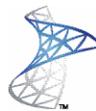# Microsoft®

private cloud solutions

Windows Server® | **Microsoft® System Center**

Top 5 Reasons to choose Microsoft Hyper-V™ R2 SP1 over VMware vSphere 5

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1. Tremendous Momentum & Strong Adoption by Customers

Since its launch in 2008, Hyper-V has gone through 3 releases and Microsoft has continued strong R&D investment in Hyper-V by adding more capabilities, increasing scalability, and enhancing performance.

Hyper-V market share expanded 285% (from 6.1% to 23.5%) during the period of CY2008 to CY2011, about 9 times more than the market share expansion for VMware vSphere in the same period[1].

Recently, Gartner published the 2011 Magic Quadrant for x86 Server Virtualization Infrastructure and listed Microsoft as a leader[2]. Added to this, a growing number of enterprise customers like Target, Siemens, Intel, T. Rowe Price, and Union Pacific are running their businesses on Microsoft Hyper-V.


2. Built-in Virtualization & Familiarity with Windows

Hyper-V exists in 2 variations- as a free standalone product called Microsoft Hyper-V Server 2008 R2 SP1 and as an installable role in Windows Server 2008 R2 SP1. Since Hyper-V is an integral part of Windows Server 2008 R2 SP1, it provides great value by enabling IT Professionals to continue to utilize their familiarity with Windows, and the collective knowledge of the community, while minimizing the learning curve.

With Windows Server 2008 R2 SP1 you get a compelling solution for core virtualization scenarios – production server consolidation, dynamic datacenter, business continuity, VDI and test & development. Hyper-V provides you better flexibility with features like live migration and cluster shared volumes for storage flexibility. Hyper-V also delivers greater scalability with support for up to 64 logical processors and improved performance with support for dynamic memory and enhanced networking support.

With VMware, you have to pay separately for the hypervisor (from $995-$3495 per processor, with memory restrictions of 32-96 GB per processor[3], support costs separate) and also purchase an operating system like Windows Server for running guest operating systems. Similar to Microsoft, VMware also offers a free hypervisor, but unlike Hyper-V, VMware's free

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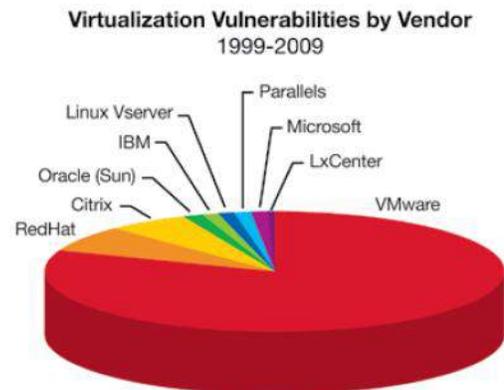
[1] IDC WW Quarterly Server Virtualization Tracker, June 2011. Data represents x86 + EPIC based server, http://www.idc.com/getdoc.jsp?containerId=IDC_P15379

[2] Gartner (June 2011): Publication Date: 30 June 2011/ID Number: G00213635, © 2011 Gartner, Inc. and/or its Affiliates. All Rights Reserved. The Magic Quadrant is copyrighted 2011 by Gartner, Inc. and is reused with permission. The Magic Quadrant is a graphical representation of a marketplace at and for a specific time period. It depicts Gartner's analysis of how certain vendors' measure against criteria for that marketplace, as defined by Gartner. Gartner does not endorse any vendor, product or service depicted in the Magic Quadrant, and does not advise technology users to select only those vendors placed in the "Leaders" quadrant. The Magic Quadrant is intended solely as a research tool, and is not meant to be a specific guide to action. Gartner disclaims all warranties, express or implied, with respect to this research, including any warranties of merchantability or fitness for a particular purpose. This Magic Quadrant graphic was published by Gartner, Inc. as part of a larger research note and should be evaluated in the context of the entire report. The Gartner report is available upon request from Microsoft.

[3] VMware vSphere pricing, http://www.vmware.com/products/vsphere/pricing.html

hypervisor doesn't have any advanced functionality like Live Migration or High Availability and imposes several restrictions like 32 GB memory limit for VMs[4].

Additionally, with a microkernelized hypervisor-based architecture, Hyper-V provides a more secure, reliable foundation for running virtual machines. The minimal hypervisor does not contain drivers; instead, the drivers are hosted in the parent partition and along with the new IO sharing model, Hyper-V provides an inherently more secure architecture[5].

3. Hyper-V Best Choice for Virtualizing Microsoft Workloads

Choosing to virtualize tier-1 data center applications with Hyper-V enables businesses to increase availability, improve agility, and overcome scalability and performance concerns. IT organizations can lower costs with built-in hypervisor support and benefit from existing skill sets to automate and monitor their environments using tools with which their staff are already familiar.

Microsoft has published third-party validated lab results that prove best-in-class performance for Microsoft workloads on Hyper-V – over 450,000 concurrent SharePoint 2010 users on one physical server with five VMs, 80,000 OLTP users on one server with four SQL Server 2008 R2 VMs, and 20,000 Exchange 2010 mailboxes on one server with four VMs.[6]

When choosing Hyper-V to virtualize Microsoft workloads, organizations also benefit by avoiding complicated support models and using Microsoft System Center as a management tool for both physical and virtual environments. Hyper-V technology provides increased deployment options, increased resource utilization, enhanced business continuity, and a more efficient IT operating environment. Put it all together and it's clear that Hyper-V R2 SP1 can be used to virtualize tier-1 data center applications with confidence.

4. Superior, Richer Management Capabilities with System Center

System Center enables physical, virtual, private and public cloud management using a single pane of glass. System Center captures and aggregates knowledge about systems, policies, processes, and best practices so that you can optimize your infrastructure to reduce costs, improve application availability, and enhance service delivery. Microsoft has a well differentiated position across all aspects of the management stack with System Center, including the following

- Support for multi-hypervisor management
- Support for third party integration and process automation

[4] http://www.vmware.com/products/vsphere-hypervisor/faq.html
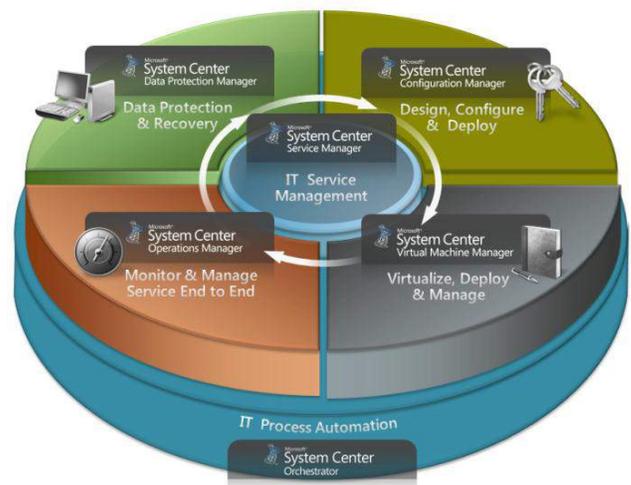
[5] IBM X-Force 2010 Mid-Year Trend and Risk Report ftp://public.dhe.ibm.com/common/ssi/ecm/en/wgl03003usen/WGL03003USEN.PDF

[6] ESG Summary on Hyper-V R2 SP1 Microsoft Workload Performance, http://www.microsoft.com/virtualization/en/us/solution-business-apps.aspx

- Ability to manage applications via a single view across private clouds and Windows Azure
- Deep application diagnostics and insight for Windows and .NET based environments
- Technologies like Server Application Virtualization, which enable you to abstract your applications from the underlying private cloud infrastructure.

## 5. Windows Server 8 Hyper-V & VMware Memory and Per-VM pricing

Microsoft introduced the developer preview of the next release of Windows Server codenamed Windows Server 8 at BUILD conference in September 2011. The Hyper-V role in the Pre-release Windows Server codename 8 provides a complete virtualization platform with increased scalability and performance and connectivity to cloud services[7]. Some of the new and enhanced features include

- Massive Scale and Performance- support for up to 160 logical processors and 2 TB of memory per host & support for up to 32 virtual processors and 512 GB of memory per virtual machine
- Multi-tenancy, Isolation, and Replication- Hyper-V Network Virtualization, Hyper-V Extensible Switch, and Hyper-V Replica
- Complete VM Mobility- Share Nothing Live Migration, Live Storage Migration, multiple concurrent Live Migrations and Live Storage Migrations, support for SMB 2.2 file based storage

VMware products like vSphere 5, Cloud Infrastructure Suite, vCenter Operations Management Suite, and vFabric Application Management Suite licensing lay the foundation for charging customers for achieving greater density and maximizing hardware resources. Specifically, the vSphere licensing model has devolved from per processor with physical core restrictions to per processor with vRAM (virtual memory) entitlements. As shown below, vSphere 5 charges you based on the virtual memory allocated to your VMs.

	vSphere 5 Standard	vSphere 5 Enterprise	vSphere 5 Enterprise Plus	Hyper-V
vRAM entitlement/processor	32 GB	64 GB	96 GB	Unlimited
Price per GB vRAM	$31.09	$44.92	$36.40	$0

Microsoft private cloud solutions built on Hyper-V are licensed on a per processor basis, so customers get the cloud computing benefits of scale with unlimited virtualization and lower costs – consistently and predictably over time. VMware private cloud solutions built on vSphere 5 are licensed by either the number of virtual machines or the virtual memory allocated to those virtual machines – charging you more as you grow. This difference in approach means that with Microsoft your private cloud ROI increases
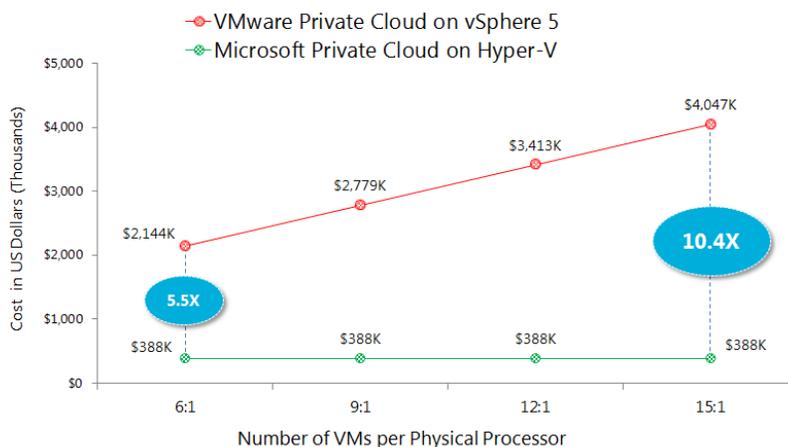
as your private cloud workload density increases. With VMware, your cost grows, as your workload density does. As shown, a VMware private cloud solution on vSphere 5 can cost from five to ten times more than a comparable Microsoft private cloud solution on Hyper-V over a period of one to three years[8].

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[7] Windows Server 8 Hyper-V Overview, http://blogs.technet.com/b/server-cloud/archive/2011/10/11/windows-server-8-hyper-v-overview.aspx

[8] 42 hosts with 2 CPU each. Costs shown for 3 years for License and Maintenance, VMware cost includes Windows Server Datacenter edition for running guests, Cost doesn't include hardware, storage or IT costs. VMware pricing info available on http://vmware.com/products