



docker

Introduction to Docker

@botchagalupe

- a.k.a. John Willis
- 35 Years in IT Operations
- Exxon, Canonical, Chef, Enstratus, Socketplane
- Devopsdays Core Organizer

Agenda

- Why Docker?
- Docker Platform
- Docker Installation
- Docker Workflow(s)

Docker Blog

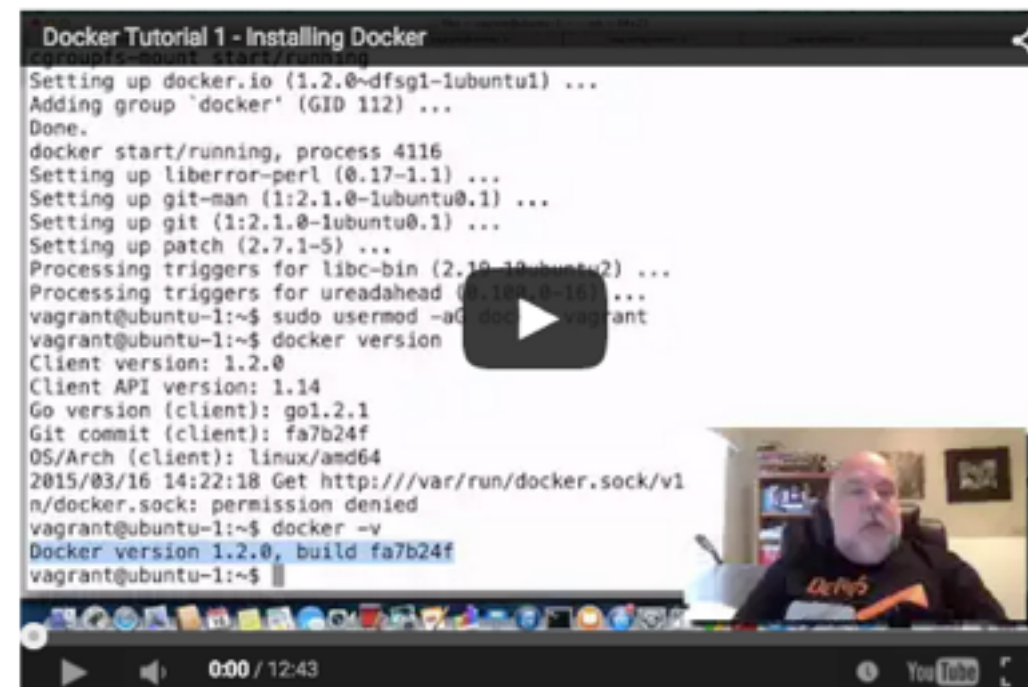
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March 18, 2015

DOCKER TUTORIAL 1 – INSTALLING DOCKER

This is a casual tutorial series. We will start out first with very simple sessions on how to [install Docker](#) and use the docker run command. In future videos we will hit more advanced topics.

This first video talks a little bit about releases in Docker and the current release cadence. We also show examples of installing from default repo's on Ubuntu, Centos and Fedora as well as installs from [get.docker.com](#) and installing from the Docker binary.



Why Docker?

- Isolation
- Lightweight
- Simplicity
- Workflow
- Community

Docker Community

- 1200 Docker Contributors
- 100,000 Dockerized Applications
- 3 to 4 Million Developers using Docker
- 300 Million Downloads
- 32,000 Docker Related Projects
- 70% of enterprises are using Docker

Docker Engine
+ Docker Hub

= Docker Platform

Docker Engine

- Docker Daemon
- Docker CLI

Docker Daemon

- Builds Images
- Runs and Manages Containers
- RESTful API

Docker CLI

- `docker build` # Build an image from a Dockerfile
- `docker images` # List all images on a Docker host
- `docker run` # Run an image
- `docker ps` # List all running and stopped instances
- `docker stop` # Stop a running instances
- `docker rm` # Remove an instance
- `docker rmi` # Remove an image

Docker Architecture

Docker Client

docker pull
docker run
docker ...



Host

Docker Daemon

Container 1

Container 2

Container 3

Container ...


Docker Hub

- Provides Docker Services
- Library of public images
- Storage for your images
 - free for public images
 - cost for private images
- Automated builds(link github/bitbucket repo; trigger build on commit)


Docker Hub

Home icon | <https://hub.docker.com>

Read Later | San Diego Ukulele Fc | <http://10.254.101.2> | <https://hub.docker.com>



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Docker Installation

Install Latest

Use (for latest)

```
wget -qO- https://get.docker.com/ | sh
```

Pre release

```
wget -qO- https://test.docker.com/ | sh
```

On UBUNTU 14-10

Repo install usually back leveled

```
sudo apt-get install -y docker.io  
sudo service docker restart
```

On RHEL/Centos/Fedora

Repo install usually back leveled

```
sudo yum install docker  
sudo service docker start
```

Docker Installation

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Docker Tutorial 1 - Installing Docker

```
Setting up docker.io (1.2.0~dfsg1~ubuntu1) ...  
Adding group `docker' (GID 112) ...  
Done.  
docker start/running, process 4116  
Setting up liberror-perl (0.17-1.1) ...  
Setting up git-man (1:2.1.0~ubuntu0.1) ...  
Setting up git (1:2.1.0~ubuntu0.1) ...  
Setting up patch (2.7.1-5) ...  
Processing triggers for libc-bin (2.19-1ubuntu2) ...  
Processing triggers for ureadahead (0.100-0-16) ...  
vagrant@ubuntu-1:~$ sudo usermod -aG docker vagrant  
vagrant@ubuntu-1:~$ docker version  
Client version: 1.2.0  
Client API version: 1.14  
Go version (client): go1.2.1  
Git commit (client): fa7b24f  
OS/Arch (client): linux/amd64  
2015/03/16 14:22:18 Get http://var/run/docker.sock/v1  
n/docker.sock: permission denied  
vagrant@ubuntu-1:~$ docker -v  
Docker version 1.2.0, build fa7b24f  
vagrant@ubuntu-1:~$
```





Get Started with

Docker Platform Workflow

- Find an Image on Docker Hub
- Pull an Image from Docker Hub
- Run an Image on Docker Host
- Stop an Instance
- Remove an Instance
- Remove an Image

Docker Workflow (Part 1)

```
docker search ubuntu  
docker search -s 10 ubuntu
```

```
docker pull ubuntu  
docker images
```

```
docker history ubuntu
```

```
cid=$(docker run -itd ubuntu)  
echo $cid  
docker ps
```

```
docker exec $cid ip a
```

```
docker stop $cid  
docker rm $cid
```

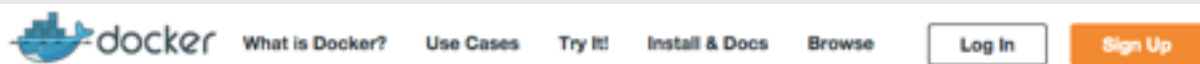
```
docker rmi ubuntu  
docker images
```



docker

Demo

Docker Run Commands

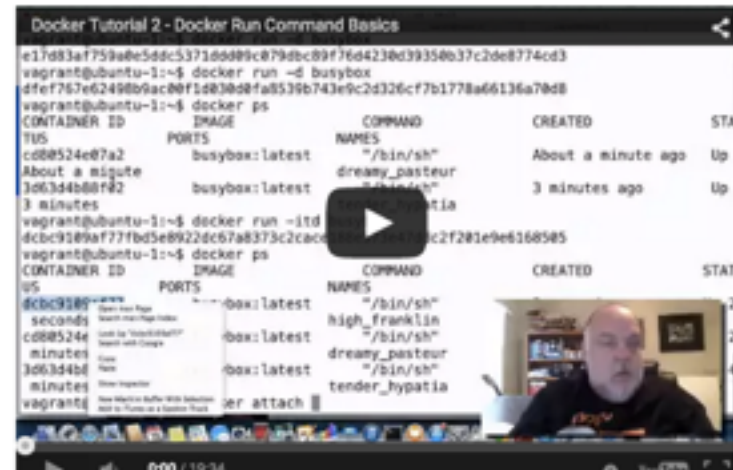


March 25, 2015

DOCKER TUTORIAL 2 – DOCKER RUN COMMAND BASICS

This is a casual Docker tutorial series. We will start out first with very simple sessions on how to install and use the docker run command. In future videos we will hit more advanced topics.

In this second video we explore some of the simple flags of the docker command. This is another basic tutorial. This time we explore the difference between some of the run flags (e.g., -i -t -d). We also explore the use of the docker ps commands while working with running and stopped containers.



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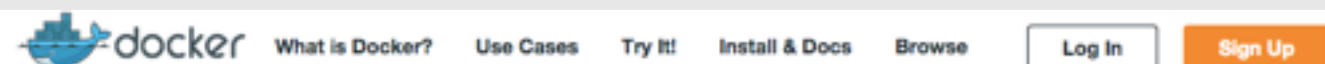
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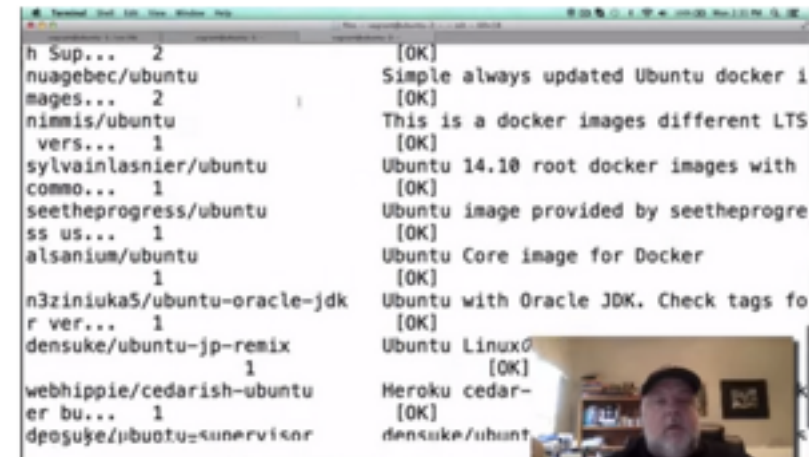
Get Started with



April 8, 2015

DOCKER TUTORIAL 4 – MORE RUN WITH A COUPLE OF EXTRA GOODIES

This is a casual [Docker tutorial series](#). We started out first with very simple sessions on [how to install Docker](#), the [docker run command](#) and had [fun with volumes](#). In future videos we will hit more advanced topics.



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Docker Platform Workflow (Build Images)

- Build a Local Image
- Run an Image on Docker Host

Docker Workflow (Part 2)

```
FROM ubuntu:14.04

RUN \
    apt-get update && \
    apt-get -y install apache2

ADD index.html /var/www/html/index.html

EXPOSE 80

CMD ["/usr/sbin/apache2ctl", "-D", "FOREGROUND"]
```

```
<h1>Docker Rocks!</h1>
```

```
docker build -t apache-test .

cid=$(docker run -itd -P apache-test)

nid=$(docker inspect --format '{{.NetworkSettings.IPAddress}}' $cid)


curl $nid
```



docker

Demo

Docker Build

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April 22, 2015

DOCKER TUTORIAL 6 – DOCKERFILE (PART 1)

This is a casual [Docker tutorial series](#). We started out first with very simple sessions on how to install and use the docker run command. In future videos we will hit more advanced topics.

In this sixth video we cover the basics of a Dockerfile. We cover basic commands such as FROM, RUN and CMD along with other basic Dockerfile commands. Basically the tutorial describes the Dockerfile DSL.

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Usage

Format

The .dockerignore file

FROM

MAINTAINER

RUN

Known Issues (PUN)

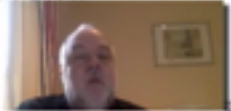
Dockerfile Reference

Docker can build images automatically by reading the instructions from a Dockerfile. A Dockerfile is a text document that contains all the commands you would normally execute manually in order to build a Docker image. By calling `docker build` from your terminal, you can have Docker build your image step by step, executing the instructions successively.


This page discusses the specifics of all the instructions you can use in your Dockerfile. To further help you write a clear, readable, maintainable Dockerfile, we've also written a Dockerfile [Best Practices guide](#). Lastly, you can test your Dockerfile knowledge with the [Dockerfile Quiz](#).

Usage

To build an image from a source repository, create a Dockerfile. This file will describe the steps to assemble the image.



Additional Notes:

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April 30, 2015

DOCKER TUTORIAL 7 – DOCKERFILE (PART 2)

This is a casual [Docker tutorial series](#). We started out first with very simple sessions on how to install and use the docker run command. In future videos we will hit more advanced topics.

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5 # Install the PHP extensions we need

6 RUN apt-get update && apt-get install -y libpng12-dev libjpeg-dev && rm -rf /var/lib/apt/lists/* \

7 && docker-php-ext-configure gd --with-png-dir=/usr --with-jpeg-dir=/usr \

8 && docker-php-ext-install gd

9 RUN docker-php-ext-install mysqli

10

11 VOLUME /var/www/html

12

13 ENV WORDPRESS_VERSION 4.1.2

14 ENV WORDPRESS_UPSTREAM_VERSION 4.1.2

15 ENV WORDPRESS_SHA512 9e914500a136623d686876ac73e49c3eb0

16

17 # upstream tarballs include ./wordpress/ so this gives us /usr/src/wordpress

18 RUN curl -s wordpress.tar.gz -SL https://wordpress.org/wordpress-\${WORDPRESS_UPSTREAM_VERSION}.tar.gz \

19 && echo "WORDPRESS_SHA1 wordpress.tar.gz" | sha1sum -c - \

20 && tar -xzf wordpress.tar.gz -C /usr/src/ \

21 && rm wordpress.tar.gz \

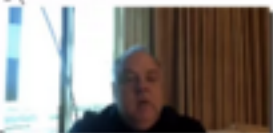
22 && chown -R www-data:www-data /usr/src/wordpress

23

24 COPY docker-entrypoint.sh /entrypoint.sh

25

26 # grr, ENTRYPOINT resets CMD now

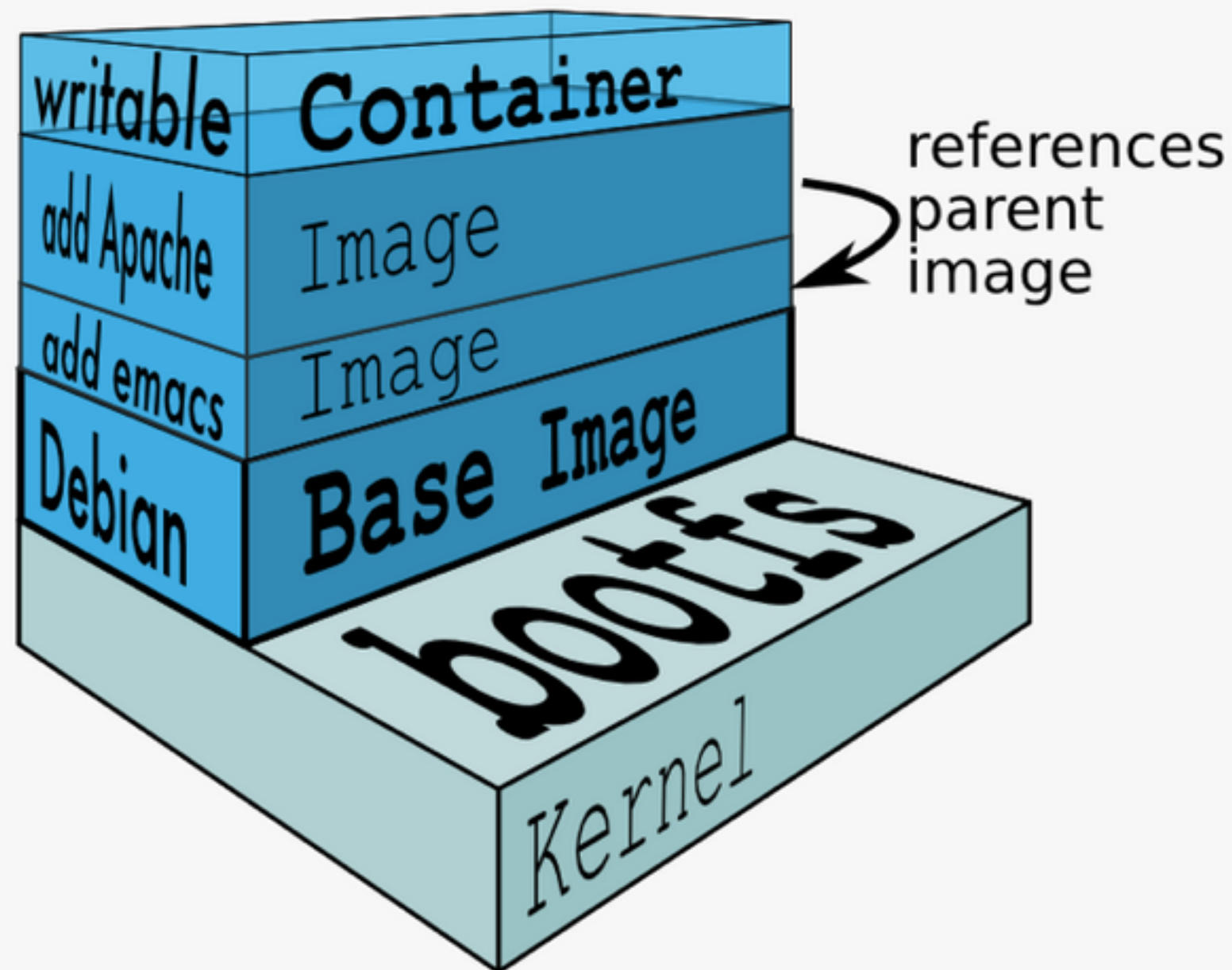


In this seventh video we cover more advanced uses of building images with Dockerfiles. We will look at a couple of the [Docker Hub](#) repos as different examples to create Apache images..

Docker Platform Workflow (Volumes)

- Using Volumes
- Mounting Docker Host Volumes

Docker Platform Workflow (Volumes)



Docker Workflow (Part 3)

```
docker run -it --name testjob1 -v /tmp1 ubuntu  
mkdir test  
cd test  
touch file1  
touch file2
```

```
docker stop testjob1  
docker start testjob1
```

```
docker exec testjob1 ls /test
```

```
docker run -it --name testjob2 -v /tmp1 ubuntu  
docker exec testjob2 ls /test
```

```
docker run -itd --name testjob3 -v $(pwd)/index.html:/var/www/html/index.html apache-test
```

```
nid=$(docker inspect --format '{{.NetworkSettings.IPAddress}}' testjob3)
```

```
curl $nid
```

(Change the index.html file

```
curl $nid
```



docker

Demo

Docker Volumes

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DOCKER TUTORIAL 3 – FUN WITH VOLUMES

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The screenshot shows a web browser displaying the Docker documentation page titled "Managing Data in Containers". The page is part of the "User Guide" section. It includes a sidebar with links to "Data volumes", "Adding a data volume", "Mount a Host Directory as a Data Volume", "Mount a Host File as a Data Volume", "Creating and mounting a Data Volume Container", and "Backup, restore, or migrate data volumes". The main content area discusses "Data volumes" and mentions "Data volume containers". A video player is visible at the bottom right of the page, showing a man speaking.

References

WHY I LOVE DOCKER... AND WHY YOU'LL LOVE IT TOO

<https://blog.docker.com/2015/03/why-i-love-docker-and-why-youll-love-it-too/>

DOCKER TUTORIAL 1 – INSTALLING DOCKER

<https://blog.docker.com/2015/03/docker-tutorial-1-installing-docker/>

DOCKER TUTORIAL 2 – DOCKER RUN COMMAND BASICS

<https://blog.docker.com/2015/03/docker-tutorial-2-docker-run-command-basics/>

DOCKER TUTORIAL 3 – FUN WITH VOLUMES

<https://blog.docker.com/2015/04/docker-tutorial-3-fun-with-volumes/>

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<https://blog.docker.com/2015/04/docker-tutorial-4-more-run-with-a-couple-of-extra-goodies/>

DOCKER TUTORIAL 6 – DOCKERFILE (PART 1)

<https://blog.docker.com/2015/04/docker-tutorial-6-dockerfile-part-1/>

DOCKER TUTORIAL 7 – DOCKERFILE (PART 2)

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