

EduConnection



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Joe Hartley, VP, Global Government, Education and Healthcare Sun Microsystems, Inc.

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Oxford Preserves Rich History with Sun-Powered Digital Library

Find out how the oldest university in the English-speaking world relies on a Sun-powered infrastructure for its library management system and on Sun thin clients for better user access — and how your institution can do the same.

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The tool is not the teacher.

MONDAY OCT 29, 2007

My oldest son is 12 and has attention deficit hyperactivity disorder (ADHD). He was diagnosed with that and a couple of other learning disabilities when he was in kindergarten. The great news is that through special education resources at our local public school, he's been able to overcome his disabilities, with the exception of some fine-motor skills such handwriting (or in his case, the lack thereof).

Where we live, "middle school" runs from the sixth grade to the eighth. Given that our son had not only handwriting challenges but the everyday challenges that most 10-and-11 year-olds face in getting themselves organized, we jumped at the chance to put him in our middle school's "Laptop Program" when he matriculated. The school forced us to buy an overpriced laptop from a specific company that sells overpriced products to schools, but we had high hopes that the program itself would create an organizational paradise in the Hartley home and overcome my son's handwriting issues.

Paradise was never found.

The laptop program was poorly thought out. Although every teacher had to maintain a Web site that documented nightly homework requirements, each teacher had a different way of doing this. There was no consistency whatsoever. Some teachers had too much homework and expected us to understand the intricacies of their specific class Web site. Others barely updated their sites. Even though the laptop forced upon us included a calendar tool as part of its software package, the school didn't use it. So instead of students subscribing to each class calendar and then getting a single aggregated view of the calendar on their laptops, we had to search six different Web sites every night to see what homework was required. To add insult to injury, none of the software tools used by the school's laptop program really required the particular overpriced laptop that we'd been required to buy. All of the software was Web-based. In other words, we could have accessed it via any laptop running any operating system.

This is not a rant about the school. What I learned in working with the teachers is that they have no time or support to manage all of this technology. They work incredibly long hours in the classroom, so any work they do on the computer has to happen after hours. They assign too much homework, and don't understand how to turn a computer into a learning tool, but that's a subject for a future blog entry.

The point is that the laptop didn't deliver on Paradise. Sure, it was expensive and booted up and ran programs and accessed email and the Internet. The problem was that we, as parents, had placed too much hope on a single tool. A laptop doesn't teach—teachers do. Learning how to use a word processor is not learning how to write. Nor is learning how to create a PowerPoint presentation is not learning how to present or to think or to persuade. In fact, as a tool, a television with compelling content can probably teach more than a computer with access to the Internet and an office automation suite.

This is why I'm so supportive of Curriki.org. Curriki is an online environment that's about sharing curriculum created by teachers and other teaching professionals. It's free. It's global. It's a community of educators helping other educators with high-quality teaching resources that may or may not be delivered by computers, but that will focus on the purpose of education: learning topics, rather than learning tools. Current offerings on Curriki range from lesson plans, assessments and media clips to complete textbooks, all available at no cost. Anyone can join Curriki. In fact, Curriki and the AARP are collaborating to encourage retired educators who are subject matter experts to share their curriculum, review content curricula, and help train teachers. The focus is the content.

When he was in seventh grade, we moved our son to a school that had smaller classes. His entire seventh grade class is now 22 students. They do not allow the use of laptops in the classroom. Despite that, we've noticed no adverse impact on my son's academic performance. The lack of computers is, however, forcing him to improve his handwriting skills.

My son's story is far from over. We'll see how it develops, but the one thing we've learned so far is this: The tool is not the teacher.

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Curbing Server Sprawl

Sun's New Intel-Powered Servers Save Space and Energy



Once again, educators dubbed “funding IT” as their main strategic concern in the EDUCAUSE list of Top-Ten IT Issues this year.

As EDUCAUSE noted in its report, “Escalating costs for IT service delivery and maintenance in the face of funding pressures at the institutional level leave little flexibility in many IT budgets.” And

as an educational institution’s IT needs grow, “server sprawl” — increasing numbers of servers in the datacenter, with spiraling costs for power, administration, and more — grows with it.

Two new systems from Sun can help institutions manage this balancing act. The [Sun Fire X4450](#) and [Sun Fire X4150](#) servers, powered by either dual- or quad-core Intel Xeon processors, enable education IT administrators to do more with less equipment. These systems solve critical problems in campus datacenters by offering more performance, higher density, and better power efficiency than competitive systems on the market.

In addition, both Sun Fire X4450 and X4150 servers offer the choice of running virtually any operating system — including the Solaris OS, Linux, Windows, or VMware — helping prevent vendor lock-in and easing integration with existing IT resources.

Early access and beta customers, such as Eastern Michigan University and Technical University of Munich, have already begun to test and implement the Sun Fire X4450 and Sun Fire X4150 servers, with positive results.

“The Sun Fire X4450 server running the Solaris 10 Operating System, combined with VMware ESX, has virtually eliminated all performance, capacity, and availability issues in our development and testing environments,” says Bill Heilman, platform specialist in the Information and Communications Technology department at Eastern Michigan University.

The Sun Fire X4450 and Sun Fire X4150 servers incorporate new, innovative design principles in a shared chassis design for maximum compute density, leading storage capacity, embedded system management, built-in virtualization support, and investment protection. The new chassis design, optimized for cooling and power efficiency, offers industry-leading energy efficiency and performance in a small form factor.

Do More with Less

Whether on an academic campus or a corporate one, datacenter space is at a premium. In a [recent study of enterprise buyers](#) by Gabriel Consulting Group, 55 percent of respondents said that their server purchases are heavily influenced by power and space concerns, while 65 percent said these considerations will become much more important in the future.

RELATED RESOURCES

- » [Sun and Intel Design Innovations](#)
- » [Sun Fire X4150 Server](#)
- » [Sun Fire X4150 Data Sheet](#)
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- » [Sun Fire X4450 Server Data Sheet](#)
- » [Sun Fire X4150 and X4450 Server Architecture White Paper](#)

Try a New Server — Free

Take a no-risk 60-day test drive of a Sun Fire X4450 or X4150 server

The Sun Fire X4450 server addresses those needs — and prevents server sprawl — with a system design that provides the ideal virtualization platform, with unmatched energy efficiency and minimized footprint in an easily managed package. It's designed to pack more compute power in a smaller space while reducing power, cooling, and maintenance costs.

In fact, the Sun Fire X4450 is the world's smallest four-socket x64 server — and delivers up to twice the expandability and compute power of other servers, yet is half the size. This makes it the perfect choice for virtualization and consolidation, as well as database and business processing applications.

Designed to scale to future computing needs, this x64 server supports up to four dual- or quad-core Intel Xeon processors, 32 memory slots, and eight disks in a 2RU form factor. It can expand up to a 16-way configuration, with up to 128 GB of memory and over 1 TB of internal storage.

Sun Fire X4150 Offers Room to Grow

Most academic institutions are under increasing pressure to deliver more services and support more users. They need to generate more computing cycles using fewer servers. The new Sun Fire X4150 is fast and expandable, and its unique design makes it energy efficient, reliable, and easy to manage.

The Sun Fire X4150 is a two-socket rackmount system powered by either the dual- or quad-core Intel Xeon processor in a compact, 1RU footprint. It has up to twice the memory capacity, internal storage, and integrated networking connectivity than other systems in the industry. With up to eight CPU cores, 64 GB of memory, four Gigabit Ethernet ports, three PCI Express slots, and more than 1 TB of internal storage, it's ideal for Web infrastructure, horizontal database, and storage-intensive applications.

Improving Energy Efficiency for Institutions

As reported in the September issue of *EduConnection*, energy and utility costs for universities have jumped 27.1 percent over the last two years. Sun is addressing this issue through its [Eco Innovation Initiative](#) and eco friendly products.

For instance, the chassis design of Sun's new Intel-based systems is optimized for cooling and power efficiency. That helps the Sun Fire X4450 server consume as much as 50 percent less energy than competitive servers, resulting in lower power and cooling costs.

Lights Out, Costs Down: Simplified Management and Serviceability

The Sun Fire X4450 and X4150 servers are designed for availability and reliability, with hot-swappable and redundant RAID-enabled disks, cooling fans, and power supplies that make component changeover fast and easy. Combined with the embedded Lights Out Manager, the servers are designed to maximize uptime, simplify system management, and reduce administration costs.

Sun offers a suite of services to optimize your Sun Fire X4450 and X4150 server implementations, with combined system and support pricing that's often less than the cost of purchasing the items separately. Sun can also help you fast-track your consolidation and virtualization initiatives with solutions that help reduce IT costs, improve availability and utilization, and simplify infrastructure management.

Questions or comments? Please email education_news@sun.com

"The Sun Fire X4450 server running the Solaris 10 Operating System, combined with VMware ESX, has virtually eliminated all performance, capacity, and availability issues in our development and testing environments."

Bill Heilman
Information and
Communications Technology
Eastern Michigan University

"The fresh Xeon-based servers from Sun mark the company's most muscular play to date in the x86 realm."

"It's Time to Pay Attention to
Sun's x86 Server Biz"
The Register,
September 26, 2007

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Oxford Preserves Rich History with Sun-Powered Digital Library



As the oldest university in the English-speaking world, the University of Oxford is a rich blend of old and new. Its main library, the Bodleian Library, was established by Sir Thomas Bodley over 400 years ago and serves as the United Kingdom's library of record, similar to the U.S. Library of Congress. Oxford's permanent collection includes some of the oldest and most valuable manuscripts in existence.

At the same time, Oxford is at the forefront of digital technology. The library maintains an extensive collection of digital media such as electronic journals and e-books. Much of its historical collection is made available to scholars as electronic "surrogates" to improve access and to prevent wear and tear on priceless original manuscripts. Oxford collaborates with Google and other Web 2.0 enterprises to incorporate technologies such as search and digital archiving.

Recently, the university turned to Sun Microsystems and its partner VTLIS Inc. to upgrade its highly specialized library management system (LMS). The Sun-powered infrastructure ensures scalability and availability for the LMS used by students, faculty, and researchers while minimizing support expenses. Oxford has also replaced hundreds of desktop PCs with Sun Ray systems that offer users cool, quieter and more secure access to the library's extensive catalog.

Updating the Library Management System

The scope of Oxford's information management challenge is daunting. Oxford is comprised of 39 colleges, each with its own internal structure and activities. The university includes 119 separate libraries with a collection of 9 million books. Users request 9000 library resources a week. Cataloging these materials and responding to these requests requires a specialized LMS tailored for the large distributed university environment. Only a few vendors make such systems, including VTLIS, located in Blacksburg, Virginia. Sun and VTLIS have a strong partnership: Nearly 75 percent of VTLIS implementations are on Sun systems.

By 2004, Oxford's LMS was reaching its end of life. After an extensive evaluation, the university chose to replace it with VTLIS Virtua software. Virtua won because it met a number of stringent criteria — support for Oxford's consortium library model; ability to manage non-Roman scripts such as Chinese, Japanese and Arabic; and automated stack request support. This last feature will be particularly important as Oxford migrates its 9-million-item collection to a controlled-atmosphere warehouse with robotic retrieval.

To host the VTLIS software, Oxford also needed to upgrade the platform. "It was a no-brainer to turn to Sun," says Dave Price, head of systems and e-research. "We've been a Sun site since 1991, when we installed a Sun 10 running SunOS 4.13 as a primary platform for our library systems."

Oxford chose Sun Fire E2900 servers running the Solaris 10 Operating System. While some groups within the university are moving to Linux, Price stayed with a sure thing: "Solaris 10 provides an industrial-grade, bulletproof platform with the performance and support that Oxford needed to fulfill its mission."

Oxford supports not only its own students and faculty but a worldwide research community, so around-the-clock operation is imperative, with no unscheduled downtime. The university wanted to have a fresh look at availability, so it called Sun.

RELATED RESOURCES

- » [Bodleian Library](#)
- » [Solaris Cluster](#)
- » [Sun Academic Excellence Grant Program](#)
- » [Sun Fire 4500 Server](#)
- » [Sun Ray 2 Virtual Display Clients](#)
- » [Sun StorageTek 5800](#)
- » [University of Oxford](#)

“Sun Professional Services was absolutely outstanding,” remembers Price. “And the team came up with the right solution, including Solaris Cluster 3.1 software. Our local Sun partner, Q Associates, provided helpful advice as well. Q Associates worked together with Sun from the first sales call. Personalization and attention to detail from Q Associates in partnership with Sun is one of the factors that made this solution work so well.”

Expecting to use the VTLs software for a decade or more, Oxford needed to be sure that the platform could grow with the university’s needs. The Sun/Solaris platform provides the right mix of affordability and scalability to ensure that Oxford will be able to keep up with the ever-increasing demands of students, faculty, and scholars.

Sun ‘Honeycomb’ Storage Makes the Grade

Oxford is also using a [Sun StorageTek 5800 system](#) to “ingest” outputs from the Electronic Ephemera project — digitized items from the world-famous John Johnson Collection — and also a large number of 19th-century books scanned for the [Google Library Project](#). The Sun StorageTek 5800 system (often referred to by its code name, “Honeycomb”) will be connected to a number of digital repositories based on the open source Fedora platform. Also, the Bodleian Library expects to be able to exploit the special features of the Sun system to accelerate Fedora-related processes and activities.

[Sun Fire X4500 data servers](#) are providing the ideal platform for consolidating file shares on the administrative side. But the most promising storage application for Oxford may be the Sun Honeycomb project. Jeffries explains: “Honeycomb is uniquely suited to our needs at Oxford. We plan to use it to store large digital objects as well as all the metadata associated with them. It’s like a digital bookshelf.”

While Oxford relies on a number of specific Sun technologies and products, the relationship runs much deeper. Sun’s commitment to the education sector gives Oxford confidence that it can continue to look to its evolving mission and not worry about infrastructure issues.

A Partner for the Long Haul

Price describes the challenges: “We take a long view here at Oxford. When David Vaisey was Bodley’s Librarian, he liked to say that most of our readers haven’t yet been born. These materials have to endure, and they have to be accessible, no matter how technology evolves.

“We’ve found that Sun is extremely willing to share in the problems and issues that we in the academic world are facing: rights management, metadata standards, digital preservation and many more. Sun participates in these discussions and that informs Sun’s product development.

“Oxford’s relationship with Sun goes beyond technology,” Price concludes. “Sun has the support and experience that we need for our digital library projects. Sun is committed to open source, giving us flexibility to grow and adapt. Other vendors go for the quick fix; Sun understands our long-term objectives and helps us achieve them.”

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David Price
Head of Systems and
e-Research
University of Oxford

Sun Ray Systems Offer Cooler, Quieter, More Secure User Access

While managing a library’s holdings is a challenge in and of itself, Oxford also needs to provide students, faculty, and researchers with access to the holdings. Oxford had traditionally provided user access to information services through PCs running Microsoft Windows. However, managing PCs at 119 different sites is expensive and time-consuming.

“Keeping them virus free, making sure they’re secure, implementing patches — it’s very resource intensive,” explains Neil Jeffries, R&D project manager. “We had good luck by using Citrix to move the applications back to the datacenter. So we wanted to take the next step in virtualization.” Also, the VTLs Virtua software was incompatible with the existing PCs, so the university would have to buy new ones — or consider other desktop options.

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Sun recommended thin client technology and donated 20 Sun Ray 2 virtual display clients free of charge to Oxford under the Sun Academic Excellence Grant program. The university used them to construct a proof of concept. Based on that successful trial, Oxford has deployed 270 Sun Ray systems. Sun Fire V240 servers, running the Solaris 10 OS and clustered with Solaris Cluster 3.1 software, host the Sun Ray software in a ratio of one server cluster for every 30 Sun Ray systems.

The Sun Ray 2 Virtual Display Client is a great fit for the Oxford environment. “Sun Rays make life much, much simpler,” says Jeffries. “We have better control over the applications and usage, and it has a smaller footprint in terms of space, power, and heat generation.”

The lower power requirements are important to Oxford on several fronts. Like all educational institutions, the university has to cope with rising electricity rates. A typical Sun Ray system uses just 4 watts, compared to 100 watts or more for the average PC. Price’s staff has calculated that each Sun Ray system saves the university about £18 GBP (\$36 USD) per year in electricity costs alone. With all 270 systems deployed, the annual savings total is nearly £5,000 GBP (\$10,000 USD). And this does not include the savings in air conditioning costs.

The Sun Ray thin clients integrate better into the university environment. They put out less heat — a godsend for Oxford’s small rooms in non-air conditioned buildings — and are quieter than PCs, a boon to students prepping for exams and writing papers.

The IT department is benefiting, too. It takes just 30 minutes a year on average to support a Sun Ray system, compared to 12 hours per PC — a 96 percent reduction. For 270 units, that translates into over 3000 hours per year, or 1.5 full-time equivalents (FTEs). Oxford saves additional time administering the Sun Ray servers — 15 days per year for the Sun clusters compared to 30 days for the same number of PC clusters.

“Sun Professional Services provided in-depth expertise,” says Jeffries. “And Q Associates — our Sun reseller — worked together with Sun from the first sales call. Personalization and attention to detail from Q Associates in partnership with Sun is one of the factors that made this solution work so well.”

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