OWASP

Open Web Application Security Project

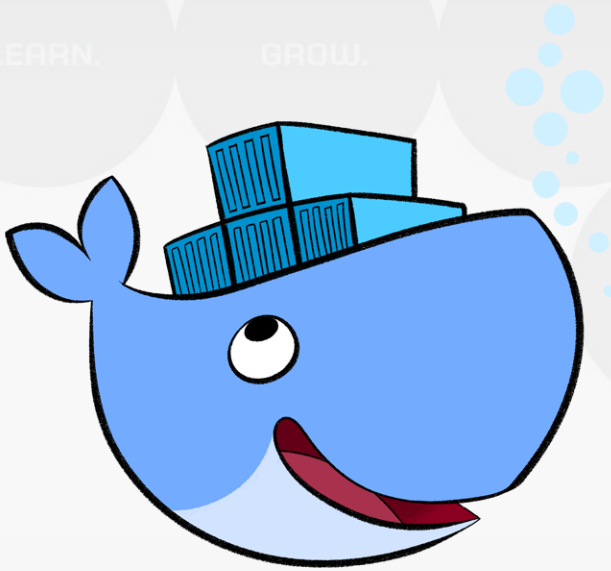
Aguascalientes Local Chapter

2nd Meeting

About – Chapter Leader

- Juan Gama
  - Application Security Engineer @ Aspect Security
  - 9+ years in Appsec, Testing, Development
  - Maintainer of OWASP Benchmark
  - I like GIFs!

Docker



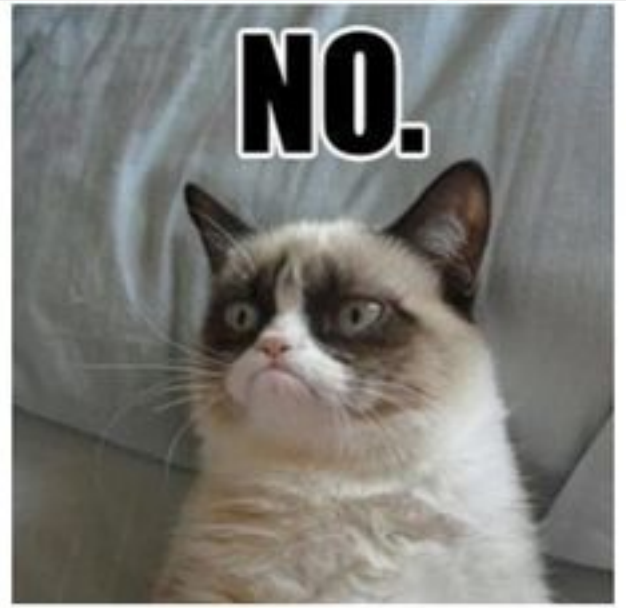
What is Docker?

- "Docker is the world's leading software containerization platform"

What is a container?

- Consists of an entire runtime environment: an application, plus all its dependencies, libraries and other binaries, and configuration files needed to run it, bundled into one package.

Docker invented containers?



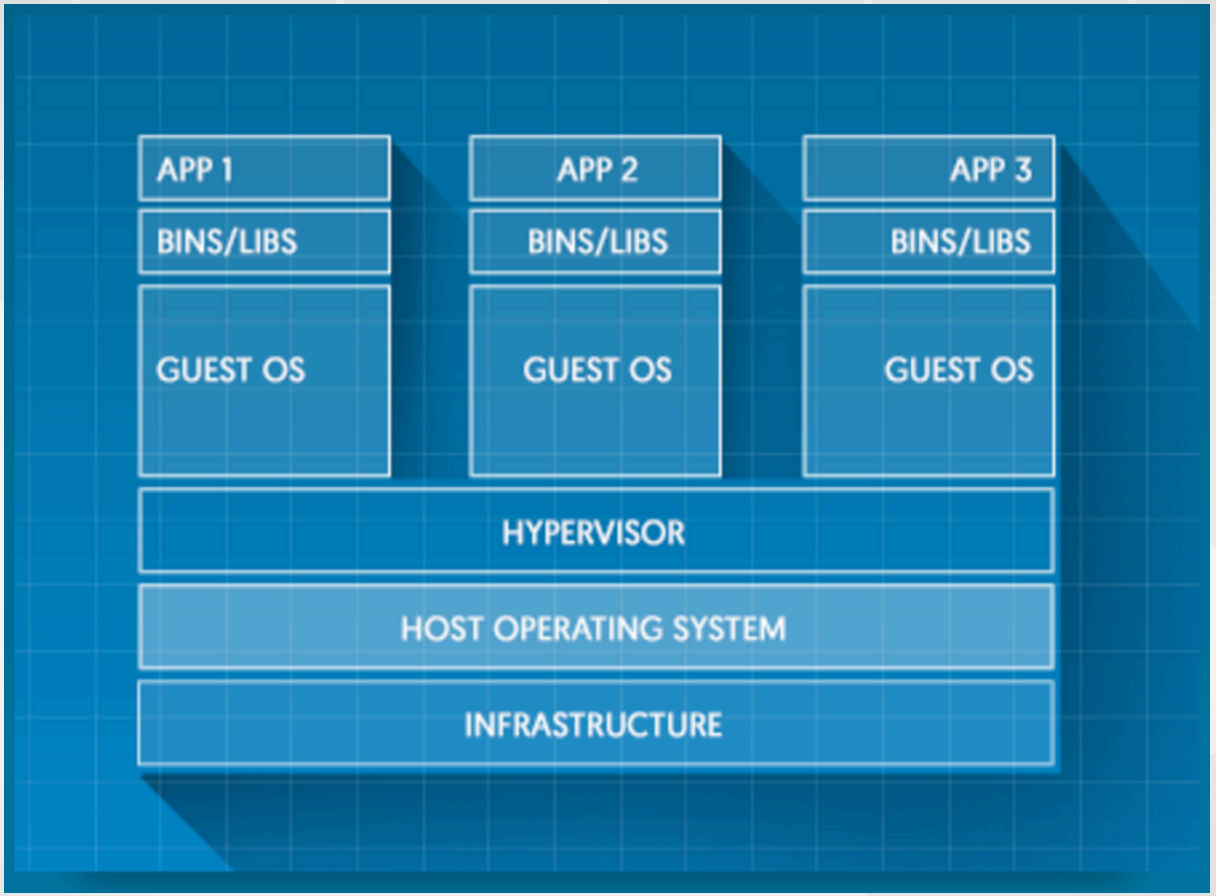
Docker vs LXC, Jails, Vagrant

- LXC runs in the host but has it's own section of RAM, CPU, disk, etc. Closer to a VM. Docker can be just one process, needs a volume.
- Vagrant is a script for VMs.

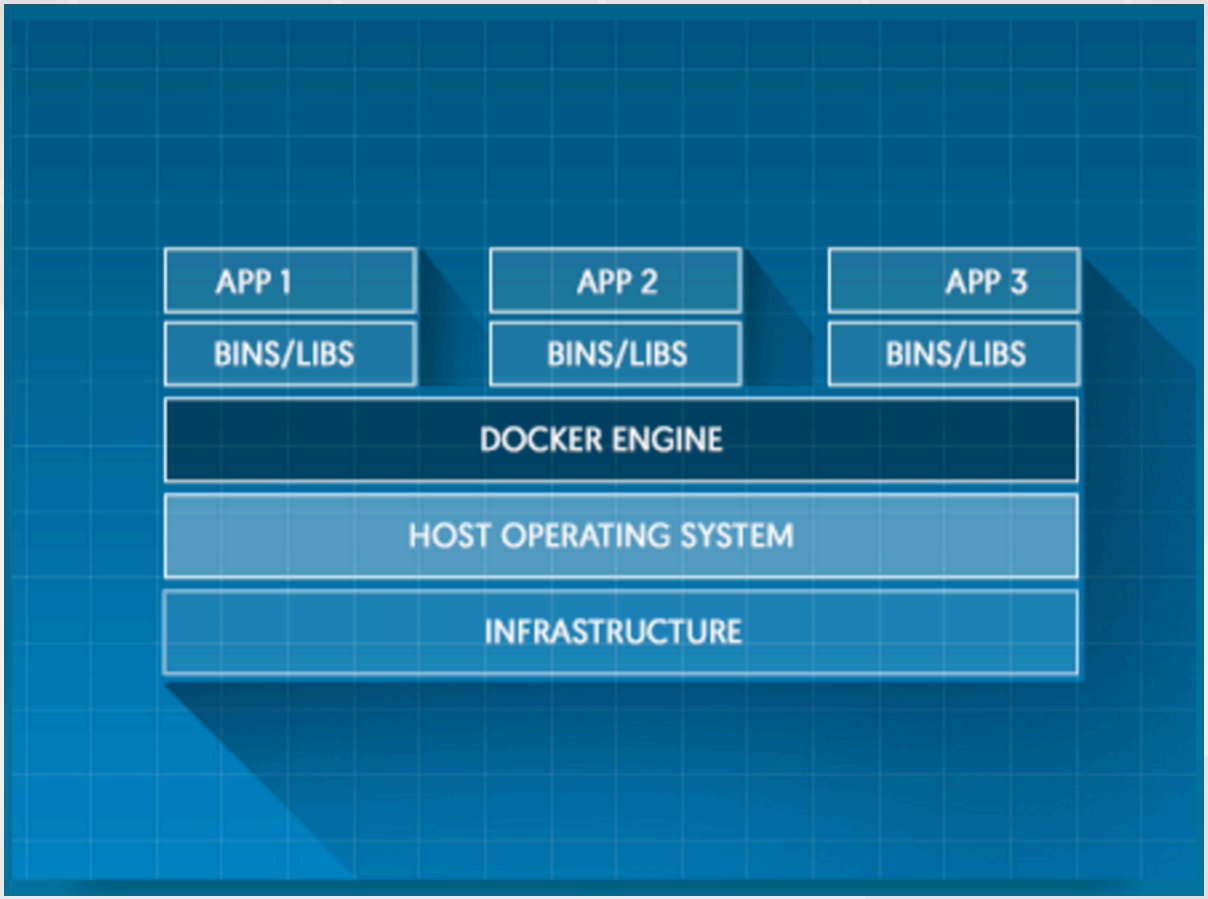
Docker vs Virtualization

- Virtualization includes an entire operating system as well as the application. Docker sits on top of the OS

Docker vs Virtualization



Docker vs Virtualization



Why Docker?

- Solves dependency problems and the problem of ancient times:

- "It works on my machine!"

Docker Components

- Docker Engine
- Docker Hub

Docker Engine

- Docker daemon
  - Runs on the host machine
- Docker Client
  - CLI used to interact with the daemon
- Windows and OSX
  - docker-machine (small linux running the Docker daemon) - Needs Virtualbox

Docker Workflow Components

- Docker image
  - Has the env, your application, OS, dependencies,
- Docker Container
  - Created from images, start, stop, move, delete
- Docker Registry
  - Public and private repo to store images
- Dockerfile
  - Automates image construction

Docker

- Docker Container
- Docker Composer
- Docker Swarm

Demo

Docker Security

- Quite secure.
- Namespaces for isolation: processes running within a container cannot see, and even less affect, processes running in another container, or in the host system
- Each container also gets its own network stack.
- Control Groups for resource accounting and limiting, ensure that each container gets its fair share of memory, CPU, disk I/O; and, more importantly, that a single container cannot bring the system down by exhausting one of those resources.

Docker Security

- Only trusted users should be allowed to control your Docker daemon
- “root” within a container has much less privileges than the real “root”. For instance, it is possible to:
  - deny all “mount” operations;
  - deny access to raw sockets (to prevent packet spoofing);
  - deny access to some filesystem operations, like creating new device nodes, changing the owner of files, or altering attributes (including the immutable flag);
  - deny module loading;
  - and many others.

Docker Security

- Additional: AppArmor, SELinux, GRSEC
- Run inside a VM
- Compromised images
- DOS
- https://www.docker.com/docker-security