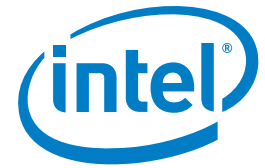


CASE STUDY

Intel® Xeon® processor 5500 series
Enterprise Server
Server Virtualization



Delivering Agile Healthcare

Wake Forest University Baptist Medical Center extends its virtual environment with the latest Intel® architecture, saving USD 450,000 on hardware acquisition and increasing IT agility

For Wake Forest University Baptist Medical Center, IT plays a critical role in providing quality patient care, producing groundbreaking medical research, and facilitating effective teaching. The organization's IT group runs more than 750 applications for everything from e-mail and Web-based learning to patient imaging and physician scheduling. Wake Forest Baptist recently integrated the Intel® Xeon® processor 5500 series into its virtualized server infrastructure to capitalize on the architecture's outstanding performance, memory bandwidth, and energy efficiency. By consolidating applications onto fewer physical servers based on the new Intel® architecture, the IT group has saved more than USD 450,000 in hardware acquisition costs and reduced energy consumption by nearly 80 percent.



"The new Intel® Xeon® processor 5500 series offers the compute performance and memory bandwidth we need to virtualize a large number of applications on a small number of physical servers."

— Chris Summers
Associate Director of Information Services
Wake Forest University Baptist Medical Center

CHALLENGES

- **Cut costs.** Continue to provide a full range of applications for doctors, researchers, students, and staff while spending less money acquiring and running physical servers.
- **Improve resource utilization.** Make better use of IT investments by increasing the utilization of servers.
- **Reduce energy consumption.** Minimize the energy used to power and cool computing hardware to reduce the environmental impact and costs of IT.

SOLUTION

- **HP servers with Intel® Xeon® processors.** The Wake Forest Baptist IT group refreshed part of its IT infrastructure to extend its virtualized environment, replacing 170 servers based on single-core Intel® processors with just 12 HP ProLiant* servers equipped with the Intel Xeon processor 5500 series.

IMPACT

- **Avoided hardware acquisition costs.** By virtualizing existing and new applications, the IT group purchased fewer servers, saving more than USD 450,000 in hardware acquisition costs.
- **Increased server utilization.** Virtualization has helped increase utilization of physical servers from 5 to 65 percent.
- **Reduced power and cooling costs.** With fewer, more energy-efficient physical servers, the IT group has eliminated three server racks and reduced power and cooling costs by nearly 80 percent, saving approximately USD 96,000 per year.

The Wake Forest Baptist IT group began virtualizing its infrastructure in 2008 to help reduce costs and maximize the return on its hardware investment. "Like many enterprises, we always try to do more with less," says Chris Summers, associate director of information services at Wake Forest Baptist. "In the past, we added physical servers as we added applications, but we averaged only 5 percent utilization per server. By enabling applications

to share resources through virtualization, we can make more effective use of our hardware investments. Reducing the total number of servers also helps us cut capital expenditures and decrease energy costs."

In addition, virtualization enables the IT group to add applications rapidly and cost-effectively. "We want to reduce the barriers for delivering new services," says Summers. "In a virtualized environment, we can deploy a new application quickly



Maximizing the benefits of virtualization with Intel® processors

and without the costs of new hardware. Virtualization helps our IT group become more responsive to new requests, and consequently it helps increase the agility of the medical center.”

As 170 of the organization’s single-core Intel® processor-based servers neared the end of their life in 2009, the IT group saw an opportunity to capitalize on the flexibility of virtualization by adding several new applications while controlling hardware costs. “We evaluated the possibility of replacing the old physical servers and adding new ones for some new applications, but the costs were astronomical,” says Summers. “Instead, we decided to run all of those applications on fewer virtualized servers.”

The New Intel® Architecture Helps Consolidate Infrastructure

To provide the hardware foundation for this next wave of virtualization, the IT group selected HP ProLiant DL380 G6* servers equipped with the Intel® Xeon® processor 5500 series. “We have strong relationships with both Intel and HP. Teams from both companies provided technology roadmaps that helped us evaluate the new Intel architecture and plan our refresh process far in advance,” says Summers. “It was clear that the new Intel Xeon processor 5500 series offers the compute performance and memory bandwidth we need to virtualize a large number of applications on a small number of physical servers.”

The new servers run VMware vSphere* 4.0 virtualization software and use multiple Microsoft Windows* and Linux* operating systems. The newly virtualized applications range from nurse scheduling, pathology testing, and statistical analysis tools to e-mail, file sharing, and print services.

By using the new Intel architecture as the platform for virtualization, the IT group was able to purchase just 12 physical servers to run more than 170 applications. “We virtualized the first part of our infrastructure using the Intel Xeon processor 5400 series, and we can run 7 to 8 virtual machines on each host,” says Summers. “The increased memory bandwidth of the new Intel architecture lets us run 15 or more virtual machines on each physical server. As a result, we can use about half as many hosts as before and achieve greater consolidation.”

Virtualization Helps Wake Forest Baptist Avoid Capital Expenditures of USD 450,000

The decision to extend virtualization to this collection of applications is helping the Wake Forest Baptist IT group achieve dramatic cost savings. “By purchasing 12 servers instead of 170, we saved approximately USD 450,000 in hardware acquisition costs alone,” says Summers. “We can reinvest savings into services that will benefit doctors, researchers, students, staff, and ultimately patients.”

Wake Forest Baptist Cuts Power and Cooling Costs by 80 Percent

With fewer, more energy-efficient servers, the IT group has significantly reduced the power and cooling required for the infrastructure. “We have decreased our power consumption from 63,000 watts per year to just 13,500, which saves us approximately USD 96,000 per year,” says Summers. “We’re reducing the environmental impact of IT, and we’re saving money.”

Virtualization Increases Utilization from 5 to 65 Percent

The IT group also has been able to increase the utilization of each server in this virtualized environment. “With the new virtualized

SPOTLIGHT ON WAKE FOREST UNIVERSITY BAPTIST MEDICAL CENTER

Wake Forest University Baptist Medical Center is an academic health system comprising North Carolina Baptist Hospital, Brenner Children’s Hospital, Wake Forest University Physicians, and Wake Forest University Health Sciences. The system includes 1,056 acute care, rehabilitation, and long-term care beds and has been ranked as one of “America’s Best Hospitals” by *U.S. News & World Report* since 1993.¹

environment, we expect to see an average of 65 percent utilization per server over the first year,” says Summers. “We will get more work out of the servers on a daily basis and still have plenty of headroom for occasional peaks.”

New Intel Architecture Helps Increase Performance and Enhance IT Agility

While the new Intel architecture is enabling the IT group to consolidate hardware, it is also helping deliver tangible performance gains for medical center workers. “Whether nurses are scheduling patients for procedures or staff members are accessing their paycheck stubs online, they receive faster results than before,” says Summers. “The new architecture is helping to speed up a full range of tasks, and that helps increase productivity.”

By integrating the Intel Xeon processor 5500 series into a flexible, virtualized environment, the IT staff is also increasing the agility of IT. “If researchers need to crunch data for a particular project, we can dynamically allocate more processor and memory resources to their application, helping to cut analysis time by days,” says Summers. “Overall, building a virtualized environment with the new Intel architecture is helping our IT group be more responsive to the needs of doctors, researchers, students, and staff. As a result, our medical center can produce better research and deliver better service to patients.”

Find a business solution that is right for your company. Contact your Intel representative or visit the Reference Room at www.intel.com/references.



¹<http://health.usnews.com/health/best-hospitals>.

This document and the information given are for the convenience of Intel’s customer base and are provided “AS IS” WITH NO WARRANTIES WHATSOEVER, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND NON-INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS. Receipt or possession of this document does not grant any license to any of the intellectual property described, displayed, or contained herein. Intel products are not intended for use in medical, life-saving, life-sustaining, critical control, or safety systems, or in nuclear facility applications.

Performance tests and ratings are measured using specific computer systems and/or components and reflect the approximate performance of Intel products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance.

Intel may make changes to specifications, product descriptions and plans at any time, without notice.

© 2009 Intel Corporation. All rights reserved. Intel, the Intel logo, and Intel Xeon are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

*Other names and brands may be claimed as the property of others. Printed in USA

1009/YMB/TDA/XX/PDF

♻️ Please Recycle

322630-001US