briforum

Hyper-V for VMware Administrators: A Crash Course

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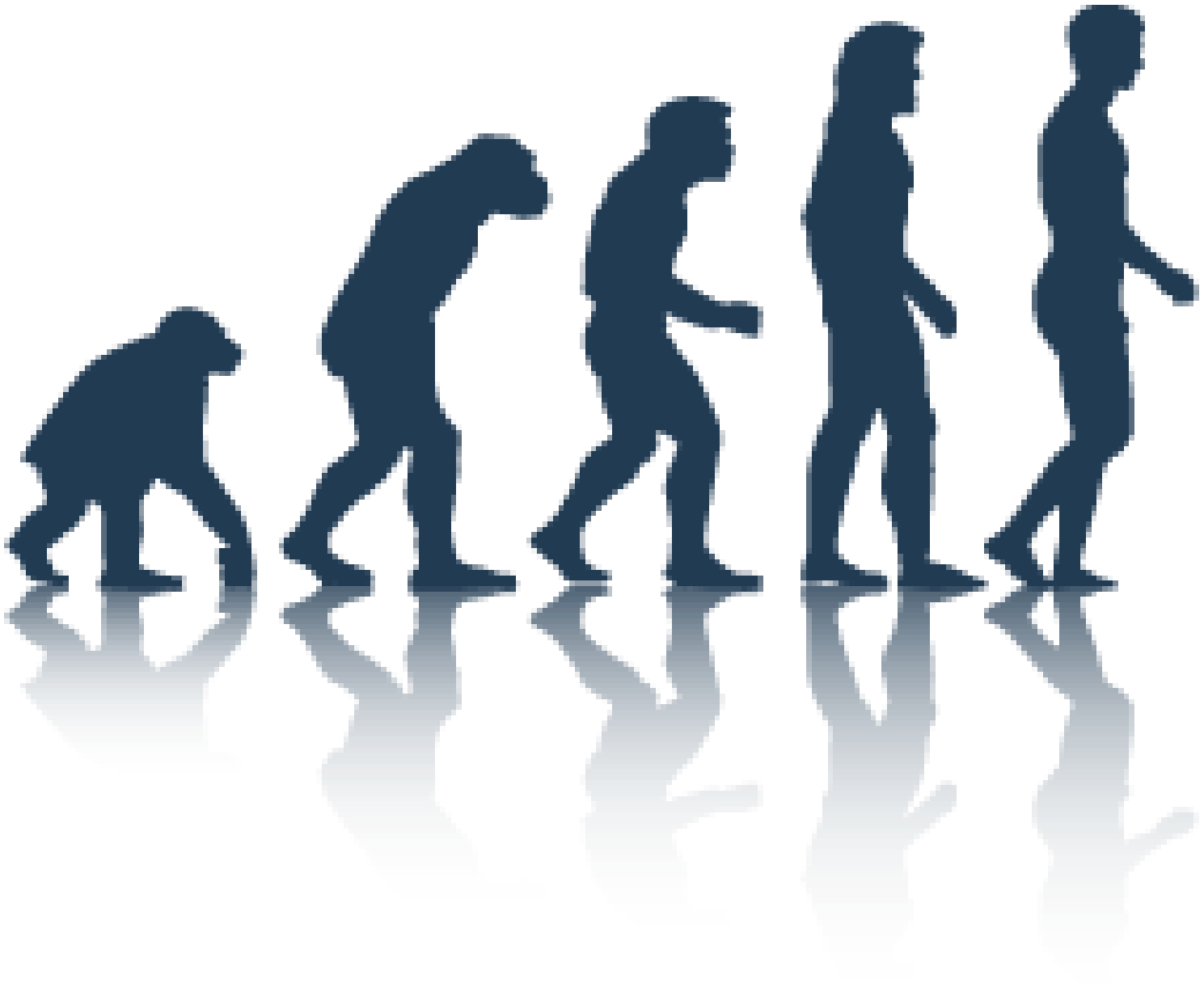
CRASH
COURSE

Topics

- Quick Questions
- A Little History
- Just Not Enough Time…
- Differences & Similarities
- The vAdmin & Managing the Mess

?




HYPERVISORS
FOR SALE
COMMODITY
HYPERVISOR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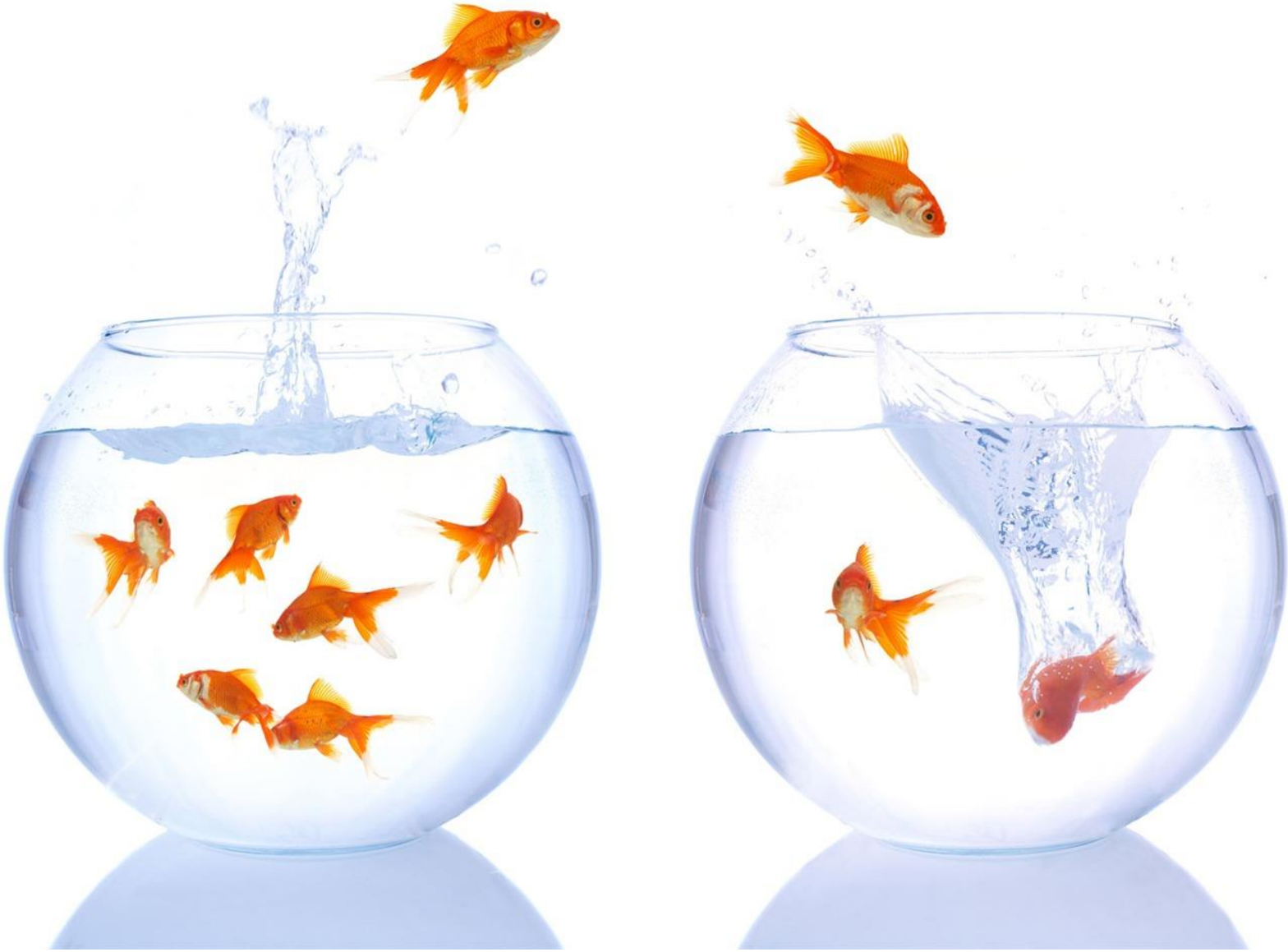


The Technical Differences

Seriously.. There are way too many to run through in the time we have today. We'll talk about a few big ones, but for a very comprehensive list, I encourage you to visit the Virtualization Matrix at – http://www.virtualizationmatrix.com

www.aidanfinn.com

Aidan Finn, IT Pro

A Hyper-V blog, but you'll also find Windows Server, desktop, systems management, deployment, and so on …

HOME EVENTS WHITEPAPERS RECOMMENDED READING ABOUT AIDAN FINN

2013 06.21

Comparing WS2012 R2 Hyper-V and vSphere 5.1

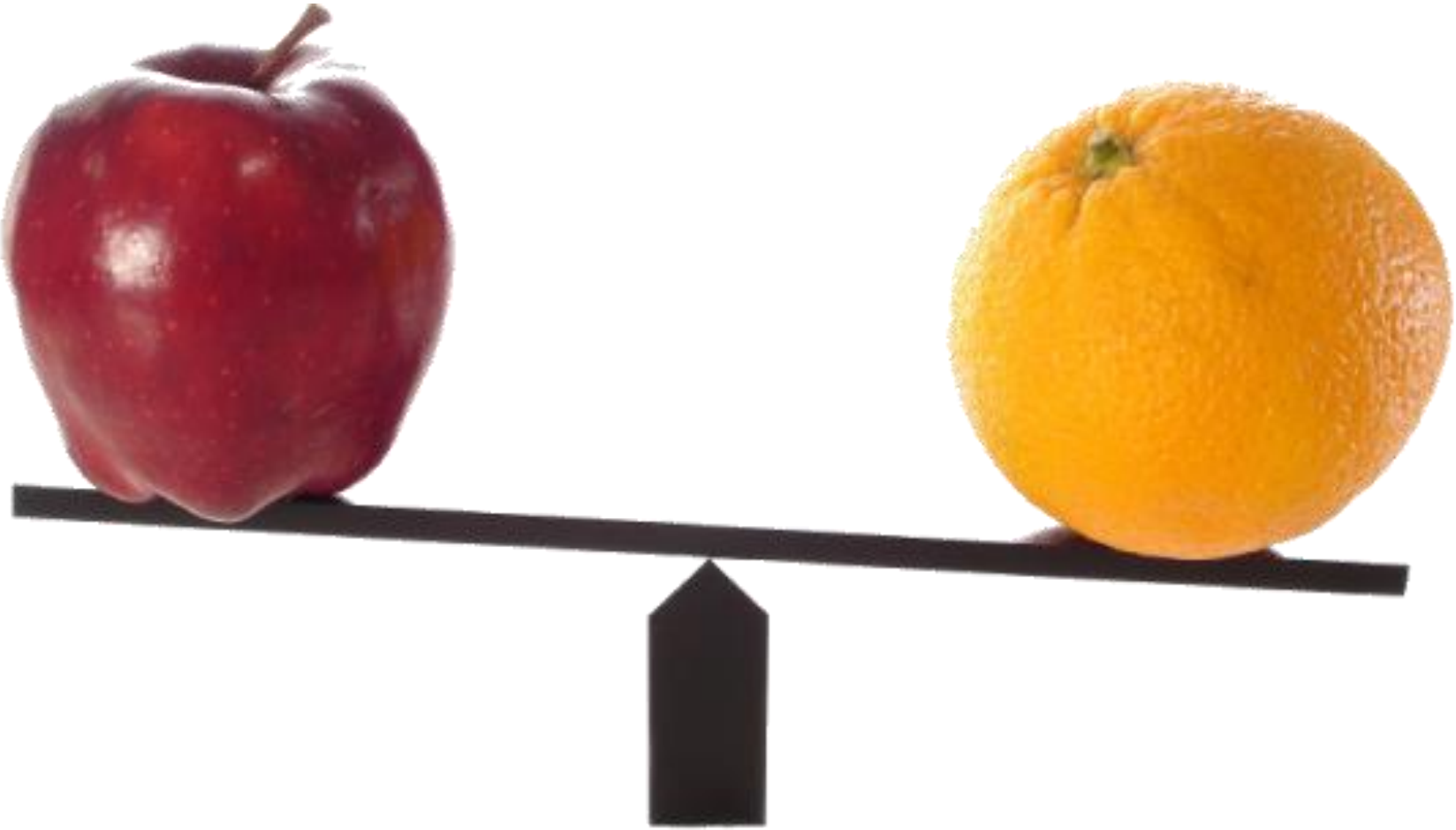
Category: Hyper-V / Tag: Hyper-V, Virtualisation, VMware, Windows Server 2012 R2 / Add Comment

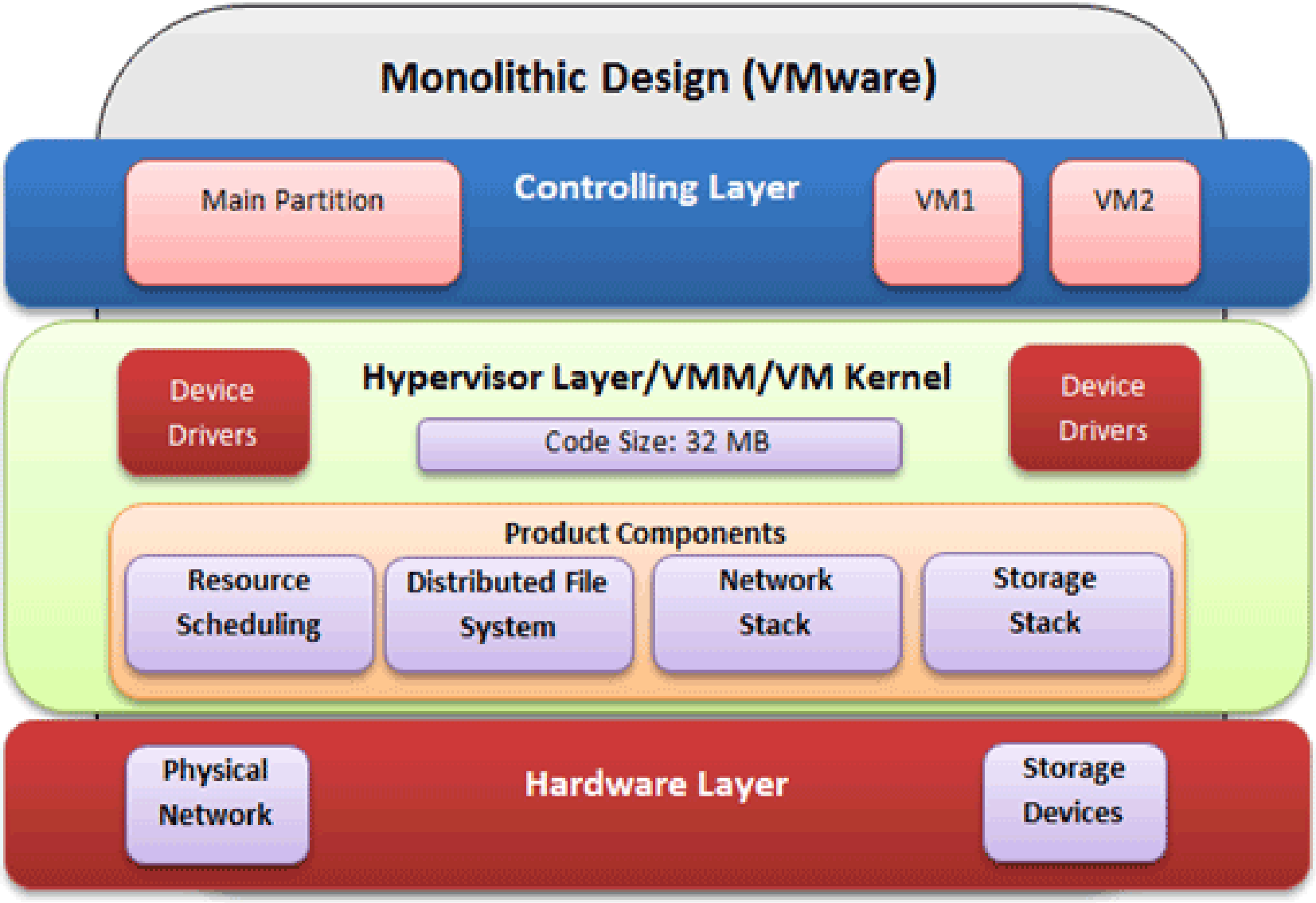
Bring on the hate! (which gets *ahem* moderated but those vFanboys will attempt to post anyway). Matt McSpirit of Microsoft did his now regular comparison of the latest versions of Microsoft Windows Server 2012 R2 Hyper-V and VMware vSphere 5.1 at TechEd NA 2013 (original video & deck here). Here are my notes on the session, where I contrast the features of Microsoft's and VMware's hypervisors.

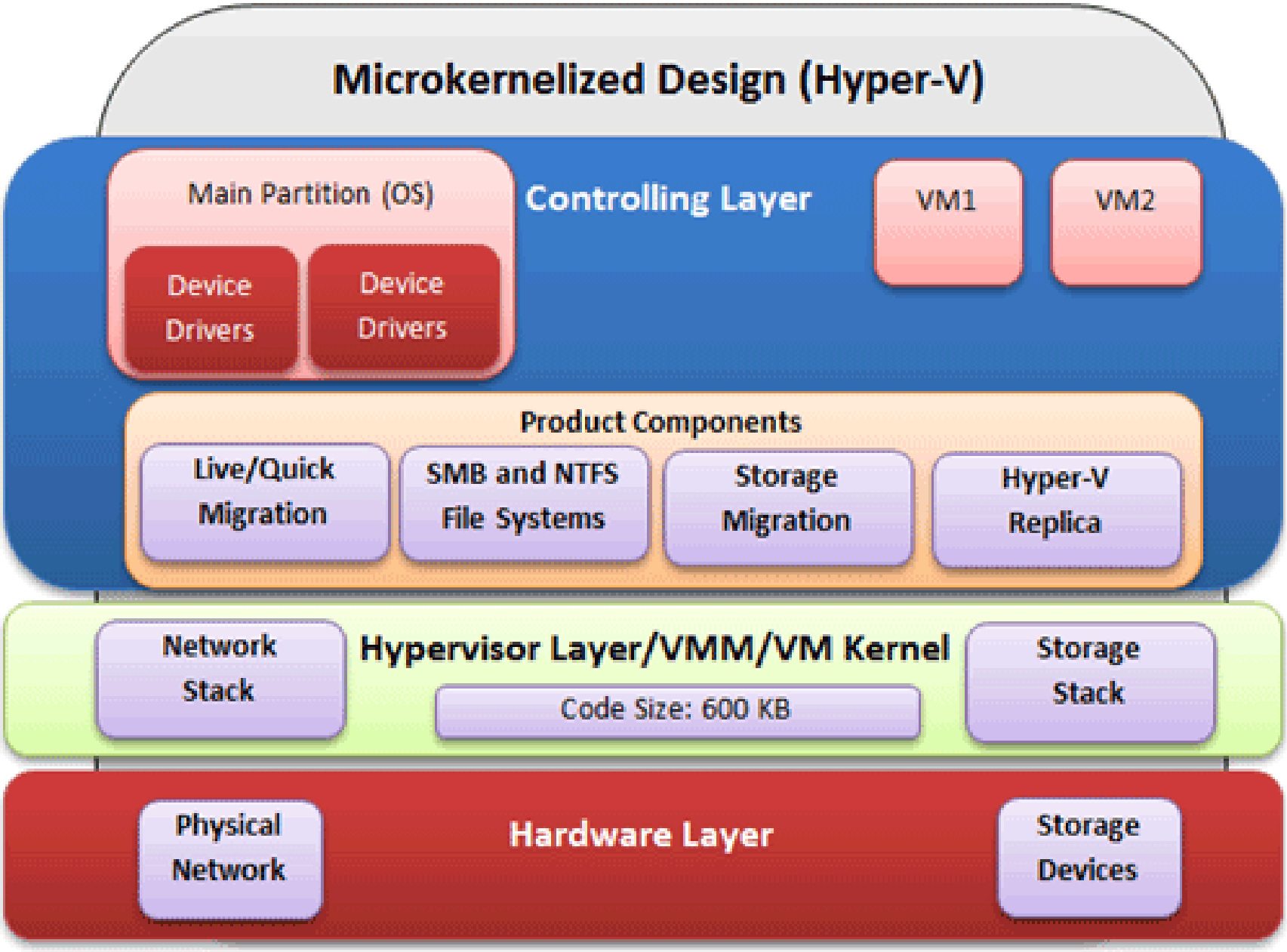
Before we get going, remember that the free Hyper-V Server 2012 R2, Windows Server Standard, and Windows Server Datacenter all have the exact same Hyper-V, Failover Clustering, and storage client functionality. And you license your Windows VMs on a per-host basis – and that's that same on Hyper-V, VMware, XenServer, etc. Therefore, if you run Windows VMs, you have the right to run Hyper-V on Std/DC editions, and therefore Hyper-V is always free. Don't bother BSing me with contradictions to the "Hyper-V is free" fact … if you disagree then send me your employer's name and address so I can call the Business Software Alliance to make an easy $10,000 reward.

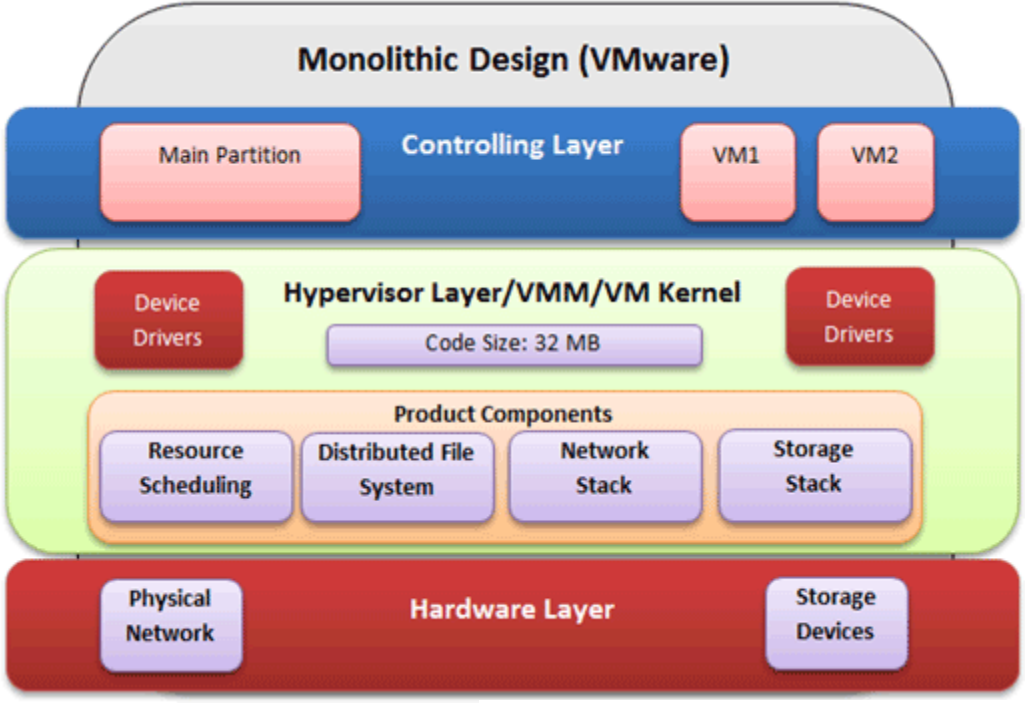
Scalability

Most of the time this information is just "Top Gear" numbers. Do I need a 1000 BHP car that can accelerate to 100 MPH in 4 seconds? Nope, but it's still nice to know that the muscle is there if I need it.

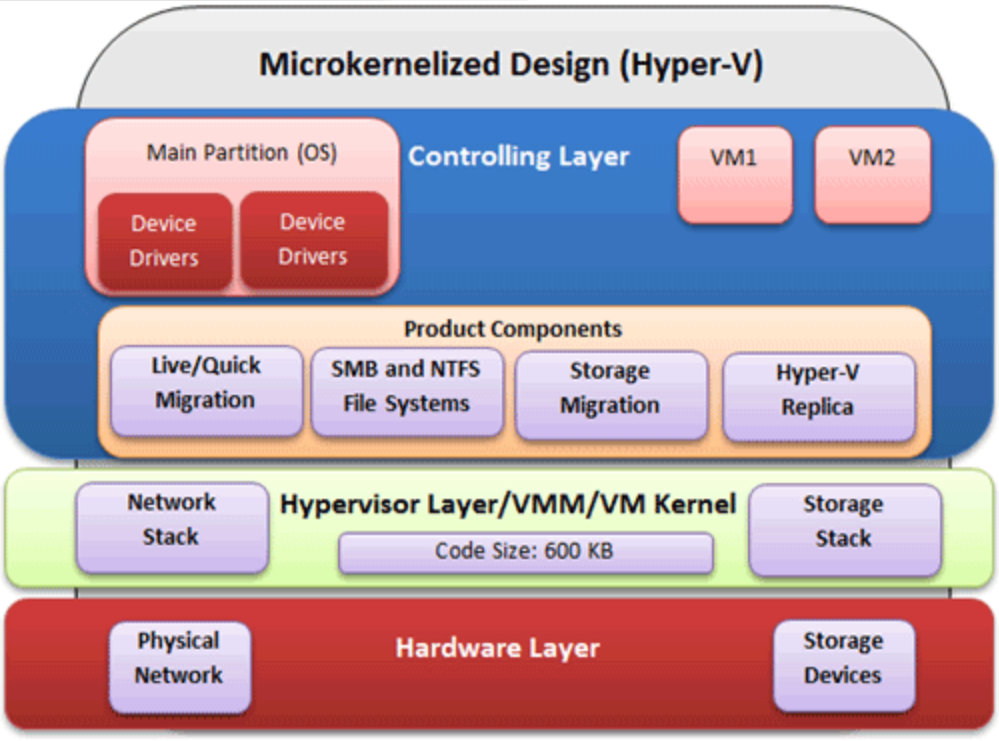



Monolithic Design (VMware)
Controlling Layer
Main Partition
VM1
VM2
Hypervisor Layer/VMM/VM Kernel
Device Drivers
Code Size: 32 MB
Device Drivers
Product Components
Resource Scheduling
Distributed File System
Network Stack
Storage Stack
Hardware Layer
Physical Network
Storage Devices


Microkernelized Design (Hyper-V)
Main Partition (OS)
Device Drivers
Device Drivers
Controlling Layer
VM1
VM2
Product Components
Live/Quick Migration
SMB and NTFS File Systems
Storage Migration
Hyper-V Replica
Network Stack
Hypervisor Layer/VMM/VM Kernel
Code Size: 600 KB
Storage Stack
Physical Network
Hardware Layer
Storage Devices



- Code injection in Hypervisor Layer
- Requires compatible hardware & device drivers
- No security patches or operating system required in the Controlling Layer



- No code injection possible in Hypervisor Layer
- Device drivers do not need to be hypervisor aware
- Controlling Layer requires OS = less secure

Deployment Options

Hyper-V

- DVD
- USB
- PXE: Windows Deployment Services
- PXE: Microsoft Deployment Toolkit 2012 U1
- PXE: System Center 2012 SP1 – CM
- PXE: System Center 2012 SP1 – VMM

vSphere

- DVD
- USB
- PXE: From Network Location
- PXE: Auto Deploy - Stateless
- PXE: Auto Deploy – Stateless Caching
- PXE: Auto Deploy – Stateful Install

Source – Virtualization JumpStart Series by Microsoft MVA

Technical Comparisons

System	Resource	Hyper-V (2012 R2)	vSphere Hypervisor	vSphere 5.1 Enterprise Plus
Host	Logical Processors	320	160	160
	Physical Memory	4TB	32GB[1]	2TB
	Virtual CPUs per Host	2,048	2,048	2,048
VM	Virtual CPUs per VM	64	8	64[2]
	Memory per VM	1TB	32GB[1]	1TB
	Active VMs per Host	1,024	512	512
	Guest NUMA	Yes	Yes	Yes
Cluster	Maximum Nodes	64	N/A[3]	32
	Maximum VMs	8,000	N/A[3]	4,000
Guest OS	Supported Operating Systems	Limited	Wide Range	Wide Range

[1] Host physical memory is capped at 32GB thus maximum VM memory is also restricted to 32GB usage.
[2] vSphere 5.1 Enterprise Plus is the only vSphere edition that supports 64 vCPUs.
Enterprise edition supports 32 vCPU per VM with all other editions supporting 8 vCPUs per VM
[3] For clustering/high availability, customers must purchase vSphere

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Resource Comparison

Capability	Hyper-V (2012 R2	vSphere Hypervisor	vSphere 5.1 Enterprise Plus
Dynamic Memory	Yes	Yes	Yes
Resource Metering	Yes	Yes[1]	Yes
Quality of Service	Yes	No	Yes[2]
Data Center Bridging (DCB)	Yes	Yes	Yes

[1] Without vCenter, Resource Metering in the vSphere Hypervisor is only available on an individual host by host basis.
[2] Quality of Service (QoS) is only available in the Enterprise Plus edition of vSphere 5.1

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Guest Migration Comparison

Capability	Hyper-V (2012 R2	vSphere Hypervisor	vSphere 5.1 Enterprise Plus
VM Live Migration (Keys=Compression, RDMA)	Yes	No[1]	Yes[2]
1GB Simultaneous Live Migrations	Unlimited[3]	N/A	4
10GB Simultaneous Live Migrations	Unlimited[3]	N/A	8
Live Storage Migration	Yes	No[4]	Yes[5]
Shared Nothing Live Migration	Yes	No	Yes[5]
Network Virtualization	Yes	No	VXLAN[6]

[1] Live Migration (vMotion) is unavailable in the vSphere Hypervisor – vSphere 5.1 required
[2] Live Migration (vMotion) and Shared Nothing Live Migration (Enhanced vMotion) is available in Essentials Plus & higher editions of vSphere 5.1
[3] Within the technical capabilities of the networking hardware
[4] Live Storage Migration (Storage vMotion) is unavailable in the vSphere Hypervisor
[5] Live Storage Migration (Storage vMotion) is available in Standard, Enterprise & Enterprise Plus editions of vSphere 5.1
[6] VXLAN is a feature of the vCloud Networking & Security Product, which is available at additional cost to vSphere 5.1. In addition, it requires the vSphere Distributed Switch, only available in vSphere 5.1 Enterprise Plus.

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Storage Options

Hyper-V

- iSCSI, Fibre Channel, SMB 3.0
- VM Disks:
  - RAW
  - VHD/VHDX's:
    - Thin Provisioned
    - Fixed
    - Differencing

vSphere

- iSCSI, Fibre Channel, NAS/NFS
- VM Disks:
  - RAW
  - VMDKs:
    - Thin Provisioned
    - Thick Provisioned Lazy/Eager Zeroed
    - Linked Clones

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Storage Comparison

Capability	Hyper-V (2012 R2)	vSphere Hypervisor	vSphere 5.1 Enterprise Plus
Virtual Fiber Channel	Yes	Yes	Yes
3rd Party Multipathing (MPIO)	Yes	No	Yes (VAMP)[1]
Native 4-KB Disk Support	Yes	No	No
Maximum Virtual Disk Size	64TB VHDX	2TB VMDK	2TB VMDK
Maximum Pass Through Disk Size	256TB+[2]	64TB	64TB
Offloaded Data Transfer	Yes	No	Yes (VAAI)[3]
Boot from USB Disk	Yes[4]	Yes	Yes
Tiered Storage Pooling	Yes	No	No

[1] vStorage API for Multipathing (VAMP) is only available in Enterprise & Enterprise Plus editions of vSphere 5.1
[2] The maximum size of a physical disk attached to a virtual machine is determined by the guest operating system and the chosen file system within the guest. More recent Windows Server operating systems support disks in excess of 256TB in size
[3] vStorage API for Array Integration (VAAI) is only available in Enterprise & Enterprise Plus editions of vSphere 5.1
[4] Hyper-V Server 2012 Only

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Scalability Comparison

Capability	Hyper-V (2012 R2)	vSphere Hypervisor	vSphere 5.1 Enterprise Plus
Nodes per Cluster	64	N/A[1]	32
VMs per Cluster	8,000	N/A[1]	4,000
Max Size Guest Cluster (iSCSI)	64 Nodes	16 Nodes[2]	16 Nodes[2]
Max Size Guest Cluster (Fiber)	64 Nodes	5 Nodes	5 Nodes
Max Size Guest Cluster (File Based)	64 Nodes	0 Nodes[3]	0 Nodes[3]
Guest Clustering with Live Migration Support	Yes	N/A[1]	No[4]
Guest Clustering with Dynamic Memory Support	Yes	No[5]	No[5]

[1] High Availability/vMotion/Clustering is unavailable in the standalone vSphere Hypervisor
[2] Guest Clusters can be created on vSphere 5.1 using the in-guest iSCSI initiator to connect to the SAN, the same as would be configured in a physical cluster. Support of guest operating systems up to Windows Server 2008 R2 means 16 node clusters are the maximum size on vSphere 5.1. WS2012 Guest Clusters not supported as per: http://www.vmware.com/support/vsphere5/doc/vsphere-esx-vcenter-server-51-release-notes.html
[3] VMware does not support VM Guest Clustering using File Based Storage i.e. NFS
[4] VMware does not support vMotion and Storage vMotion of a VM that is part of a Guest Cluster
[5] VMware does not support the use of Memory Overcommit with a VM that is part of a Guest Cluster

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High Availability Comparison

Capability	Hyper-V (2012 R2)	vSphere Hypervisor	vSphere 5.1 Enterprise Plus
Incremental Backups	Yes	No	Yes[1]
VM Replication	Yes	No	Yes[2]
NIC Teaming	Yes	Yes	Yes
Integrated High Availability	Yes	No[3]	Yes[4]
Guest OS Application Monitoring	Yes	N/A	No[5]
Failover Prioritization	Yes	N/A	Yes[6]
Affinity Rules	Yes	N/A	Yes[6]
Cluster-Aware Updating	Yes	N/A	Yes[6]

[1] VMware Data Protection is available in Essentials Plus and higher vSphere 5.1 editions
[2] vSphere Replication is available in Essentials Plus and higher vSphere 5.1 editions
[3] vSphere Hypervisor has no high availability features built in – vSphere 5.1 is required.
[4] VMware HA is built in to Essentials Plus and higher vSphere 5.1 editions
[5] VMware have made APIs publicly available, but actual application monitoring is not included
[6] Features available in all editions that have High Availability enabled.

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Networking Comparison

Capability	Hyper-V (2012 R2)	vSphere Hypervisor	vSphere 5.1 Enterprise Plus
Extensible vSwitch	Yes	No	Replaceable[1]
Confirmed Partner Extensions	5	No	2
Private Virtual LAN (PVLAN)	Yes	No	Yes[1]
ARP Spoofing Protection	Yes	No	vCNS/Partner[2]
DHCP Snooping Protection	Yes	No	vCNS/Partner[2]
Virtual Port ACLs	Yes	No	vCNS/Partner[2]
Trunk Mode to Virtual Machines	Yes	No	Yes[3]
Port Monitoring	Yes	Per Port Group	Yes[3]
Port Mirroring	Yes	Per Port Group	Yes[3]

[1] The vSphere Distributed Switch (required for PVLAN capability) is available only in the Enterprise Plus edition of vSphere 5.1 and is replaceable (By Partners such as Cisco/IBM) rather than extensible.
[2] ARP Spoofing, DHCP Snooping Protection & Virtual Port ACLs require the App component of VMware vCloud Network & Security (vCNS) product or a Partner solution, all of which are additional purchases
[3] Trunking VLANs to individual vNICs, Port Monitoring and Mirroring at a granular level requires vSphere Distributed Switch, which is available in the Enterprise Plus edition of vSphere 5.1

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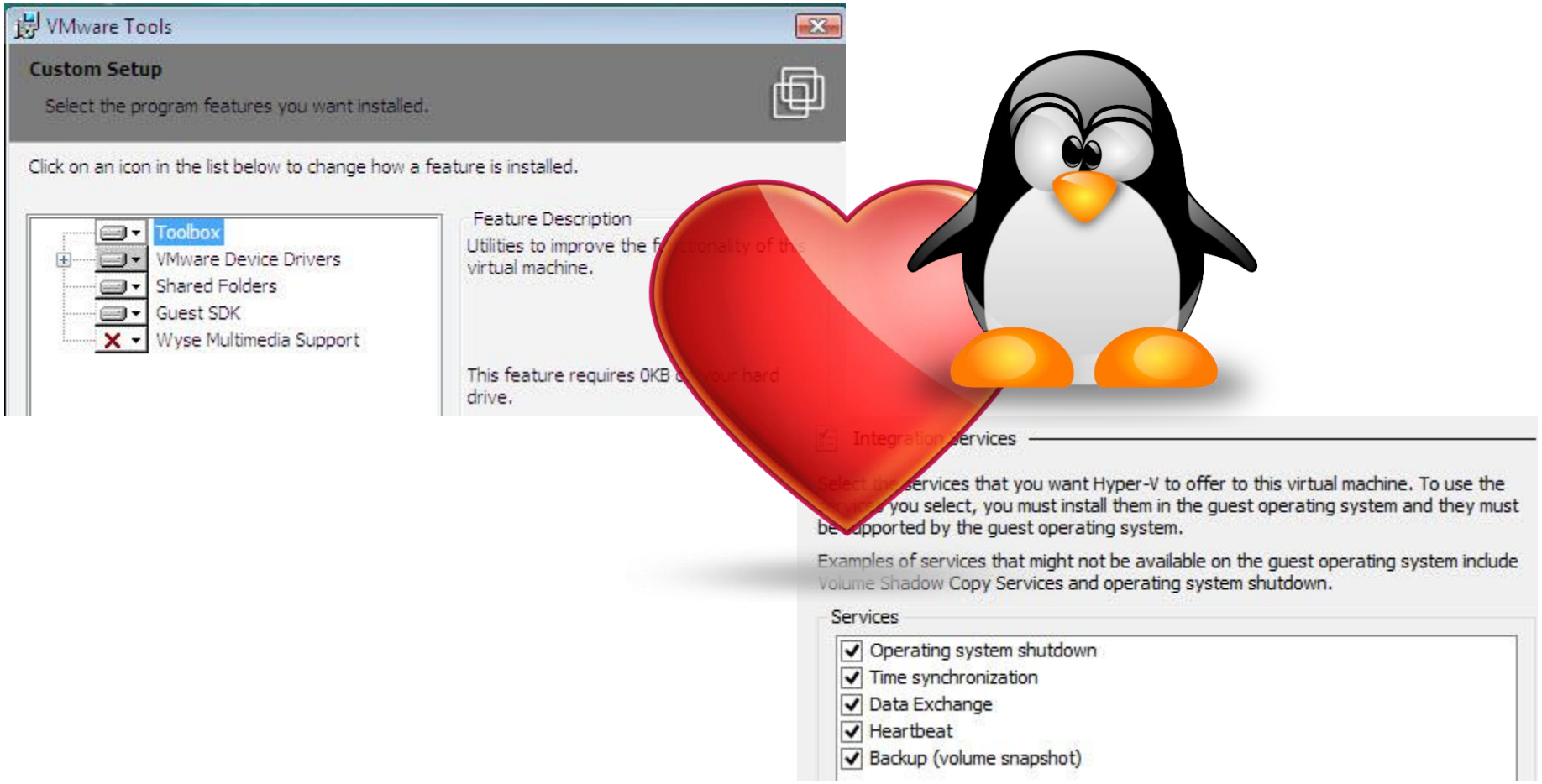
Integrating Virtual Machines



vSphere 5.1

Linux:

- Asianux
- SUSE
- RedHat
- Fedora
- CentOS
- OS X (Darwin)
- E-Com Station
- Debian
- FreeBSD
- Mandrake
- Java Desktop
- Oracle desktop
- TurboLinux
- Ubuntu
- Solaris
- SCO
- Netware

Other?:

- OS/2 Warp

Windows:

- Server 2012
- Server 2008 / R2
- Server 2003 / R2
- Server 2000
- Server NT
- Windows 8
- Windows 7
- Windows Vista
- Windows XP
- Windows 98
- Windows ME
- Windows 95
- Windows 3.1
- DOS

Hyper-V 2012 R2

Linux:

- Asianux
- SUSE
- RedHat
- Fedora
- CentOS
- OS X (Darwin)
- E-Com Station
- Debian
- FreeBSD
- Mandrake
- Java Desktop
- Oracle desktop
- TurboLinux
- Ubuntu
- Solaris
- SCO
- Netware

Other?:

- OS/2 Warp

Windows:

- Server 2012
- Server 2008 / R2
- Server 2003 / R2
- Server 2000
- Server NT
- Windows 8
- Windows 7
- Windows Vista
- Windows XP
- Windows 98
- Windows ME
- Windows 95
- Windows 3.1
- DOS

What About These Hyper-V?

- Hot-Add, Hot-Remove
- Fault Tolerance
- DRS
- DPM
- Data Protection
- Host Profiles

What About You?

007

Mike Nelson - Briforum London 2013

The Basics

Many basic Admin tasks are accomplished in similar ways, while others are not so similar

- Create a guest
- Power control
- Guest settings
- Create storage
- Connecting to a Guest
- Snapshots
- “Tools” installation
- Resource Allocation
- Updates & Patches
- Templates & Clones

Terminology

What	VMware	Hyper-V
Move guest from host to host	vMotion	Live Migration
Move guest storage	Storage vMotion	Quick Storage Migration
Storage	Datastores	Volumes (“Storage Nothing”)
Object Heiarchy	Datacenter	Fabric
Scripting	PowerCLI & Workflows	PowerShell & Runbooks
Dynamic Core Resource	DRS	*PRO (Performnace & Resource Optimizations)
High Availablity	HA	Failover Clustering
Guest Memory Allocation	Resource Allocation & Reservation	Dynamic Memory
DR	SRM	Replica

Disk Files

What	VMware	Hyper-V
Virtual hard disk, VMware: disk descriptor contains flat.vmdk (raw data) config	.VMDK	.VHD, .VHDX
Snapshot, differencing file – VM state – VMware: see -DELTA.VMDK	.VMSN	.AVHD
Snapshot information – snapshot metadata	.VMSD	.XML
VM primary configuration file (1). (Microsoft Virtual server uses the VMC filetype)	.VMX	.XML
Saved state, memory, paging – Hyper-V: Additional .VSV and .BIN files are created for each running snapshot. VMware: paging file. Present when VM is running or has crashed	.VMEM	.VSV, .BIN
Virtual floppy disk	.FLP	.VFD
Template – VHD should be sysprepped to change SSID and MACs or scripts run to clone hardware into a new xml (4). OVF may have a manifest, .MF file	.OVF, .VMTX, .VMTD	.VHD
Driver files (2)	VIB	INF

How Do We Manage Them?

vSphere -

- vCenter
- vCenter Client
- vCLI
- vMA
- PowerCLI
- 3rd Party - ?

Hyper-V -

- Virtual Machine Manager (VMM)
- System Center Virtual Machine Manager (SCVMM)
- Service Console (SC)
- PowerShell
- 3rd Party – 5Nines, HVRemote, vUtilites

Why Not SCVMM for VMware?

VMware Whitepaper:

- Opening line “Why trying to use SCVMM 2012 will frustrate vSphere administrators”
- Microsoft is trying to convince vSphere administrators to manage their VMware environment using System Center Virtual Machine Manager 2012 (SCVMM 2012). However, vSphere administrators will find that SCVMM 2012 -
  - 1. Increases Complexity While Adding Little Value
  - 2. Is Not a “Single Pane Of Glass Interface”, vCenter Server Is Still Required
  - 3. Adds New Overheads, Delivers Little Benefit
  - 4. Degrades Operational Efficiency, Frustrating Administrators
- SCVMM 2012 offers only rudimentary management capabilities for VMware environments and introduces unnecessary complexity, overhead and frustration for vSphere administrators.


F.U.D.

Cross-Platform Management

- Migration tools (not management tools really)
  - Converters and the like
- VMware Multi-Hypervisor Manager
- HotLink (vC Plugin)
- SCVMM 2012 SP1 – Although VMware disagrees -
  - http://www.vmware.com/files/pdf/getthefacts/vmw-limitations-of-managing-vSphere-with-MS-SCVMM.pdf
- Others??
- PowerShell

SHAME ON YOU


I DON'T ALWAYS WRITE CODE,
BUT WHEN I DO, ITS IN POWERSHELL

PowerShell & PowerCLI

- Hyper-V cmdlets are native to the new PowerShell “core” in Server 2012 & Win 8.
- You do not need to install the Hyper-V role, just the Module
- Win7 cannot manage Hyper-V 3 (yet) & Win 8 cannot manage Hyper-V 2 (yet) – Use 5Nines
- PowerCLI is somewhat vSphere version dependent & requires VIX install (API)
- Multiple PowerCLI packages for other products (i.e. Update Manager)
- You can run both together, but watch out!

The Setup

- Enable the Hyper-V Role or just the Module
- Install PowerCLI
- Modify your PoSH profile to add the vSphere snapins (yes, they are still snapins)
  - `add-pssnapin vmware.vimautomation.core`
  - `add-pssnapin vmware.vumautomation (only if installed Update Manager CLI)`
  - `add-pssnapin vmware.vimautomation.license`
  - `add-pssnapin vmware.imagebuilder`
  - `add-pssnapin vmware.deployautomation`
- Run PowerShell as Administrator and Set-ExecutionPolicy Unrestricted (or Unsigned)
- Remember the gotcha – prefix the cmdlet with the module name
  - `Get-Command –CommandType cmdlet | Group Name | Where {$_.Count –gt 1}`

DEMO

Thank You!

Don’t forget the Surveys