Microsoft Application Containers For Geeks

uberAgent
controlUP
fslogix
unidesk
LiquidwareLabs
ravello systems
LOGINVSI
xenappblog.com virtual expo

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MVP, CTP, vExpert, MAA
@nelmedia

Family, beer, technology, & food

Discussion

- Containers
- Docker
- Windows & Hyper-V Containers
- Azure Containers
- Demos

Who manages containers? With What?

Where does NanoServer fit?

What is Docker?

Is it only about DevOps?

What are MicroServices?

What about PowerShell?

What's the difference between Windows Containers & Hyper-V Containers?

How does this affect me & my career?

Why would you use containers?

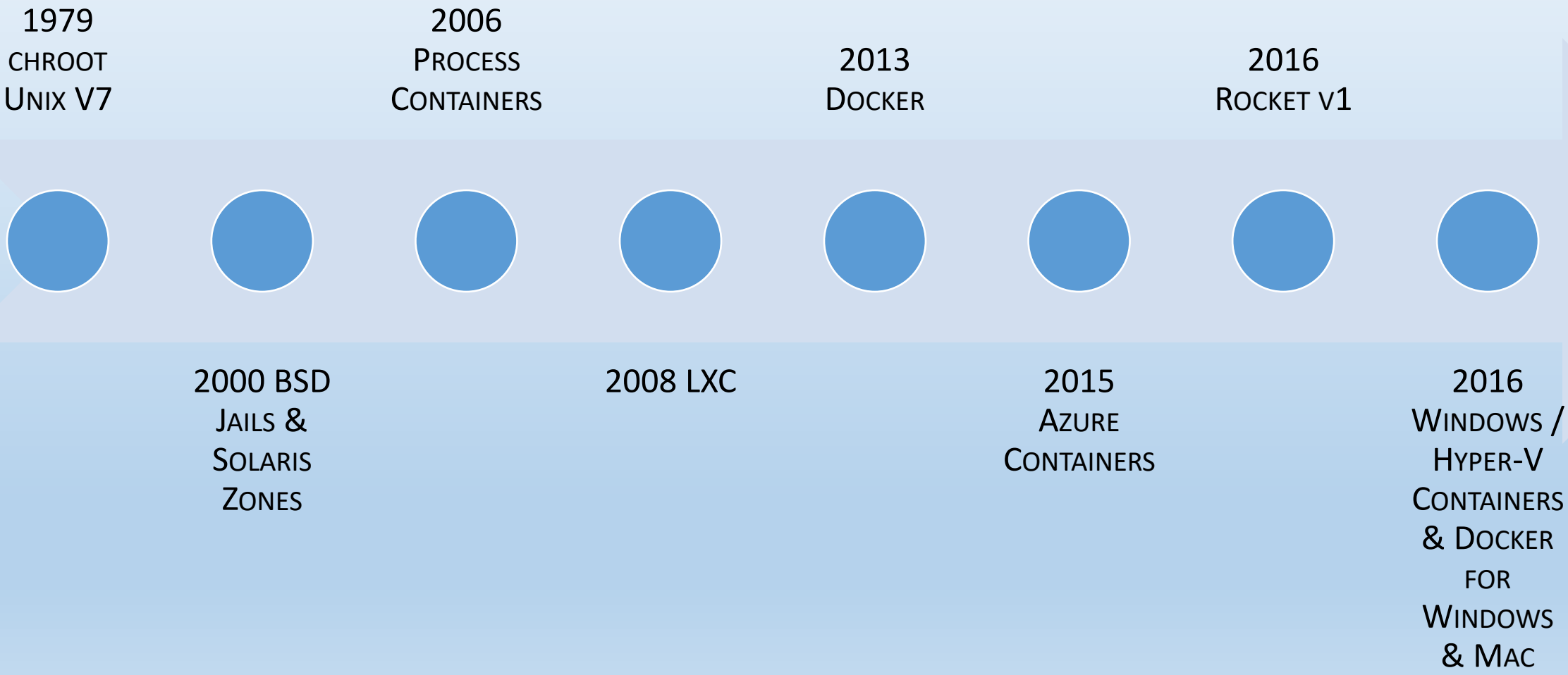
Where can containers be run?

What apps can run in containers?

What are containers?

Containers are Operating System-level Virtualization.

Containers encapsulate applications into individual isolated environments on a shared operating system with their own processes, network, binaries, and libraries.


1979
chroot
Unix V7
2000 BSD
Jails &
Solaris
Zones
2006
Process
Containers
2008 LXC
2013
Docker
2015
Azure
Containers
2016
Rocket v1
2016
Windows /
Hyper-V
Containers
& Docker
for
Windows
& Mac

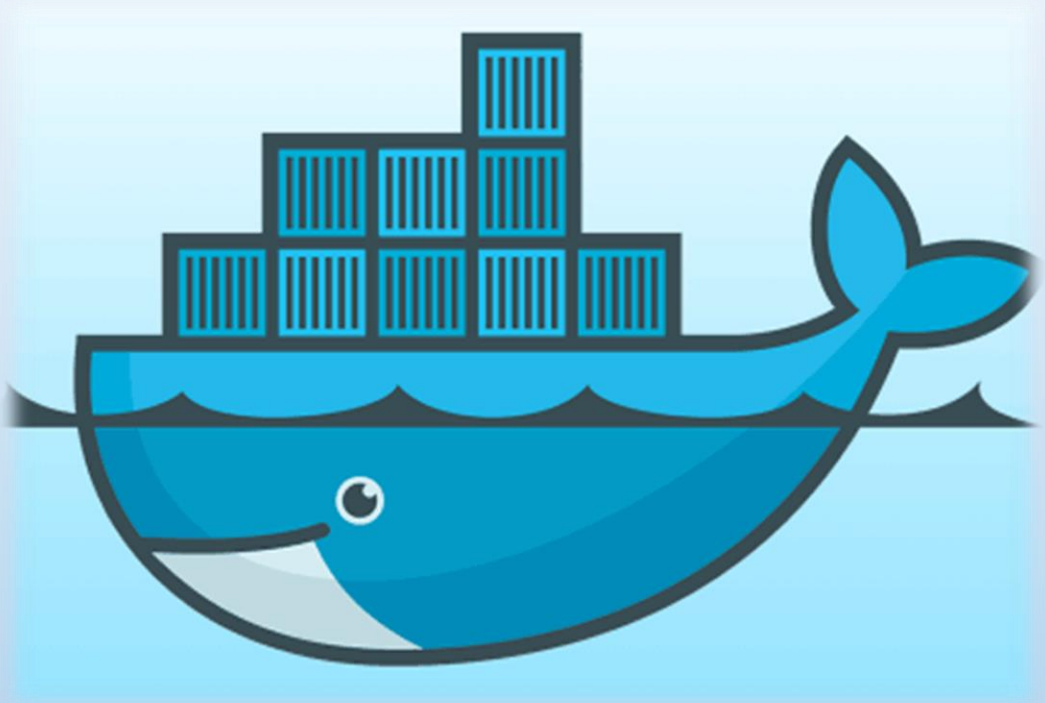
"It is all about the applications."

- Why Containers:
  - Are not just for DevOps anymore!
  - Reduce Development "friction"
  - "Throw-away" components
  - Deploy really, really, really fast
  - Dev Frameworks are diverse – "Works on my machine"
  - Are extremely compact & lightweight
  - Density, density, and more density
  - Reusable and portable
  - Have an "Open" Standard. Well... kinda.
  - Management is simple, but mostly CLI for now
  - Have a massive EcoSystem – like really, really big.

What is docker?

Docker is an open platform container technology. It is a management, API, host, and packaging platform for containers.

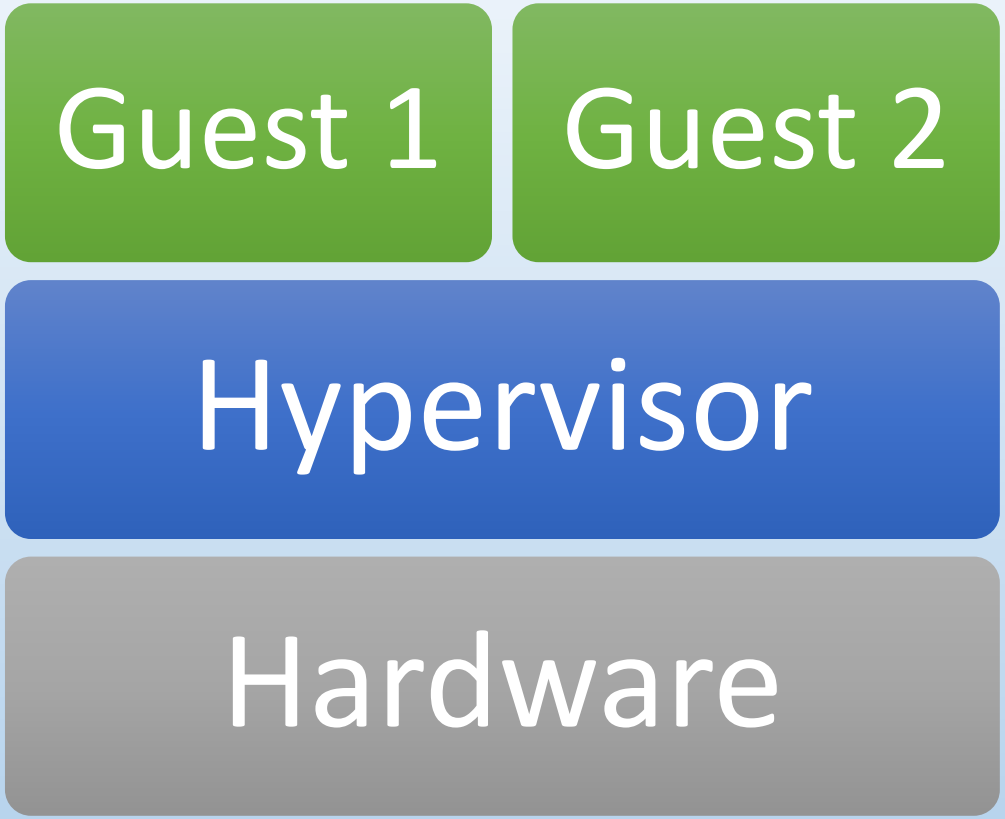
Docker has a huge ecosystem of applications & services that allow for growth, scale, resiliency, and redundancy.



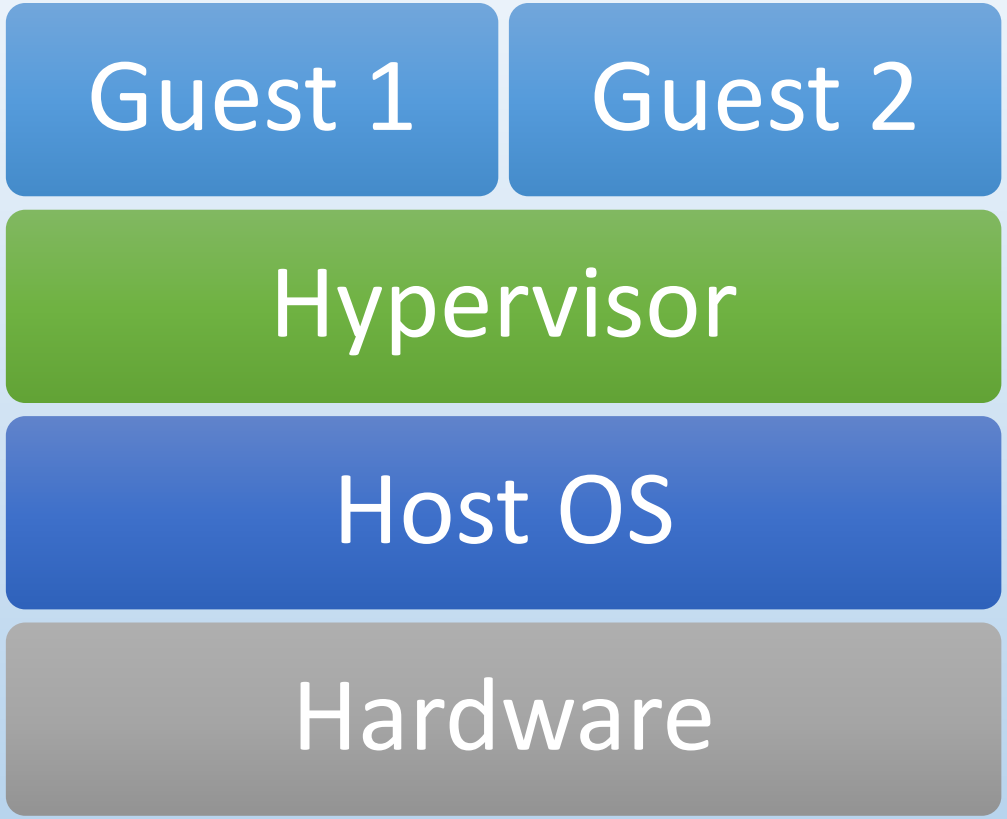
Not the only game in town anymore…

Rocket Windows Containers

Hypervisor Architectures

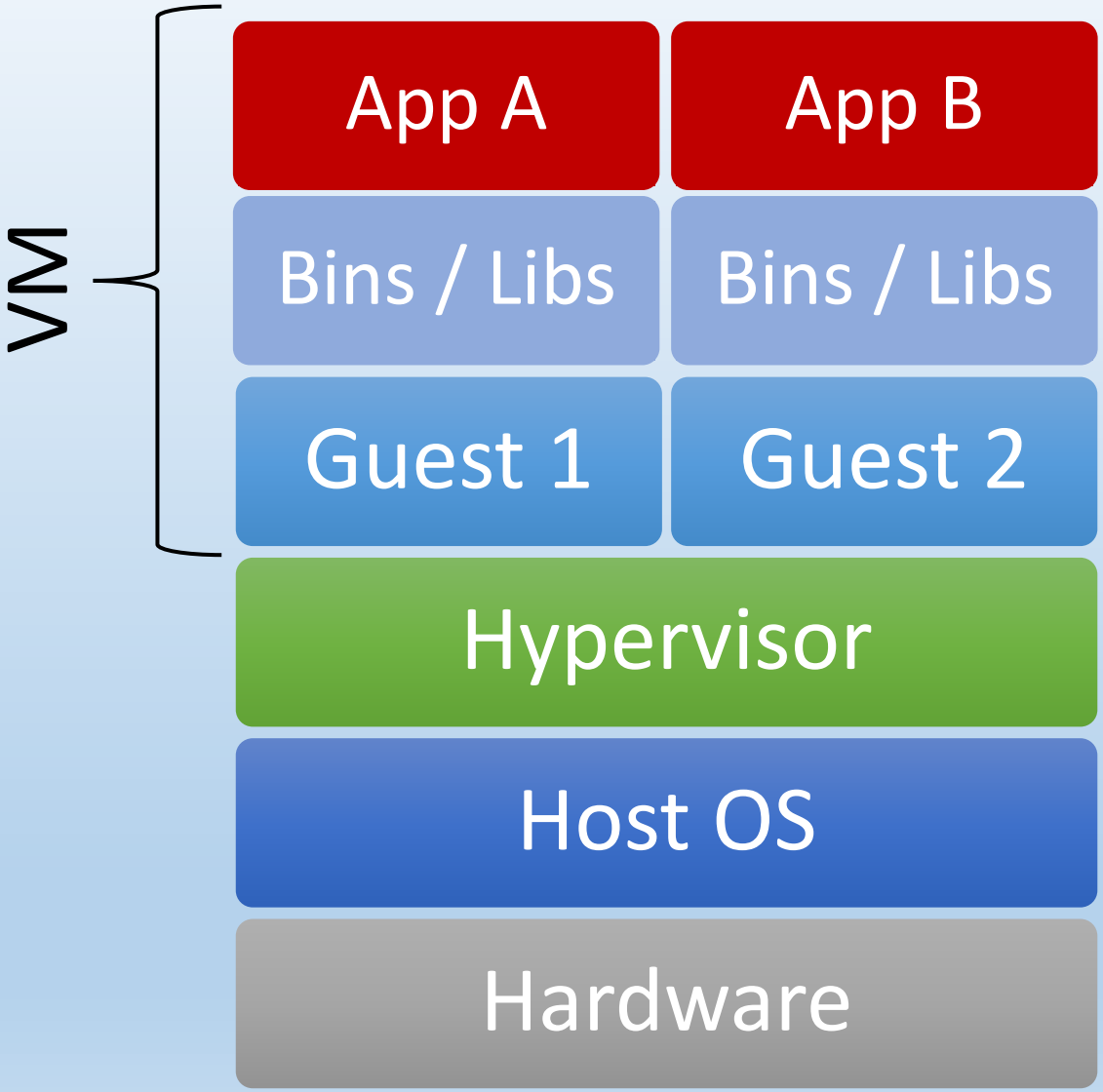


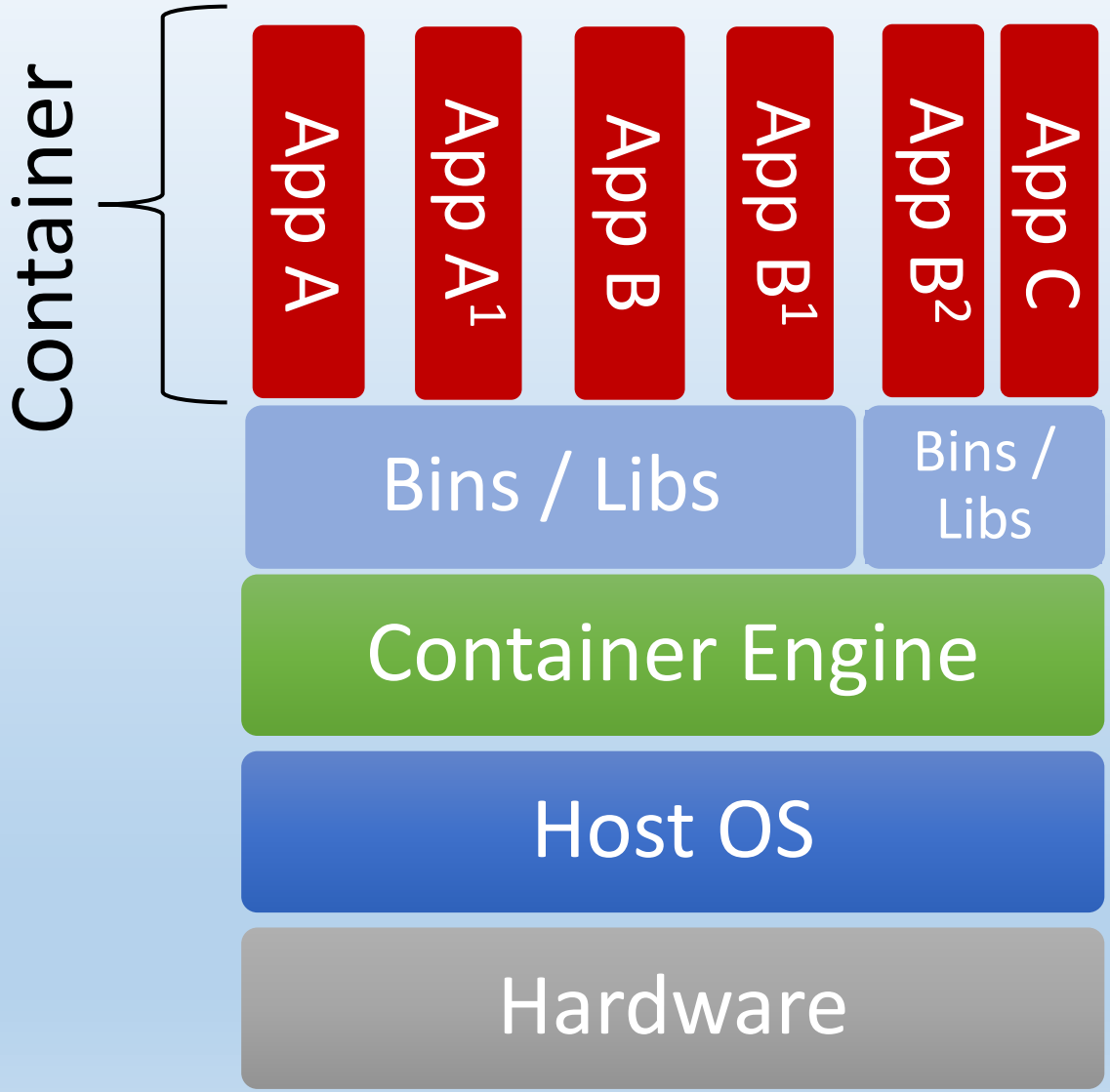
Type 1

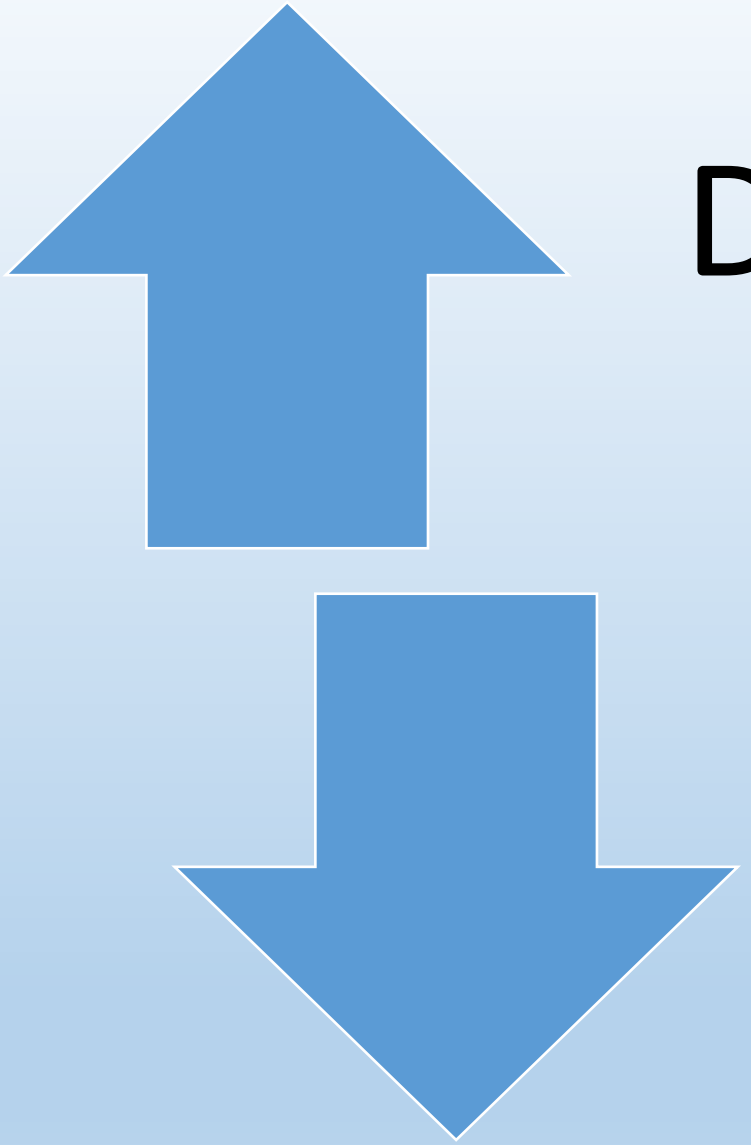


Type 2

VM vs Containers Architecture







Density

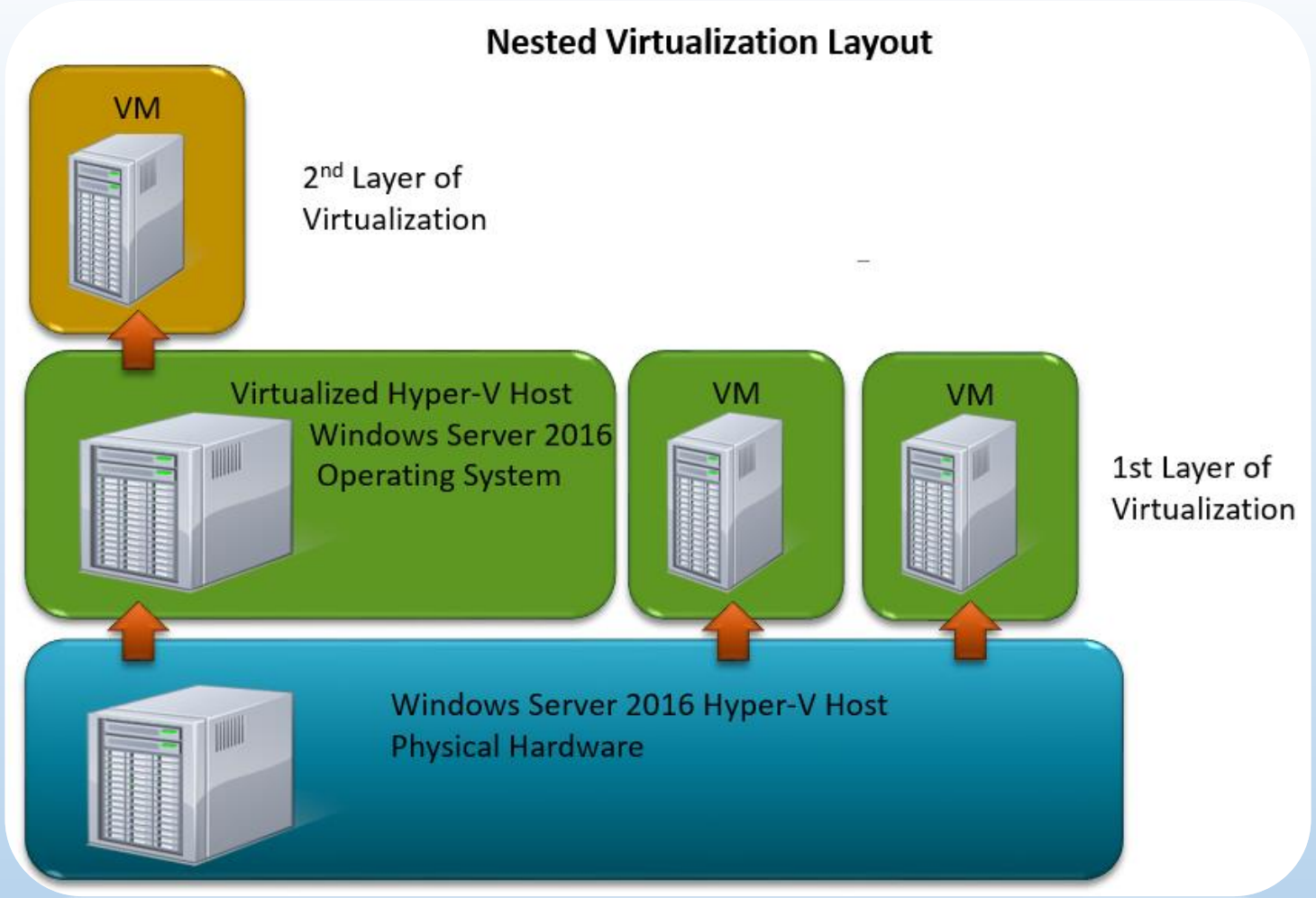
OS Cost

Opening Windows to Containers

- Docker Toolbox (legacy)
- Docker for Windows & Mac
  - Beta - replaces Toolbox
  - Does not work with Windows Containers *yet*
  - *beta.docker.com*
- Windows Containers
- Hyper-V Containers

"What are the core differences between Windows Containers and Hyper-V Containers?"

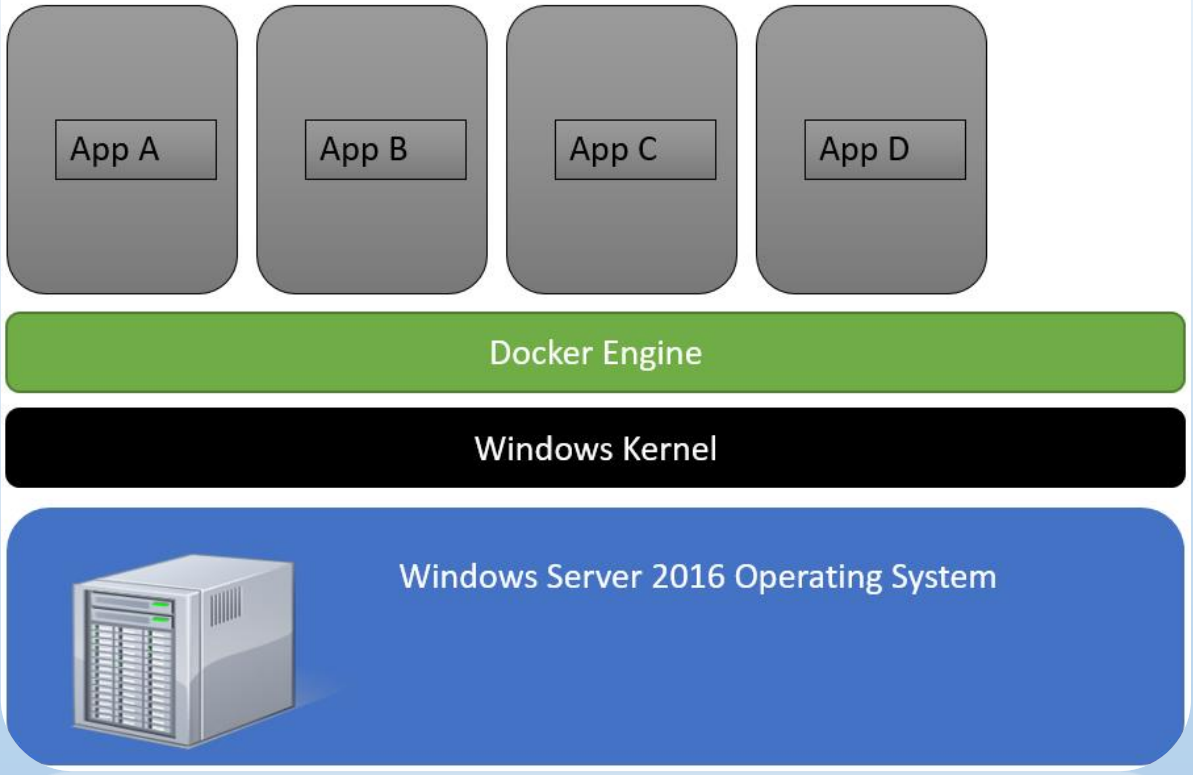
- Trust
  - Hyper-V Containers - Isolation is tighter
  - Windows Containers – OS trusts the apps & apps trust each other
- Density
  - Hyper-V Containers – Nesting
- Platform
  - Windows Containers does not require Hyper-V



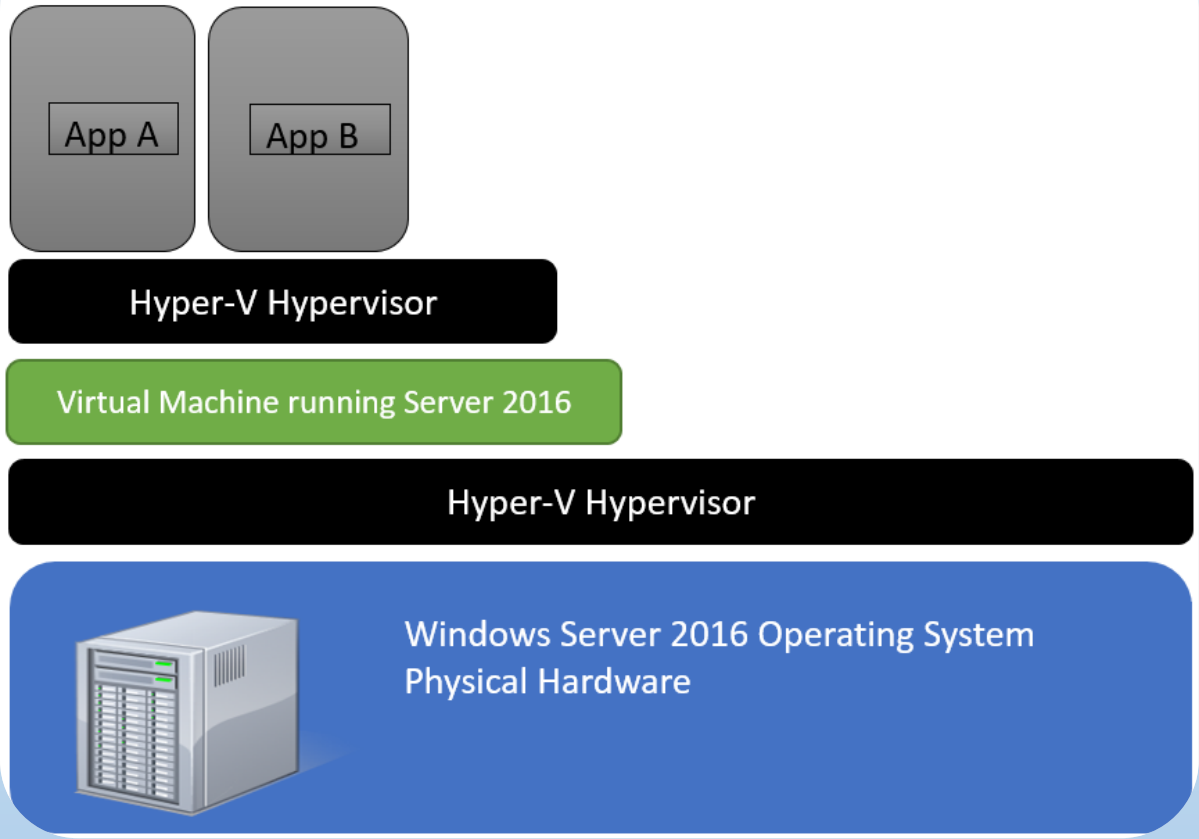
Set-VMProcessor -VMName <Target VM's Name> -ExposeVirtualizationExtensions $true

Graphic credit: www.altaro.com

Basic Windows Container Architecture



Basic Hyper-V Container Architecture



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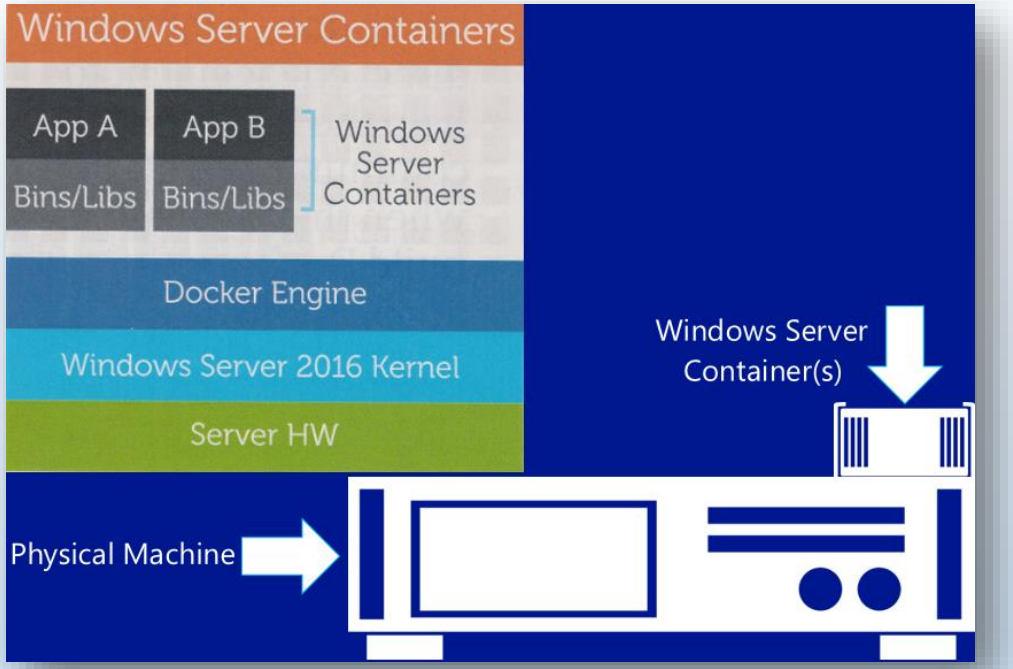
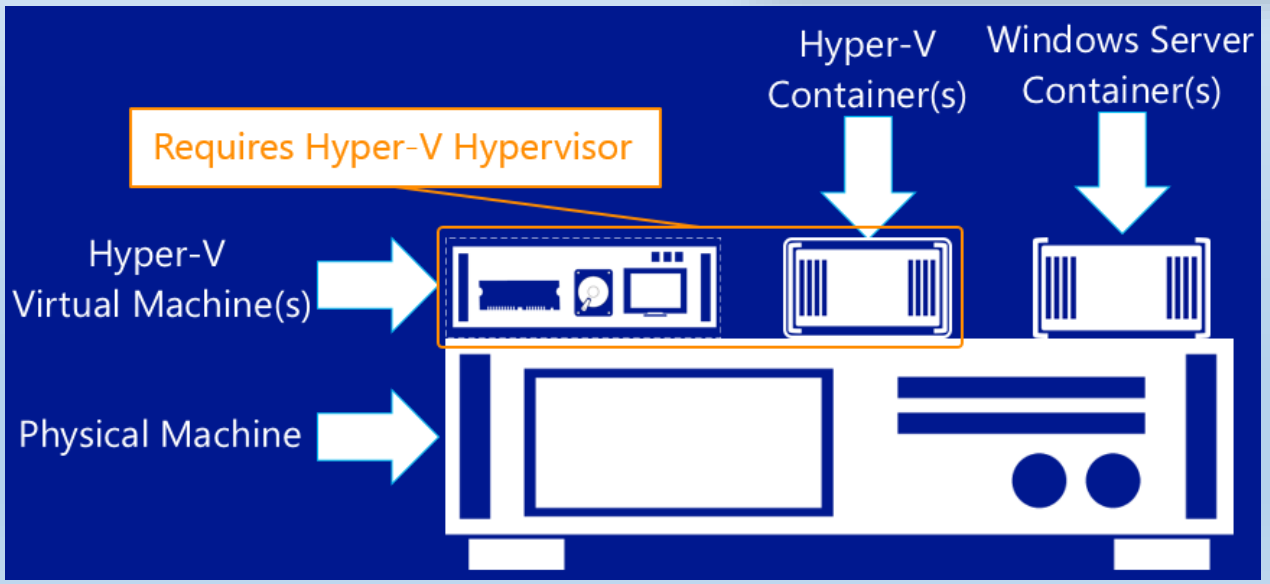
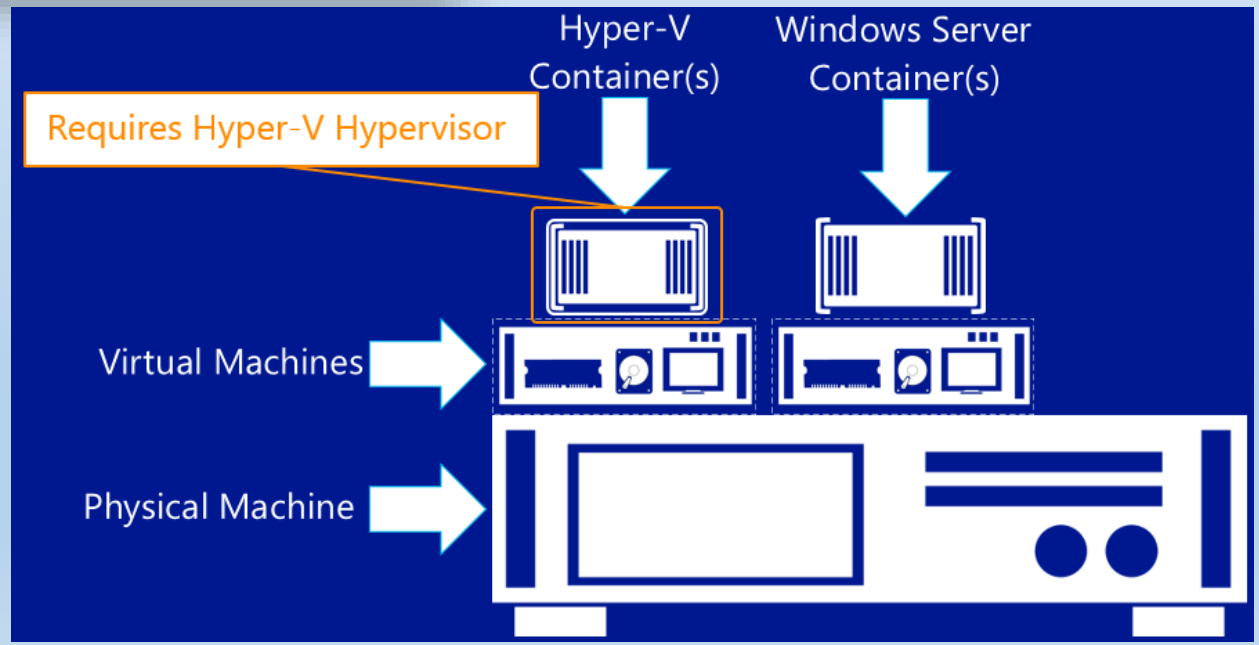
Windows Containers



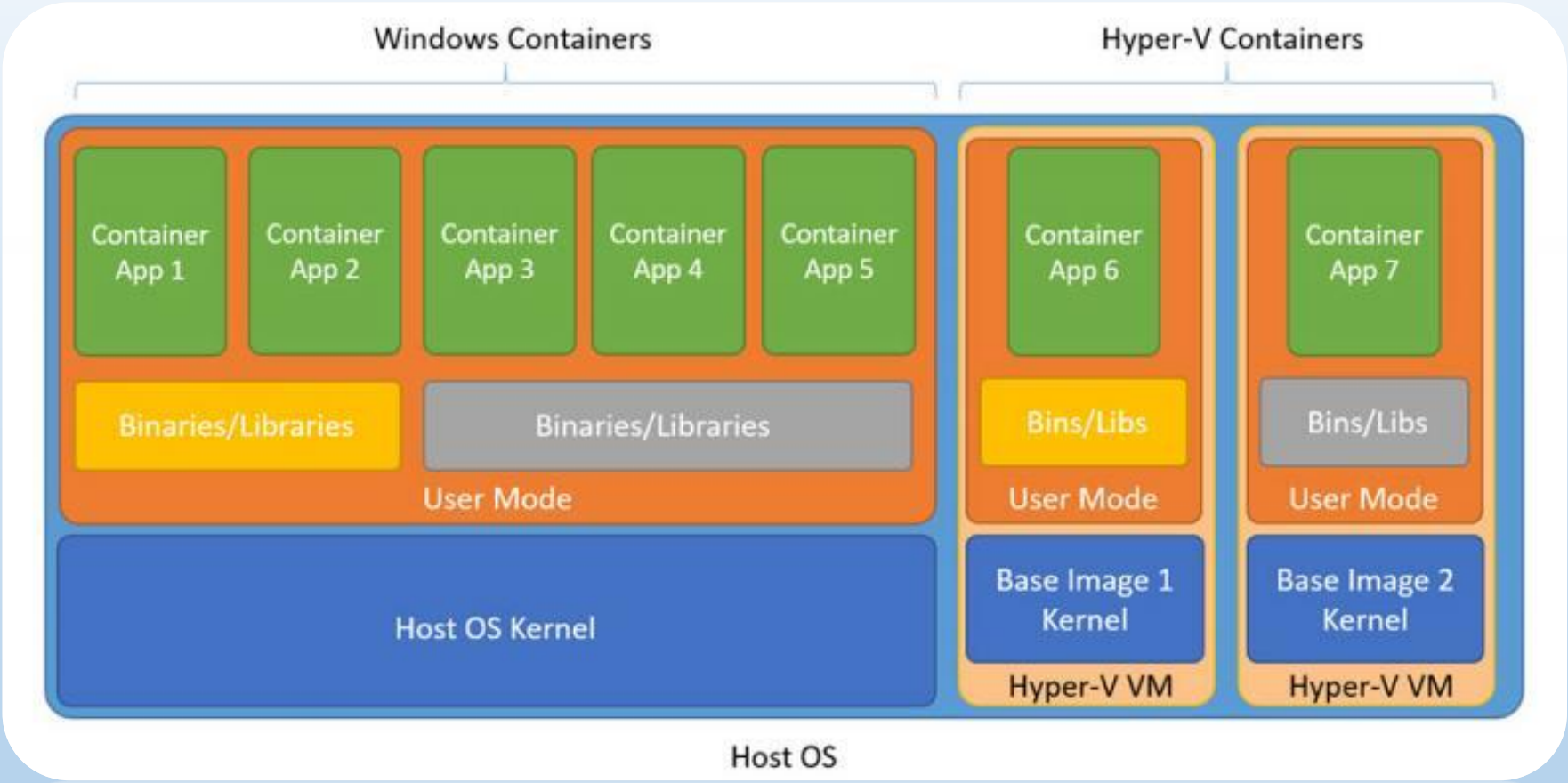
Hyper-V Containers



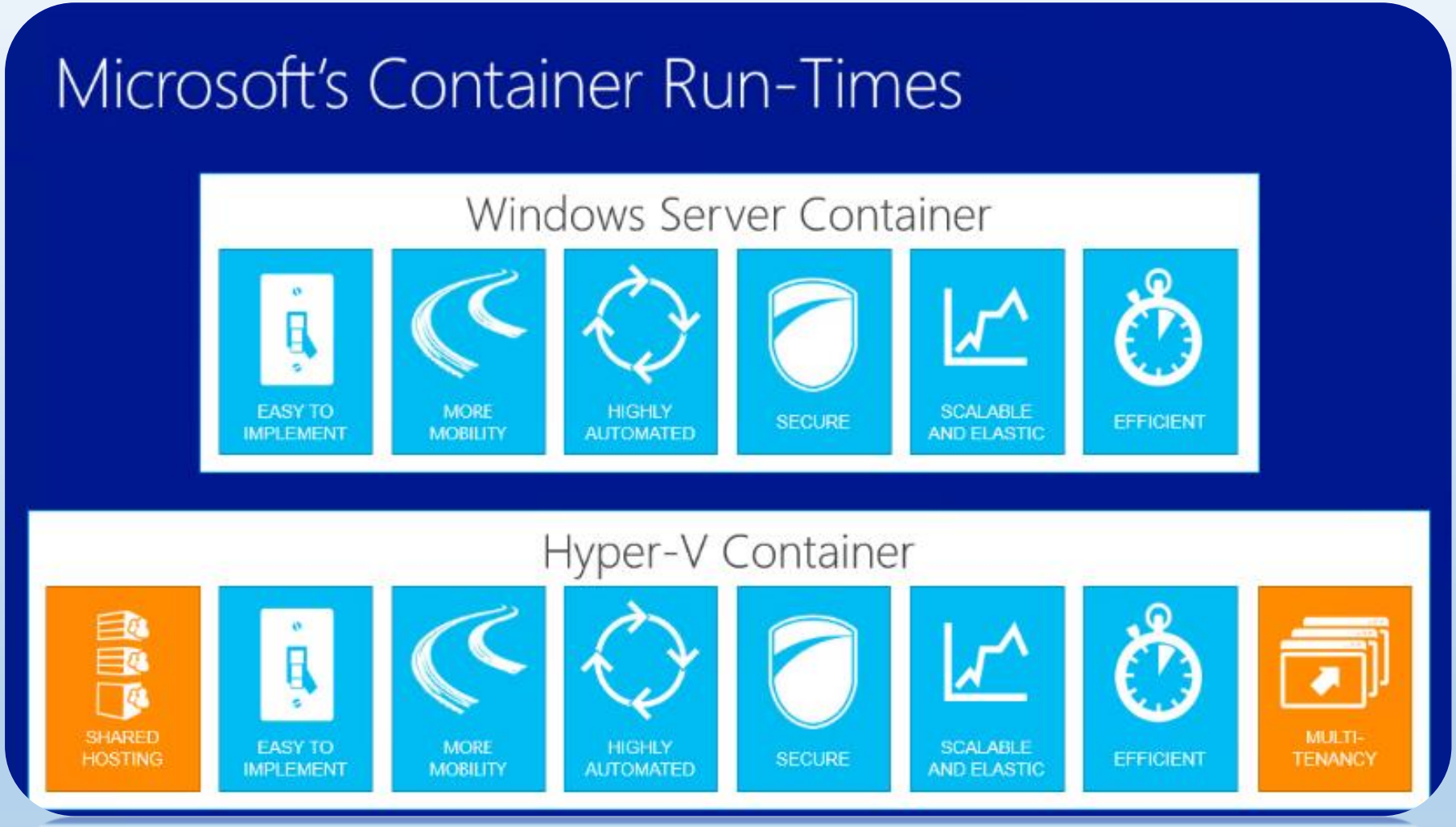
Nested Hyper-V Containers



Graphic credit: Aiden Finn


Windows Containers
Hyper-V Containers
Container App 1
Container App 2
Container App 3
Container App 4
Container App 5
Container App 6
Container App 7
Binaries/Libraries
Binaries/Libraries
Bins/Libs
Bins/Libs
User Mode
User Mode
User Mode
Host OS Kernel
Base Image 1 Kernel
Base Image 2 Kernel
Hyper-V VM
Hyper-V VM
Host OS

Marketing Difference?



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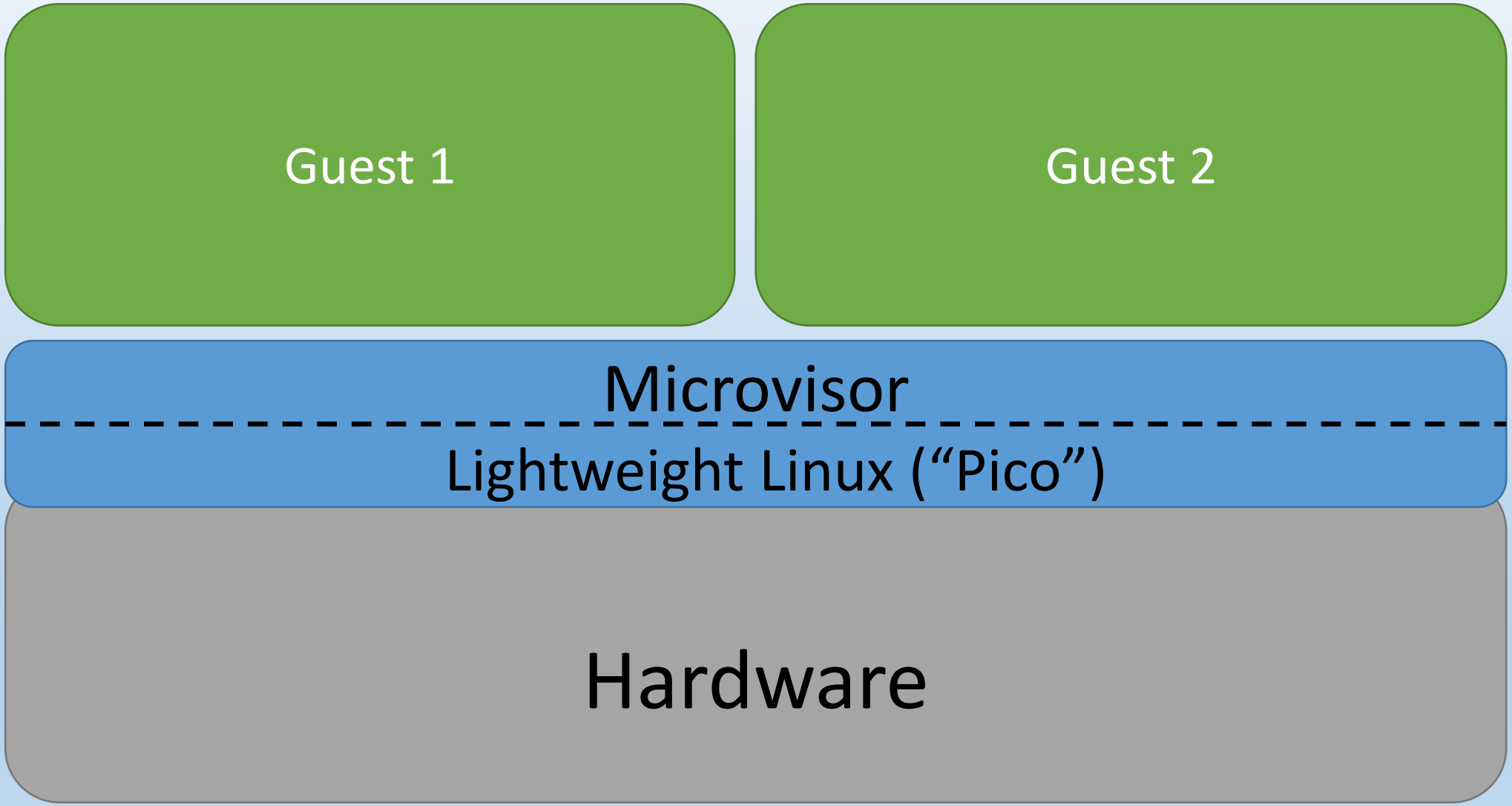
One Billionth

Try it out – http://aka.ms/nanoeval

- No login
- No GUI
- No RDP
- No 32bit support
- No MSI installer
- The goal of NanoServer was for Azure & Azure Stack
- NanoServer is refactored (i.e. restructured) Windows Server code
- Installation is very different
- There is no path from NanoServer to Core or Full

Microvisor Architecture



Azure Containers

- Install manually on supported Linux VM's
- Docker VM Extension
- Built-in to Windows Server 2016 TP
- Marketplace
  - Pre-installed on Ubuntu
  - Multi-container composed apps (eg – Wordpress+mySQL)
  - Docker Trusted Registry, Jenkins, etc.
- Azure Container Service

Microsoft Azure

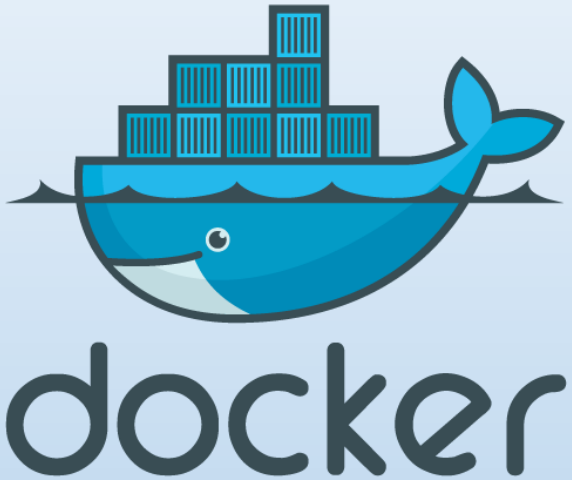
Azure Container Service (CaaS)

- Streamlined provisioning of Apache Mesos Clusters
- VM Scale Sets
- Layered support of Swarm, Marathon, and Chronos
- Docker tooling and API support
- Integrated app management and scaling
- Linux and Windows Server containers
- Public and private cloud

Container Management in the Enterprise

Cluster deployment and management	Scheduling and automation	Service Discovery	Container Registry
Container placement and resource mgmt	Security	Continuous deployment/ integration	Monitoring and Logging

Docker & Windows Container Core Management



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Windows Containers created with Docker = must use Docker to manage

Windows Containers created with PowerShell = must use PowerShell to manage

SCVMM?
SCCM?
Intune?
5Nines?
???

DEMO TIME!

AZURE CONTAINERS

WINDOWS CONTAINERS

HYPER-V CONTAINERS