



## KEY HIGHLIGHTS

INDUSTRY: MANUFACTURING

**CHALLENGE**

Build an easily managed, high-availability infrastructure to support SAP ERP—and develop it cost-effectively in just four months

**SOLUTIONS**

Use VMware Infrastructure to quickly build a virtualized SAP ERP implementation that meets and exceeds the enterprise's business demands, yet is so easy to manage that it's overseen by an IT staff of two

**VMWARE AT WORK**

VMware Infrastructure 3 Enterprise, featuring:

- VMware ESX 3.5
- VMware vCenter 2.5
- VMware VMotion
- VMware High Availability
- VMware Distributed Resource Scheduler (DRS)

**DEPLOYMENT ENVIRONMENT**

- ESX 3.5 on Dell PowerEdge 6950 hosts with dual-core, 2.6 GHz AMD Opteron processors and 32 GB of RAM
- Host servers connected to an EqualLogic iSCSI storage array consisting of iSCSI SANs
- VMware vCenter 2.5 on a standalone Dell PowerEdge 2600 server with an Intel Xeon 3.2 GHz processor and 2 GB of RAM
- Guest operating systems: 64-bit Windows Server 2003 R2, 32-bit Windows Server 2003 R2
- Mission-critical applications running in production in virtual machines: SAP ERP 2005 (ECC 6.0); SAP Supply Chain Management Server 5.0; SAP Solution Manager 4.0; Apache Tomcat 5; Microsoft SQL Server 2000 and 2005; Microsoft Exchange 2003; Microsoft SharePoint Services 3.0; Windows Server 2003 print servers; Windows Server 2003 domain controllers; WehrSoft's web-based application to manage instruments, plant drawings, projects, etc.

*"Since we were starting from scratch, we had the unique opportunity to put together any solution we wanted, so we focused on developing an infrastructure that met the demanding requirements of SAP ERP. Not only did we have a lot to do, we had a short time to do it: less than four months to get everything set up and configured. We needed an SAP infrastructure that was reliable, flexible, manageable and scalable—and we needed it yesterday. And since we only have two people to support the entire IT infrastructure, we needed a system that was self-sufficient and would 'just work' without a lot of attention. That's why we went with VMware Infrastructure."*

Lance Wehrung

Senior Engineer, Systems, FutureFuel Chemical Company

## FutureFuel Chemical Company

FutureFuel, which manufactures specialty chemicals and biodiesel, energizes its data center with VMware technology. The Batesville, Arkansas, company's virtualized infrastructure supports almost every area of its business, including domain controllers, all of its primary SQL Servers (which run some key Web-based applications), Microsoft SharePoint, print servers, Microsoft Exchange and SAP ERP.

FutureFuel's virtualized SAP ERP implementation is one of the most mission-critical components of the chemical company's daily operations. "SAP is a major part of our business," says Senior Engineer, Systems, Lance Wehrung. "We use it for everything from financials and production to rail-car tracking and handling our regulatory and safety data."

When FutureFuel was considering its options for building a robust SAP solutions-based infrastructure back in late 2006, it found that adding the additional physical servers it would need for a traditional SAP ERP installation would be costly, from both an equipment and a management standpoint. "It would have meant adding about eight physical servers, and they weren't going to be cheap," Wehrung says. "They would need quite a bit of memory and lots of CPU resources. And we'd have to go for overkill on some of those boxes to ensure availability and make maintenance more feasible, which means there would be wasted hardware resources.

"We also looked at other virtualization software, but VMware just rose up to the top," he adds. "Once we analyzed all the costs and benefits, the bottom line was that nothing compared to the solution offered by VMware—we were that impressed with the company and the product. VMware Infrastructure gave us all we needed and more."

Because FutureFuel did not have an infrastructure in place for SAP before virtualization, the company built it from the ground up. "Since we were starting from scratch, we had the unique opportunity to put together any solution we wanted, so we focused on developing an infrastructure that met the demanding requirements of SAP ERP. Not only did we have a lot to do, we had a short time to do it: less than four months to get everything set up and configured. We needed an SAP infrastructure that was reliable, flexible, manageable and scalable—and we needed it yesterday. And since we only have two people to support the entire IT infrastructure, we needed a system that was self-sufficient and would 'just work' without a lot of attention. That's why we went with VMware Infrastructure."

FutureFuel's current SAP solutions-based landscape runs on Microsoft Windows Server using Microsoft SQL Server as the back-end database. "At the time of our implementation in 2007, SAP and Microsoft hadn't yet given their stamp of approval on running SAP ERP and SQL Server on VMware Infrastructure," Wehrung explains. "So we did a lot of research and testing on our own, including talking to other companies and participating in VMware discussion forums. Although virtualization was relatively new for SAP landscapes at the time, by the time we implemented the solution, it didn't feel like a gamble at all."

The implementation went as smoothly as Wehrung expected. "In fact, we had consultants working with us on our SAP implementation, and they never knew we were running everything on VMware, because virtualization didn't present any problems," he says. "It was only at the end of the project, when one of the consultants asked me how I was able to add servers and make changes like memory upgrades so quickly, that I confessed: I'm not really working harder, just smarter—thanks to VMware."

### Using ESX to make the most of SAP software

FutureFuel began running its virtualized SAP ERP implementation on April 1, 2007. It may have been April Fool's Day, but more than a year later, Wehrung says the decision definitely turned out to be a wise one—and the benefits were significant from the start. "Using VMware Infrastructure, we were able to save over a month's time in getting our SAP infrastructure up and running," he says. "That helped us save over \$100,000 in costs associated with a service contract we had in place, so we got a return on our investment in VMware almost instantly."

Another way running SAP ERP on ESX has saved FutureFuel considerable money is by allowing the company to reduce spending not just on physical servers, but on other hardware resources as well. "One really nice thing about virtualized servers is the ability to upgrade them very easily," Wehrung reports. That means he can "rightsize" the SAP implementation, configuring servers with minimal memory, storage and CPU requirements. If that approach does not meet requirements, additional resources can be added within minutes.

Running SAP ERP on ESX has sped up server provisioning—and made those servers far easier to manage. Thanks to VMware Infrastructure, it only takes minutes to create Windows servers that are ready to be configured with SAP solutions. At FutureFuel, that has included virtual machines that need up to 8 GB of RAM and up to 400 GB of storage along with server-class processing power. "With ESX, we can set up a base server and replicate it multiple times within minutes," Wehrung says. "And once you've set up a virtual machine, you can run it on any box without reconfiguring it," he says. "Wherever that server's housed physically, you can count on it doing what it needs to do. It eases our workload considerably when we don't have to go in there and reload an OS and configure things."

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Except for software upgrades, downtime is a thing of the past. "With VMware tools like VMotion, DRS and HA, we never have to worry about applications being unavailable due to hardware issues," he says. "If a VMware host server is lost due to a hardware failure, the virtualized server stays online as it moves to another VMware host server in the HA cluster."

Testing and backup have been vastly improved as well. "With VMware snapshot capabilities, we're able to install new software and change configurations without the hassle of backing up the entire server each time we want to make a change," Wehrung says. "This gives us the ability to fully test software before making it a permanent part of the server installation. If we make a mistake, we can go back to the previous server configuration in minutes." For routine backups, FutureFuel uses a solution from VMware partner PHD Technologies called esXPress. "It allows us to back up everything we have in the virtualized environment," Wehrung says. "We can fully restore everything in the amount of time it takes for the data to copy back to the servers."

Looking ahead, FutureFuel plans not only to virtualize more of its business-critical applications, but also to extend the benefits of VMware software to new hardware platforms. "We've had such a good experience on the server side, we're now looking at expanding virtualization to our desktops so we can significantly reduce our maintenance issues," Wehrung reports. "Thanks to all of our success with VMware, we don't have any doubts about taking that route with our desktops."

## Results

- Mission-critical applications, including SAP ERP, run smoothly with high availability
- Major savings on hardware and maintenance—including \$100,000 on the labor costs of developing an SAP solutions-based infrastructure
- The company's data center is about 90 percent virtualized
- New servers are created within minutes, instead of the hours or days it takes to set up a physical server
- A virtualization-first policy for new applications and servers—with plans to extend the benefits of VMware software to the desktop realm as well

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