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## Inquiry Spotlight: Server Virtualization, Q3 2008

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### EXECUTIVE SUMMARY

As organizations continue to deploy server virtualization, questions have shifted from “if” to “how.” Out of all 220 inquiries Forrester’s IT infrastructure and operations team answered on data centers, servers, and virtual appliances in 2008 to date, 72 were specifically in regard to server virtualization. These IT professionals’ most common inquiries addressed vendor comparison, optimum physical to virtual consolidation ratios, expected ROI, and situation-specific concerns regarding the possible benefits that virtual servers could provide. These inquiries came from organizations in the early stages of implementing server virtualization — if you are considering or are in the process of implementing, you too should be asking these questions.

### VIRTUAL SERVERS SHOULD BE IN YOUR DATA CENTER

According to Forrester’s Enterprise and SMB Hardware Survey, North America and Europe, Q3 2007, 28% of firms had already implemented server virtualization by July 2007, and another 11% planned to implement virtual servers by July 2008. These firms also anticipated virtualizing 42% of their servers by July 2009, which is a significant increase from the 24% reported in July 2007.<sup>1</sup> In short, the interest in virtual servers is still on the rise for both veteran and inexperienced firms, and thus these firms are finally asking the questions that will help them succeed in their deployments.

### Your Peers Are Asking: “What Hypervisor And VM Management Tools Should I Use?”

Fifty-four percent of all server virtualization inquiries between January 2008 and September 2008 included questions on vendor selection and management tools (see Figure 1). Some IT professionals wanted a hypervisor vendor recommendation, while others focused on the management tools necessary to administer virtual servers.

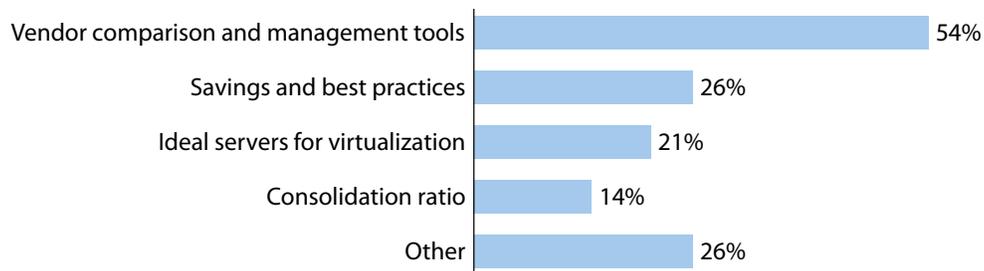
- **What you need to know:** At present there are three main choices for a hypervisor: VMware ESX, Citrix XenServer, and Microsoft Hyper-V (see Figure 2). There are other variants, such as Symantec’s Veritas Virtual Infrastructure, which bundles Symantec storage management and virtualization with Citrix XenServer. In addition to the hypervisor itself, you need two extra classes of tools to successfully deploy and manage a virtual environment: migration/capacity planning tools and a system management platform. Most virtualization vendors offer physical-to-virtual migration and capacity planning tools at little to no cost. However, third-party tools like Novell PlateSpin provide more automation as well as the ability to revert to physical hardware if desired. Others, like CiRBA, offer planning tools that can optimize VM placement to maximize your hardware savings.

There are three main system management platforms available for ongoing management of your virtual environment: VMware's product suite, Microsoft System Center, and Citrix XenCenter. This system must be compatible with the hypervisor and migration/capacity planning tools you have selected. The hypervisor you select will have a big impact on which tools you ultimately use to manage your overall environment.

- **What you should do about it:** Most customers we speak with continue to favor VMware, which is considered the highest performing virtualization platform on the market. In addition, the capabilities of VMware's extensive management and automation tools exceed what is available from competing virtualization providers. In the coming 12 to 18 months, this decision becomes less straightforward, because competitors will begin to match certain must-have features like live migration or fault tolerance. Even so, we believe that VMware still maintains a lead in technical specs like the maximum amount of virtual machine memory, processors, and I/O bandwidth.

Over the next couple of years, hypervisor performance will become less of a deciding factor. You'll need to make your decision based on the management tools and their integration with your existing infrastructure.<sup>2</sup>

**Figure 1** Vendor Comparison And Management Tools Is The Top Concern On Server Virtualization



Base: 72 end user inquiries on server virtualization  
(multiple responses accepted)

Source: Forrester's Inquiries January 2008 to September 2008

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Source: Forrester Research, Inc.

**Figure 2** Hypervisor Vendor Summary

Product	Vendor	Description
VMware Server	VMware	Market leader and most mature offering with most enterprise production deployments. It has a large ecosystem of management, monitoring, professional services, and support organizations that currently work with the platform.
XenServer	Citrix	Another solid option that has a codevelopment relationship with Microsoft, which ensures strong interoperability and mutual support. Does not have a significant market share or ecosystem of ISVs and professional services organizations. This can be problematic when trying to find certified professionals or third-party applications that support it.
Hyper-V	Microsoft	New product integrated with Microsoft Windows Server and System Center that is expected to see broader adoption in 18 months.

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Source: Forrester Research, Inc.

### Your Peers Are Asking: "What Kind Of Savings Should I Expect?"

Twenty-six percent of inquiries relating to server virtualization addressed ROI and best practices. The majority of these questions asked whether companies that adopted server virtualization had experienced a positive ROI. Others wanted information on best practices and ROI tracking tips.

- What you need to know:** By virtualizing your servers, you should experience decreased server hardware purchases and maintenance costs, lower facility costs, fewer network ports, reduced provisioning and migration costs, and fewer applications failures. More specifically, depending on their consolidation ratio, organizations are saving up to 50% on hardware costs, as well as delaying new server purchases for 12 to 18 months. Server virtualization also frees up data center space that was previously occupied by mainly idle servers — which drew a great deal of power while not in use.<sup>3</sup> In addition, server virtualization can reduce the number of expensive Fibre Channel and Gigabit Ethernet ports required. For example, a modular, chassis-based enterprise-class 10 GbE core switch costs a minimum of \$5,000/port, and an Enterprise 4 Gb Fibre Channel switch with a high port count runs around \$1,500/port.<sup>4</sup> Simply freeing up expensive switch ports can help build your business case. Most firms have also found that they spend less time building and provisioning new servers, saving both time and money. Furthermore, platforms like VMware ESX and Citrix XenServer have built-in workload management and high availability technologies that can prevent applications from running out of capacity and that will automatically restart failed applications. This reduces costly downtime and employee productivity losses.<sup>5</sup>

- **What you should do about it:** Be sure to look at both the hard and soft cost savings for virtualization. First, examine the hard cost savings in server hardware, maintenance, switch ports, power, and facilities. Don't initially count on management savings — these are hard to calculate and depend on the degree of automation and process change you can digest. After looking at the hard costs, move on to the more difficult savings — like better availability for more of your apps or a shorter wait for new server requests.

Finally, a big part of your ROI depends on your physical-virtual consolidation ratio, which will determine how much you pay on a per virtual machine basis for all the hardware and software in your server farm. Understanding your environment will also help you determine what virtual-physical ratio you should adopt. Forrester recommends hiring an IT consolidation consultancy such as Accenture, AT&T Consulting, HP Professional Services, or IBM Global Services, who can provide detailed analysis of which servers in your portfolio are best candidates for consolidation and what the cost of this transition will be for your specific circumstances.<sup>6</sup>

### Your Peers Are Asking: "Is My IT Shop A Good Candidate For Server Virtualization?"

Twenty-one percent of all server virtualization inquiries came from clients wanting to know if server virtualization would be useful in their organization. What types of IT shops benefit from server virtualization, and what kinds of server environments make it worthwhile?

- **What you need to know:** Server virtualization lowers IT costs in a variety of ways, most of which stem from eliminating excess infrastructure. However, there are other, harder-to-calculate benefits, such as near-instant provisioning and quicker recovery from disasters or application failures. Still, server virtualization is not ideal for everyone.<sup>7</sup> Answer the questions below to get a better idea of whether virtualization is right for you. Also keep in mind that Forrester has found that almost everyone can benefit from some server virtualization.
- **What you should do about it:** Ask yourself the following seven questions: 1) Do we have a large number of underutilized x86 servers running Windows or Linux? 2) Do we have a relatively centralized organizational structure? 3) Do we have networked storage? 4) Do we have low server utilization? 5) Do we need to roll out cost-effective DR to a wide range of applications? 6) Do we have a shortage of raised floor space in our data center? and 7) Do we have limited power and cooling resources? If you said yes to even a few of these questions, your company would benefit from adopting virtual servers. It may not be appropriate for every server today, but the percentage of applications that can be successfully virtualized has been growing year after year. As a result, many firms make virtual machines their default server policy and require waivers for applications that have a demonstrated need for their own physical hardware.

## Your Peers Are Asking: “What Physical-Virtual Server Consolidation Ratio Should I Have?”

Fourteen percent of inquiries on server virtualization included questions about ideal server consolidation ratios. These IT pros also want to know what percentage of their servers they should virtualize to achieve the greatest cost efficiencies.

- **What you need to know:** To determine the most cost-effective percentage of your servers to virtualize, you need to understand which servers would benefit the most from virtualization. As suggested, hiring an IT consolidation consultancy would help you answer this question for your specific environment. According to the August 2007 US Enterprise IT Consolidation Online Survey, an average of 36% of firms’ x86 servers are virtualized or partially virtualized.<sup>8</sup> These same respondents hope to reach a 45% virtualization level by the end of their consolidation efforts. Seventy-five percent of respondents were using virtual servers for at least part of their strategy in 2007. The survey also found that 43% of IT firms expect to achieve a virtual-physical consolidation ratio between 3 to 1 and 5 to 1, and another 24% expect a consolidation ratio between 6 to 1 and 10 to 1.
- **What you should do about it:** Consolidation ratios depend on your application workload, as well as the hardware platform you select for your virtual machines. If you are experimenting with virtual machines or are running older products like Microsoft Virtual Servers and VMware GSX, expect a virtual-physical ratio of 5 to 1 at a minimum. Experienced virtual production environments usually have around 30 virtual machines on a four-socket server like HP’s DL585. In actuality, this is well below the maximum capacity of such a server — especially when using proprietary features like VMware’s memory overcommit, which acts as a deduplication for memory pages. On VMware and Citrix platforms you can use automated resource scheduling tools to drive your servers to near full capacity. If an application spikes, live migration tools can relocate VMs to spread out the workload. By using these advanced features, you can run 50 or more VMs on a machine, driving your per VM costs down even further.

## ENDNOTES

- <sup>1</sup> Source: Enterprise And SMB Hardware Survey, North America And Europe, Q3 2007.
- <sup>2</sup> VMware is the most mature, stable, and supported x86 hypervisor on the market today, and as Forrester has previously recommended, is the choice for organizations selecting a platform now. However, we don’t recommend locking yourself into a single hypervisor strategy in the long term, such as by over-investing in custom integration with proprietary management tools. See the December 5, 2007, “[Citrix’ Xen Belongs In Your Virtualization Portfolio](#)” report.
- <sup>3</sup> Source: The Green Grid, “Five Ways to Reduce Data Center Server Power Consumption” ([http://www.thegreengrid.org/gg\\_content/White\\_Paper\\_7\\_-\\_Five\\_Ways\\_to\\_Save\\_Power.pdf](http://www.thegreengrid.org/gg_content/White_Paper_7_-_Five_Ways_to_Save_Power.pdf)).
- <sup>4</sup> Today, 10 GbE is recognized as the next phase of network evolution; the only question remaining is how soon it will be widely deployed. With pricing for enterprise-class 10 GbE core switches from major vendors

still upward of \$10,000 per port, adoption is currently limited to cutting-edge environments that truly push the bandwidth envelope. But emerging vendors are already exerting downward pricing pressure, with offerings available in the \$500 to \$1,000 per port range. Forrester anticipates that it will be another couple of years before equilibrium is reached, with 2010 being the year of widespread investment in 10 GbE infrastructure. Specifically, 10 GbE must cross two hurdles: 1) the reduction of 10 GbE component prices, and 2) the increased bandwidth needs on corporate networks. How? Increased competition accomplishes the first, and a combination of storage traffic migrating to Ethernet and the ongoing increase of Web traffic takes care of the second. See the May 16, 2008, "[10 GbE: Its Time Is Coming](#)" report.

- <sup>5</sup> Companies have come to the realization that the cost of downtime includes not only revenue losses, but also employee productivity losses; compliance penalties (e.g., fees because your finance system was unavailable at a critical fiscal close); and penalties and discount losses (e.g., penalties or late fees from an inability to process payments, or potential discount losses from an inability to process early payments and take advantage of discount terms). See the October 24, 2007, "[X86 Server Virtualization For High Availability And Disaster Recovery](#)" report.
- <sup>6</sup> In general, Forrester has found that most organizations can benefit from some degree of virtualization, as average server utilization tends to be below 25%. And by consolidating the physical servers in your environment, you should be able to fund your virtualization project by postponing future server purchases, reclaiming data center space, and lowering power and cooling costs. For a detailed analysis, it's worth engaging an IT consolidation consultancy such as Accenture, HP Professional Services, IBM Global Services, or AT&T Consulting, who can provide detailed analysis of which servers in your portfolio are best candidates to be consolidated this way and what the cost of this transition will be for your specific circumstance. See the June 17, 2008, "[Ten Common Questions About x86 Server Virtualization](#)" report.
- <sup>7</sup> The best way to decide this is to examine your current IT asset portfolio and determine if you are as efficient as you could be today and if virtualization can improve your efficiency (and if so, to what degree). In general, Forrester has found that most organizations can benefit from some degree of virtualization, as average server utilization tends to be below 25%. And by consolidating the physical servers in your environment, you should be able to fund your virtualization project by postponing future server purchases, reclaiming data center space, and lowering power and cooling costs. See the June 17, 2008, "[Ten Common Questions About x86 Server Virtualization](#)" report.
- <sup>8</sup> Source: August 2007 US Enterprise IT Consolidation Online Survey.