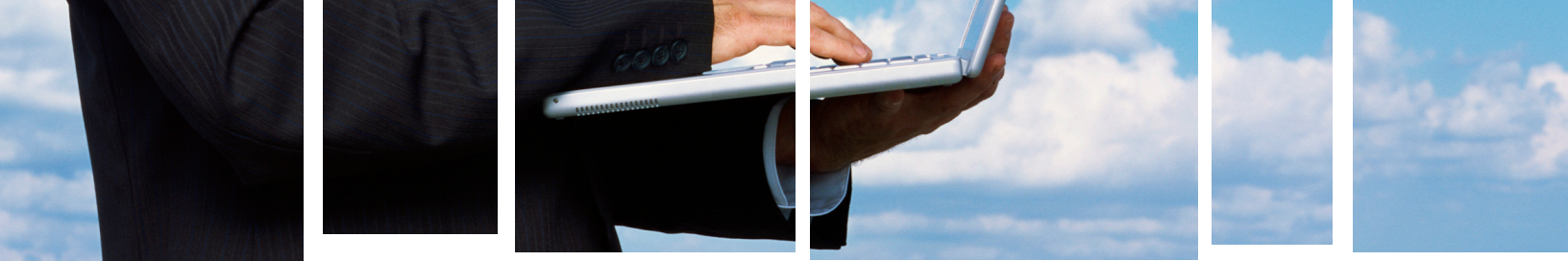# Four Reasons Why Application Specialists are Learning to Love Virtualization

Performance advancements in virtualization technology are benefiting development, testing, and deployment activities in Microsoft, Oracle and SAP environments

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Four Reasons Why Application Specialists are Learning to Love Virtualization

Performance advancements in virtualization technology are benefiting development, testing, and deployment activities in Microsoft, Oracle and SAP environments

By Alan Joch

No doubt you've noticed that virtualization is a hot topic these days. Infrastructure experts and CFOs alike see virtualization as a proven way to do everything from cutting IT costs to taking a big step toward green computing. But if your job is to spend every waking minute thinking about launching new business applications and keeping them humming at optimum speeds, the virtualization juggernaut can sometimes look like a runaway train.

Applications specialists spend long hours developing, testing and fine tuning business-critical systems—why risk it all by throwing virtualization into the mix? The short answer is that server and storage virtualization can pay big dividends not only for IT infrastructures, but just as importantly for the business systems they support. This includes Microsoft Exchange and SharePoint, SAP Applications, and Oracle and Microsoft databases. It's enough to convince even the staunchest skeptics to take a second look.
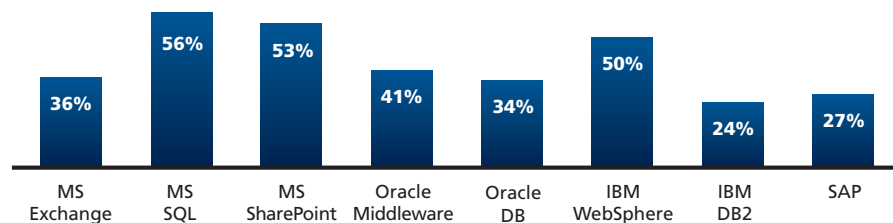
Finding common ground is never easy, especially when two groups have conflicting interests (Cut costs or boost performance? Consolidate hardware or improve reliability?). The challenge for applications people is to understand what virtualization can do for them and make sure enterprise virtualization strategies fully address their needs. The good news is that, with the right plan in place, virtualization offers benefits everyone can appreciate.

Overcoming Fears

Fear of performance degradation used to be the single biggest hurdle that kept applications specialists from fully embracing virtualization. But now, those responsible for applications can comfortably embed their servers within a virtual framework and still achieve the performance levels business users need (see sidebar Performance Gains).

This helps explain why a VMware survey

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Virtualization Acceptance Grows

MS Exchange	MS SQL	MS SharePoint	Oracle Middleware	Oracle DB	IBM WebSphere	IBM DB2	SAP
36%	56%	53%	41%	34%	50%	24%	27%

A recent poll reported that a growing percentage of VMware customers use virtualization to support key applications in production systems.
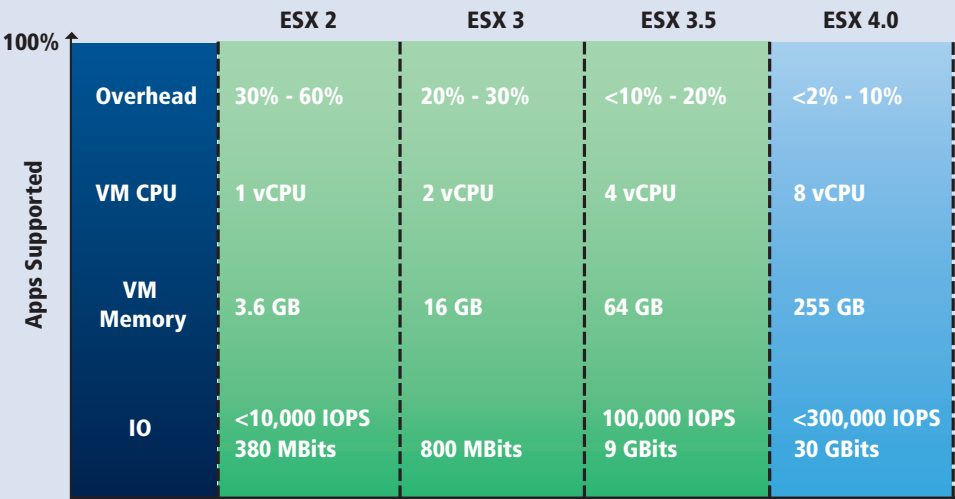
of its customers found that 56 percent were running at least one production instance of Microsoft SQL Server on its virtualization plat- form. Other applications where virtualization adoption is growing include Microsoft Exchange, Microsoft SharePoint, SAP, and Oracle Database.

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PERFORMANCE GAINS

In the early days, first generation technology was certified to work only with single CPU computers and a mere 3.6 gigabytes of memory per virtual machine, and levied a perfor- mance hit of anywhere from 30 to 60 percent compared to physical servers. Application people had good reasons to designate production systems virtualization-free zones.

Fast forward to today. The latest generation virtualization technology supports eight-CPU Intel x86 Nehalem chipsets, 255 gigabytes of memory, and 30 times more I/O calculations per second than before. Performance overhead has dropped to less than 2 percent in some cases (see figure below).

Virtualization Adds Negligible Overhead

Apps Supported		ESX 2	ESX 3	ESX 3.5	ESX 4.0
	Overhead	30% - 60%	20% - 30%	<10% - 20%	<2% - 10%
	VM CPU	1 vCPU	2 vCPU	4 vCPU	8 vCPU
	VM Memory	3.6 GB	16 GB	64 GB	255 GB
	IO	<10,000 IOPS 380 MBits	800 MBits	100,000 IOPS 9 GBits	<300,000 IOPS 30 GBits

Advancements in successive generations of VMware ESX virtualization technology have lowered performance overhead to insignificant levels.

Source: VMware

Additional performance efficiencies are possible when applications and databases are paired on the same virtual host. Doing so enables the two components to exchange data at the speed of modern system buses.

Such compelling data helps turn the tide among virtualization naysayers in applications departments. For example, 73 percent of respondents in a poll conducted by IT researcher Gartner said they have virtualized mission-critical applications in production systems.

Four Reasons Why Virtualization Benefits Applications

1. Test and development time reduced

2. High availability made easy

3. Resources optimized

4. Scaling capacity

Top Four Reasons Why Virtualization Benefits Applications

Now that performance fears are fading away, applications teams are rethinking virtualization's merits and learning that there may in fact be a lot to love about the technology. Four reasons rise to the top of the list:

Reason #1: Test and Development

Provisioning delays in test and development environments can rack up hundreds of thousands of dollars in wasted consultants' fees and time-to-market setbacks when a new application has the potential to increase an organization's competitiveness. Inadequate testing also represents one of the greatest risks for the applications staff because an overlooked coding error may eventually go on to corrupt production data, which for most environments represents one of the worst possible nightmares. With virtualization, developers can dynamically provision test-bed servers, memory, and storage systems to perform the comprehensive testing they need.

"Before virtualization, if I had a new request that required a new SAP test instance, it would take several weeks to buy a new server and install the operating systems and SAP application before development and testing could begin," says Chinh Van, senior manager, global ERP systems at Callaway Golf Co. "But now with VMware, we just provision it within 30 minutes and we're off and running."

Reason #2: High Availability Made Easy

Ask application specialists what keeps them up at night and they probably will boil it down to one word: downtime. The risk is heightened when core applications rely on physical servers that bring business operations to a halt when something goes haywire. With virtualization, however, an applications specialist only needs to locate an alternative virtual machine from the pool and provision it to run the application. Management tools like VMware High Availability and VMotion speed these changeovers. Another plus: high

availability capabilities in virtual environments typically require less volume-management expertise than what's required for running proprietary clustering technologies from database vendors.

University of Plymouth in southwestern England discovered these advantages when it virtualized 50,000 Microsoft Exchange mailboxes on VMware Infrastructure. "We used Microsoft clustering with our physical implementation of Exchange 2003, but we now use VMware for high availability, which takes away the complexity that clustering added to our system," says Adrian Jane, infrastructure and operations manager at the university. "The VMware platform also provides high availability for every virtual machine, not just the mailbox server."

Reason #3: Resource Optimization

When IT cost savings are realized, more resources are available for new application initiatives. A single virtual machine can consolidate five to ten physical servers, yielding cost savings for the company and an overall improvement in the quality of IT services for the applications department.

For example, as volatile business conditions push enterprises to react to changes and new opportunities faster than their competitors, organizations are looking to become more agile by reducing the complexity of their IT infrastructures. Virtualization

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CHECKLIST FOR APPLICATION VIRTUALIZATION

- Leverage the expertise of vendors who understand the application and underlying infrastructure to develop options

- Collaborate with in-house infrastructure experts to develop an overall virtualization strategy

- Virtualize testing environments to reduce the risks that coding errors will corrupt data in production systems

- Then scale virtualization to your full IT environment

- Develop virtualization expertise by targeting servers in Tiers 2 and 3, such as Web front ends for Microsoft Exchange or in Oracle clusters

delivers this agility by creating single technology stacks of databases, which can then be paired with e-mail, ERP or collaboration applications.

Reason #4: Scaling Capacity

The single stack approach in turn benefits applications specialists by allowing them to provision IT resources more quickly. With virtualization, managers carve out a new virtual machine and see the extra capability up and running in less than a day. In the past, the same result would have required a purchase order for a new physical server, a month or more waiting for delivery, and then a day or two to bring the new hardware online.

Virtualization flexibility can be especially important for businesses that experience seasonal highs and lows, such as retailers that count on the Christmas shopping season for the bulk of their annual sales. Virtualization lets applications groups at these companies quickly allocate CPU, memory, and storage resources to meet demand peaks and just as quickly re-provision those resources to other areas when crunch time passes.

Virtual machines also provide automated load-balancing tools that can monitor pre-set CPU usage thresholds to spot a frequently used server before it's in danger of maxing out its capacity. The tools then locate underused CPUs elsewhere and spread the traffic to a collection of devices.

First Steps to Applications Virtualization

As a growing number of applications specialists are discovering, virtualization can work for them—but only if they and the infrastructure side of the aisle are on the same page about each other's goals and needs. Here's how applications people can start the process of making virtualization work for them.

First, like most things IT, planning is key. Before jumping into a virtualization project, work with the infrastructure experts to plan an overall strategy that includes some upfront testing to gauge the performance and scalability results that might be attainable in your particular environment. To get both groups in sync, some organizations conduct a series of meetings to hammer out the guiding principles of their virtualization strategy, including the concerns of applications specialists. Include specific timeframes for how long it will take to set up test servers, provision new resources for production environments, react to unplanned downtime,

and other key areas where virtualization benefits are expected.

To prepare for these talks, think in terms of tiers. IT infrastructures architected for high performance and high availability use Tier 1 for the organization's essential business applications—the e-mail, database, ERP CRM, and collaboration applications that business users can't live without. Tiers 2 and 3 often include important but somewhat less crucial file, Web, infrastructure and network servers along with test and development systems for ERP applications.

Knowing about tiers can help pinpoint low-hanging virtualization fruit. For example, most Microsoft Exchange environments consist of a complex series of Web front ends and tiered servers that interconnect with the heart of the system—the mailbox server and all the active e-mail messages being sent and delivered. So if the time isn't right to virtualize a giant mission-critical server, no problem. A conservative approach is fine.

Similar virtualization advantages exist for other platforms. So if SAP releases an update or Enhancement Pack that offers an innovation for general ledgers, developers can tap a virtual machine to run a quick proof-of-concept pilot to gauge the impact on the production environment and to elicit management buy-in for the new capability.
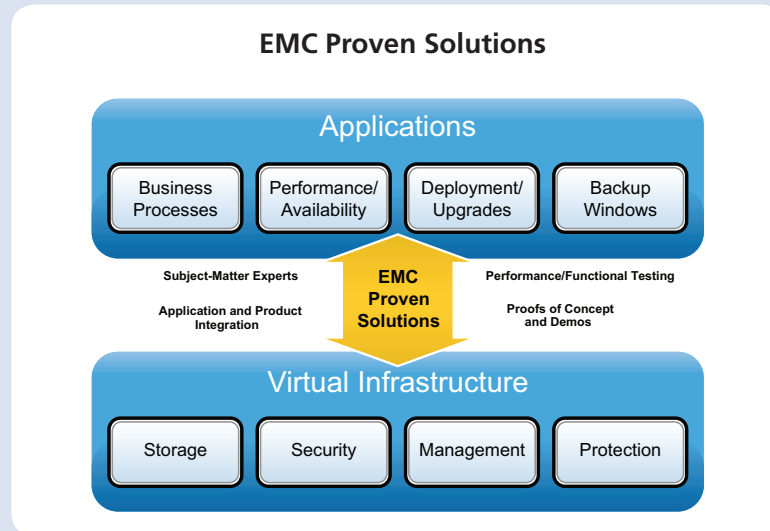
Oracle specialists who want high availability without the complexities and domain expertise associated with Oracle Real Application Clusters will also find relief with virtualization. VMware provides out-of-the-box high availability as well as simplified horizontal scalability for two-node server applications. Once the planning, strategy sessions and tier considerations have been nailed down, it's time to begin the journey.

What's the best first step to application virtualization? Many organizations target the test and development servers to take advantage of the provisioning capabilities discussed earlier and enjoy the immediate pay off of reducing the risks of coding errors. From there, consider virtualizing the many small servers in Tiers 2 and 3 into consolidated pools for agility, flexible provisioning and high availability.

The lessons applications specialists learn in these environments will build the confidence they need to consider everything else prime virtualization territory. ✧

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Application and Product Integration

EMC Proven Solutions

Performance/Functional Testing

Proofs of Concept and Demos

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