VMware and Intel work together to deliver reliability, value and ease of deployment in the dynamic data center of today and in the future, giving customers the confidence to start benefiting from virtualization now.

Virtualization is here, and two organizations are at its forefront: VMware and Intel. VMware, a leader in virtualization, provides software that virtualizes servers, storage, and networking, to allow multiple unmodified operating systems and their applications to run independently on virtual machines while sharing physical resources. Its built-in high availability, resource optimization, operational automation and security capabilities provide better service levels to applications at a lower cost than a static, physical infrastructure. VMware virtual infrastructure software for industry-standard systems currently has some 20,000 corporate customers and over 4 million users.

Intel, a global leader in the microprocessor technology that powers those industry-standard systems, is committed to adding functionality that enables virtualization and easier systems management. Its robust server platforms address many kinds of business applications by combining performance, scalability and availability to deliver outstanding service levels. Intel also offers a wide variety of optimized tools and resources. When combined with VMware technology, these tools and resources can drive server consolidation ratios as high as 20:1, provide the foundation for effective disaster recovery and deliver affordable high-availability solutions.

Relying on the respective and combined domain expertise of VMware and Intel, a growing number of organizations are finding that infrastructure optimization can be addressed holistically across the data center.

Financial Giant Adopts Virtualization
A case in point is AXA Technology Services, an internal service provider for the
AXA Group, a global organization with 52 million clients and more than 120,000 employees. In early 2004, AXA Technology decided to adopt VMware® ESX Server™ to consolidate 11 Wintel servers that supported AXA Financial’s Broker Dealer Infrastructure, an internally developed application that runs across a heterogeneous server environment including Windows, UNIX and mainframe systems.

Because of the critical role Broker Dealer Infrastructure played within the AXA Group, it was vital that it perform as well in the VMware virtual environment as in its traditional physical environment.

“We wanted to gain the benefits of server consolidation, but we needed to guarantee that the performance of broker applications running on virtual machines would be as reliable as running them on physical servers,” says Ken Torricella, AXA’s director of infrastructure solutions services. “With VMware ESX Server, we were able to successfully migrate our applications to virtual machines, and the applications ran flawlessly.”

In fact, the virtual machines were distributed on a 4-CPU Intel® Xeon® processor-based IBM x Series server, each with 16 Gb RAM. Nine virtual machines ran on a single ESX Server-enabled IBM host, two ran on a second (along with several non-broker-dealer virtual machines), and one ESX Server instance was reserved for standby operation in the event of a disaster.

Results of the move to virtualization included:

• $550,000 in hardware expenditure savings
• 30 percent improvement in server utilization
• faster server procurement
• reduction in time needed to acquire and build server from days to hours
• 12:1 server consolidation ratio overall

Timothy Midgley, the technical lead in Torricella’s group, was in charge of the migration. VMware tools were used to migrate and then test the application running on virtual machines on ESX Server hosts. “...We were able to quickly and easily migrate servers to our consolidated virtual machine environment, enabling optimal resource management and performance,” Midgley says.

In the end, the broker-dealer application worked flawlessly in the virtual machine environment on ESX Server. The brokers who use the system noticed no change in availability, performance or service levels. “We wanted to gain the benefits of server consolidation, but we needed to guarantee that the performance of broker applications running on virtual machines would be as reliable as running them on physical servers,” says Torricella.

“The VMware software has increased our capabilities while allowing us to conserve our hardware. We are able to respond faster and we have complete control of our computing resources.”

—TIMOTHY MIDGLEY, TECHNICAL LEAD, INFRASTRUCTURE SOLUTIONS SERVICES, AXA
to respond faster and we have complete control of our computing resources.”

**A Growing Number of Companies Become Converts to Virtualization**

AXA Technology Services is not alone in its quest to harness virtualization to accomplish multiple goals, such as business continuity, higher availability and overall server consolidation. Others have also realized benefits from the VMware-Intel virtualization combination.

For example, the Canadian Space Agency (CSA) was established in 1989 to oversee five core functions: Space Programs, Space Technologies, Space Science, the Canadian Astronaut Office and Space Operations. The agency employs about 1,000 people, including several hundred engineers and consultants, primarily at three sites in St. Hubert, Quebec and two sites in Ottawa. With separate locations and numerous programs to manage, the organization discovered that it was experiencing low utilization on too many servers. After successfully implementing 15 VMware GSX virtual servers, CSA decided the demonstrated reliability made a convincing case to fully embrace virtualization. With the help of local partner Omega Technologies, Inc., CSA migrated to VMware’s ESX enterprise platform. This allowed for a move from 64 Dell servers to just three IBM servers and eight Dell servers. The immediate result: an 81 percent reduction in server cost, with no loss of performance. The transition was accomplished quickly and achieved other benefits, not the least of which was that CSA gained a great deal of physical space formerly occupied by dozens of physical servers. And since the initial implementation of VMware ESX, CSA has added 30 virtual servers to the ESX infrastructure without any additional costs.

Another organization that has become a virtualization convert is Duke Clinical Research Institute (DCRI), which combines the clinical expertise and academic leadership of a premier teaching hospital with the full-service operational capabilities of a major contract research organization. Before VMware, senior systems administrator Todd Robinson and his team faced many challenges. In addition to one server whose lease was about to expire and need replacement, two servers had already failed, and the data center was approaching its power availability limit. “We were getting close to having to shut down the data center if we needed another circuit,” Robinson says. “Obviously, we were trying to avoid that.” DCRI also found that server CPUs were severely underutilized, running at only 2 to 5 percent of capacity. Ultimately, Robinson helped convince the CIO that virtualization could solve those problems—and others. DCRI is using VMware ESX Server on HP blades with dual 3.2 GHz Xeon processors and 5GB of RAM as well as ESX Server connected to an HP EVA 5000 SAN. Robinson says,

**WHEN COMBINED WITH VMWARE TECHNOLOGY, INTEL’S OPTIMIZED TOOLS AND RESOURCES CAN DRIVE SERVER CONSOLIDATION RATIOS AS HIGH AS 20:1.**

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“Almost all of our new application servers are now deployed as virtual machines. In the past 16 months, we’ve built two physical Windows boxes and more than 40 virtual ones.”

Finally, there’s Siemens Medical Solutions, a supplier to the healthcare industry, with approximately 33,000 employees globally in more than 120 countries. The company, known for bringing together innovative medical technologies, healthcare information systems, management consulting, and support services, is no stranger to the benefits of technology. To keep up with the pace of business, Siemens Medical Solutions required an ever-increasing number of servers. Not only did the company run up against physical storage constraints, but also, because of the growing number of servers, IT administrators discovered it was more difficult to manage a mounting list of maintenance issues. “Cost-effectively keeping up with technology is a challenge. As we increased our server numbers, we also increased our need for more management resources,” says John Paul, an IT architect in the Enterprise Hosting Solutions group. The company first looked at VMware software in 2003, evaluating it as a server consolidation technology. Paul, who works with many of the internal application groups, says, “My team spent several months evangelizing virtualization throughout the company before we got the green light from upper management to choose a vendor.” Today, between 3,000 and 4,000 Siemens Medical Solutions’ employees routinely access applications running on virtual machines. “This comprises software for time and project management, time reporting, software development support—you name it,” Paul says. After an exhaustive ROI evaluation of its VMware installation—which includes ESX Server running on HP and Dell servers as well as VirtualCenter—Siemens has quantified benefits such as: a $4 million reduction in operating expenses, reduced space and cooling requirements through consolidation, and improved availability. “With VMware software, we can now keep up with our workload. It’s that simple. I don’t know how we would have done it without virtualization technology,” Paul says.

Finding Your Virtualization Solution
The bottom line is that no other route to server consolidation, infrastructure optimization, or the total dynamic data center can approach the results that virtualization provides, particularly when that virtualization is enabled by the combination of VMware and Intel.

VMware and Intel deliver an integrated approach to virtualization based on a deep and solid business relationship. They deliver solutions that not only solve your most troubling strategic problems; they reduce total cost of ownership. (A free online TCO calculator is now available at www.vmware.com/go/calculator.)