

CASE STUDY

WAKE FOREST UNIVERSITY CHOOSES RED HAT FOR MULTIPLE PROJECTS

Located in the Western Piedmont of North Carolina, Wake Forest University is home to more than 6,000 wireless-enabled students with demanding computing needs. Since launching its technology initiative in 1996, the university has received national recognition for its leadership in educational technology including the 1998 and 2000 EDUCAUSE awards for its network computing initiatives and the #2 ranking for the most connected campus in America by The Princeton Review in 2003.

The Wake Forest Information Systems Department is committed to continuous improvement in the services they provide to students, faculty, and staff. So when they needed to build a high-performance computing cluster and increase performance in mission-critical applications, Wake Forest turned to Red Hat® Enterprise Linux® and Red Hat Network (RHN) Satellite Server to get the job done.

DIFFERENT PROJECTS, SAME SOLUTION

When Tim Miller, Systems Analyst Lead first came to Wake Forest in 2002, he was asked to head up a high performance computing cluster initiative. At the time the only high-performance computing environment at Wake Forest was an IBM SP2 solely used by the Physics Department. "We looked at several options in how to build our cluster," Miller said. "Our fundamental goals related to the cluster revolved around disk space, storage, and performance. We needed to make sure the cluster met the broader needs of the University's diverse research groups."

In a separate project, Wake Forest required a highly reliable operating environment to power

Program Link, the largest central administrative computing conversion in the university's history. Closely tied to the Oracle installation, Program Link is the cornerstone of the University's initiative for a totally integrated digital campus, so it was imperative that Wake Forest find an operating system that integrated cleanly with Oracle's total product line.

FAST FACTS

Industry: Education

Challenge: Quick deployment of servers in an ever-growing network

Platform: Red Hat Enterprise Linux, v.4

Management
Red Hat Network Satellite Server

Software: Oracle, Blackboard, Banner

Benefits:
Quicker deployment of servers and increased security and performance on mission-critical applications within budget requirements.

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WHY RED HAT?

The Wake Forest team spent months evaluating different alternatives based on cost, performance, support, manageability, and security. They considered other operating systems, but according to Miller, “In the end, Red Hat proved to be the better option in terms of all our needs.”

SECURITY

Security was top priority for both the DEAC computer cluster and Program Link. “Red Hat Enterprise Linux, combined with Red Hat Network Satellite Server, allowed us to readily secure our systems,” said Seth Stein, Systems Analyst for the Wake Forest UNIX/Linux team. “It is essential that we get updates in place quickly and efficiently to keep the systems and users secure. If we had to compile everything from source, it would be a major drain on our time. With RHN we have all the updates we need. It saves us time because the packages have been compiled and tested. As a result, we can provision a server in 30 minutes.”

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VENDOR SUPPORT

Wake Forest gained more confidence when they saw that industry-leading vendors backed Red Hat. “The relationship between Red Hat and Oracle is very important to us,” Stein said. “With Oracle’s total product offering supporting Linux, we can make the case to our managers for deploying the entire Oracle environment on a more

easily maintained and secured operating system. In the end, that means we save money by reducing administrative time and maintaining longer uptimes for university business. This produces a major benefit in that the students, who access services and data from those databases, have a much better user experience.”

On the cluster side, research revealed that many cluster vendors actually developed their software on Red Hat products, which created additional stability for the environment. Miller said, “Since the DEAC cluster supports multiple research groups, we use a wide range of software: Gaussian, CHARMM, VMD, NAMD, MEAD, Matlab, BLAST, and ClustalW. Some groups maintain their own software analysis packages and utilize freely available libraries, such as ATLAS, BLAS/LAPACK, MPICH and GSL.”

COST

The final compelling reason in favor of Red Hat Enterprise Linux versus another Linux distribution was cost. “The new licensing costs for many of Red Hat’s competitors were more than we wanted to spend,” Miller said.

IMPRESSIVE RESULTS

“The University has an extensive collection of computing facilities that serve both academic and business needs,” said Jay Dominick, Assistant Vice President for Information Systems and Chief Information Officer. “Red Hat has played a critical role in the upgrade of our information infrastructure from proprietary Unix-based servers to open source-based computing and the deployment of a cluster-based supercomputing facility. It has also allowed us to standardize our computing support—both scientific and business computing—around one operating system. The advantages for us in terms of support, availability and disaster recovery are substantial.”

Use of Linux and other open source solutions have grown rapidly across Wake Forest as the choice for not only high-performance computing and enterprise infrastructure, like Blackboard, Banner, and Oracle, but also for online and network services like email, DNS, LDAP, and library search engines.

In production now for two years, DEAC serves as the primary research computing resource for Wake Forest's main campus, heavily utilized by the Biophysics, Physics, Computational Chemistry, and Biomedical Engineering departments. Researchers from the Wake Forest University School of Medicine also rely on DEAC.

And through their Red Hat academic site subscription, Wake Forest students and faculty have unlimited access to the entire Red Hat Enterprise Linux product family, including client, workstation, and server products.

ADVICE FOR GETTING STARTED

Miller offered this advice for companies contemplating a migration to Linux: "Make sure you attack the problem in a structured manner. Plan your deployment and realize the full potential in Linux as it tends to really outperform in areas you least expect. Start with an architectural approach and test your replication plan to make sure it really works. You'll save yourself a headache later on."

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"Keep an open mind. The perception that open source is not supported, not ready for mission-critical applications is not accurate," advised Richard Ray, Systems Analyst for the WFU IS UNIX/Linux team.

"The community model is much better. Open source has so many eyes looking at it that it is pretty solid. It just grows and evolves over time."

THE FUTURE IS OPEN

In regards to future plans with Linux, Miller has at least three upcoming projects that will be based on open source solutions. The first will be a grid-based, web infrastructure compatible with the MCNC statewide efforts (<http://mcnc.org>) using the Globus Toolkit (v4) and various web technologies including Tomcat, XML, and SOAP. "The second project is to evaluate the Red Hat Global File system (GFS) as a potential GPFS replacement," he said, "and the third is to convert our custom, home-grown post-imaging environment to cfengine."

"Our experience with open source and Linux has been extremely positive," adds Dominick. "Because of the support from Red Hat, we will continue to always consider it as a viable option for our infrastructure. We consider Linux as our primary option for our computing resources. The support from Red Hat makes this an easy decision."

