

CASE STUDY

Intel® Xeon® processors 7500 and 5600 series

Enterprise Server

Mission-Critical Computing, Virtualization



Replatforming the Enterprise Backbone

Eli Lilly saves millions and supports growth by migrating mission-critical SAP* system to Intel® Xeon® processors

Striving to optimize operations and reduce costs, Eli Lilly's IT organization is several years into an enterprise-wide strategy of virtualizing and standardizing on Intel® Xeon® processors and HP ProLiant* servers. But could those platforms handle the company's global SAP* deployment? That application is so mission-critical that Lilly's IT executives estimate an hour of downtime can potentially stop or slow product shipments, the disposition of manufactured product, payments, training, receivables, etc.

For Lilly, the answer has been a clear yes. Members of Lilly's Global Business Integration Program (GBIP) Next Generation Infrastructure (NGI) project migrated the company's SAP deployment from Sun SPARC* servers running Solaris* and Oracle* 10g to HP ProLiant servers based on Intel Xeon processors 7500 and 5600 series, Red Hat Enterprise Linux* (RHEL*), and IBM DB2*. With the new solution in production since May 2010, IT leaders at Lilly say it is saving millions of dollars while delivering important new business functionality, improving performance, and reducing the company's carbon footprint.



The Lilly logo, featuring the word "Lilly" in a red, cursive script font.

CHALLENGES

- **International growth.** With business expanding in Asia, Lilly wanted to implement Unicode, an ASCII alternative that supports Asian character sets but can more than double the data storage requirements.
- **IT modernization.** Lilly's goal is to eliminate RISC platforms and virtualize wherever possible. Migrating and virtualizing SAP and its database would be the acid test.
- **Scale and reliability.** The new environment must support 50,000 SAP users and deliver performance that is equal to or better than the previous environment.

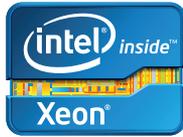
SOLUTIONS

- **Eliminate big iron.** Lilly IT rearchitected the company's SAP solution to add Unicode support and run on HP ProLiant DL580 G5 servers with the Intel Xeon processor 7560 and HP ProLiant DL380 G6 servers with the Intel Xeon processor 5660 and 5620. The team chose the EMC Symmetrix V-Max* Storage System with Intel Xeon processors to provide scale and flexibility for its multi-terabyte storage requirements.
- **Optimize and virtualize.** The team migrated the database to IBM DB2 9.7 for its improved compression capabilities, and used VMware vSphere* 4.0 for virtualization.

IMPACT

- **Business value.** With Unicode support and greater ability to expand its SAP footprint, Lilly is well-positioned to handle continued growth around the world.
- **Multi-million-dollar savings.** Lilly expects to see a two-year payback on its hardware investment based on lower costs for hardware and operating system (OS) maintenance.
- **Greener data center.** The Intel processors' energy-efficient performance helped Lilly eliminate 35 racks of servers and reduce power and cooling consumption by more than 80 percent.
- **Performance increases.** Performance has risen up to 40 percent on some modules and 11 percent overall, even though many Lilly codes had been optimized for Oracle.

Lilly's global SAP* instance supports 50,000 users and all aspects of business-to-business activity



"From a strategic perspective, we were trying to standardize on commodity hardware to reduce costs. That is one of our key drivers. We wanted to position ourselves for the future, and we chose the Intel® architecture as our reference platform."

— Gregory J. Adair
Linux/UNIX* Platform Architect
Eli Lilly

Business Value Drives Transformation

Lilly is a leader in IT as well as pharmaceuticals. The company has had a unified SAP system for several years and is well along the path to a consistent, virtualized environment based on energy-efficient Intel® processors. Now Lilly has completed an IT project that delivers strong business value and earns respect from IT professionals for its breadth, complexity, and success.

GBIP NGI was a massive modernization project that had top management support and brought together IT teams and business functions from across Lilly. "People are amazed at the scope of the project and the amount of change that occurred," says Greg Adair, a Linux/UNIX* platform architect in Lilly's Global Infrastructure Center of Excellence. "In my sphere, just moving from Solaris to Linux is a major change. When you combine it with all the other aspects we tackled, it's just really an amazing thing to many people."

Scott Dial, a SAP Basis* Architect in Lilly's General and Administrative IT Department, hears similar reactions. "Most of the response I've gotten is the wow effect that, yes, we did undergo such a dramatic change," Dial says.

"More than that, people wanted to know why and what provoked this type of transformation."

The cascade of changes started with the need to support Lilly's global growth. "In IT, everything is driven by business value," says Dial. "Our business value was that we were trying to get our SAP infrastructure into more countries that have a double-byte requirement for character representation, which mandated us to reorganize the database. We said, 'If we're going to go through the Unicode conversion, which is huge, what else shall we combine with it?' Then the ball just started rolling."

With database reorganization a necessity, the team looked for ways to offset the storage impact of Unicode's double-byte character representation. They decided to migrate the database to DB2 for its advanced compression and tight integration with SAP.

The team also made the key decision to align with corporate initiatives aimed at lowering costs and optimizing the IT environment. In three closely related efforts, they migrated from proprietary, RISC-based technologies onto Lilly's IT standard of Intel Xeon processors 7500 series and 5600 series in HP ProLiant DL580 G5 and DL380 G6 servers, moved from Solaris to RHEL* 5.3, and virtualized with VMware vSphere 4.0.

Mission-Critical Migration

For a global giant like Lilly, it's hard to think of a more critical application than SAP. "SAP handles all our business-to-business activity, all our advanced planning, all our HR, all our warehousing and distribution—it's all integrated," Dial says. "It's foundational."

When the SAP replatforming project began, Lilly's IT teams didn't have to choose a new platform architecture, OS, or virtualization technologies, since those had been established as corporate standards several years previously. Each quarter, IT teams review the corporate standard to ensure Lilly takes advantage of the latest advances.

"We're always looking at cost for performance," says Adair. "Every quarter, we review server and processor offerings, look at our requirements, and decide where the sweet spot is. We have performance options for the ProLiant 580 and 380, and try to fit all our customers onto those standards, for both Linux and Windows* computing." The Intel Xeon processors provide Lilly with energy-efficient performance across a range of core counts and capacities. The processors also include value-added capabilities such as Intel® Virtualization Technology (Intel® VT)—hardware-assisted support that works with software such as VMware to help businesses improve manageability, security, and flexibility of their virtualized environments.

"We went through all the due diligence when we first started moving from SPARC and Solaris to Intel, HP, and Linux, and we were familiar with all the Intel reliability and performance features," Adair continues. "By the time we got to this project, we felt really comfortable sticking with our standards."

But the Lilly teams did need to ensure that the corporate standard could handle such a large SAP environment and deliver performance that was better than or equal to the previous deployment. Lilly's legacy SAP implementation was hosted on 40 racks of Sun SPARC servers with multiple generations of hardware and several versions of Solaris.

Lilly worked closely with its vendor community to plan and manage the massive project. A meeting with strategic vendors helped get everyone in sync, including Intel, HP, IBM, Red Hat, and EMC. A proof of concept confirmed the decisions to move the database to DB2 and to migrate the hardware to HP ProLiant servers based on the Intel Xeon processors. Intel and HP collaborated to help Lilly size its SAP workloads and map them to the ProLiant platforms, using industry-standard tools such as the SAP Standard Application Benchmarks*.

The virtualization team exceeded its target of virtualizing 65 percent of the solution. All databases smaller than 500 GB are virtualized, as are all SAP application servers except the ERP Central Console* (ECC*). SAP Business Warehouse (BW) Reporting* uses data partitioning to run in parallel across four ProLiant DL380s. VMware ESX* hosting runs on six HP ProLiant DL580 servers, taking advantage of the Intel Xeon processor 7560's increased memory bandwidth and memory capacity, along with the processor's eight cores. Adair estimates that 95 percent of the solution's virtual machine guests run on ProLiant DL380 servers.

Reaping the Rewards

IT rolled out the new platforms in three phases, without unplanned downtime or disruption, and the company is reaping the benefits. With the addition of Unicode support and the migration to a standardized virtual environment based on Intel® technologies, Lilly enjoys greater business agility and more frictionless operations around the world. IT delivers those benefits while saving millions of dollars and creating a greener and more responsive data center. The energy needed to operate and cool the SAP server environments is down by more than 80 percent, and the data center footprint has shrunk by 90 percent. Despite the addition of Unicode support, database storage requirements for SAP are 60 percent lower, contributing to the project's outstanding ROI.

Overall performance is up an average of 11 percent, with some modules running 40 percent faster. "Keep in mind a lot of our code was written for Oracle, even custom objects," he says. "So we've gained in performance, and SAP is running much more smoothly." Dial adds that the tight integration between IBM and SAP also improves productivity for Lilly's Basis administrators and allows them to do more database work.

Virtualizing the environment increases IT's ability to respond rapidly to changing business requirements. "We've had several instances where we've had to change the size of the guests that are running in the virtual space, and we've been able to do that with little or no business impact," says Adair. "Previously, we would have had to purchase additional hardware. Now, it's literally not much more effort than clicking a couple buttons."

SPOTLIGHT ON ELI LILLY AND COMPANY

Eli Lilly, a leading innovation-driven corporation, is developing a growing portfolio of pharmaceutical products by applying the latest research from its worldwide laboratories and collaborations with eminent scientific organizations. Headquartered in Indianapolis, Indiana, Lilly is the world's tenth-largest pharmaceutical company and consistently ranks as one of the best companies in the world to work for. The company has research and development facilities in eight countries and manufacturing plants in 13 countries.

Stamp of Approval for Modernization

Lilly's SAP migration is a key step on the company's move away from big iron. "Lilly started this overall migration from RISC platforms to Intel® architecture, and we're probably 70 percent of the way there," Adair says. "Our goal within the next year and a half is to get as close to 100 percent as possible, with 80 percent virtualization. That's our near-term goal for the entire company."

As Lilly advances toward that goal, the SAP project validates the strategy and confirms its benefits. "Most people around here consider GBIP to be one of the most important environments, if not *the* most important environment, at Lilly," Adair says. "For GBIP to start using the Linux service, that puts the stamp of approval on Linux for other key initiatives."

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