Innominds

ENGINEERING INNOVATION

Docker Basics and AWS ECS Deployment

February 2018

Topics

- What is Docker
- Containers v/s VMs
- Docker Platform
  - Docker Engine
  - Images
  - Containers
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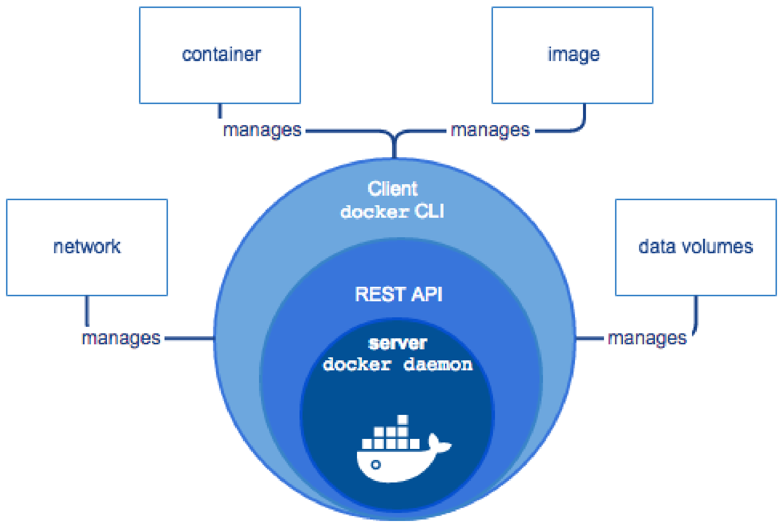
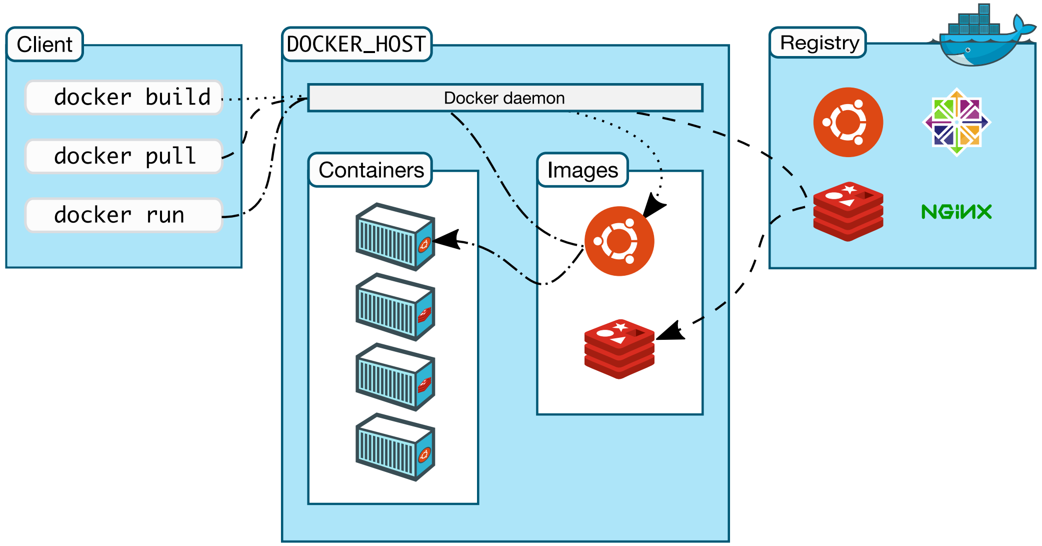
  - Repositories
  - Docker Hub
- Sample Service on Docker
- AWS Deployment Options
- AWS ECS Deployment Overview
- Deployment Steps
- Conclusion

Docker Overview

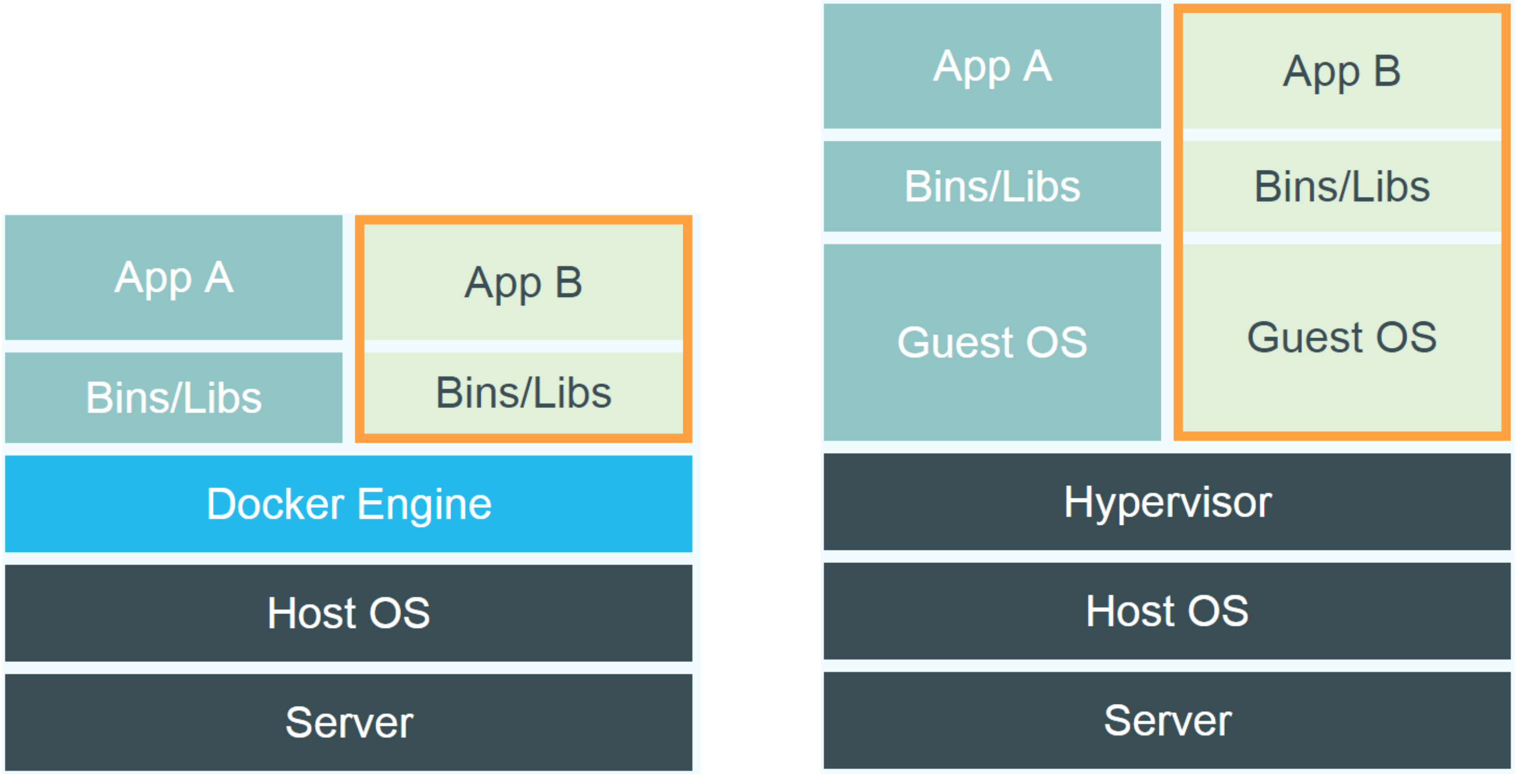
What is Docker

- Docker is the **PLATFORM** for **Developing, Shipping and Running applications** using **Container Virtualization** Technology
- Similar to Similar to shipping containers
  - The container is always the same, regardless of the contents and fits on all trucks, cranes, ships
- Docker Platform = Docker Engine + Docker Hub





Docker vs. Virtual Machine



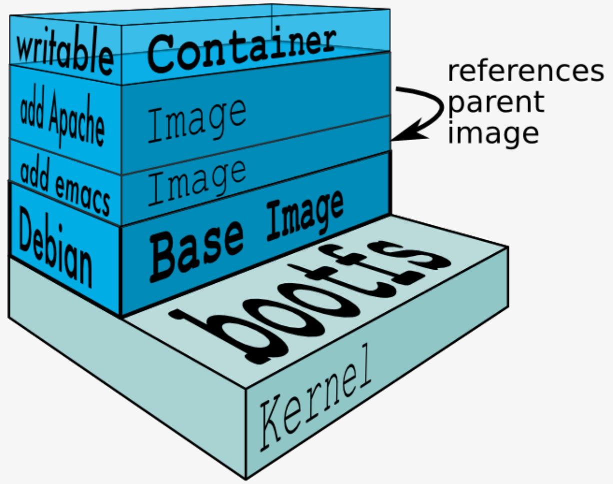
Docker Technology

Docker Technology

- Platform Virtualization
- Multiple isolated Linux systems (containers) on a single host
- Layered File System

Runs On

- Various Linux distributions (Ubuntu, Fedora, RHEL, Centos, openSUSE, ...)
- Cloud (Amazon AWS, Google Compute, AZURE)

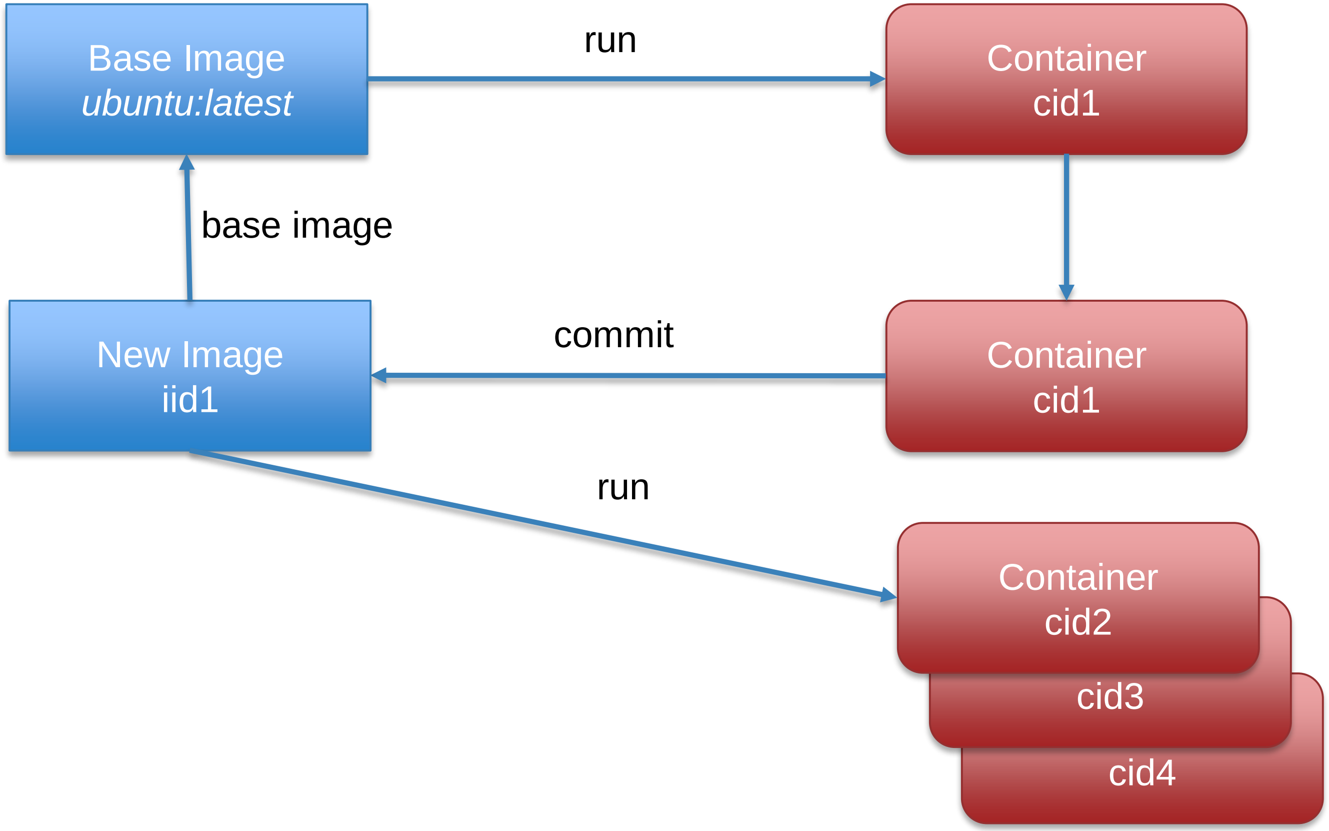


[Source: https://docs.docker.com/terms/layer/]

```
docker run ubuntu echo Hello World
docker images [-a]
docker ps -a
```

Terminology

- **Images -** *Persisted snapshot that can be run*
  - *images:* List all local images
  - *run*: Create a container from an image and execute a command in it
  - *tag*: Tag an image
  - *pull*: Download image from repository
  - *rmi*: Delete a local image
- **Container -** *Runnable instance of an image*
  - *ps:* List all running containers
  - *ps –a*: List all containers (incl. stopped)
  - *top*: Display processes of a container
  - *start*: Start a stopped container
  - *stop*: Stop a running container
  - *pause*: Pause all processes within a container
  - *rm*: Delete a container
  - *commit*: Create an image from a container



Terminology

- Services
  - Allow you to scale containers across multiple Docker daemons, which all work together as a swarm with multiple managers and workers
  - Services are really just “containers in production.”
- Docker Hub
  - Public repository of Docker images
- Docker Compose
  - Provides a mechanism to bind different containers together and work in collaboration, as a single service
- Docker Swarm
  - A swarm is a group of machines that are running Docker and joined into a cluster
- Docker Stack
  - A stack is a group of interrelated services that share dependencies, and can be orchestrated and scaled together

Dockerfile

⇢ Dockerfile

- Create images automatically using a build script: «Dockerfile»
- Can be versioned in a version control system like Git or SVN, along with all dependencies
- Docker Hub can automatically build images based on dockerfiles on Github

Dockerfile:

```
FROM ubuntu
ENV DOCK_MESSAGE Hello My World
ADD dir /files
CMD ["bash", "someScript"]
```

```
docker build [DockerFileDir]
docker inspect [imageId]
```

```
docker run -ti -v /hostLog:/log ubuntu
```

```
docker run -ti --volumes-from
firstContainerName ubuntu
```

```
docker run -t -p 8080:80 ubuntu nc -l 80
```

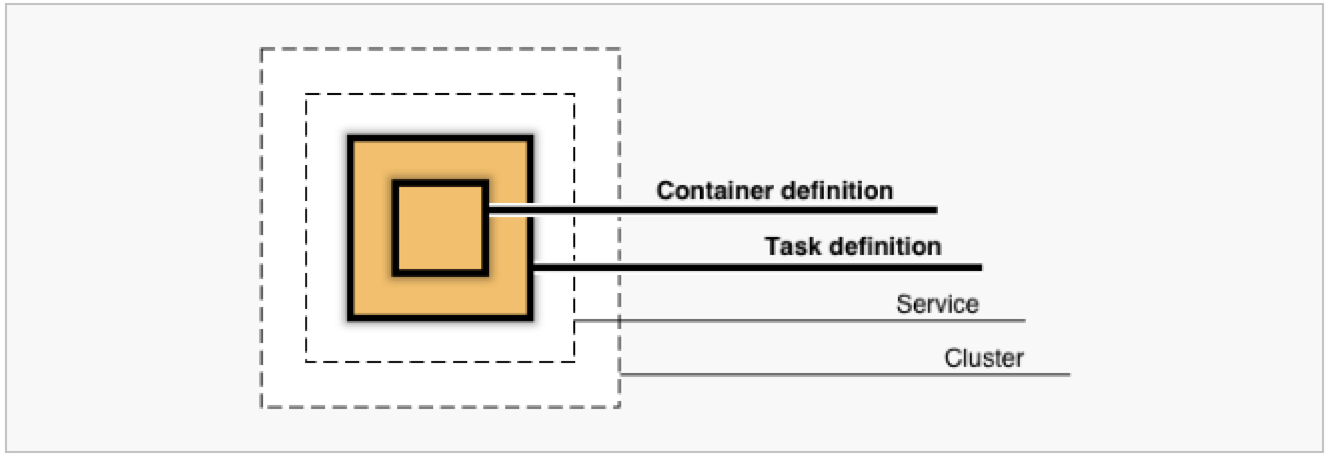
Useful Commands

- **To see all running containers:**
- docker ps
- **To see all containers(even stopped ones):**
- docker ps -a
- **To see all images**
- docker images
- **To stop a container**
- docker stop <container_id>
- **To restart a container**
- docker restart <container_id>
- **To delete a container**
- docker rmi -f <container_id>
- **To build a container (In the directory containing Dockerfile)**
- docker build -t <container_name> .
- **To tag a docker container**
- docker tag <old_container_name> <new_container_name>
- **To push a docker container(If pushing into a private repository** needs docker login command first)
- docker push <container_name>

AWS ECS Deployment

AWS Elastic Container Service (ECS) objects

Diagram of ECS objects and how they relate



Steps for Running Docker on ECS Container

- Build Your Service Image
- Publish the service into AWS ECR
- Set up your first run with Amazon ECS
- Create a task definition
- Configure your service
- Configure your cluster
- Launch and view your resources

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