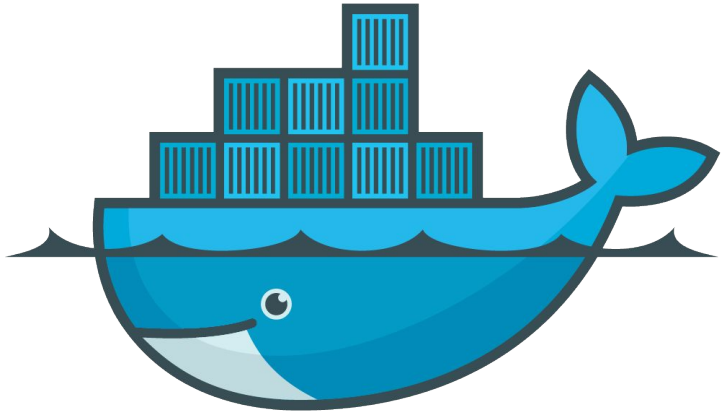


Docker

DETI; Universidade de Aveiro

Rafael Ferreira; Rodrigo Cunha

Prof. Diogo Gomes
Prof. João P. Barraca

GIRS

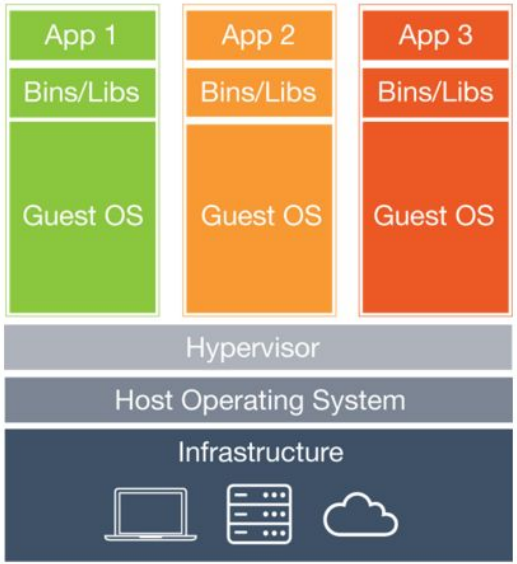
67405; 67800

What is docker?

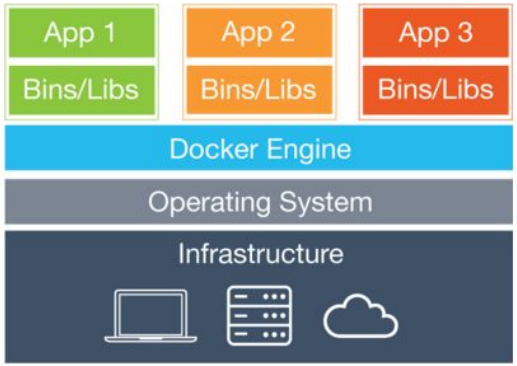
- Lightweight
- Open
- Secure

Share:

- Docker Hub
- Quay.io



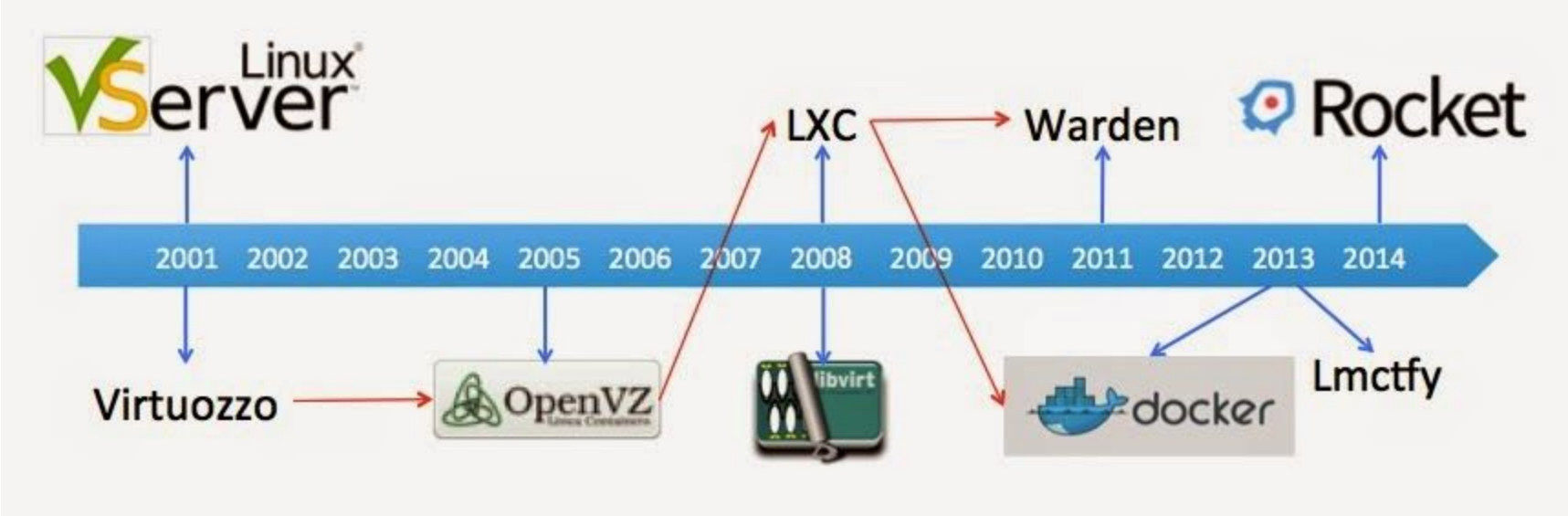
Virtual Machines



Containers

https://www.docker.com/what-docker

History



http://kiwenlau.blogspot.pt/2015/01/linux-container-technology-overview.html

Why IS it so DARN popular?

- Use shared operating systems
- **Instead** of virtualizing hardware, containers rest on top of a **single** Linux instance

This in turn means you can “leave behind” the useless 99.9% VM junk !!

- According to Parallels CTO, with a perfectly tuned container system, you can have as many as **four-to-six times** the number of server application instances as you can using **Xen** or **KVM VMs** on the same hardware.

https://www.bbvaopenmind.com/en/containerization-of-cloud-computing/

Dockerfile > Image > Container

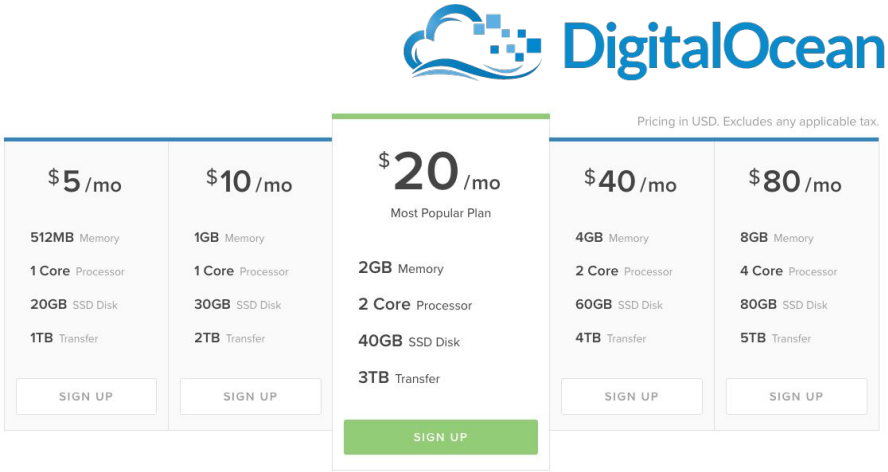
- Builds one docker image
  - Docker image: contains **packages** pre-installed ≠ ubuntu machine image
- When the image is ready we can run it
  - Then we have one container
- Other machines can run your images
- **What is the +?**
  - We can make images to one team use the same environment, for example, the same Python version and env, Django version, PyCharm version with all the configurations done etc

https://docs.docker.com/engine/reference/builder/

What about hosting provider?

We need to **limit** the:

- Memory (RAM)
- Number of cores
- Disk space
- Network data transfer

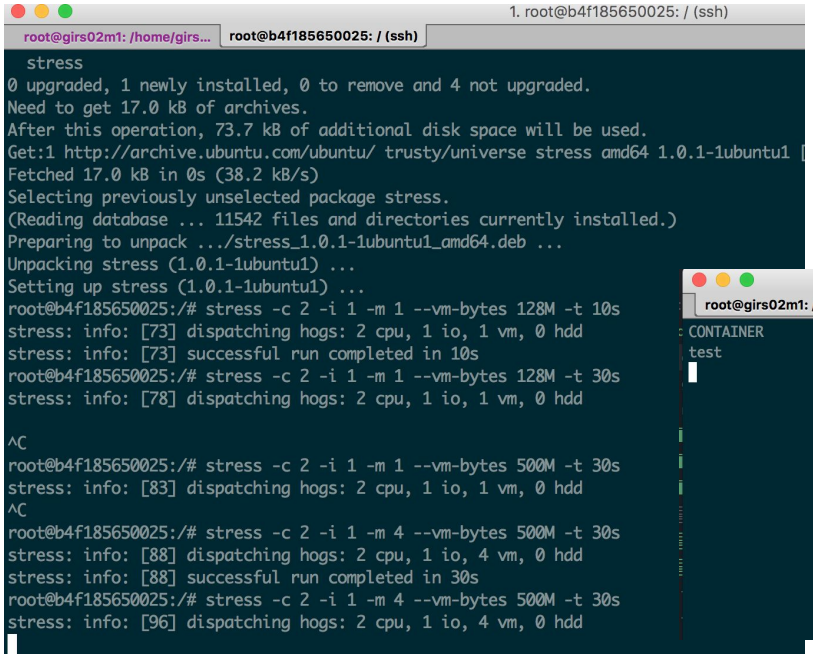


https://www.digitalocean.com/?refcode=7836853b6ce1

CPU LIMIT

TEST 1

- With this test we tried to fulfill all the CPU's available to the container.

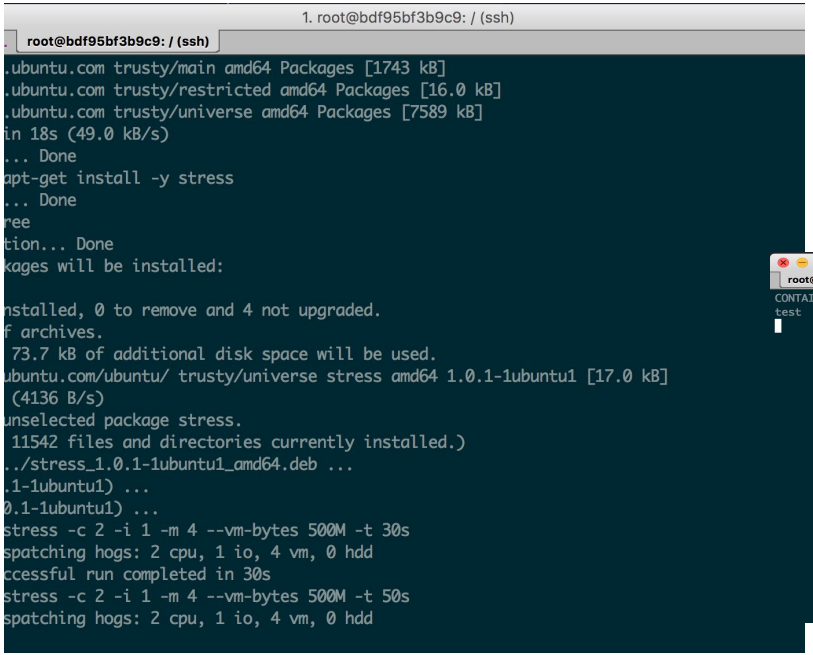


198.41%

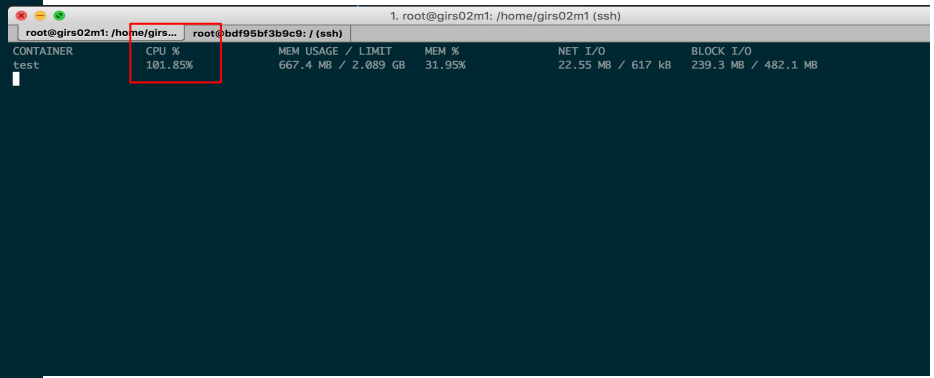
CPU LIMIT

TEST 2

- With this test we tried to fulfill all the CPU's available to the container.



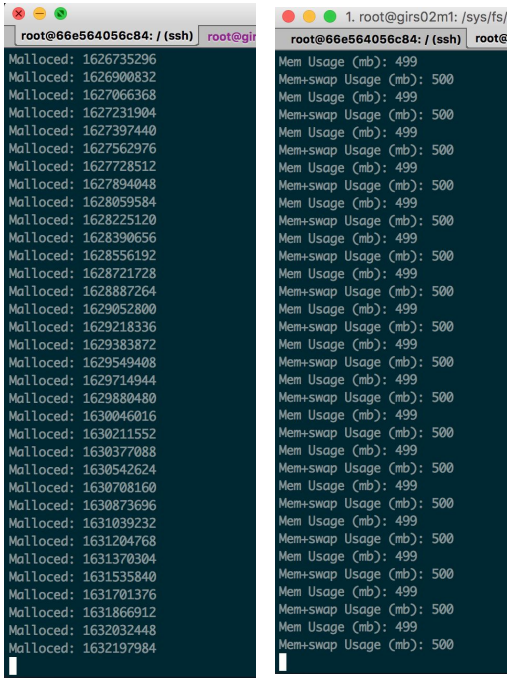
101.85%



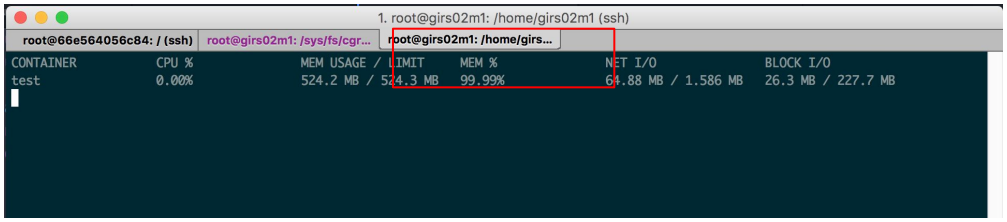
Memory Limit

TEST 1

- With this test we tried to fulfill all the memory available to the container.



Limit: 500mb ✅



Network Data Transfer

- There is **no tool** available for the run command.
- Other options:
  - https://github.com/docker/docker/issues/9607
  - Build your own bridge... (?)

Disk Space Limit

- There is **no support** in the atual version of Docker.

- Alternative:
  - Sparse loopback mounted ext4 directory (not tested)
- Or:
  - By default limit the disk space for all containers
    - `docker -d --storage-opt dm.basesize=5G`

https://github.com/docker/docker/issues/3804
https://goldmann.pl/blog/2014/09/11/resource-management-in-docker/#_limiting_disk_space
https://docs.docker.com/engine/reference/commandline/daemon/#storage-driver-options
http://stackoverflow.com/questions/29029326/how-to-define-a-disk-quota-for-docker-containers

Geek Bench

Host Vs Container

Geekbench Browser | Geekbench 3 | Geekbench 2 | Benchmark Charts | Search Geekbench 3 Results

System manufacturer System Product Name vs System manufacturer System Product Name

	System manufacturer System Product Name	System manufacturer System Product Name
Geekbench 3 Score	1003	995
Geekbench 3 Multicore Score	2244	2246

System Information

	System manufacturer System Product Name	System manufacturer System Product Name
Operating System	Ubuntu 15.10 4.2.0-16-generic x86_64	Ubuntu 14.04.4 LTS 4.2.0-16-generic x86_64
Model	System manufacturer System Product Name	System manufacturer System Product Name
Processor	Intel Core 2 Duo E8200 @ 2.66 GHz 1 processor, 2 cores	Intel Core 2 Duo E8200 @ 2.66 GHz 1 processor, 2 cores
Processor ID	GenuineIntel Family 6 Model 23 Stepping 6	GenuineIntel Family 6 Model 23 Stepping 6
L1 Instruction Cache	32 KB x 2	32 KB x 2
L1 Data Cache	32 KB x 2	32 KB x 2
L2 Cache	6144 KB	6144 KB
L3 Cache	0 KB	0 KB
Motherboard	ASUSTeK Computer INC. P5GC-MX	ASUSTeK Computer INC. P5GC-MX
BIOS	American Megatrends Inc. 0402	American Megatrends Inc. 0402
Memory	1992 MB	1992 MB

http://browser.primatelabs.com/geekbench3/compare/5420023?baseline=5419394

END.

THANK YOU!

Questions…