

Container Fundamentals and Introducing Kubernetes

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Course Overview

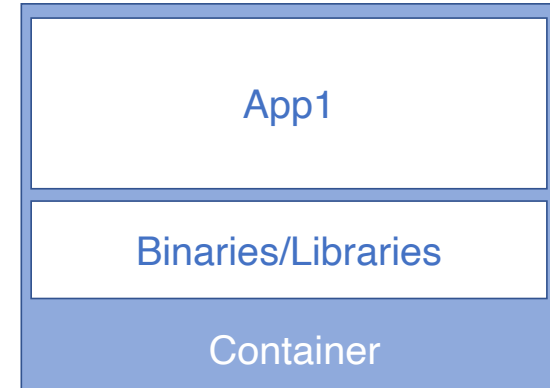
- **Module 0** - Introduction
- **Module 1** - Container Fundamentals
- **Module 2** - Kubernetes Architecture and API Objects
- **Lunch @ 12:00-12:45**
- **Module 3** - Interacting With Your Cluster
- **Module 4** - Deploying Applications in Kubernetes
- **Module 5** - Building and Deploying Container-based Applications in Kubernetes

Agenda

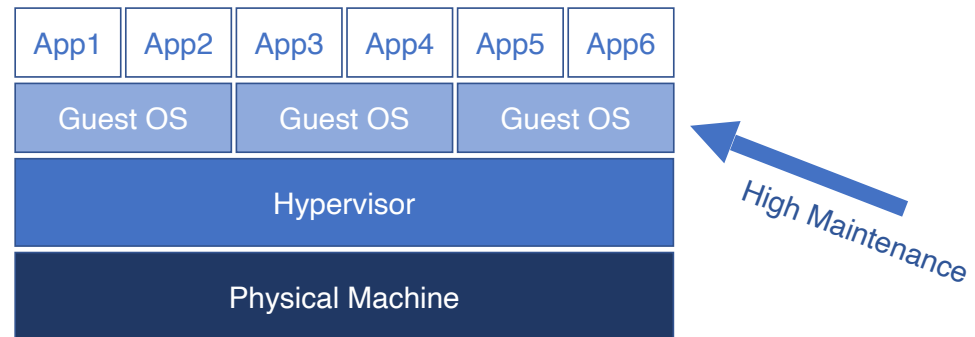
- **Container and Linux Fundamentals**
 - Container Fundamentals
 - Container Based Application Deployment
 - The Need for Container Orchestrators

Container Fundamentals

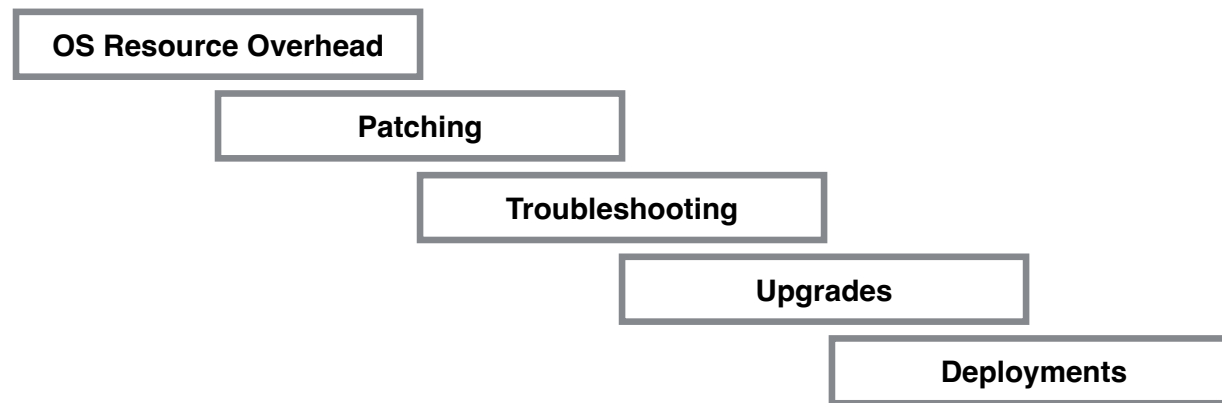
- Operating system virtualization
 - Shared kernel and system resources
- Container...contain...
 - Binaries, libraries and file system
- One app inside the container
 - This is the unit of work
- Containers are ephemeral
 - Let's start off with a comparison...



Virtual Machines

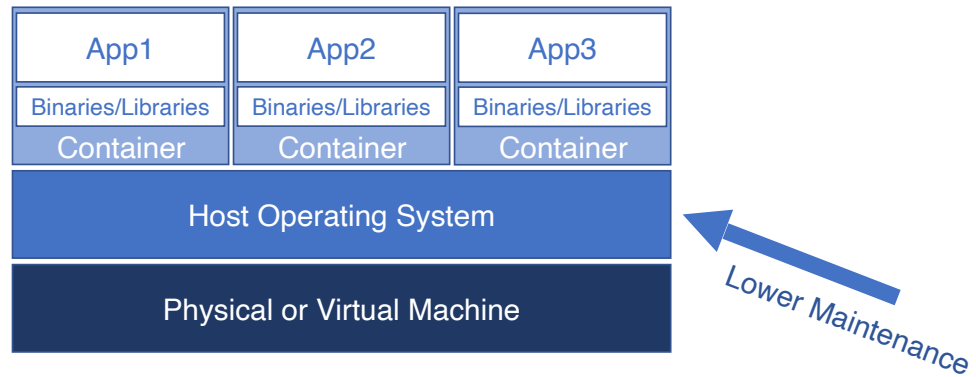


What's so Hard About Virtual Machines?

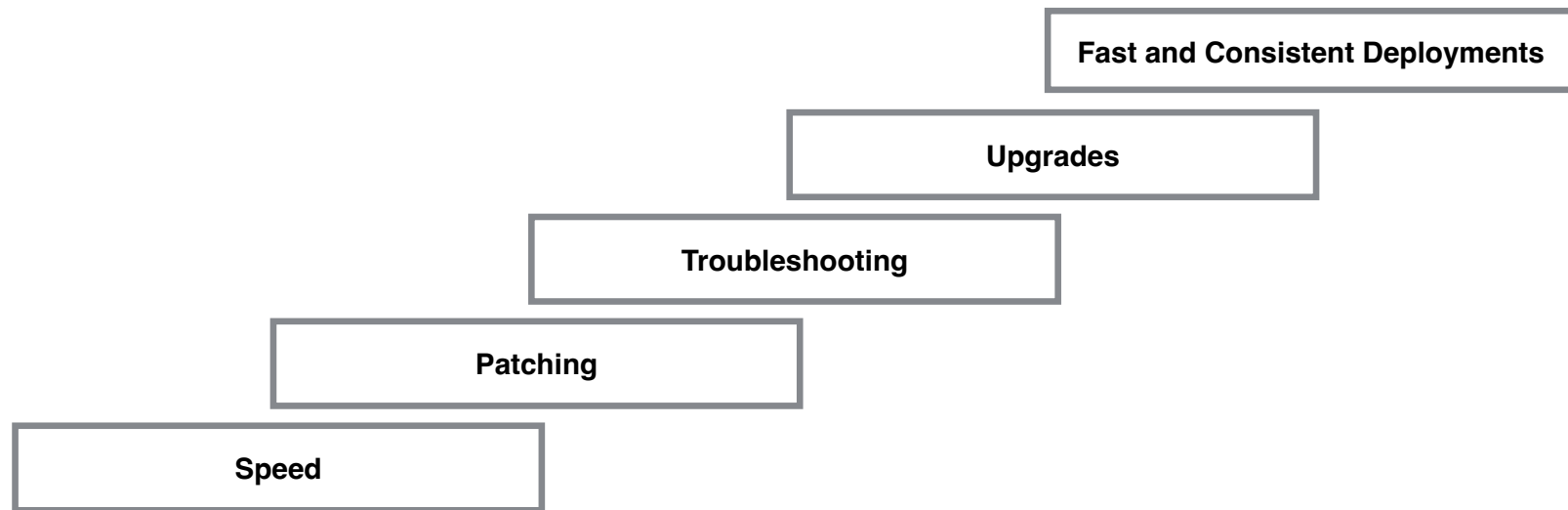


Does any of this move your business forward?

Containers



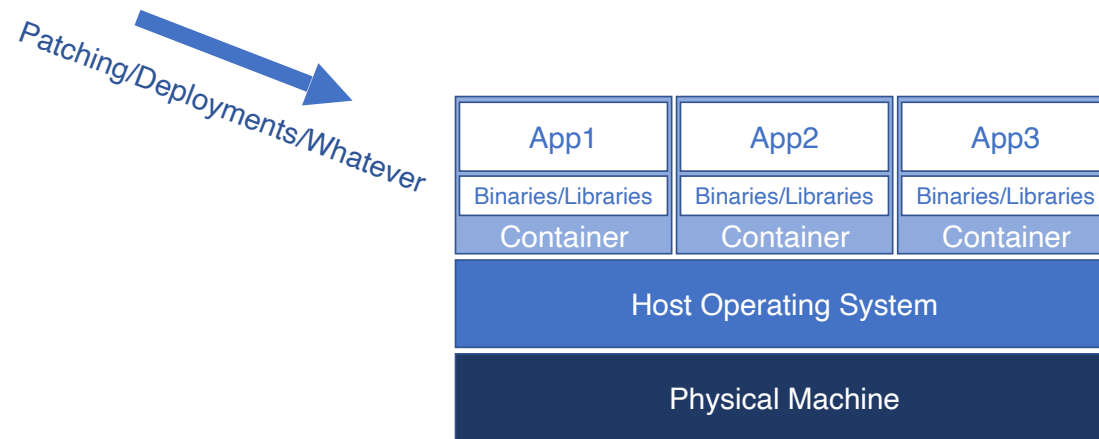
What do Containers Bring to the Table?



Services, we care about getting work done!



Containers

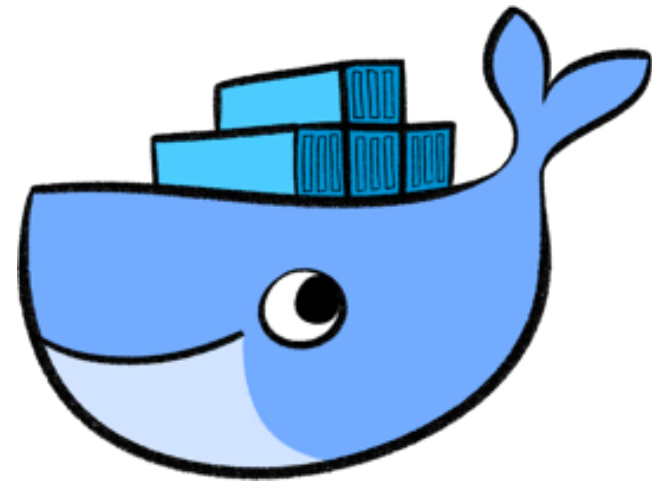


Containerizing Apps and Data Centers

- Reducing development time
- Deployment automation – speed and consistency
- Enables DevOps and CI/CD scenarios
- Orchestration
- Rethink how you deploy - it's the service, not the server

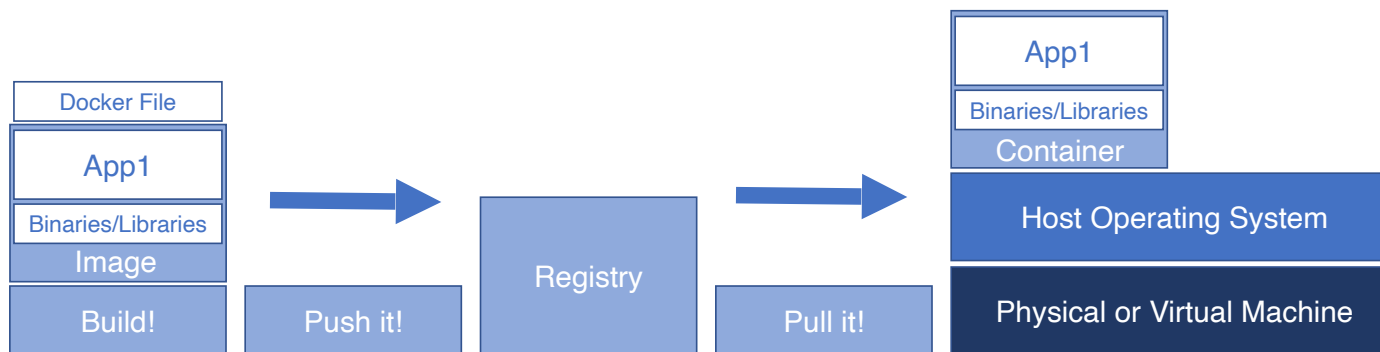
The Container Universe

- Docker
 - Linux
 - Windows
 - Mac
- Docker Inc.
- Other Container Runtimes
 - containerd
 - CoreOS
 - Windows
 - chroot...chwhat?



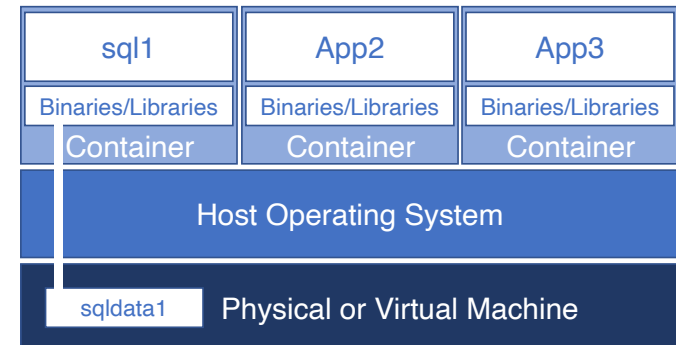
Getting Containers

- **Images** – code, runtimes, libraries, environment variables
- **Registries** – where images live. Docker Hub, Azure Container Registry, internal
- **Docker Files** – defines the container image



Data Persistency in Containers

- If your container is alive so is your data, don't delete the container
- Docker Data Volumes
 - Docker managed resource
 - Independent of the container
- <https://docs.docker.com/storage/>



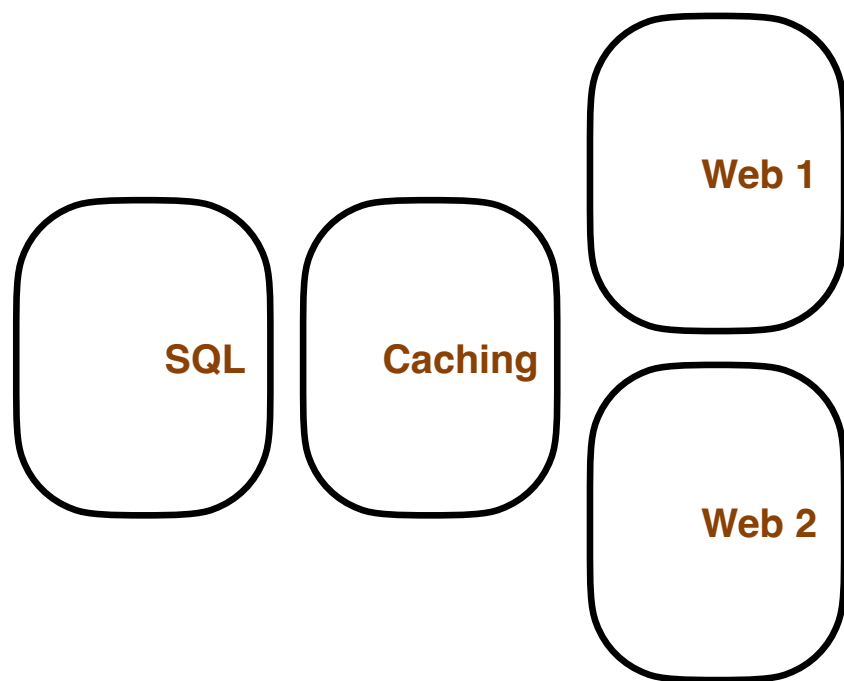
Running SQL Server in Containers

- Why run SQL Server on a Container?
- Same reasons...
 - Deployments, upgrades, patching, speed...agility
 - What if the unit of persistency IS the database...NOT the Server!
- Only Linux is available
- Windows is no longer available
- Active Directory authentication available now

Hands on lab time...

- Pull an Image
- Run a Container
- Access our application
- Connect to the Container
- Persisting data with a Container

Modern Application Deployment



- Where do I run the application?
- How do I scale the application?
- How do I consistently deploy?
- How do I or my applications access the services?

Review

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