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

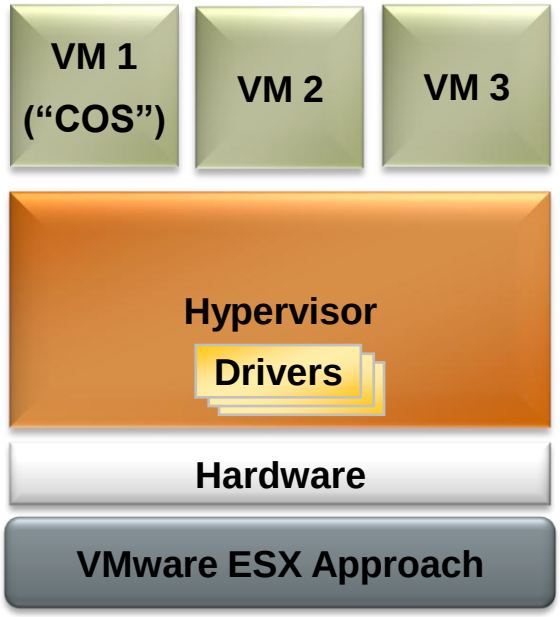
- Version choice
- Deployment in datacenter
- Guest OS
- Memory over-commit
- Migrations
- Storage usage
- Windows 2008 R2 Hyper-V 2.0
- VMware vSphere

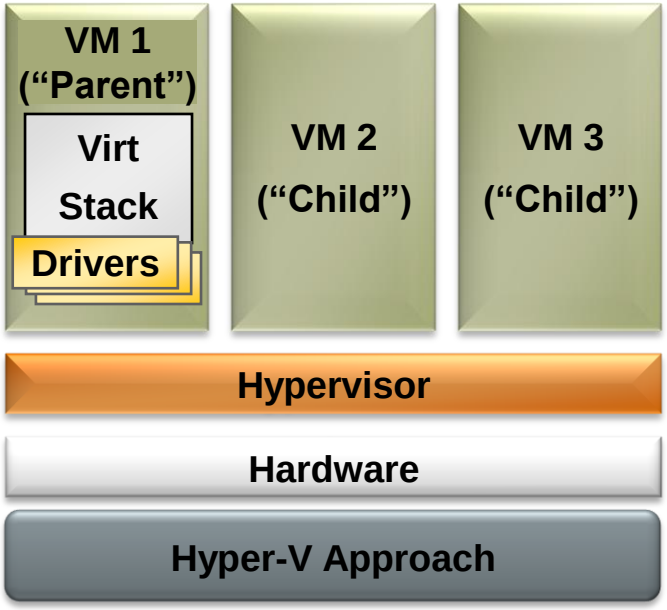
Version choice

- **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 optimalisations?





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
HCL but extensive hardware choice	**No HCL, but more limited in hardware choice !!!**

Guest OS

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	

Guest OS

- 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
			101 Gb

Hardware RAM

Motions

- 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, 3rd party tools

- QuickMigration means down time for more as just the application
- Emergency repair of host hits large number of applications

Motions

- Cluster Storage in Hyper-V demands a separate LUN per VM.
  - Per VM extra storage needed for snapshots and 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 x 40 + 700 x 10 = 35 TB
  - With ESX we use 30 VMs per LUN and reserve 30Gb per LUN
    - 25 LUNs x 30VMs x 40GB = 30 TB
    - 25 LUNs x 30GB spare = 750GB
  - **Total 4TB less disk capacity required**

Windows 2008 R2 Hyper-V 2.0

- 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 ?)

VMware vSphere

- 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 garantuees at application level
- Expected release summer 2009

Questions??

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