POWERSHELL + DEVOPS GLOBAL SUMMIT

Containers - You Better Get on Board

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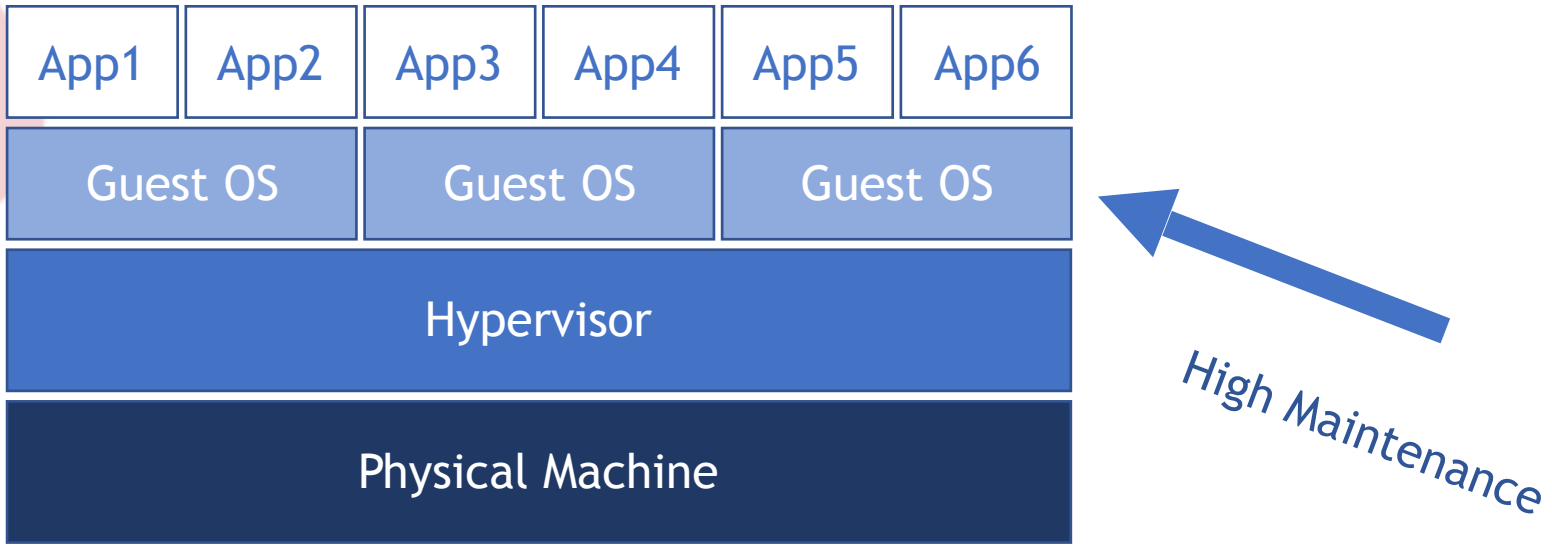
Agenda

- Introducing Containers
- Running SQL Server and PowerShell in Containers
- The Container Universe
- Hands on with Containers
- Container Orchestration

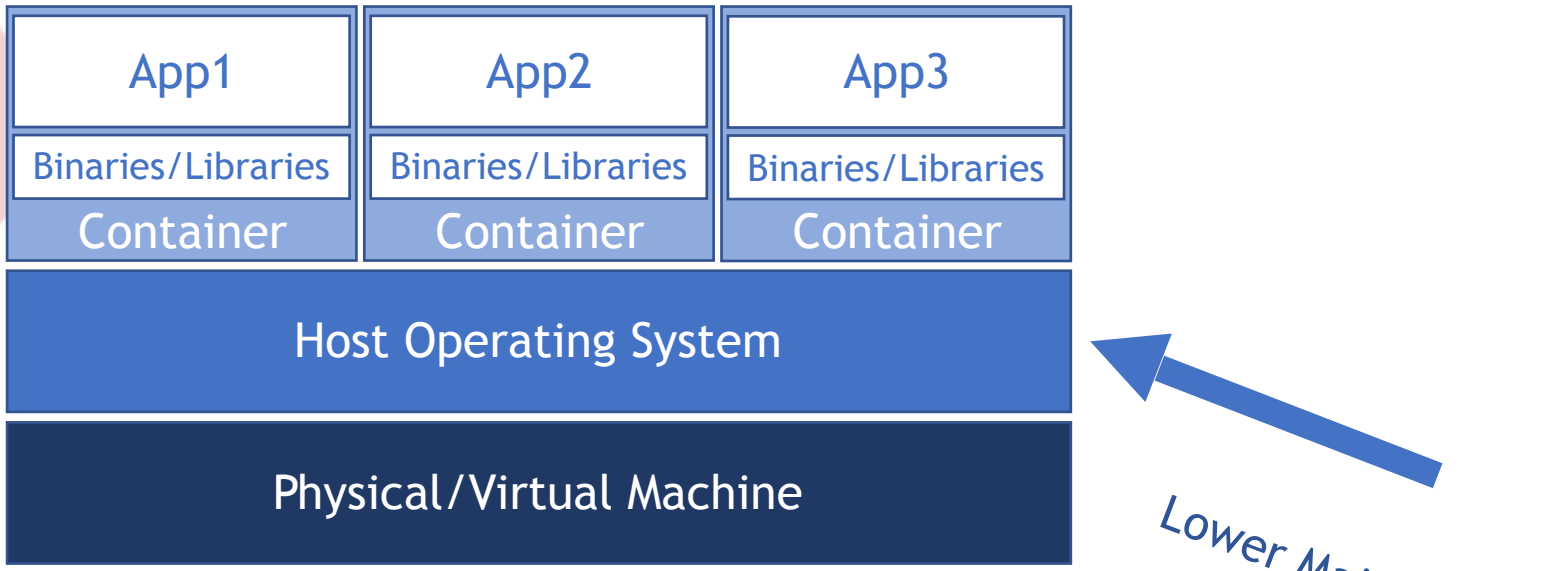
Introducing Containers

- 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…

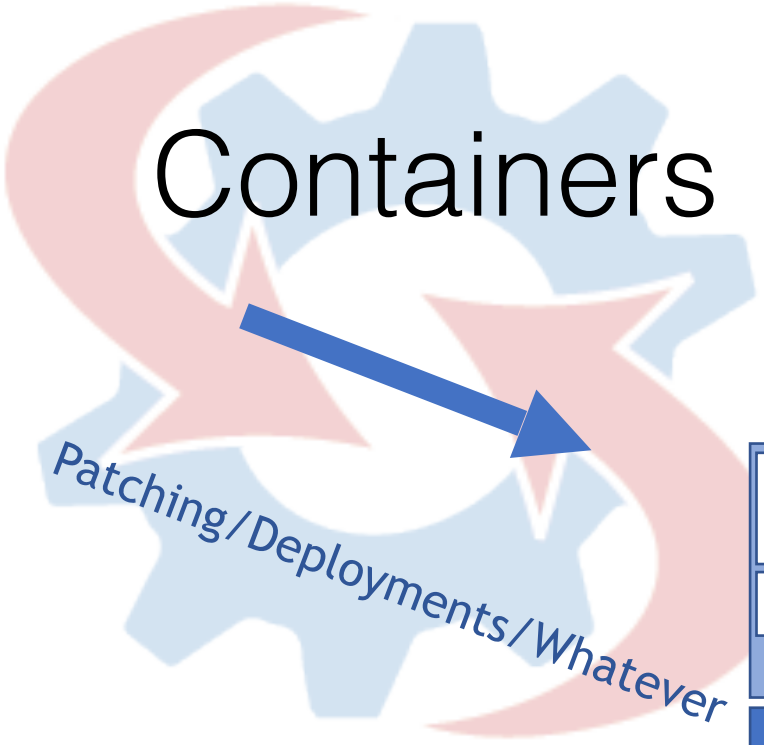
Virtual Machines

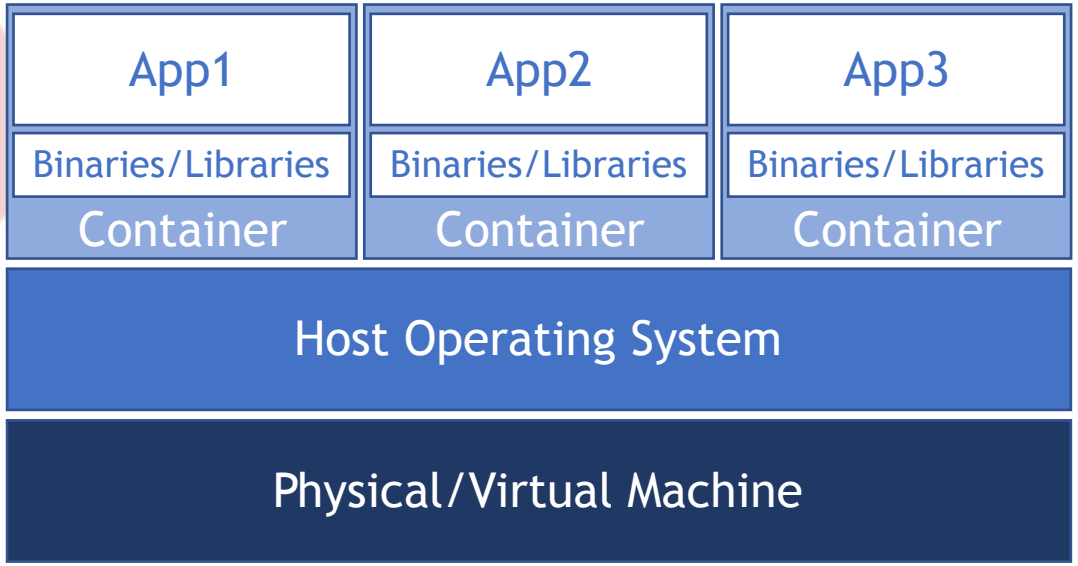


Containers


App1
App2
App3
Binaries/Libraries
Binaries/Libraries
Binaries/Libraries
Container
Container
Container
Host Operating System
Physical/Virtual Machine
Lower Maintenance

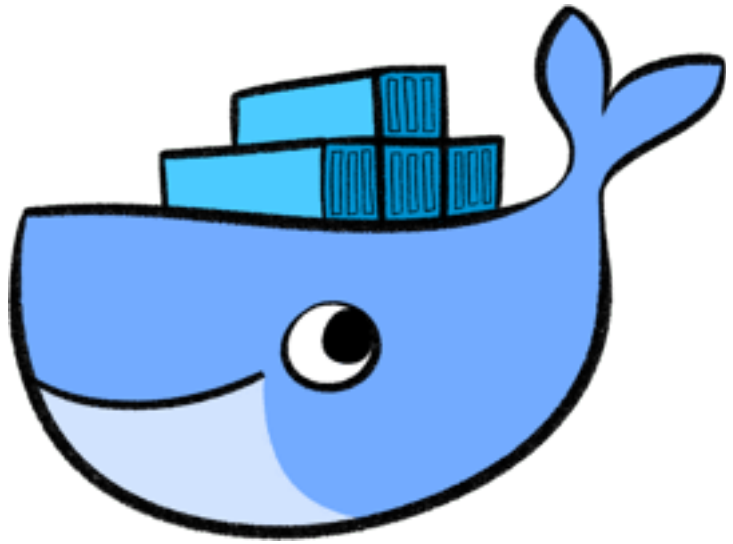
Containers


Patching/Deployments/Whatever


App1
App2
App3
Binaries/Libraries
Binaries/Libraries
Binaries/Libraries
Container
Container
Container
Host Operating System
Physical/Virtual Machine

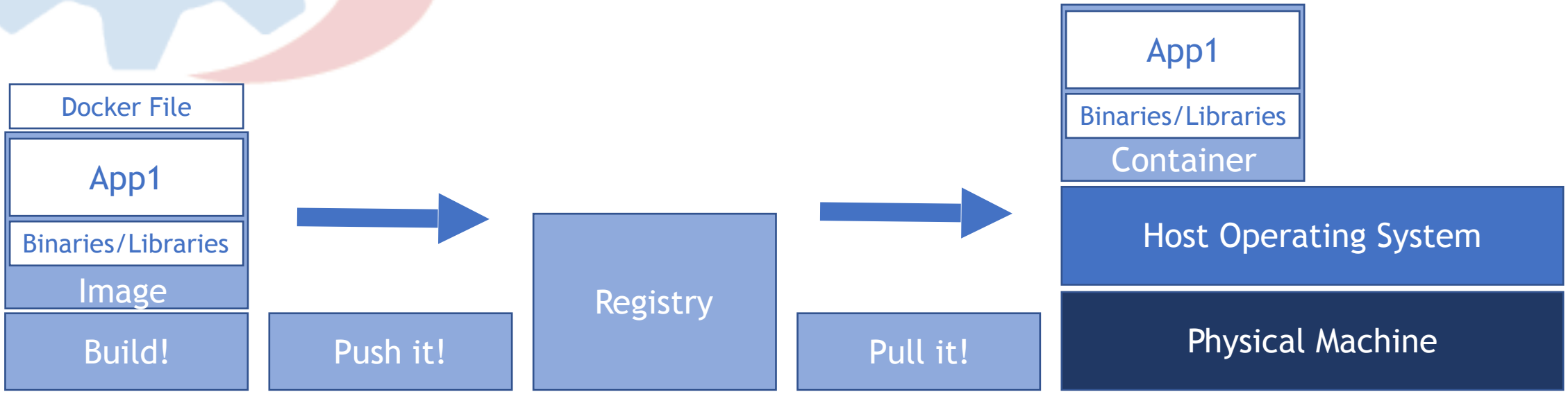
The Container Universe

- Docker
  - Linux
  - Windows
  - Mac
- Docker Inc.
- Other Container Engines
  - rkt
  - CoreOS
  - Windows
  - chroot…chwhat?



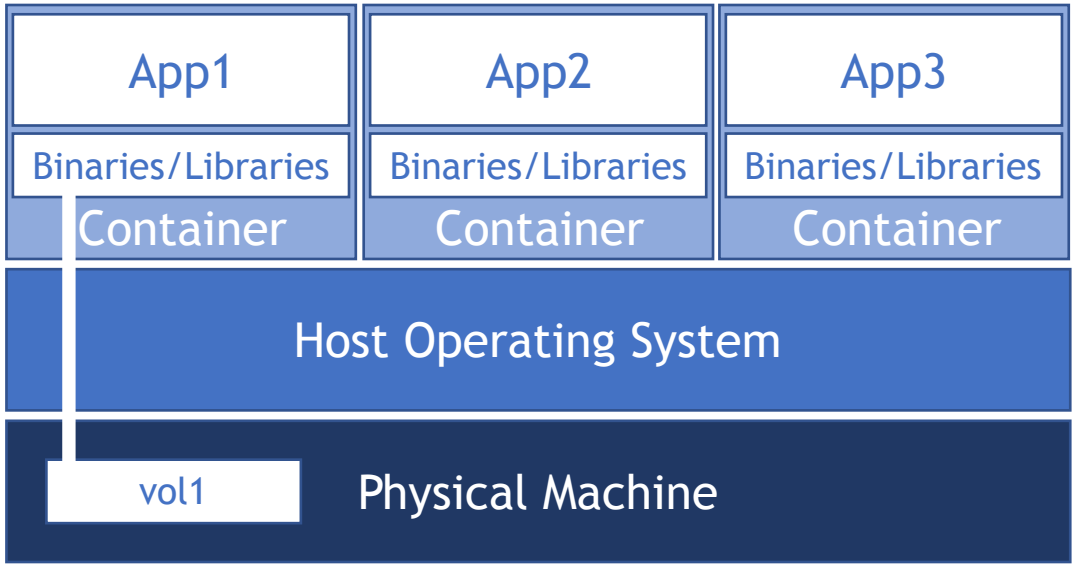
Getting Containers

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



Data Persistency in Containers

- Container Images are read only
- 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 PowerShell in Containers

- What's the vision for PowerShell Core?
  - PowerShell everywhere right?
- What if we run whatever version of PowerShell we wanted…
- Wherever we wanted…
- As a container!
- Sounds like…serverless, right?
- But what about job distribution?
- Testing scenarios…of course

Running SQL Server on Containers

- Why run SQL Server on a Container?
- Same reasons…
    - Deployments, upgrades, patching, speed…agility
- Windows and Linux is available
    - https://github.com/Microsoft/mssql-docker
- Non-production on Windows
- Production on Linux, but no Windows auth…but that's OK, right?

Demo!

- Pull an Image
- Run a Container
- Access our application
- Connect to the Container
- Persisting data with a Container
- Pass commands and scripts into Containers
- Build our own “Serverless” FaaS platform

Container Orchestration

- Workload placement
- Managing state, starting things up and keeping things up
- Load balancing services
- Networking
- Persistent storage
- Declarative model
- Job distribution (PowerShell, or any workload really)
- Secrets and certificate management

Container Orchestrators

- Docker Swarm
- Kubernetes
- Red Hat OpenShift
- Azure Kubernetes Services (AKS)
- Google Kubernetes Engine (GKE)
- Amazon Elastic Container Service for Kubernetes (EKS)

Review

- Introducing Containers
- Running SQL Server and PowerShell in Containers
- The Container Universe
- Hands on with Containers
- Container Orchestration

Need more data?

- **Contact me!**
  - **email:** aen@centinosystems.com
  - **Twitter:** @nocentino
- **Blog**
  - www.centinosystems.com/blog
- **Pluralsight**
  - Understanding and Using Enterprise Linux 7
  - Kubernetes Installation and Configuration Fundamentals
  - Managing Kubernetes: The API Server and Pods (releasing soon)

Resources

- Installing Docker
  - https://docs.docker.com/docker-for-windows/install
  - https://docs.docker.com/install/linux/docker-ce/centos
- Running Docker
  - https://docs.docker.com/get-started
  - https://docs.docker.com/storage
  - https://docs.docker.com/engine/security/security

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