

Microsoft | Virtualization

Microsoft Virtualization Delivers More Capabilities, Better Value than VMware

It's clear that virtualization can help you save money and operate more efficiently. However, what may not be so apparent at first glance, is which virtualization approach makes the most sense.

VMware says it can reduce costs and improve flexibility. But a closer look reveals that its approach introduces more complexity and expense. Microsoft believes that, rather than undertaking a costly revolution, you should evolve your environment in a way that preserves and extends existing investments, strengthens your data center and desktop infrastructures, and reduces the burden on IT staff.

Microsoft® virtualization solutions deliver the capabilities, savings, and simplicity you need to tackle today's challenges and facilitate future growth.

Built-in Virtualization

To save your business time and money, we built virtualization directly into the operating system with Windows Server® 2008 R2 with Hyper-V™ virtualization technology and into the management platform with the Microsoft® System Center suite of solutions.

With Microsoft, your virtualized infrastructure consists of the three computing layers you already have: hardware, operating system, and applications. Virtualization is simply a role within the Windows® operating environment. But with VMware, you need a fourth layer just for virtualization: the VMware virtualization products, such as vSphere. If you use VMware, your IT staff must learn and support an extra virtualization level and vendor.

Just as daunting is the major forklift migration needed to move from VMware ESX 3.5 to vSphere—it is a significant change to customers' environments. For instance, vSphere breaks compatibility with existing tools that work with VMware Infrastructure 3 (VI3), and because vSphere virtual machines are not compatible with VI3, separate infrastructures must be maintained for each version of VMware. And—at a cost of \$5120 per processor and 2 years of maintenance for vSphere Enterprise Plus—it can make a tremendous dent in your budget.

When you use Microsoft solutions, however, your IT team already has the knowledge and tools needed to administer a virtualized environment. And, you don't need to manage an extra layer or pay a virtualization tax to get the functionality you require.

Extensive, Unified Management

The more you virtualize, the more complex your environment can become, and the more essential a comprehensive management system is to enabling a cost-effective, dynamic infrastructure.

With the Microsoft System Center suite, you get System Center Virtual Machine Manager, System Center Operations Manager, System Center Configuration Manager, and System Center Data Protection Manager—all integrated and all for one price.

Don't be confused by VMware's comparison of our management solutions. It tends to group all of its products together, and then pit them against just System Center Virtual Machine Manager.

But for a realistic assessment, you should compare them to the System Center suite. System Center gives you all the features of the disparate VMware products, and much more. It is the only solution that enables you to easily manage physical machines, and provides both host and in-guest management of virtual machines—all through one pane of glass.

Even if you already use VMware, you can still take advantage of everything Microsoft has to offer, particularly as you virtualize more servers. Unlike VMware, Microsoft can manage your existing VMware virtual machines and your Hyper-V–based virtual machines, through the same integrated system.

Covering All the Bases

For virtualization to significantly impact your business, it has to span your enterprise. Because Microsoft is a platform company—not a niche vendor, like VMware—we have the broadest view of a virtualized infrastructure and the most extensive portfolio of proven virtualization solutions, including Windows Server 2008 R2 with Hyper-V, Windows Virtual PC, Microsoft Enterprise Desktop Virtualization, Remote Desktop Services, Microsoft Application Virtualization, and the Microsoft System Center family. Unlike VMware, we address all aspects of the infrastructure—servers, applications, and desktops—and enable you to easily manage everything.

Hard Cost Savings

The savings that Microsoft virtualization solutions deliver over VMware are pretty straightforward: VMware typically costs three to five times more than Microsoft solutions. But VMware has introduced creative pricing strategies that make these clear-cut savings harder to see.

VMware has been misleading the market about its costs by moving features from one product to another and pricing them separately. For instance, VMware says vSphere 4 Enterprise costs less than Virtual Infrastructure Enterprise did, but that's only because it is now priced for one processor instead of two. Many new vSphere features are available only with the vSphere Enterprise Plus SKU, which costs 18 percent more than vSphere Enterprise and six times more than the comparable Microsoft solution.

VMware's pricing seems even more exorbitant when you consider that, with Microsoft Hyper-V Server 2008 R2, features such as clustering, high availability, and live migration are included at no

extra charge. To get many of the new vSphere features, such as 1 terabyte of host memory, Cisco vSwitch, and Host Profiles with VMware, you need vSphere Essentials Plus. Not only is this a cost upgrade for all current VMware customers, it is six times more expensive than the Microsoft solution for new purchases.

Is it worth all that expense for VMware when Microsoft solutions offer comparable or even better functionality at much less cost?

Enterprise vSphere vs. Windows Server 2008 R2/Server Management Suite Datacenter Comparison

5 servers, 2 processor system, with management server cost, 2 year maintenance, no operating system cost

	vSphere Standard	vSphere Advanced	vSphere Enterprise	vSphere Enterprise Plus	Server Management Suite Datacenter
Price Hypervisor + Management	\$13,958 +\$7,318 \$21,276	\$32,885 +\$7,318 \$40,203	\$42,124 +\$7,318 \$49,442	\$51,207 +\$7,318 \$58,525.00	\$0 +\$9,698 \$9,698
Cost Difference	2.2x more	4.2x more	5.1x more	6x more	↓
vSMP Support	4-way	4-way	4-way	8-way	4-way
Physical Memory	256GB	256GB	256GB	1TB	1TB
VM/OS Updates	✓	✓	✓	✓	✓
HA/Clustering		✓	✓	✓	✓
VMotion/Live Migration		✓	✓	✓	✓
Backup/Recovery	✓	✓	✓	✓	✓
Hot Add		✓	✓	✓	✓ Storage
Fault Tolerance		✓	✓	✓	
Storage VMotion			✓	✓	✓ Quick
DRS/PRO			✓	✓	✓
vNetwork/Host Profiles				✓	✓
Physical Mgmt					✓
In-guest Monitoring					✓
Cross Hypervisor					✓

(Microsoft Hyper-V Server 2008 R2 or existing Windows Server 2008 R2)

The Microsoft Technology Advantage

With Microsoft, you get the same core features that VMware offers, plus key capabilities that make managing your infrastructure much easier and that enable you to operate with much greater effectiveness.

In-Guest Management and Monitoring

Having a single tool to manage the virtual infrastructure, with the familiar interface of System Center and Windows, enables IT organizations to integrate virtualization into existing tools and processes, and take advantage of existing skill sets, thereby saving management, software, and training costs.

But there is much more to virtualization than just managing virtual machines and virtual hardware. The applications and workloads that run on those virtual machines are of primary importance. Because virtual machines are machines first, and virtual second, they must be managed and monitored just like physical machines, with additional features for virtualization management.

With Microsoft, this is easily accomplished through integrated physical and virtual management—specifically by integrating System Center Virtual Machine Manager 2008 R2 and System Center Operations Manager 2007 R2. Virtual Machine Manager includes a product connector for Operations Manager, which adds the virtualization-specific information from Virtual Machine Manager into the already rich monitoring database of Operations Manager.

Using System Center Operations Manager, administrators can monitor the entire IT infrastructure, both the physical and virtual, and get a visual diagram view of the complete virtual infrastructure. You can drill down into the logical groupings of hosts, into virtual hosts, into virtual machines, and right into the actual Windows installation and all the applications running in the virtual machine. Real-time status of the systems, including the status of their applications and services, is visible at each level. In fact, it doesn't matter if the applications are running on a physical or a virtual machine. What's important is that you can manage the entire IT infrastructure from existing tools. You can eliminate costs associated with adding or expanding virtualization to the existing infrastructure by taking advantage of existing System Center investments. And you can eradicate the cost and complexity of having two management infrastructures, one for physical and one for virtual.

Automated Virtual Machine Optimization with In-Guest Knowledge

Only Microsoft provides both host and in-guest management of all virtual machines. The combination of Hyper-V and System Center delivers critical insights into the virtual infrastructure at the application and service levels, as well as tools to leverage that knowledge. One of the features that enables this is Performance Resource Optimization (PRO) in Virtual Machine Manager. It allows optimization at both host and application levels. This is critical because managing virtual machines from an application perspective ensures a reliable, high-performing environment.

VMware does not offer this capability, as it is focused on the virtual machine rather than the workload. VMware's lack of in-guest management also affects its often-touted Memory Overcommit feature, which enables allocating more memory to virtual machines than they actually have. However, over-allocating memory to a virtual machine can result in under-utilization of resources on the host system, which goes against one of the driving factors for using virtualization for server consolidation. And when disk swapping occurs, the virtual machines will suffer significantly and the applications will endure most of the problems. In essence, the initiation point of issues moves from the virtual machine to the application. Because VMware does not have in-guest application and service monitoring, there is no way to assess problems within the virtual machine. While an administrator may see some metric indications of memory and disk usage, the impact on the actual application will remain unknown.

VMware has a Distributed Resource Scheduler (DRS) feature for performing post-placement optimization, but unlike PRO, DRS can only monitor CPU and memory utilization and cannot react automatically to application issues. VMware customers who do not have System Center would need to purchase and implement additional third-party applications for in-guest management, such as backup and software distribution. Many of these third-party applications are charged per virtual machine. By contrast, the System Center suite is licensed at the host level. This means that, as organizations scale more virtual machines per server, the capital cost benefits with Microsoft increase while the benefits associated with VMware decrease.

End-to-End Management

By providing both application-level knowledge and support, Microsoft enables much greater integration with virtualization. And with the comprehensive capabilities within the System Center suite, you can easily achieve seamless, end-to-end management, which is not

possible with VMware. Microsoft provides integrated software distribution and patch management (including virtualized applications with Microsoft Application Virtualization); compliance monitoring; system, applications, and service level monitoring; full backup and recovery of hosts; virtual machines and the applications inside the virtual machines; and integrated virtual and physical machine management.

Production Scalability

VMware claims superior scalability for its hypervisor; however, the tremendous scalability and reliability of Hyper-V is clearly evident. The popular Microsoft TechNet site, which receives more than 1 million hits a day, and MSDN®, which exceeds 3 million hits a day, both run 100 percent on Hyper-V. Even www.microsoft.com, which averages more than 1 billion hits a month, is a largely Hyper-V-based site.

Microsoft Technical Differentials

Microsoft virtualization solutions have key technical differentials that VMware likes to ignore. Some of the more notable examples include:

- **Integrated Live Migration and Failover Clustering:** With Windows Server 2008 R2, Hyper-V offers integrated live migration and failover clustering. These critical features are available at no cost in our stand-alone hypervisor, Microsoft Hyper-V Server 2008 R2—visit www.microsoft.com/virtualization/tryit/product-demos/default.msp for a free download. The least expensive version of vSphere that has vMotion, VMware's answer to live migration, is the Advanced SKU, which costs thousands of dollars per server.
- **Large Memory Support:** Windows Server 2008 R2 Hyper-V supports up to 1 terabyte of RAM on the hosts. VMware ESX only supports 256 gigabytes, and vSphere/ESX 4.0 supports up to 1 terabyte of RAM, but only in the most expensive SKU.
- **64-bit Hypervisor:** Hyper-V is already a 64-bit hypervisor, something that VMware is only just introducing with vSphere 4.0.
- **VMware vCenter Server Support:** System Center Virtual Machine Manager 2008 not only supports managing VMware hosts through Virtual Center integration, it can also manage and integrate multiple Virtual Center servers to give an overall view of your VMware infrastructure. This is a feature that VMware is just now adding to vSphere 4.0.

Microsoft virtualization is clearly a better value than VMware. With virtualization built into the Windows environment, and the free Hyper-V hypervisor, you don't need to support an extra layer or pay a virtualization tax. With the Microsoft System Center suite of integrated solutions, there's no added complexity when it comes to end-to-end management. And with the breadth of Microsoft desktop to data center products, you can create the virtualized environment that best suits your business.

Is it worth the extra line item on the invoice, the extra line in the budget, to use VMware virtualization when virtualization is built into Windows Server 2008 R2? The bottom line is this: there is no need to pay more and get less with VMware when you can get all the capabilities you need with Microsoft virtualization solutions.

For more information on how Microsoft virtualization is better than VMware, visit: www.microsoft.com/vmwarecompare

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