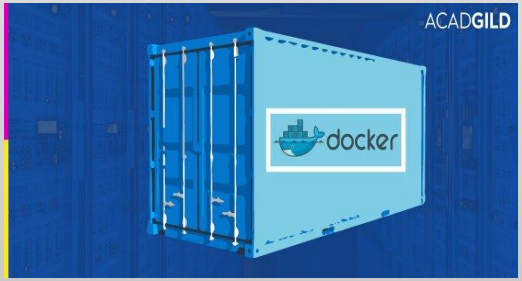








Container: Package once and ship anywhere with any transport mode



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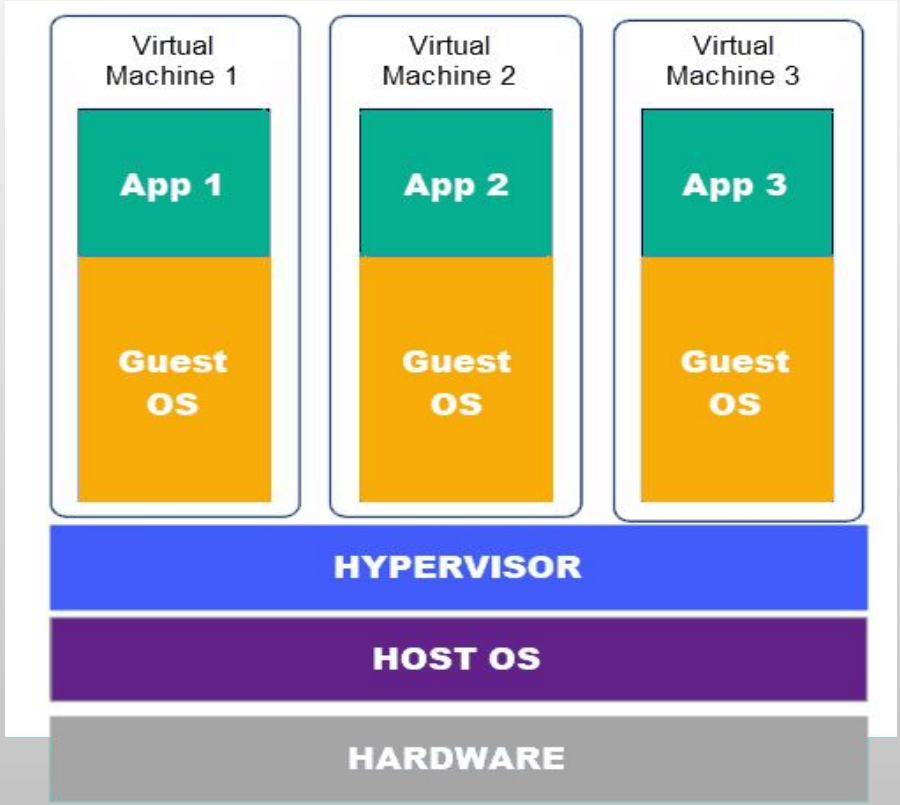
Problems before Docker

Application is running fine on developer system but not in production, because different computing environment

Developer

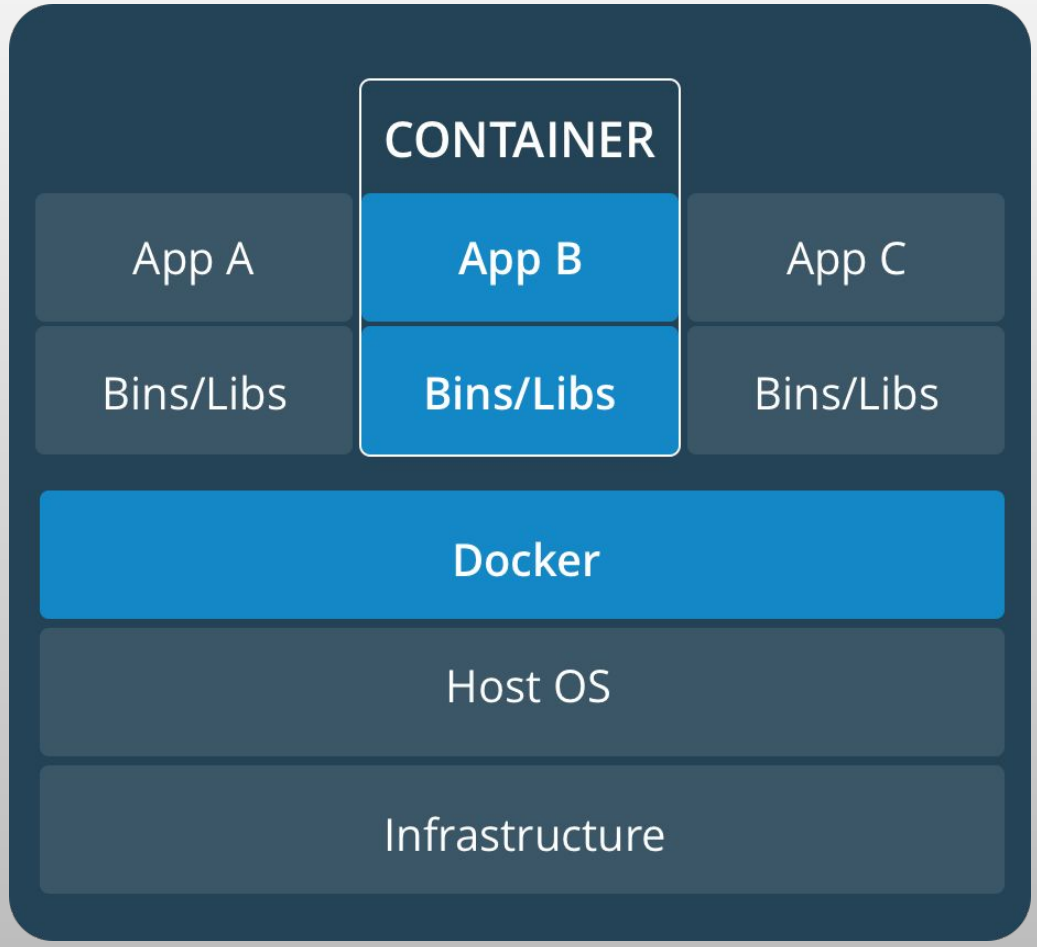
DevOps

Problems before Docker



- Each VM contains the dependency for one micro services.
- Disadvantage lots of wastage of resources like RAM, processor, disk space.
- What happen if we need 50 micro services?
- So VM is not an option make seance.

What is Docker?



- Docker is the world most “Software container platform”.
- Docker is a tool designed to make it easier to create run and deploy application by using containers.
- Docker container are light-weight alternatives of VM.
- Fully resource utilization.

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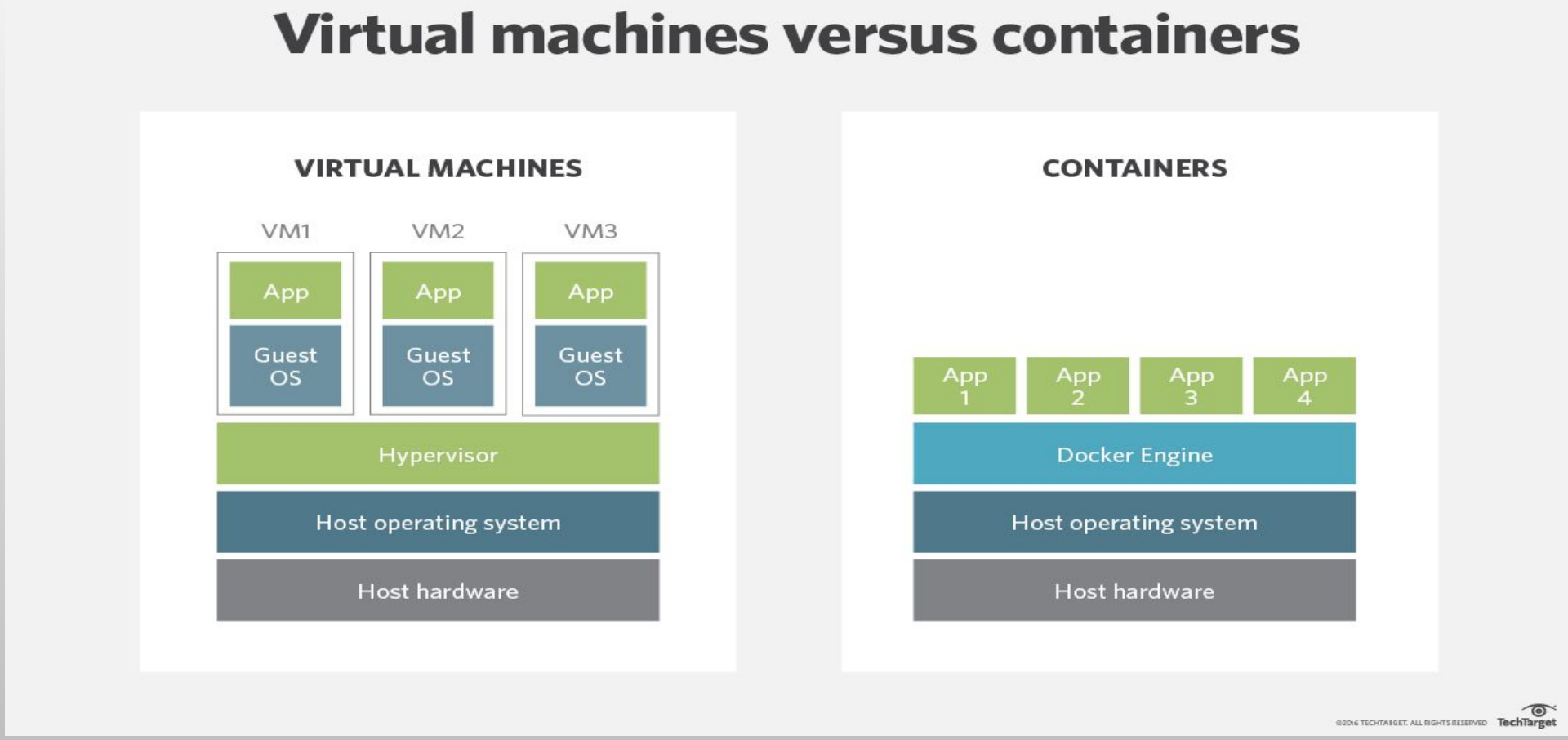
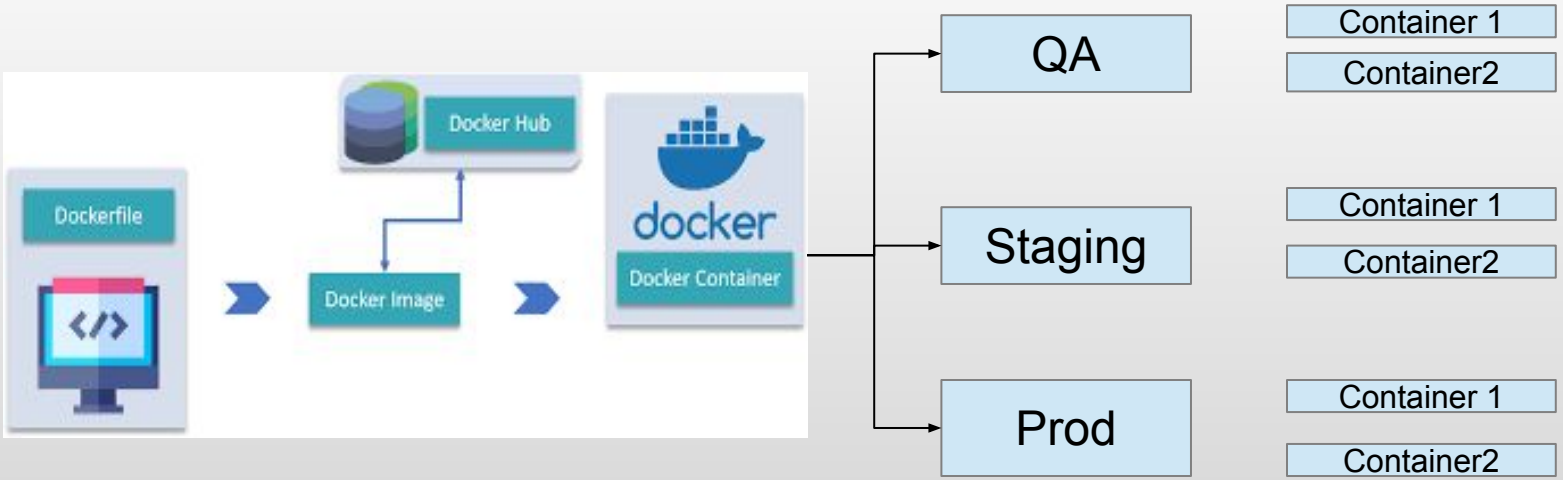
How Docker solve the problem



General workflow of Docker



- A developer write the code that defines an app requirements or dependency in an easy to docker file.
- Docker file produces docker image, so whatever dependency required for that application present in that docker image.
- Now image is uploaded to docker hub.
- From docker hub DaveOps people pull the image and create container.
- Advantages whatever dependency requisites present throughout the software development life cycle.

Installation of Docker for windows and linux

- https://docs.docker.com/docker-for-windows/install/
- https://runnable.com/docker/install-docker-on-linux

Running “Hello World” and “CentOS” image

Docker image pull

```
D:\>docker pull centos
Using default tag: latest
latest: Pulling from library/centos
8a29a15cefae: Pull complete
Digest: sha256:fe8d824220415eed5477b63addf40fb06c3b049404242b31982106ac204f6700
Status: Downloaded newer image for centos:latest
docker.io/library/centos:latest
```

Running Docker Image

```
D:\>docker run -it centos
[root@7f89bca5bc2b /]# exit
exit
```

Docker Commands (https://labs.play-with-docker.com/)

- **docker --version** -Version of docker Engine This command returns the version of docker installed
- **docker --help** -This command returns list of command available in docker along with flag
- **docker pull** -This command is used to pull images from the docker repository(hub.docker.com)

docker pull ubuntu:14.04

- **docker build** -This command is used to build an image from a specified docker file

docker build -t demo .

- **docker run** -This command is used to create a container from an image

docker run hello-world

- **docker exec**-This command is used to access the running container

docker run -d -it ubuntu

docker exec -it ef913eddd2bc bash **(-it interactive mode)**

Docker Commands

- **docker ps**-This command is used to list the running containers
- **docker images** -This command lists all the locally stored docker images
- **docker stop** -This command stops a running container
- **docker kill** -This command kills the container by stopping its execution immediately
- **docker rm** -This command is used to delete a stopped container
- **docker rmi** -This command is used to delete an image from local storage
- **docker commit** -This command creates a new image of an edited container on the local system
- docker commit [container id] satyanarayansahu/imagename

Docker Commands

- **docker login** -This command is used to login to the docker hub repository
- **docker push** -This command is used to push an image to the docker hub repository

docker tag demo satyanarayansahu/demo:version
docker push satyanarayansahu/demo

- **docker container -** Manage containers(start, run, kill, stop, rm)

docker container start|run|stop

- **docker compose -**Docker compose commands

Assignment

-Pull ubuntu image
-Customize ubuntu image with ur own image name(tag) with version
-login to docker hub and push the image
-Now pull the image again and run that
-Try to work with different version