

Containers

DOSAR

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Open Science Grid

Containers



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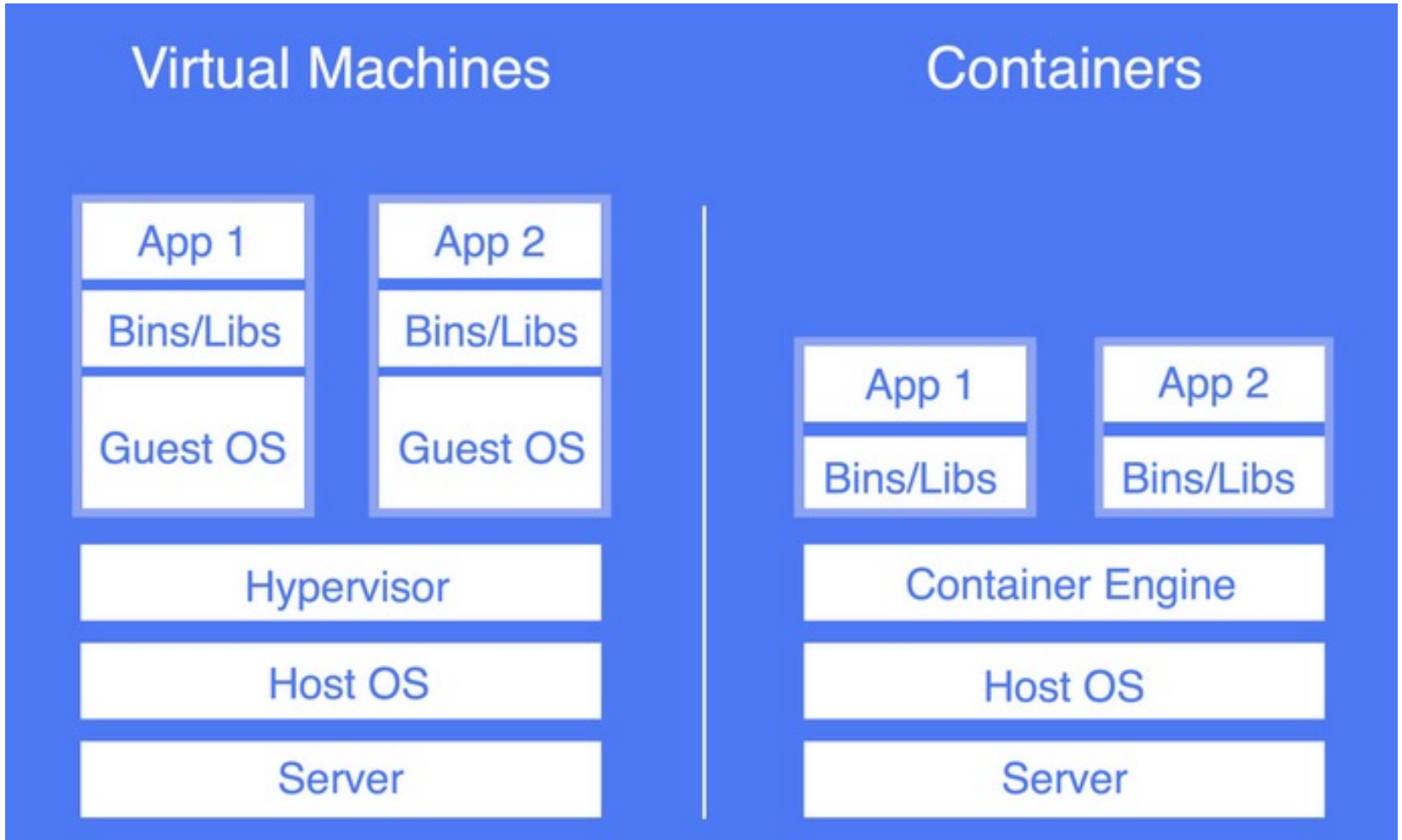


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What are containers?

- Operating System Level Virtualization
 - Lightweight, providing the minimal level of overhead for the application to function properly.
 - Super minimalist VMs
 - No Hypervisor
 - Abstracts away the operating system and hardware
 - Share the OS Kernel with other containers
 - Container size is very small and therefore quick and easy to provision

How do they differ from VMs?



More differences...

- Size
 - Containers are usually 10s of MB
 - VMs can be several GB
- Shared hypervisor vs. shared kernel
- VMs have their own kernels so a deeper level of isolation
- Containers virtualize the OS while VMs virtualize the hardware

Container Advantages

- Size
- Less resource intensive
- Quick provisioning
- Easy allocation of resources
- Quicker development cycles
- Cost effective
- Very good for microservices

Container Disadvantages

- Security – shared kernel with root access
- Less flexibility in OS
- Networking can be tricky
 - Properly configuring sufficient networking resources is challenging

Container Software

- Docker
- Singularity
- LXC, LXD
- Solaris Zones
- RKT
- BSD Jails
- chroot

Questions?

- Questions? Comments?
 - Feel free to ask us questions now or later:
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 - Exercises start here:
 - https://osg-htc.org/dosar/ASP2022/ASP2022_Materials/
 - Presentations are also available from this URL.