

An Introduction to Docker

Coffee And Code, 14th August 2014

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So what is it?

- Common platform for deploying and running applications
- Virtual machines take too long
- RPMs too dependent
- Docker shares core components between images
- Better hardware usage
 - Unit of isolation is the container, not the machine

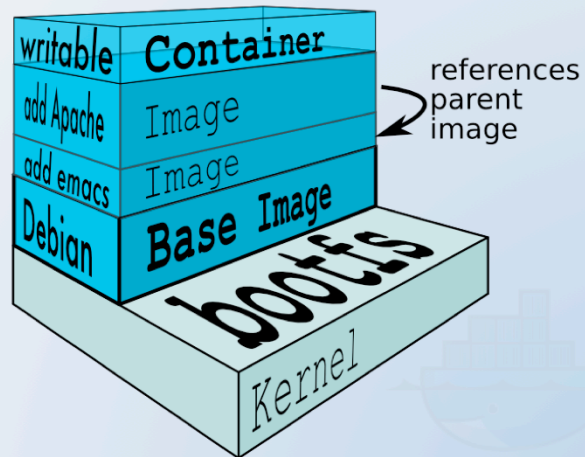
(Other containerization solutions available – eg LXC, OpenVZ, BSD Jails)

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When I say Unit of Isolation, I mean – rather than having 100 separate virtual machines, why not have 10 virtual machines running 10 containers? If most of your virtual machines run at 1% utilisation, then Docker could reduce your VM bills.

The Key Technology



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Image taken from <https://docs.docker.com/terms/image/> which describes the layering approach

What does it mean for me?

Develop

- Write your application to run in a container
 - <http://12factor.net/>
- Supply a Dockerfile to build your appliance (Optional)

Deploy

- “docker run <image>”
- “docker run <image>
java -jar /usr/lib/
myapp/something”



Limitations

- API keeps changing!
 - v1.0.0 to v1.1.2 took me 4 hours to update
- Resource leaks
 - Lack of init.d means no clean-up
 - (so I've been told – not used in anger)
- No persistent storage
 - SysLog?
- Networking
 - Creates host-only network now, should be fine

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If you exit your container without committing the changes, the changes are lost. Not a bad thing if you want a fast restore to a known state!

Demo

Have a go yourself!

<https://www.docker.com/tryit/>



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Do The Demo Yourself (MacOS)

- Install the Docker using the installer
 - <https://docs.docker.com/installation/mac/>
- Start the installed Boot2Docker app
 - Copy the “export DOCKER_HOST=tcp://<some_ip_here>:2375” line from the Terminal and paste it into a new Terminal window
- `curl -O -L`
<https://raw.githubusercontent.com/AndrewGorton/DockerJavaMavenBuildBox/v1.0.3/build-base.sh>
- `curl -O -L`
<https://raw.githubusercontent.com/AndrewGorton/DockerJavaMavenBuildBox/v1.0.3/build-builder.sh>
- `chmod u+x build-base.sh build-builder.sh`
- `./build-base.sh`
- `./build-builder.sh`
- Follow the instructions printed on the screen to run the DropWizard service, and then CURL it from a different window

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If you've previously used a Brew version, I suggest you “boot2docker delete”, then `brew unlink boot2docker and docker`.

Notes from Demo

- `docker run -it <image> <command> <params>`
 - To start a docker container
- `docker commit <container>`
 - Persists the container's changes
- `docker ps`
 - Shows running docker instances
- `docker images`
 - Shows your images
- `docker rmi`
 - Removes images locally (tidy up)



Dockerfile

- Scripted creation of Docker containers
- `docker build -t <new_image_name> - <buildbase.dockerfile`
- On success, creates a local image as designated



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Sample Dockerfile

```
# Set the base image
FROM ubuntu:latest

# Install OpenJDK
RUN apt-get update
RUN apt-get install -y openjdk-7-jdk
RUN echo export JAVA_HOME=/usr/lib/jvm/java-7-openjdk-amd64 > /etc/profile.d/java.sh

# Install Maven
RUN apt-get install -y wget
RUN wget http://mirror.cc.columbia.edu/pub/software/apache/maven/maven-3/3.1.1/binaries/
  apache-maven-3.1.1-bin.tar.gz
RUN apt-get install -y tar
RUN tar xzf apache-maven-3.1.1-bin.tar.gz -C /usr/local
WORKDIR /usr/local
RUN ln -s apache-maven-3.1.1 maven
WORKDIR /
RUN echo export M2_HOME=/usr/local/maven > /etc/profile.d/maven.sh
RUN echo export PATH=${M2_HOME}/bin:${PATH} >> /etc/profile.d/maven.sh
RUN echo source /etc/profile > ~/.profile
```

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Further Adventures

- Google Compute Engine supports Docker
- Amazon EC2 has AMI Docker Release Candidates
- Google has released management tools for Docker
 - “Everything at Google, from Search to Gmail, is packaged and run in a Linux container.”
- Private Docker Repository
 - Nexus but for images

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Google Compute Engine support - https://developers.google.com/compute/docs/containers#container-optimized_google_compute_engine_images
Amazon EC2 Docker Release Candidates - <http://aws.amazon.com/amazon-linux-ami/2014.03-release-notes/>
Google Cloud Platform releases tools - <http://googlecloudplatform.blogspot.co.uk/2014/06/an-update-on-container-support-on-google-cloud-platform.html>
Private Docker Repository - <https://blog.codecentric.de/en/2014/02/docker-registry-run-private-docker-image-repository/>

Questions?



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