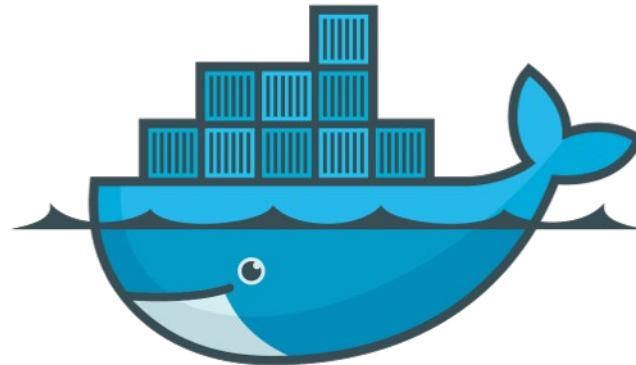


Intro to Docker



docker

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~~The~~ My Problem(s)

- I can't stand a bunch of crap clogging up my system.
- Virtualenv is only for Python. Not per project. Not for other things.
- VMs per application or client are too big (both in size and cumbersome nature).
- If I want true isolation I have to host 5 different environments for 5 projects.
- I evaluate and test lots of different custom customer software.

Who I Am

Chris Berg.

CTO / Chief Consultant @ Firemaple Industries.

Formerly Software Engineer, DoD contractor.
Linux user since Debian Hamm (1998).

Hot sauce sommelier. Lover of all things aircraft.

Related experience: AIX / FreeBSD / Solaris

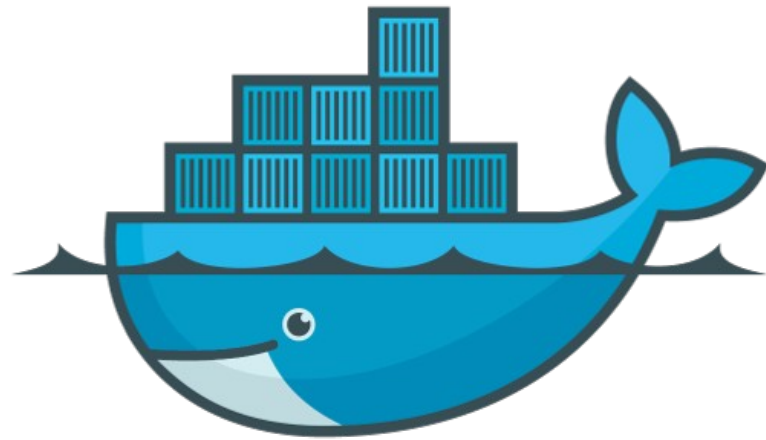


FIREMAPLE INDUSTRIES

Who You Are

- Linux (or Mac) user.
- A control freak who demands crazy things. Like no crazy dependencies clogging up your system.
- A believer in lightweight standardization across dev and production.
- A dedication to less painful environment spoolup for your team.

The Solution



docker

~~Who~~ What is Docker?

what is docker



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dock·er

/'däkər/

noun

another term for [longshoreman](#).



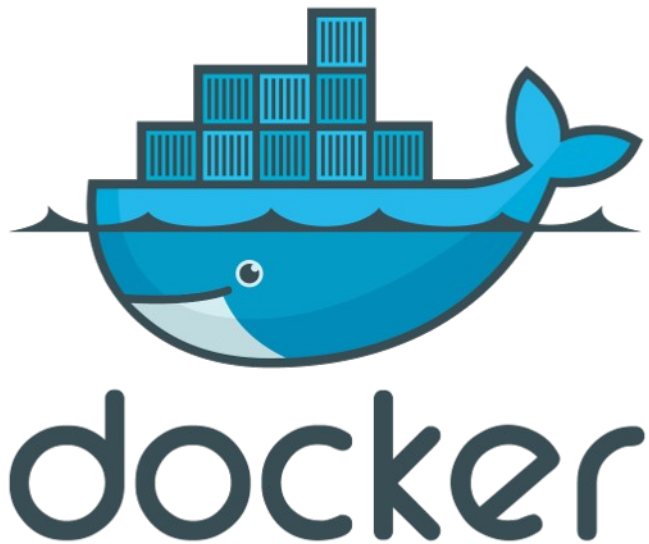
Translations, word origin, and more definitions

[What Is Docker? An open platform for distributed apps](#)

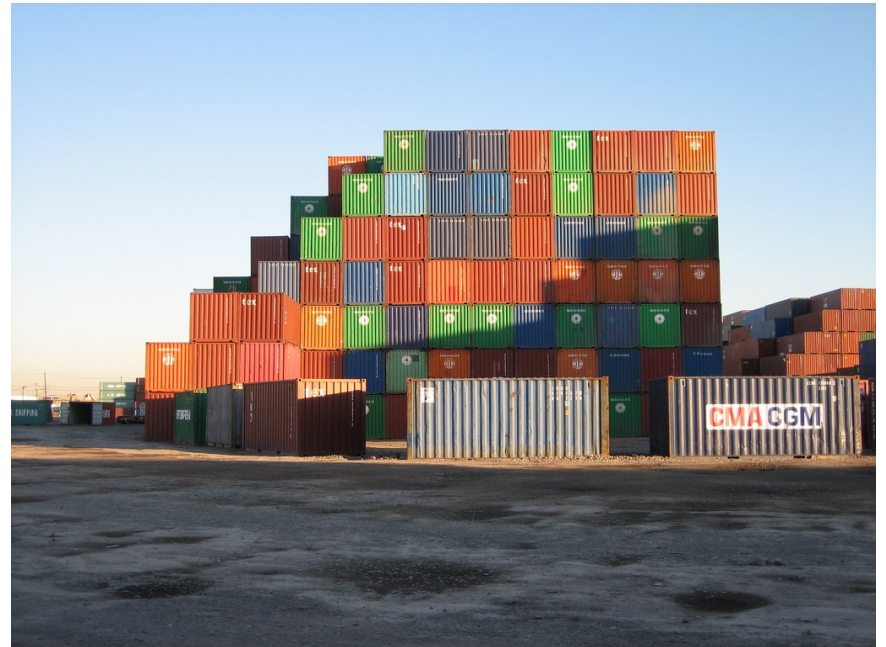
www.docker.com/whatisdocker/ ▾

Docker is an open platform for developers and sysadmins to build, ship, and run distributed applications.

Who What is Docker..really?



=



CC BY-ND 2.0 – Herman Yung

Really?



CC BY 2.0 – Peter Pawlowski

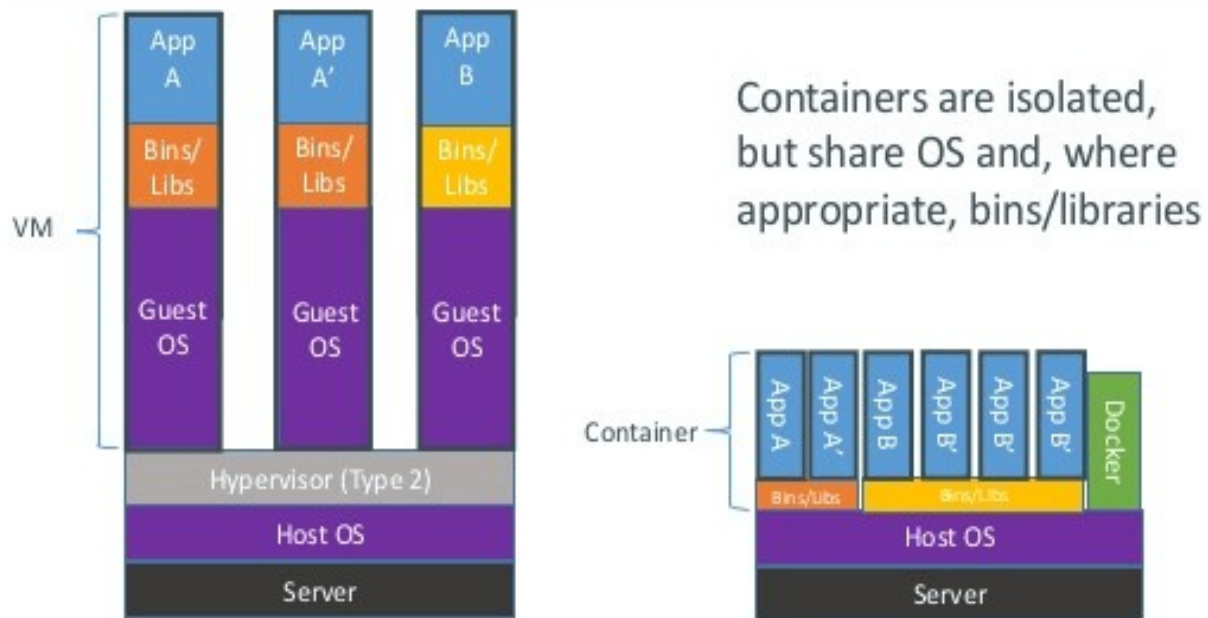
Docker is an entire platform including a daemon that services docker images, Docker Hub, a SaaS service for managing application stacks, and Dockerfiles.

Greater Details

- Docker is a daemon that services docker images (containers).
- Copy on write. 3 containers, same underlying OS, the storage necessary is only the difference between the base image.
- You can **finally** contain all your dependencies.
- It's speedy! And runs everywhere.

How is that different from a VM?

Containers vs. VMs



Mercilessly pilfered from Docker.com



How is that different from a VM?

- Docker uses LXC (Linux Containers) that run in the same OS as the host.
- Less isolation, more lightweight.
- Docker diff
- It's speedy! Leaves VMs in the dust.

What does that really look like?

```
~/P/F/hidocker >>> docker run --name gimme-some-mysql-love -e  
MYSQL_ROOT_PASSWORD=nottelling -d mysql:5.7
```

```
Unable to find image 'mysql:5.7' locally
```

```
Pulling repository mysql
```

```
8f71d44defe9: Download complete
```

```
511136ea3c5a: Download complete
```

```
...
```

```
21151bc5b759: Download complete
```

```
bbe6dfaaf5c7: Download complete
```

```
5d068cadd394: Download complete
```

```
97a33b55c988: Download complete
```

```
Status: Downloaded newer image for mysql:5.7
```

```
1d0bcc0af5b772742ddba217191c68597327f0e96d2f23d5be50ed31db57d176
```

Is it really running?

```
~/P/F/hidocker >>> docker ps
```

CONTAINER ID NAMES	IMAGE	COMMAND	CREATED	STATUS	PORTS
1d0bcc0af5b7 gimme-some-mysql-love	mysql:5.7	"/entrypoint.sh mysq	About a minute ago	Up About a minute	3306/tcp

What happened under the hood?

```
~/P/F/hidocker >>> docker logs gimme-some-mysql-love
Initializing database
2015-04-07T21:53:45.745083Z 0 [Warning] InnoDB: New log files created, LSN=45790
2015-04-07T21:53:45.953384Z 0 [Warning] InnoDB: Creating foreign key constraint system tables.
2015-04-07T21:53:46.023337Z 0 [Warning] Failed to setup SSL
2015-04-07T21:53:46.023387Z 0 [Warning] SSL error: SSL context is not usable without certificate and private key
2015-04-07T21:53:46.024530Z 1 [Warning] root@localhost is created with an empty password ! Please consider switching off the --initialize-insecure option.
Database initialized
2015-04-07T21:53:50.026929Z 0 [Note] mysqld (mysqld 5.7.6-m16) starting as process 1 ...
2015-04-07T21:53:50.030339Z 0 [Note] InnoDB: Mutexes and rw_locks use GCC atomic builtins
2015-04-07T21:53:50.030374Z 0 [Note] InnoDB: Uses event mutexes
2015-04-07T21:53:50.030379Z 0 [Note] InnoDB: GCC builtin __atomic_thread_fence() is used for memory barrier
2015-04-07T21:53:50.030382Z 0 [Note] InnoDB: Compressed tables use zlib 1.2.7
2015-04-07T21:53:50.030385Z 0 [Note] InnoDB: Using Linux native AIO
2015-04-07T21:53:50.030666Z 0 [Note] InnoDB: Number of pools: 1
2015-04-07T21:53:50.030759Z 0 [Note] InnoDB: Using CPU crc32 instructions
2015-04-07T21:53:50.031801Z 0 [Note] InnoDB: Initializing buffer pool, total size = 128M, instances = 1, chunk size = 128M
2015-04-07T21:53:50.048584Z 0 [Note] InnoDB: Completed initialization of buffer pool
2015-04-07T21:53:50.050358Z 0 [Note] InnoDB: If the mysqld execution user is authorized, page cleaner thread priority can be changed. See the man page of setpriority().
2015-04-07T21:53:50.051931Z 0 [Note] InnoDB: Highest supported file format is Barracuda.
2015-04-07T21:53:50.072586Z 0 [Note] InnoDB: Creating shared tablespace for temporary tables
2015-04-07T21:53:50.072648Z 0 [Note] InnoDB: Setting file './ibtmp1' size to 12 MB. Physically writing the file full; Please wait ...
2015-04-07T21:53:50.962396Z 0 [Note] InnoDB: File './ibtmp1' size is now 12 MB.
2015-04-07T21:53:50.965253Z 0 [Note] InnoDB: 96 redo rollback segment(s) found. 96 redo rollback segment(s) are active.
2015-04-07T21:53:50.965284Z 0 [Note] InnoDB: 32 non-redo rollback segment(s) are active.
2015-04-07T21:53:50.965794Z 0 [Note] InnoDB: Waiting for purge to start
2015-04-07T21:53:51.016903Z 0 [Note] InnoDB: 5.7.6 started; log sequence number 2321731
2015-04-07T21:53:51.017293Z 0 [Note] Plugin 'FEDERATED' is disabled.
2015-04-07T21:53:51.018389Z 0 [Warning] No existing UUID has been found, so we assume that this is the first time that this server has been started. Generating a new UUID: 93970f69-dd70-11e4-ac29-0242ac110002.
2015-04-07T21:53:51.019743Z 0 [Warning] Failed to setup SSL
2015-04-07T21:53:51.019766Z 0 [Warning] SSL error: SSL context is not usable without certificate and private key
2015-04-07T21:53:51.019778Z 0 [Note] Server hostname (bind-address): '*'; port: 3306
2015-04-07T21:53:51.019881Z 0 [Note] IPv6 is available.
2015-04-07T21:53:51.019896Z 0 [Note] - '::' resolves to '::';
2015-04-07T21:53:51.019933Z 0 [Note] Server socket created on IP: '::'.
2015-04-07T21:53:51.036893Z 0 [Note] Event Scheduler: Loaded 0 events
2015-04-07T21:53:51.036921Z 0 [Note] Execution of init_file '/tmp/mysql-first-time.sql' started.
2015-04-07T21:53:51.038418Z 0 [Note] Execution of init_file '/tmp/mysql-first-time.sql' ended.
2015-04-07T21:53:51.038515Z 0 [Note] mysqld: ready for connections.
Version: '5.7.6-m16' socket: '/var/run/mysqld/mysqld.sock' port: 3306 MySQL Community Server (GPL)
```

How is that defined? (Dockerfiles!)

```
FROM ubuntu
```

```
RUN dpkg-divert --local --rename --add /sbin/initctl
```

```
RUN ln -s /bin/true /sbin/initctl
```

```
RUN echo "deb http://archive.ubuntu.com/ubuntu precise main  
universe" > /etc/apt/sources.list
```

```
RUN apt-get update
```

```
RUN apt-get -y install mysql-server
```

```
EXPOSE 3306
```

```
CMD ["/usr/bin/mysqld_safe"]
```

How is that defined? (Dockerfiles!)

```
# Firefox over VNC
#
# VERSION          0.3

FROM ubuntu

# Install vnc, xvfb in order to create a 'fake' display and firefox
RUN apt-get update && apt-get install -y x11vnc xvfb firefox
RUN mkdir ~/.vnc
# Setup a password
RUN x11vnc -storepasswd 1234 ~/.vnc/passwd
# Autostart firefox (might not be the best way, but it does the trick)
RUN bash -c 'echo "firefox" >> /.bashrc'

EXPOSE 5900

CMD ["x11vnc", "-forever", "-usepw", "-create"]
```


OH NO! How did my image change?

```
~/P/F/hidocker >>> docker diff so-  
26230214
```

```
C /etc
```

```
C /etc/default
```

```
D /etc/default/ntpdate
```

```
C /root
```

```
A /root/.bash_history
```

```
C /tmp
```

```
A /tmp/foo.txt
```

Docker Options

- There's tons. Really.
 - <http://docs.docker.com/reference/commandline/cli/>

The future!

- **Machine** takes you from “zero-to-Docker” with a single command. It lets you easily deploy Docker Engines on your computer, on cloud providers, and in your own data center.
- **Swarm** is native clustering for Docker containers. It pools together several Docker Engines into a single, virtual host. Point a Docker client or third party tool (e.g., Compose, Dokku, Shipyard, Jenkins, the Docker client, etc.) at Swarm and it will transparently scale to multiple hosts. A beta version of Swarm is now available, and we’re working on integrations with Amazon Web Services, IBM Bluemix, Joyent, Kubernetes, Mesos, and Microsoft Azure.
- **Compose** is a way of defining and running multi-container distributed applications with Docker. Back in December we opened up its design to the community. Based on the feedback from that, Compose will be based on Fig, a tool for running development environments with Docker.

Mercilessly pilfered from Docker.com

That's all folks!

Good luck and tell me about how Docker helped you!

@TechFarmerChris

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