

# Hyper-V vs ESX at the datacenter

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## Which hypervisor to use in the data center?

- Virtualisation has matured
- Virtualisation in the data center grows fast
- The battle on which hypervisor to use at the data center has started
- Lies, damn lies and marketing

## Compare of the following items

- Version choice
- Deployment in datacenter
- Guest OS
- Memory over-commit
- Migrations
- Storage usage
- Windows 2008 R2 Hyper-V 2.0
- VMware vSphere

### – ESXi (Free)

- › No Console OS, 32Mb size, BIOS
- › As powerful as ESX
- › Patches are treated like BIOS firmwares, so no part fixes
- › HA / VMotion via a purchasable license upgrade

### – ESX 3.5

- › RedHat EL5 derivative as the console OS, 2Gb size
- › HA, VMotion extra licenses
- › Updates and patches for Kernel and RedHat OS (only from Vmware)

### – Microsoft Hyper-V Server 2008 (Free)

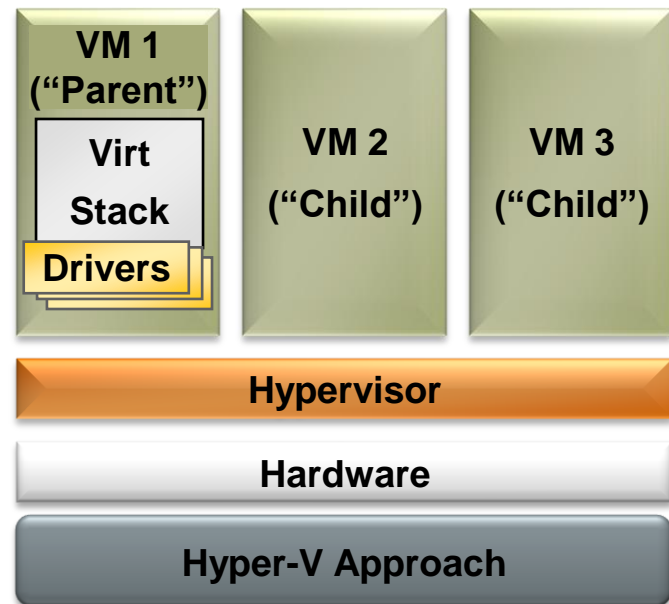
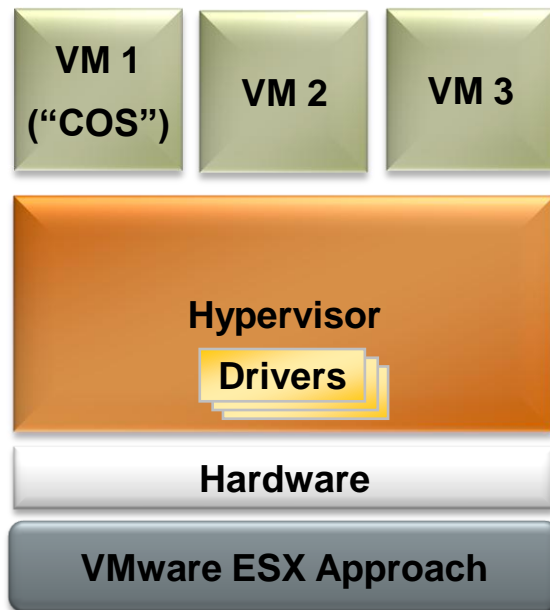
- › Windows 2008 core behind the scenes
- › Max 32Gb host RAM, max 4 host cpu
- › As patch sensitive as Windows 2008 core
- › No HA, No Quick Migration

### – Microsoft Server 2008 Enterprise & Datacenter with Hyper-V

- › HA, Quick Migration
- › Windows 2008 core patches or Windows 2008 patches

## Deployment in data center

- HCL a limitation or a blessing?
  - Host systems predominantly the main brands
  - Network configurations with extended switch configurations
  - Driver optimisations?



## Deployment in data center

VMware ESX 3.5	Hyper-V
Extended HCL with more as 400 host systems	Datacenter network demands limit freedom of choice tremendously
32bit and 64bit hosts	Demands Intel VT / AMD-V Extensions
Hardware independent deployment for HCL systems	Specific host drivers limit deployment
<b>HCL but extensive hardware choice</b>	<b>No HCL, but more limited in hardware choice !!!</b>

VMware ESX 3.5	Hyper-V
All Windows server flavors	W2k Sp4 (1 cpu), W2003 Sp2 (1 of 2 cpu), W2008 (1,2 of 4 cpu)
Various Linux distributions (Mandrake, Ubuntu, RedHat, SUSE, TurboLinux)	SUSE Linux Server 10 Sp1 / Sp2 (1 cpu)
FreeBSD, Netware 4.2 and up, SUN Solaris	

- Support en support
  - OS supported by Hypervisor
  - Hypervisor supported by OS
  - Windows Server Virtualization Validation Program (SVVP)
- Old OS versions and multiple CPUs
  - Real life customer example with 721 VMs
    - 4 x RedHat Linux
    - 2 x NT4
    - 8 x Windows 2000 (2 cpu)
    - 15 x Windows 2003 with 4 cpu
    - 100 x Windows 2003 SP1 with 1 or 2 cpu
    - **Total: 129 VMs are not Hyper-V compatible**
    - Especially older hardware, more expensive in maintenance



# Memory usage

- Definition of overcommit is important!
  - Microsoft:
    - Ability to assign more memory to VMs as is available in host
    - Result is swap to disk a.k.a. slow
  - VMware:
    - Ability to assign more memory to VMs as is available in host
    - BUT VMs real memory usage never exceeds host memory
    - Result is NO swap to disk but big savings
- Transparent Page Sharing
  - Store equal memory blocks just 1x

Name	Host (Gb)	Assigned (Gb)	OverCommit
esx-01	40	38	
esx-02	40	46	6
esx-03	40	33	
esx-04	40	48	8
esx-05	40	35	
esx-06	40	49	9
esx-07	40	29	
esx-08	40	42	2
esx-09	40	37	
esx-10	40	33	
esx-11	40	35	
esx-12	40	45	5
esx-13	40	52	12
esx-14	40	48	8
esx-15	40	37	
esx-16	40	42	2
esx-17	40	46	6
esx-18	40	30	
esx-19	64	87	23
esx-20	64	35	
esx-21	64	85	21
			<b>101 Gb</b>
<b>Hardware RAM</b>			

- Cold Migration
  - VM powered off, migrate VM and/or data, VM power on
- Hyper-V Quickmigration
  - Suspend VM, disconnect sessions, restart VM
  - No CPU compatibility check
- VMware ESX VMotion
  - Live migration of VM between hosts without disconnects
- VMware ESX SVMotion
  - Live migration of the disks between datastores
  - Tough command line interface, 3<sup>rd</sup> party tools
- QuickMigration means down time for more as just the application
- Emergency repair of host hits large number of applications

- Cluster Storage in Hyper-V demands a separate LUN per VM.
  - Per VM extra storage reserveren voor snapshots en resizing +/- 10-15Gb
  - Current customer:
    - Average VM disk size = 40 GB
    - 700 VMs
  - Hyper-V:
    - Average VM disk size: 40Gb -> 10Gb extra per LUN
    - Over 700 VMs =  $700 \times 40 + 700 \times 10 = 35 \text{ TB}$
  - With ESX we use 30 VMs per LUN en reserve 30Gb per LUN
    - $25 \text{ LUNs} \times 30\text{VMs} \times 40\text{GB} = 30 \text{ TB}$
    - $25 \text{ LUNs} \times 30\text{GB spare} = 750\text{GB}$
  - **Total 4TB less disk capacity required**

- Failover Clustering in Windows Server 2008 R2 known as Cluster Shared Volumes or CSV
- Live Migration (1 per host)
- iSCSI Configuration UI included in Hyper-V 2008 R2
- Dynamic Disk configuration
- Expected release 2010 Q1 ( +180 days for Hyper-V ?)

- VM Fault Tolerance: clustering on VM level (1 cpu, 10% performance hit)
- VM Safe / VM vShields: security on hypervisor level instead of OS level
- Hot Clone VMs
- VMware AppSpeed: Performance guarantees at application level
- Expected release summer 2009

# Questions??

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