Containers

DOSAR

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• https://osg-htc.org/dosar/ASP2022/ASP2022_Materials/
Containers
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?

- Feel free to ask us questions now or later:
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Exercises start here:

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