Docker

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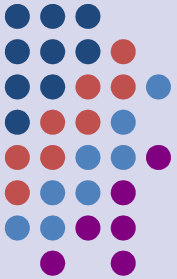
VM vs Container



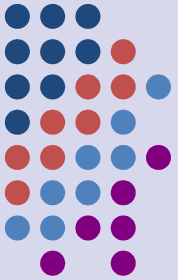
Virtual machine

- A VM is an *emulation* of a particular computer system
- A VM comes with a complete operating system, its own drivers, a complete set of libraries and virtual disk storage
- In essence: It is executing a full computer within a computer

Virtual machine

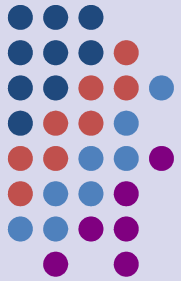
- A VM goes through the entire boot process exactly like a normal piece of hardware
- Normal boot time in a VM is quicker than those tied directly to hardware but still needed several seconds to minutes to boot up

The Container



- Every single application will run, for a separate user space
- CPU usage and overhead associated is less, because there is no need for a new kernel loading for each user

The Container



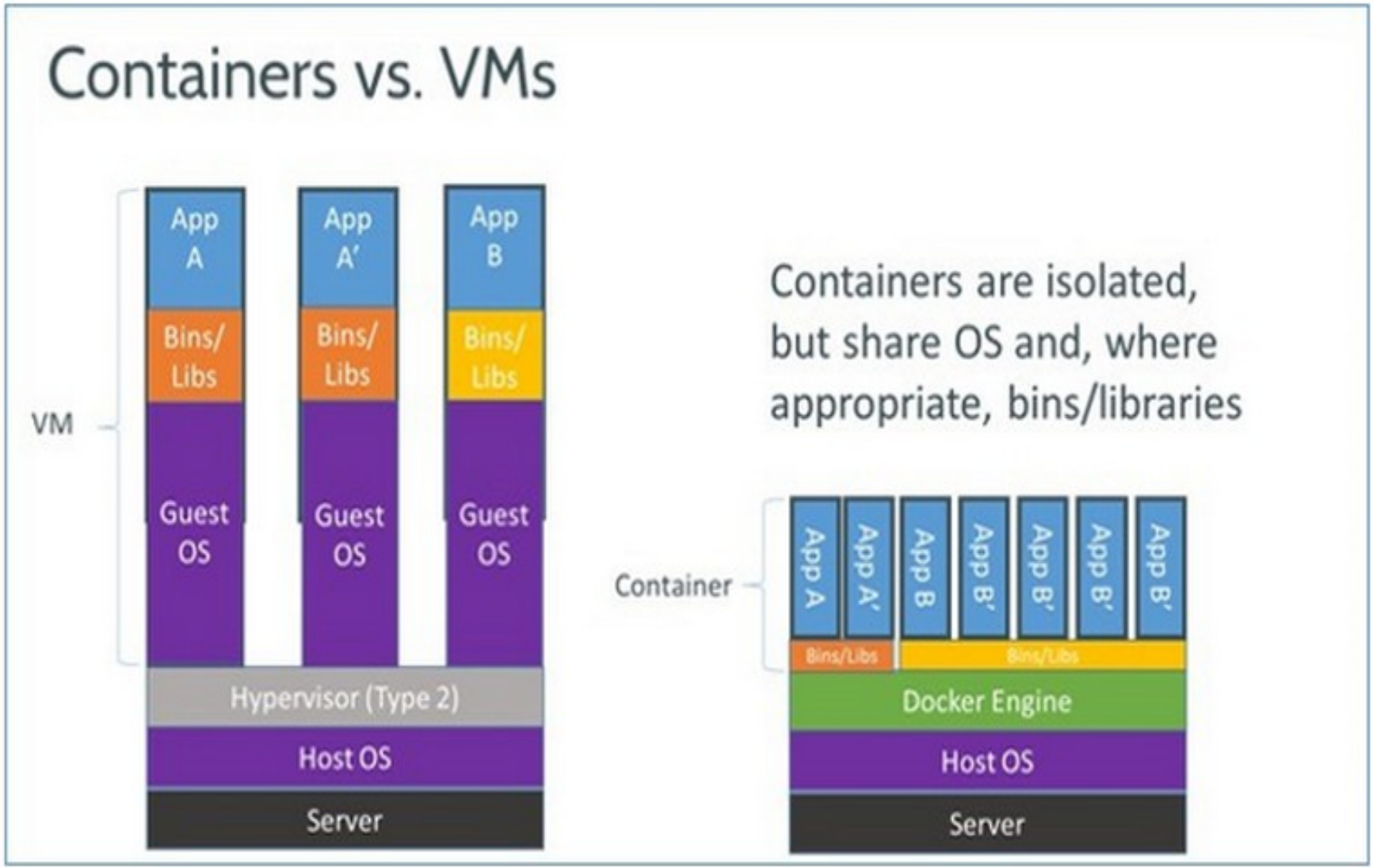
- One of the reasons for using containers is the fact that the they use less CPU and memory compare to using a VM
- In a same condition the number of supported users that using the same server are more compare to VM’s

VM vs Container:

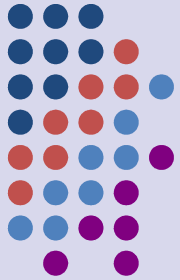
- A Virtual Machine
  - needs an hypervisor
  - and a full OS inside
- Bigger footprint
  - RAM needed
  - Storage space
- Tend to be slower
  - 2 filesystems, 2 OSes
- Strong resource management

- A Container
  - talks to the host kernel
- Smaller footprint
  - no RAM needed for Guest OS
  - differential storage
- Tend to be faster
  - direct CPU access
- Less sophisticated resource management

Containers vs VM's

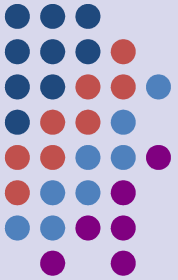


What is Docker?



Docker containers wrap up a piece of software in a complete filesystem that contains everything it needs to run: code, runtime, system tools, system libraries – anything you can install on a server. This guarantees that it will always run the same, regardless of the environment it is running in. (https://www.docker.com/what-docker)

Docker

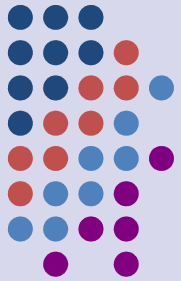


- Docker is Lightweight as all containers that are running in a single machine use the same operating system kernel.
- Docker is open-source
- Docker can be run on any computer, on any infrastructure and in any cloud.

Docker

- Docker working in Linux environment like Red Hat and Windows
- Software companies such as Microsoft have also embraced Docker
- Docker on average ship software 7X more after deploying

Some Disadvantages of Docker



1. It has less performance, in CPU, Disk IO and Network
2. Requires more space for base filesystem
3. Compared to VM it is less secure
4. Containers have more contact area with the running kernel, and so more chances to escape of it
5. Containers can only run apps for the base kernel, you can’t run windows apps in a Linux container

References:

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- https://blog.xenproject.org/2015/08/11/will-docker-replace-virtual-machines/
- https://www.docker.com
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