Introduction to Docker

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https://github.com/mtreinish/intro-to-docker

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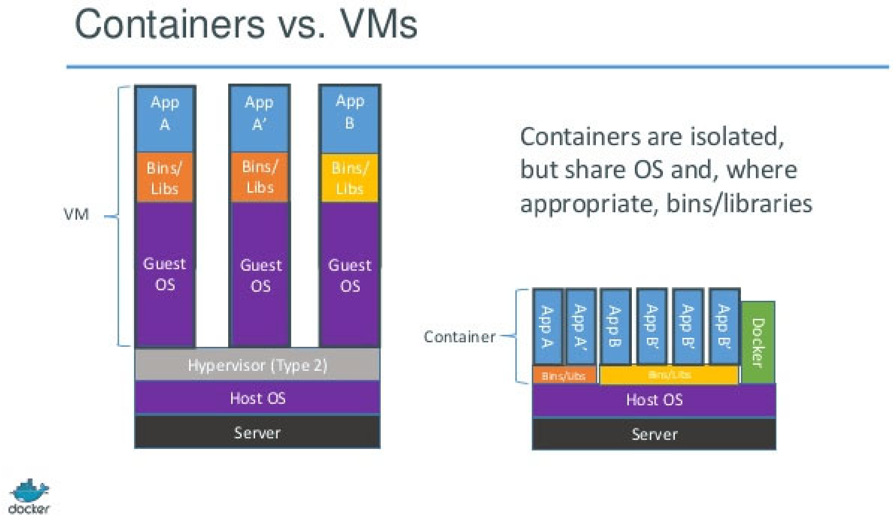
What is Docker?

- Tooling to manage platform
- Manages the lifecycle of containers
- Simplified existing technologies for ease of use

Containers

- A group of processes run in isolation
  - Similar to VMs by managed at the process level
  - Run on a shared kernel
- Each container has its own namespaces
  - **PID** process IDs
  - **USER** user and group IDs
  - **LTS** hostname and domain name
  - **NS** mount points
  - **NET** network devices, stacks, ports
  - **IPC** inter-process communications, message queues
  - **cgroups** controls limits and monitoring of resources

Containers vs VMs



Containers vs. VMs

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

First container

```
$ docker run ubuntu echo Hello World
```

What Happened

- Docker created a directory with a ubuntu filesystem (image)
- Docker created a new set of namespaces
- Ran a new process: echo Hello World
- Using those namespaces to isolate it from other processes
- Using that new directory as the root of the filesystem (chroot)
- That's it!
- Notice as a user I never installed ubuntu
- Run it again, notice how quickly it ran

ssh-ing into a container

$ docker run -ti ubuntu bash

- Now the process is *bash* instead of *echo*
- But its still just a process
- Look around, mess around, its isolated

Look under the covers

$ docker run ubuntu ps -ef

Things to notice with these examples:

- Each container only sees its own processes
- Running as root
- Running as PID 1

Docker images

Layering

- Docker uses a copy-on-write (union) filesystem
- New files (or modifications) are only visible to current/above layers
- Layers allow for reuse
- Images are tarballs of layers

Dockerhub

https://hub.docker.com

- Public registry of Docker Images
- Hosted by Docker Inc.
- Free for public images
- By default docker engines will look in DockerHub for images
- Browser interface for searching, descriptions of images

The Dockerfile

DockerHub

Where to get more information