



Linux Containerization

(more than a cage, it's an isolation!)



LUG - Francavilla Fontana



Alessandro Argentieri - feb 2024

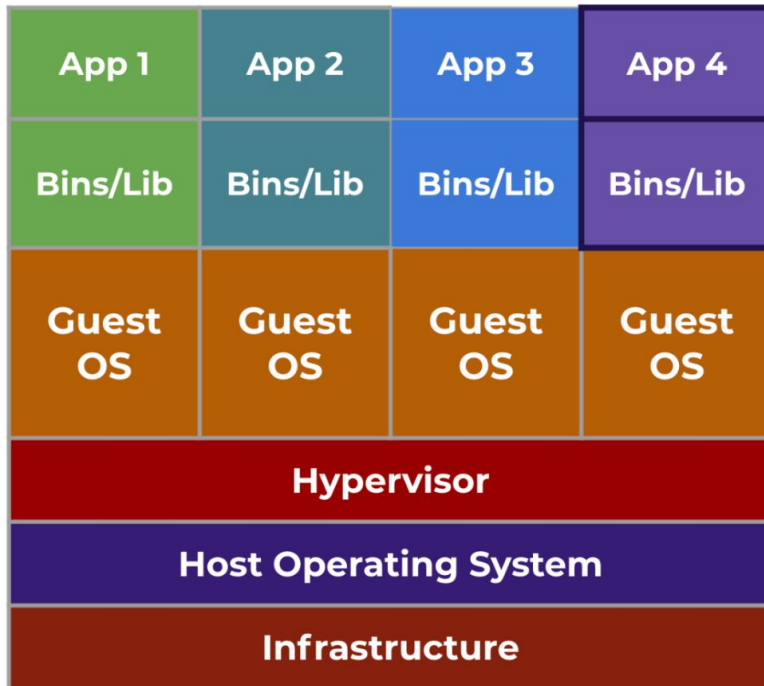


Linux components allowing containerization

Linux namespaces: Namespaces provide a layer of isolation for the containers by giving the container a view of what appears to be **its own Linux filesystem**. This limits what a process can see and therefore restricts the resources available to it.

Linux cgroups: A cgroup allocates and limits resources such as **CPU, memory, network I/O** that are used by containers.

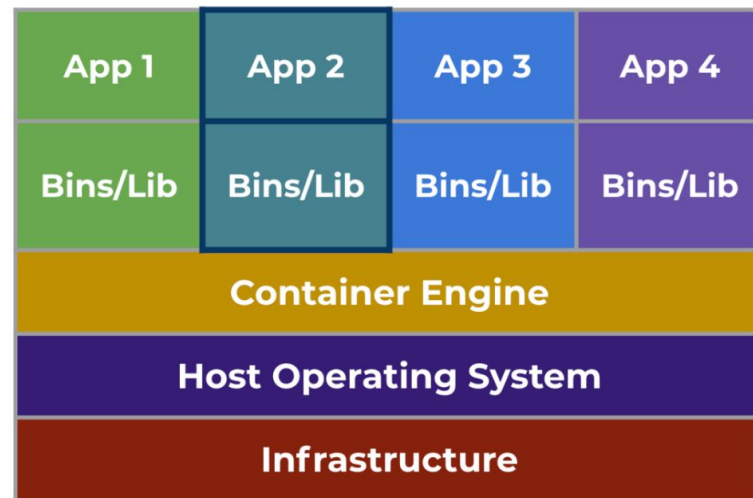
Types of Virtualization



Virtualization

Virtual machine
Heavyweight hardware level virtualization

Container
Lightweight OS level virtualization



Containerization

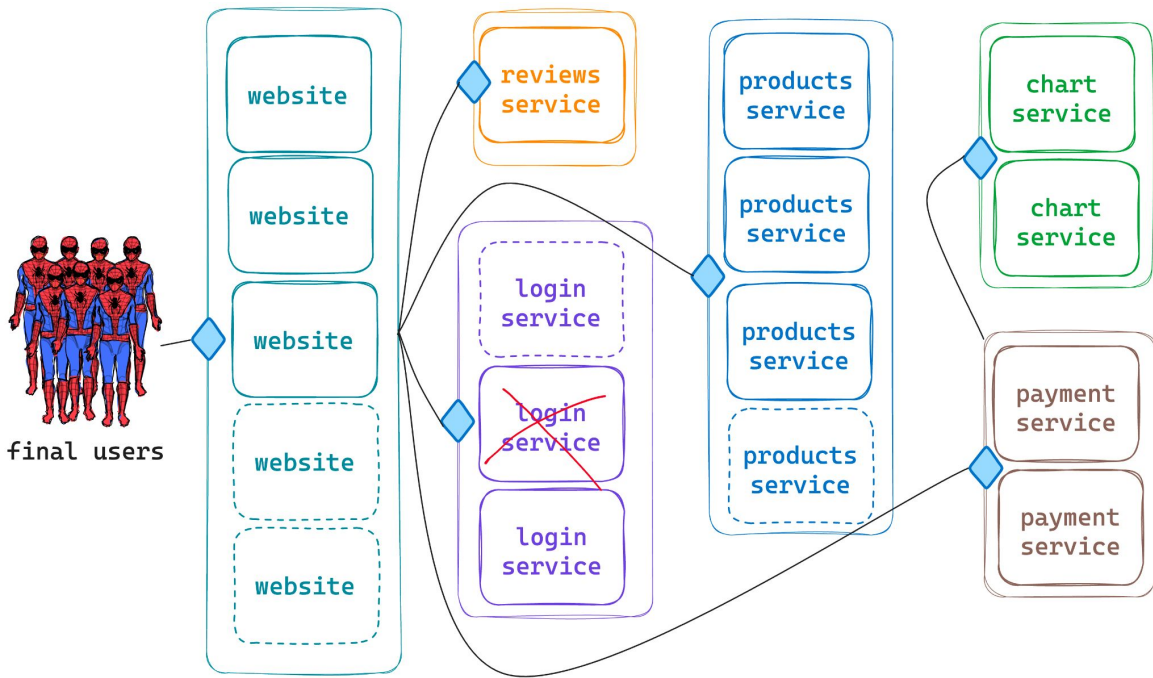


Why using containers?

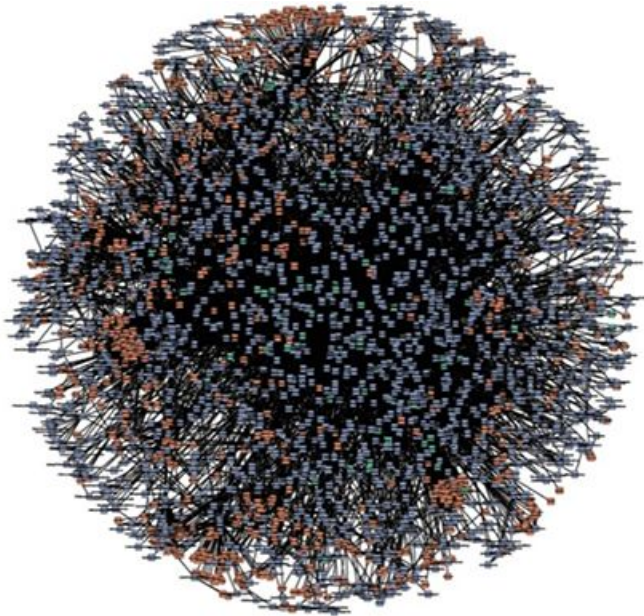
Isolation with light components: Isolation needs for multi tenancy on a shared server is better achieved (of course) with containers instead of VMs

Scalability: modern applications need extreme scalability and containers are faster to scale

Why using containers?



Microservices everywhere!



amazon.com[®]



Docker flow to have a container

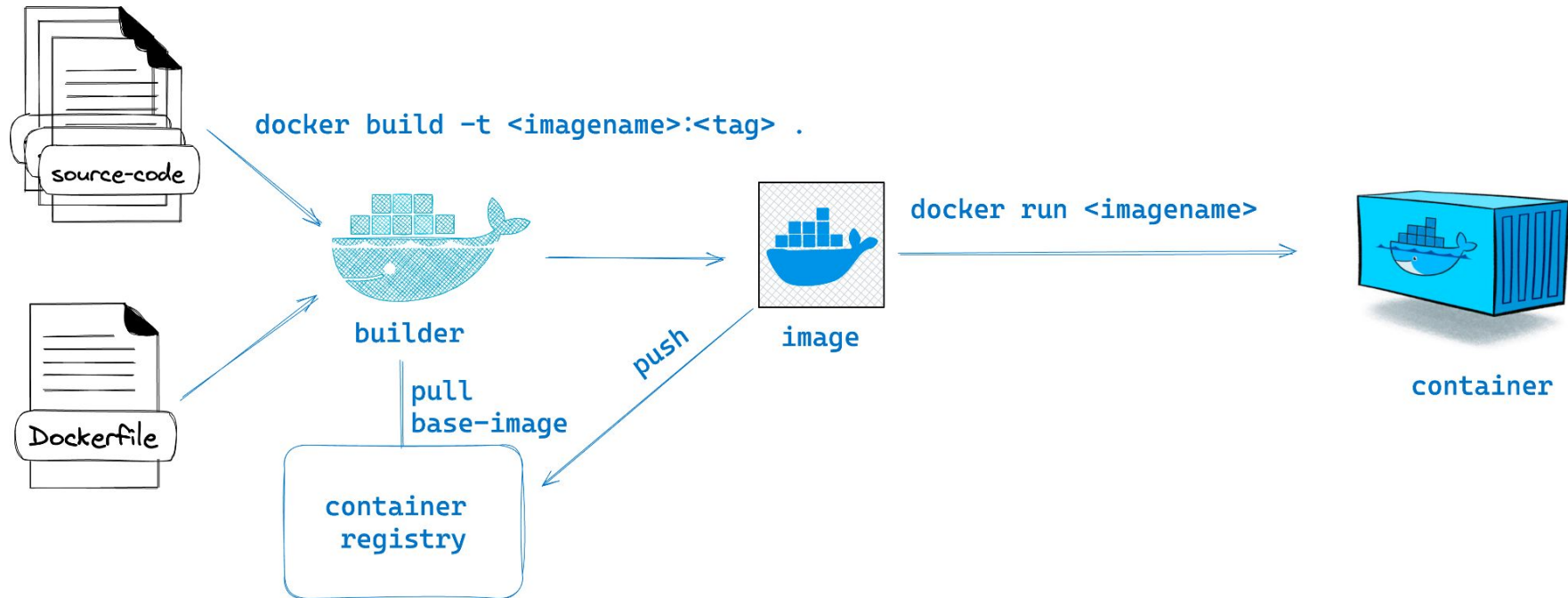
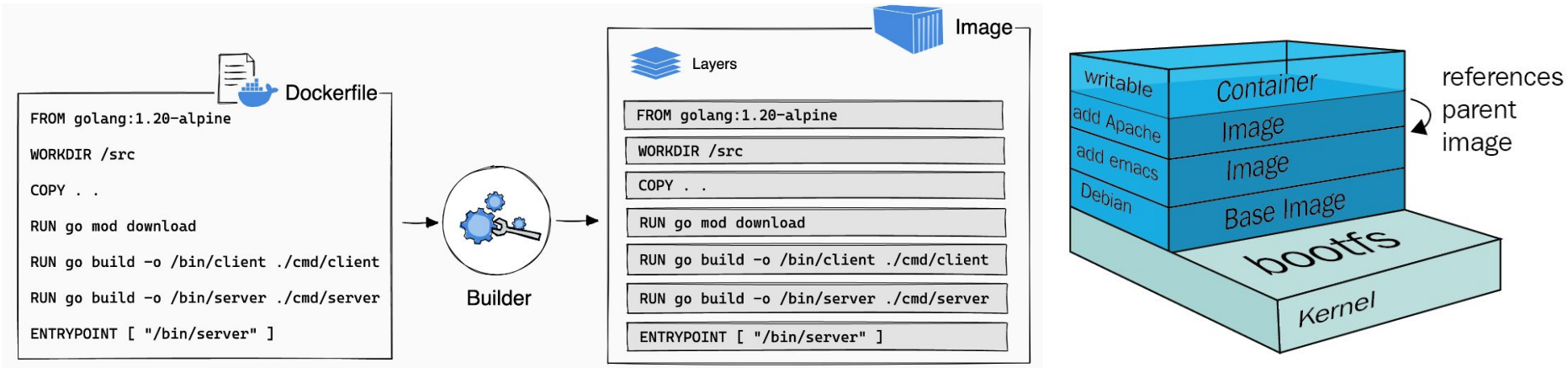


Image: snapshot to create containers from

A Docker image is an immutable (unchangeable) file that contains the source code, libraries, dependencies, tools, and other files needed for an application to run.

Due to their read-only quality, these images are sometimes referred to as snapshots. They represent an application and its virtual environment at a specific point in time.





Images sizes

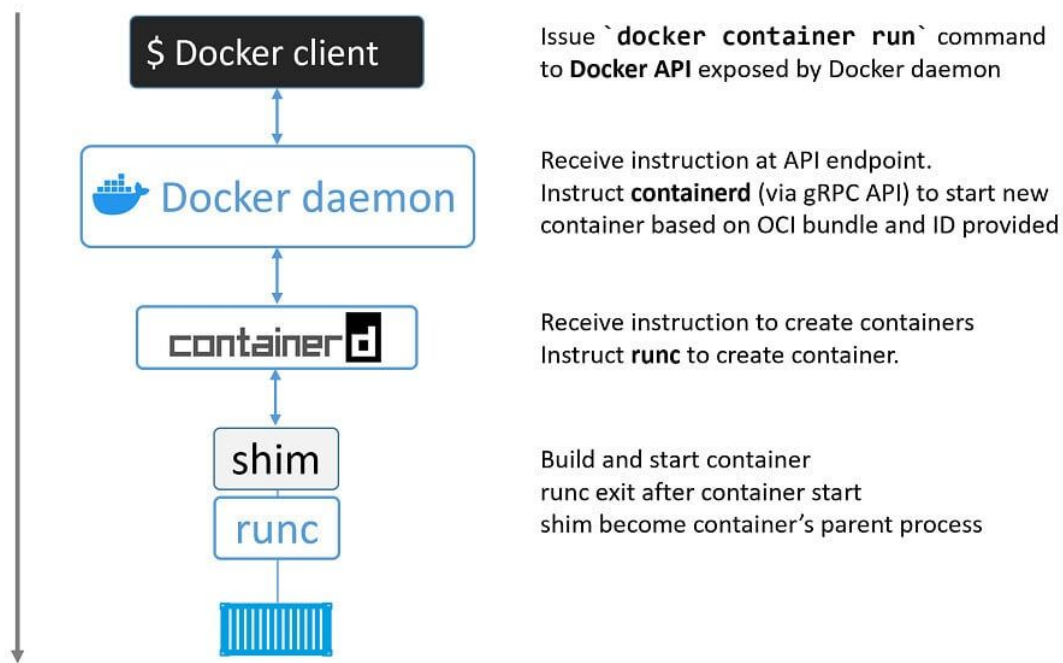
<https://github.com/docker-library/golang/blob/master/Dockerfile-linux.template>

<https://github.com/docker-library/busybox/blob/master/Dockerfile.template>

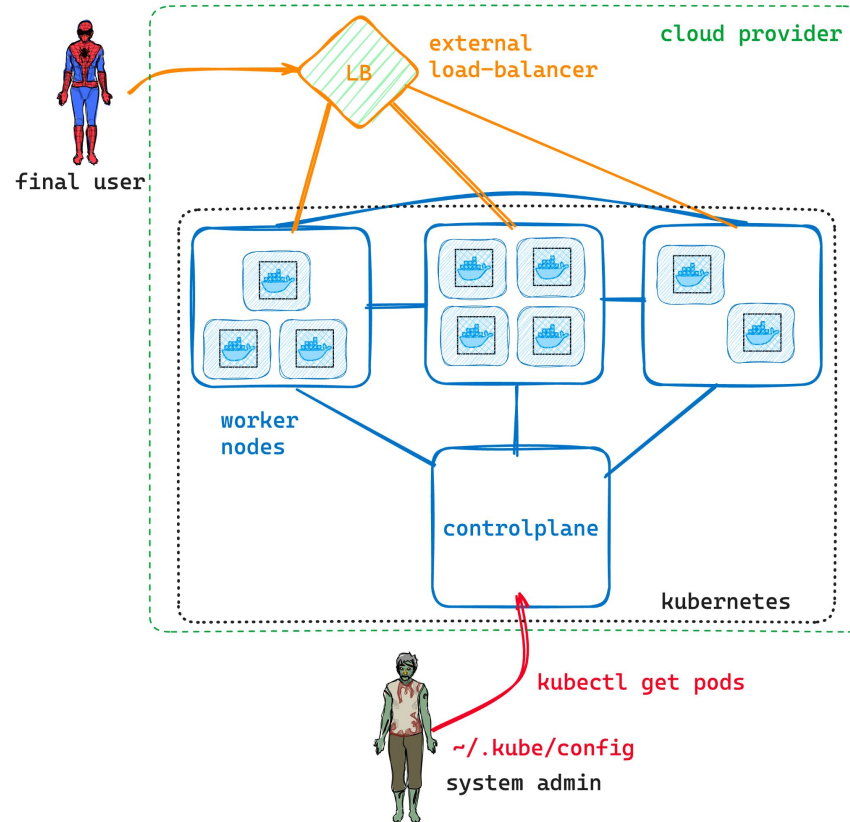
<https://stackoverflow.com/questions/47373889/what-is-dockers-scratch-image>

| REPOSITORY | TAG | IMAGE ID | CREATED | SIZE |
|------------|----------------|--------------|-------------|--------|
| alpine | latest | 961769676411 | 4 weeks ago | 5.58MB |
| ubuntu | latest | 2ca708c1c9cc | 2 days ago | 64.2MB |
| debian | latest | c2c03a296d23 | 9 days ago | 114MB |
| centos | latest | 67fa590cfc1c | 4 weeks ago | 202MB |
| bash | 5.1-alpine3.14 | 69ca0bc7703d | 2 years ago | 12.8MB |
| busybox | latest | 3e4fd538a9a0 | 12 days ago | 4.04MB |

Docker stack



Anatomy of a typical K8s cluster



Thanks for attending!



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