



KEY HIGHLIGHTS

INDUSTRY: MANUFACTURING

**CHALLENGE**

Rein in server sprawl, simplify systems management, and develop a disaster-avoidance plan to protect mission-critical applications

SOLUTION

Deploy VMware software to consolidate servers, streamline systems management, and build a cost-effective disaster-avoidance system for vital production applications, including Microsoft's Exchange Server and SQL Server

VMWARE AT WORK

VMware Infrastructure 3 Enterprise, featuring:

- ESX 3.0.2
- VMware Converter
- VMotion
- High Availability
- Distributed Resource Scheduler (DRS)

VMware Workstation

DEPLOYMENT ENVIRONMENT

- ESX 3.0.2 running on EMC, HP, Dell, NetApp and Xiotech SANs and blade servers
- Mission-critical applications running in production in virtual machines: Boise Inc.'s Production Management System, Microsoft Exchange Server 2003 and 2007, Microsoft SQL Server 2000 and 2005, Oracle Database 8i and 9i, Apache Tomcat
- Guest operating systems: Windows Vista; Windows XP; Windows 2003 (Enterprise and Standard); Windows 2000 (Enterprise and Standard); Red Hat, SUSE and other Linux distributions

"We use VMware software all over our company, and it has saved each individual area time, money and resources. It has helped us consolidate our Windows Servers and strengthen our disaster-avoidance and disaster-recovery plans. We run our production system and key Microsoft applications like Exchange and SQL on virtual machines. They run smoothly while using less CPU, less disk space, and a lot less memory than when they're run on physical machines. Having seen other virtualization technologies, we know that no competitive product comes even close to the value that VMware delivers to our organization every day."

Bill Frost, Senior IS Engineer

Boise Inc.

Boise Inc. (NYSE: BZ) manufactures packaging products and papers including corrugated containers, containerboard, label and release and flexible packaging papers, imaging papers for the office and home, printing and converting papers, newsprint, and market pulp. The company was looking for a solution that would ease server sprawl and improve systems management at its eight data centers across the country. Hoping to address those issues, the company began experimenting with VMware's ESX 1.5 on development and test machines at its Boise, Idaho, headquarters in March 2003. Based on the success of that initial VMware deployment, Boise Inc. has been virtualizing servers across the enterprise ever since. In fact, after ESX 2.5 was released, one location decided the software was so robust it could take the plunge and go 100 percent virtual.

Boise Inc. sees VMware Infrastructure 3 as a reliable platform for mission-critical applications like the company's Production Management System and key Microsoft applications. The Production Management System covers everything from how customers place orders to how the company ships all of its paper products. "If we lost that, we'd have to shut the mills down—and that would cost us millions of dollars," Senior IS Engineer Bill Frost points out, adding that VMware's reliability "and phenomenal disaster avoidance" make it an ideal platform for bet-the-business applications.

Lead IS Engineer Gary Bowman's two favorite features are VMware High Availability (HA) and Distributed Resource Scheduler (DRS). "I believe HA and DRS really sold VMware to all our locations. HA was the main reason we decided to run the Production Management System and some major Microsoft applications on VMware virtual machines," Bowman explains. "And DRS—basically, not having to worry, 'Am I overloading this box?'—is another great benefit. I believe HA and DRS allowed VMware to take off and get far ahead of everyone else in the market."

VMware software simplifies systems management, according to Bowman. "It's just phenomenal what you can do with VMware technology, and what tools are available nowadays to make uploading updates, testing, all sorts of operations easier," he says. "We can give our end users a virtual machine in half an hour, when it takes two to three weeks to spec out, order, and set up a physical one."

Efficient resource allocation is easier on VMware virtual machines as well. "We can start out with smaller servers, and add disk space if it's needed," Bowman adds. "With physical machines, you often wind up over-allocating computer resources, but not with virtual machines."

Making the Most of Microsoft

Boise Inc. currently runs Microsoft applications like Exchange Server and SQL Server, as well as much of their Windows Server environment, on VMware virtual machines.

After testing and use in production, the company discovered that those applications run better on VMware virtual machines than on physical ones.

Boise Inc.'s DeRidder, Louisiana, facility currently has close to 900 Exchange Server mailboxes housed on one virtual machine. Another location is also using a virtual machine for its mail server, and others are considering following suit. Frost sums it up this way: "Exchange will run on virtual machines, and it will run very, very smoothly. We're using less CPU, less disk space, and a lot less memory." Meanwhile, the company has saved money on hardware—including the more costly 64-bit machines required to run Exchange 2007.

Microsoft SQL Server is another mainstay of Boise Inc.'s operations—and the company has opted to run it on virtual machines as well. "We decided the benefits from VMware tools like HA, VMotion and DRS would outweigh any performance issues that might arise," Bowman says. "As it turned out, we've had very few performance issues, and the benefits have been even better than we'd hoped." For example, in one test at the company's headquarters, his team pulled out a server's power cord and had HA bring it up on another host. "It took three minutes from the time we pulled the cord to when SQL Server was running on the other host," Bowman says.

VMware virtual machines aren't just the platform of choice for vital production applications, they're also a key part of a disaster-avoidance plan that protects those applications—and ensures that the company's mills keep running. The mill in DeRidder, Louisiana, for instance, has two separate data centers, each with about 40 virtual machines on four hosts. "If something like a hurricane destroyed one of our server rooms, we'd switch operations over to the other one, running the total number of virtual machines on that site's four hosts," says Frost. "We'd be up and running again with maybe a maximum of 30 minutes downtime."

Results

- A Microsoft environment that includes Windows Server and applications like Exchange Server and SQL Server run smoothly on virtual servers—while using less CPU, disk space and memory
- Exchange Server requires 55 percent less RAM on virtual machines; the CPU load has decreased 30 percent
- Significant server consolidation across the company; at one location, the number of physical servers was cut by 75 percent
- Considerable hardware savings; one site saved \$50,000 by eliminating the need to purchase six new physical servers
- Simplified data center and network management
- Development of a comprehensive disaster-recovery plan
- Reduced power and cooling costs; one branch saved approximately \$100,000 last year alone, since it didn't have to replace a formerly overtaxed UPS

"We've been very happy with VMware software because it works as advertised. It just works. It's funny, because after you've been using VMware awhile, you almost don't think that's a big deal. You just expect the ease of management, the reliability, and the cost savings. I don't know how we'd live without it."

Gary Bowman, Lead IS Engineer

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