# Baker Hill Builds Virtual Infrastructure for Streamlined Test, Development and Production

**Baker Hill Cuts Infrastructure Costs by 25 Percent While Increasing Flexibility and Productivity for QA, Development and Production**

## RESULTS

- Reduced infrastructure costs by 25 percent
- 25:1 server consolidation ratio in development and QA
- 10:1 server consolidation ratio in production
- Server CPU utilization increased from ten percent to 75 percent
- Server deployment time decreased from two to three weeks to less than two days
- Used VMware P2V Assistant to quickly migrate applications
- Increased system reliability and uptime
- Increased flexibility and productivity in development and QA
- Migrated complex production environment into virtual machines for stable, easily-managed environment

## Uphill Hardware Battle

For more than two decades, Baker Hill has served the banking industry, delivering solutions that address business process needs and working as a trusted advisor to its banking clients. More than 1,200 financial institutions use Baker Hill's relationship management, credit origination and portfolio risk management solutions as enabling technologies.

To meet the growing company's needs, Baker Hill needed a scalable IT infrastructure. "We were concerned about server containment and meeting the needs of our developers," says Eric Beasley, senior network administrator for Baker Hill. "Every time a new environment was proposed, we'd have to go look at a minimum of three servers because most of our applications are Web applications, needing three tiers: Web tier, middle tier, and SQL backend. It was difficult to get approval in time; it could take a month to get an environment running."

The company also faced server sprawl, as growing server numbers crowded limited physical space. Test servers were in a separate room from the main data center, and as the number of servers and workstations grew, the company started to have heating and power problems.

The company also wanted to standardize its environment. "From my experience with Windows servers in the past, with NT 4, Windows 2000, Windows 2003, the device drivers and hardware conflicts can get in the way of detecting application or code errors," Beasley says.

## Moving Up

Baker Hill had been successfully using VMware Workstation since 2002 to test legacy configurations with virtual machines replicating typical client configurations. "We liked that we were able to encapsulate each server in a virtual machine instead of working directly on the hardware," Beasley says. So he evaluated VMware GSX Server to gain the same benefits on a larger scale.

The company first purchased GSX Server for its ASP environment. "We needed Exchange and some other servers but we didn't want to get physical boxes for them because they would be underutilized."

When this first project was successful, Baker Hill brought GSX Server to development and QA, with extra motivation for the change provided by the move to a new office. "We didn't have room in the new space for development servers and workstations," Beasley explains. "We didn't want developers to have to leave their desks, walk down a flight of stairs, and go to another side of the building to do their work. Instead, virtualization allowed them to work from their desks and have complete control of their environments."

**"By standardizing on VMware virtualization products across the entire software lifecycle, all the way from development to production, we are able to increase productivity, build higher quality software and decrease our time to market."**

*—Eric Beasley*
*Senior Network Administrator*
*Baker Hill*

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**VMWARE VIRTUAL INFRASTRUCTURE AT WORK**

- VMware Workstation on 1-CPU IBM NetVista computers, 512 MB RAM
- GSX Server on 2-CPU IBM x235s, 4GB RAM
- ESX Server on 2-CPU IBM x345s and x346s, 8 GB RAM
- VirtualCenter on 1-CPU IBM x345, 2.5 GB RAM
- Host operating systems: Microsoft® Windows XP, Windows 2000, Windows 2003, RedHat Linux
- Guest operating systems include: Windows 98, Windows XP, Windows 2003
- Test and staging applications in virtual machines include: Microsoft Active Directory, Microsoft SQL 2000, Microsoft Exchange 5.5, Exchange 2003, Microsoft IIS5, Business Objects Crystal Reports Server
- Production applications in virtual machines include: Microsoft Active Directory, ADP Payroll Server, Microsoft Outlook Web Access, Citrix Secure Gateway, RSA Server, Citrix Nfuse, Sybase Jaguar Server

"When you have 20 workstations, and no central console, you can't get at them from a developer's desktop," Beasley adds. "They would have to go to the lab. GSX Server has a console so developers can connect to virtual machines from their desktops and manipulate that machine without leaving their chairs."

Success with GSX Server made Baker Hill eager to try ESX Server. "We saw how our people enjoyed the flexibility of using GSX Server, so we wanted to move up to ESX Server and find out what more we could offer."

Baker Hill approached VMware Premiere Partner New Age Technologies to deploy ESX Server, along with VMware VMotion and VirtualCenter, in October 2004. New Age assessed what was needed to build a scalable platform for Baker Hill's production environment, and got the company set up in a matter of days, with the use of best practices.

"We fully embraced virtual infrastructure when New Age Technologies showed us how we could use ESX Server to emulate some of our complex environments – multiple subnets, the full three tiers on one box," Beasley says. "They showed us that we could run quite a large load on a single box. When we saw that we could run 10 virtual machines at once, I was hooked."

## Peak Performance

Using VMware software throughout its software lifecycle, from development and testing to production deployment, Baker Hill has achieved the following benefits:

- Decreased costs. Beasley estimates a 25 percent reduction in infrastructure costs as a result of implementing a virtual infrastructure.
- Server consolidation. In development and QA, Baker Hill is able to put 25 virtual machines on each server. In production, they can put ten to 15 virtual machines on each server. "I think that's pretty compelling," says Beasley.
- Increased server utilization. Before using VMware software, CPU utilization was around ten percent with most servers running just one application. Now, servers run at about 75 percent utilization.
- Increased stability. Whereas hardware problems used to prevent developers from spotting coding errors, virtual infrastructure means developers are working in a stable environment with operating systems that have the same drivers, same NICs, same video. "If there are problems, we can drill down to see if it's an application or code error, rather than having to spend time troubleshooting hardware problems," Beasley says.
- Memory sharing increases efficiency. The ESX Server memory agent eliminates redundant copies of memory pages on a server when virtual machines are running instances of the same operating systems. "With the memory agent involved, we're using memory more efficiently because we're running a lot of the same operating systems."
- Faster server deployment. With its virtual infrastructure in place, Baker Hill is able to respond to user requests within days. "Before, when we needed a new environment, there was a two to three week time lag before we could make the equipment available," Beasley says. "Now, if something urgent comes up, we can set up a new server right away."
- Efficient migration from physical to virtual. Baker Hill used VMware P2V Assistant to migrate its applications from a physical environment to virtual machines. "We were able to get rid of workstations and servers that we converted to virtual machines," he says. "VMware P2V Assistant saved a huge amount of time."
- Increased system reliability and uptime. The ability to manage resources, provision new servers, and move them around with VirtualCenter and VMotion has resulted in increased uptime and reliability – which is especially important for clients in the financial industry. "If we're having problems with a server, we can move applications from that box to another without having to take the application down. For our ASP solution, it's important because we have strict service level agreements with our financial institutions."

## Higher Productivity

With its VMware Virtual Infrastructure, Baker Hill has been able to streamline processes, allowing IT to

provide the computing resources needed for development, testing and production more efficiently.

"Virtualization puts QA and development back in to the hands of the people," Beasley says. "Before, developers would find workstations in a corner, pop in a CD, and then, when it broke, they called IT. Developers know how to code, not how to build a network. I can create the environments they need and hand it off so they can do what they do best. I can build the systems with my best practices, and they have no reason to go around IT. Basically, with VMware software, I sleep better at night."

The productivity gains from the virtual infrastructure have also positively impacted the business. "By standardizing on VMware virtualization products across the entire software lifecycle, all the way from development to production, we are able to increase productivity, build higher quality software and decrease our time to market," Beasley says.

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