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KIM'S NOTEBOOK

Dear EduConnection member:

Use of open standards and open source can be a key strategy for your educational institution. I'd like to offer some specific recommendations for approaching these issues.

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Kim Jones,
VP Global Education and Research
Sun Microsystems, Inc.



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February 2006

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**Solaris Enterprise System:
No-Cost Software. No Restrictions.
No Limits.**



With the Sun Solaris Enterprise System, customers get the Solaris OS, the Sun Java Enterprise System, Sun N1 Management software, and Sun developer tools at no cost for both development and deployment.

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**Streamlining Research at Oxford's
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Research at Oxford's Theoretical
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With a history of substantial contributions to its field, Oxford's Theoretical Physics sub-department requires heavy computational analysis for scientific research. Sun systems supply all the power it needs. [MORE »](#)

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Kim's Notebook: Open Source Strategies

In my role at Sun, I speak to many educators, senior administrators, and IT professionals around the world. I hear a similar message at many institutions: You're under tremendous pressure to do more with less. Budgets are being tightened, staff is often cut, and you're left trying to meet increasing demands to roll out new services and applications with fewer resources.

This problem is compounded by the fact that there are few commercial applications that support your core mission: learning and research. You can't go out and buy what you need, so you're left to create it on your own.

We believe that one of the best ways to handle this problem is to engage in collaborative creation of your mission-critical applications. Work with other educational institutions that are developing similar applications and services. The most important factor is collaboration — working with others, you have more leverage to get the job done. This concept is the foundation of the open source and open standards movements.

I'd like to offer some specific recommendations for approaching the issues of open standards and open source.

First of all, decide what your requirements are, and make the long-term strategic decision to implement your mission-critical applications using open standards. When you use open standards, you protect yourself against the future with a modular, flexible system that allows you to replace one component with another, so long as it implements open standards. Work collaboratively with other educational institutions to leverage your effort.

Sun works with many collaborative organizations such as the [IMS Global Learning Consortium](#), the [Schools Interoperability Framework Association \(SIF\)](#), the [Sakai Project](#), the [Java Architectures Special Interest Group \(JA_SIG\)](#), and many more.

Standards-Based Success

When you consider the middleware that you'll need, standardize on middleware that's used across all industries. This way you'll get the benefit of using software that has a large user base, increasing the likelihood that your own staff already has experience using it. The [Sun Java Enterprise System](#) is one example, providing a complete set of pre-tested, pre-integrated enterprise middleware that can now be downloaded and used with no license cost.

With your foundation built on open standards and standards-based middleware, focus on building your mission-critical educational applications. At this point, you can make your buy, build, or open-source decisions on a case-by-case basis, using the components that suit your needs best. What was once a big decision — should we go all open source? — now is a tactical decision that you can later change with little penalty.

Finally, don't forget about your operating system platform. Use standard platforms like the Solaris Operating System on SPARC or x86-architecture platforms, or Linux. Choosing a good platform is like choosing good middleware — you protect your future by making sure that you can run it on your choice of platforms now and well into the future. With the recent announcement of the [Solaris Enterprise System](#), customers get the Solaris OS, the Java Enterprise System, Sun N1 Management software, and Sun developer tools at no cost for both development and deployment.

Sun has a long history of creating and supporting open standards, and competing to create the



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best implementation of them. This approach helps to produce high-quality, cost-effective commercial products. By competing in the open marketplace, Sun takes a big risk — you can choose software from the competition instead of ours. That's what keeps us on the leading edge, producing some of the best software available anywhere.

Sincerely yours,

Kim Jones
Vice President, Sun Global Education and Research



Solaris Enterprise System: No-Cost Software. No Restrictions. No Limits.



Sun Microsystems recently announced two landmark moves that will create the software platform of choice for the next generation of the Internet.

First, having seen tremendous momentum with the Solaris Operating System as free and open source software, Sun is making the Sun Java Enterprise System, Sun N1 Management software, and Sun developer tools available at no cost for both development and deployment. Sun is also committed to open source this software.

Second, Sun is integrating all of this software along with the Solaris OS into the Solaris Enterprise System, the only comprehensive and open infrastructure software platform available today.

With this announcement, Sun is creating the no-cost and open alternative to the Windows environment. The Solaris Enterprise System has all of the benefits of an integrated offering while still providing customers the flexibility to address their requirements by deploying the specific components they need into alternative operating systems.

In addition to being combined under a single distribution with the Solaris Enterprise System, the Sun Java Enterprise System and the Sun developer tools can be used at no cost on other existing multi-platform environments including Windows, HP-UX, and Linux.

For the free download, please visit: <http://www.sun.com/software/solaris/get.jsp>

“With more than 3.4 million Solaris 10 OS licenses and nearly 1 million Java Enterprise System subscribers, customers and developers around the world have asked us to take the next logical step -- combining the world’s fastest growing open source operating system with the world’s most complete and ready to deploy infrastructure software platform,” said Jonathan Schwartz, president and COO of Sun. “One hundred percent of our customers are deploying Web infrastructures and asking for relief from onerous licenses and system integration activity. With our announced intent to open source the entirety of our software offerings, every single developer across the world now has access to the most sophisticated platform available for Web 1.0, 2.0, and beyond.”

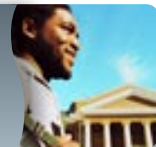
What’s Included in Solaris Enterprise System?

Included at no cost in the new Solaris Enterprise System are:

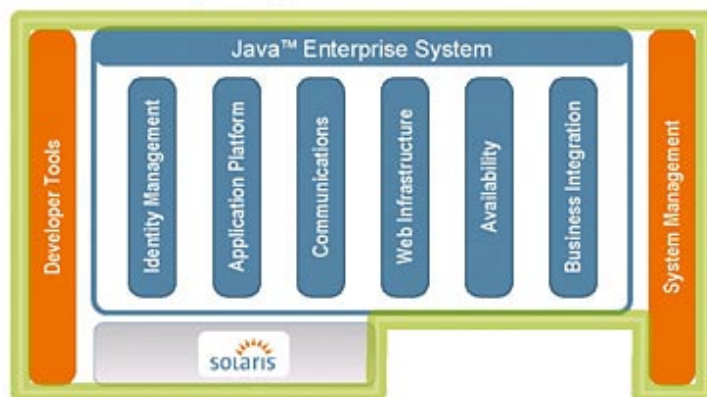
- The award-winning and open source Solaris 10 OS, with the recently announced PostgreSQL database
- The entire Sun Java Enterprise System infrastructure software platform, including the Sun Java Identity Management Suite, Sun Java Integration Suite, Sun Java Communications Suite, Sun Java Application Platform Suite, Sun Java Availability Suite, and Sun Java Web Infrastructure Suite
- The N1 Management Software including the Sun N1 System Manager, the Sun N1 Service Provisioning System, the Sun N1 Grid Engine
- All tools for C, C++, and Java technology development, including Sun Studio 11, Sun Java Studio Enterprise 8, and Sun Java Studio Creator IDE
- Sun Ray ultra-thin client software
- Sun Secure Global Desktop Software

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Solaris™ Enterprise System



Solaris 10 OS: The Choice for Education

In less than one year, the Solaris 10 OS has set more than 46 performance world records and has a broad range of ISV support with over 1500 committed applications. In addition, the Solaris 10 OS currently offers one of the broadest ranges of platform choice in the industry with over 534 supported systems based on SPARC, AMD Opteron and Intel Xeon processor-based systems from vendors as diverse as Dell, Fujitsu, IBM, HP and Sun.

“One of our main concerns is security,” says James Dobson, system architect at Dartmouth College. “We work with a lot of student volunteers for research work, necessitating a high level of security and information protection.” The Solaris 10 OS offers new increased identity security features for authentication, secure data flows, and stronger log-in controls, which help Dartmouth ensure that only authorized users may research or personal data. “Hundreds of people try to hack into our IT system. We have found the Solaris 10 OS to be highly secure, right out of the box,” says Dobson. “By easily changing one setting in the Solaris 10 OS, access to all services can be denied. Not one Solaris 10 OS system has been compromised.”

“Sun’s Solaris 10 Operating System, UltraSPARC technology, and Sun’s commitment to education all are helping the University of Delaware meet our school’s mission of being a technologically advanced institution.”

Daniel Grim
Executive Director of IT
University of Delaware

[Click here for more on University of Delaware’s use of Solaris 10 OS](#)

[Click here to read more about Dartmouth’s use of Solaris 10 OS.](#)

Explore, Develop, and Deploy

Sun is offering a risk-free opportunity to explore, develop, and deploy on Sun’s pre-tested and pre-integrated software platform. This is a complete platform that incorporates Sun’s existing and recently acquired technology, including its market-leading identity management products, service-oriented architecture-based integration and composite application products from Sun’s recent acquisition of SeeBeyond, and remote secure display capabilities from Sun’s acquisition of Tarantella.

Sun is also rolling out a vast number of new, complementary services that span from early developer training and education to sophisticated remote and managed services to automate processes that are currently manually accomplished. Sun’s new Customer Network Services can provide administrators and developers with automated support for operations management, including



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patches, upgrades, updates and warranty, without the high costs associated with professional services.

Sun has committed to open sourcing its entire software portfolio using industry-standard open source licensing models to allow customers easy and broad access to all of its source code. Many of the components of Sun's integrated platform are already available as open source, including the Solaris OS, the Sun Java Application Server, the NetBeans software tools, and several key underlying services like single sign-on capabilities and the ability to connect multiple, independent applications in a standard way. This is a trend in which Sun continues to be a pioneer.

For more information on the Solaris Enterprise System, please go to <http://www.sun.com/solaris>

[Click here](#) to have your local Sun representative contact you, or email education_news@sun.com



Streamlining Research at Oxford's Theoretical Physics Dept.



The Physics Department of the University of Oxford is one of the largest in the United Kingdom, with an award-winning research program that covers everything from quantum computing to Martian atmospheres. This work attracts both students looking for the best preparation for physics-based careers, as well as substantial funding from research councils, industry, and the European Commission.

As research requirements become more complex, the demands on the department's computing capabilities grow accordingly. With a history of substantial contributions to their field, even producing Nobel prize-winning graduates, the sub-department of Theoretical Physics (TP) especially requires heavy computational analysis for scientific research.

But with constant pressure to stay competitive among the foremost universities, the TP sub-departments' hardware platform was not living up to the job. Oxford turned to Sun Microsystems to provide a total hardware and networking solution.

The Need for a Competitive Edge

Lory Rice, computer manager of the Theoretical Physics sub-department, explains his department's computing needs: "TP's computing needs are three-fold: Heavy computational analysis for scientific research entailing hours, days and even weeks of computing. Second is the preparation of scientific papers for journals, presentations for talks, and the drafts for scientific books. Third is communication between colleagues throughout the world, principally by email but with other computer-based technologies evolving rapidly."

According to Rice, Oxford TP has a fundamental and ongoing need to increase its processing capacity. "The reason that needs have grown is just a reflection of the way that computing needs have changed and grown in the wider society. In the case of theoretical physicists, they can undertake more complex research requiring greater computational power just because appropriate computers are available. Much of today's research, especially in the physical sciences, could not be done before the advent of today's powerful computers."



A Messy Mix of Hardware

When Rice joined Oxford in 1995, he inherited an inefficient and disconnected mixture of hardware. "In the early '90s, the Theoretical Physics sub-department moved away from relying on VT100-compatible terminals connected to VAX computers serving the whole of the Physics Department to its own network of first-generation SPARC servers and processor technology," Rice says. "Driven by the familiar mantra within universities of 'value for money,' by 1995, when I arrived to take charge of TP's computers, this purchasing policy had given rise to a mixture of perhaps 40 machines which included Silicon Graphics Indys and DEC Alphas as well as the SPARCs."

Not only was the system inefficient and disjointed, but Rice saw computing and servicing needs growing beyond what this ad hoc method could handle. "With a growth to an eventual doubling in the number of machines, to give everyone a desktop computer, it was becoming impossible

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to provide adequate support with three operating systems on this number of machines.”

Rice chose to resist this ineffective purchasing policy and started looking for the best hardware to create a streamlined and unified system. He found the complete solution in a combination of Sun Microsystems products.

A Total Solution and Immediate Implementation

Sun Microsystems put forward an unmatched, complete solution, providing the high-quality hardware required to meet the demanding needs of the TP sub-department. The solution included Sun Fire servers and Sun StorEdge SCSI Arrays. Sun brought in Streamline Computing (a specialist in High Performance and Technical Computing and a leading provider of parallel and distributed systems and software) to provide the expertise in the parallel computing software and networking side, including the integration of a high speed interconnect and software stacks.

“Sun had worked previously on similar successful projects involving such systems with Streamline Computing and we had confidence and previous experience of the high quality of Sun’s hardware and support,” Rice says.

“The Sun solution, in conjunction with Streamline Computing, offered a cluster of computers organized to run in parallel, thus enabling a large, complex problem to be broken down into smaller parts which could be run simultaneously on separate nodes, enabling the whole calculation to complete more quickly. The new 40-node dual-processor Beowulf Cluster is for research computational analysis and, at present is exclusively used by the TP sub-department.”

Sun was the solution for updating the TP desktop needs as well. As Rice explains, “Starting with the UltraSPARC machines in the late ‘90s, eventually all the machines on the desktop were Sun UltraSPARCs, followed by Ultra 5s and now all Sun Ray ultra-thin clients. Sun also provided central servers for maintaining the network infrastructure.”

The implementation went quickly and smoothly, adds Rice. “It was delivered in one day, configured by Sun and Streamline Computing the next and running test codes by our users on the third. It was very quick because it was pre-assembled and tested elsewhere by Sun’s distributor and Streamline before delivery to us.”

Providing a Competitive Advantage

Thanks to Sun, the theoretical physicists at Oxford now have a streamlined and scalable system, and plans for future expansion. Rice explains, “Calculations never before possible can now be done. Sun has lived up to our expectations. We have a software and hardware support contract with Sun and Streamline Computing and are likely to expand the cluster significantly in the next six months. Without such computers, Oxford TP would not have the tools to compete with other world-class universities in the U.S.A. and elsewhere. Now we have the tools to do so.”

For more information on Sun servers, please visit <http://www.sun.com/servers>

[Click here](#) to have your local Sun representative contact you, or email education_news@sun.com

Key results:

- » 40-node (80 CPUs) grid with high-speed interconnect
- » Complete hardware and software solution
- » Increased computing power for theoretical and computational purposes
- » A computing system that provides scalability to meet evolving computational demands

Key benefits:

- » Faster throughput of research outcomes
- » Easier systems management
- » More computing power for theoretical analyses and advanced calculations
- » Vastly increased storage capacity and computing speed



Educators Worldwide Benefit from Latest Sun Products

During its quarterly earnings call in January, Sun Microsystems profiled some of the new and current customers that recently chose Sun products in its fiscal second quarter. The company experienced an up-tick in customer demand resulting from new products delivered to market in past two quarters. Demonstrating continued market momentum in core industries such as education, customers are rapidly adopting the Solaris 10 Operating System, Sun Java Enterprise System, Sun storage products, and Sun's comprehensive line of industry-standard Sun Fire servers.

Recent education and research customers that have signed with Sun include:

Northwestern University

Northwestern University selected Sun Microsystems to replace a homegrown identity management system with limited capabilities. Leveraging Solaris 10 OS, Sun Fire V210z servers, and the Java Enterprise System, including Sun Java Identity Manager and Sun Java Access Manager, Northwestern University can roll out new single sign-on and identity management that is flexible, affordable, and compatible with the standards of its numerous academic and administrative applications.

The Scripps Research Institute, Florida

Scripps Florida is a state-of-the-art biomedical research institute located in Jupiter, Florida (Palm Beach County) on the campus of Florida Atlantic University (FAU). Scripps Florida selected Sun for a stable, scalable and cost-effective compute cluster solution to support bio-research initiatives. The new compute cluster is comprised of Sun Fire V20z and V40z servers running Sun N1 Grid Engine and attached to Sun StorEdge 3510 FC arrays. The Sun Solution Center for High Performance Computing was engaged to conduct benchmark tests with customer applications, and the Sun Customer Ready Systems Program to pre-load, -integrate, and -test the solution prior to shipment. Sun also provided Scripps Florida with onsite implementation services, support services and new systems' training. The compute cluster is running multiple bio-research tools and applications for more than 100 researchers.

Tokyo Institute of Technology

One of the world's leading technical institutes, Tokyo Institute of Technology is creating Japan's largest supercomputer on Sun technology to help its science and engineering researchers dramatically increase their productivity. The system will be based on Sun Fire x64 servers with 10,480 AMD Opteron processor cores — totaling more than 50 trillion floating point operations per second. Using Sun N1 System Manager and Sun N1 Grid Engine software, the system will be provisioned to support the Solaris 10 Operating System as well as Linux operating environment. The grid-based supercomputer plans to expand to more than 100 teraFLOPS by its operation in spring 2006 and is moving toward becoming one of the five largest supercomputers in the world as ranked by Top 500 in summer 2006.

University of Alberta, Faculty of Engineering

Sun Fire server and StorEdge technologies are continuing to shape nanotechnology research being conducted by University of Alberta's Faculty of Engineering. Building on investments in Sun technology made in 2003, the award-winning research team has commenced a second phase of its IT system expansion with the acquisition of Sun Fire V40z and X4100 servers as well as Sun StorEdge 6130 and 6920 arrays running on Solaris OS. The new x64 implementation will help facilitate future growth, reduce operating costs, and increase the University of Alberta's ability to develop research tools necessary for retaining its position among the top six international leaders in nanotechnology research.



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University of California, Los Angeles

The Laboratory of Neuro Imaging (LONI) at UCLA has selected Sun systems, software, and services as the computational infrastructure for its comprehensive mapping of brain structure and function. By studying and comparing the structure and function of healthy and unhealthy brains, LONI seeks to better understand brain development and the differences between healthy and diseased brains. LONI has already made significant advances in understanding Alzheimer's, AIDS, and brain development. LONI is using over 300 Sun Fire V20z servers running the Solaris 10 OS, the Sun N1 Grid Engine, and Sun Control.

The University of Southern California

The University of Southern California (USC) Center for High-Performance Computing and Communications (HPCC) added 360 of Sun's dual-core Sun Fire V20z x64 (x86, 64-bit) servers to its powerful supercomputer cluster. The HPCC selected the servers for their advanced cooling capabilities, smaller form factor, energy efficiency and superior price/performance. Driven by a steady desire to strengthen the performance and capability of its supercomputing server cluster, which is currently ranked as the 24th-fastest supercomputer in the world on the Top 500 list, the recent addition of the Sun Fire V20z server increased USC's HPCC system total number of compute nodes from 1716 to 1830.