

Platform™

The Power of Sharing

"With the nature and scope of research at the University of Oklahoma, HPC success is dependent upon a stable, reliable scheduler."

-Henry Neeman, Director, OU Supercomputing Center for Education and Research

Reliability is the key to satisfaction

Customer

OU Supercomputing Center for Education and Research, University of Oklahoma

Solution

Platform LSF

Industry

Education

Results

Challenges

- Ensure that researchers, faculty and staff have adequate computational resources to conduct their research
- Provide HPC resources for national and regional weather forecasting services

- Designed to ensure timely completion of research projects, so scholars can spend time on advancing knowledge rather than waiting for results
- Workload scheduler designed to handle hundreds of applications running on a 531 node cluster
- Facilitates unique storm-tracking computations both locally and nationally
- Gold standard support keeps clusters working smoothly



The University of Oklahoma (OU), OU Supercomputing Center for Education and Research (OSCER) – a division of OU Information Technology – provides students, faculty and staff with High Performance Computing (HPC) resources, supporting the needs of research and education in the Colleges of Arts and Sciences, Atmospheric and Geographic Sciences, Business, Earth and Energy, Engineering, and Medicine.

OSCER was established in fall of 2001 and deployed its first cluster in spring of 2002. The early going was rough, because OSCER was using open source workload scheduling software. "It was one disaster after another," says Henry Neeman, OSCER's director. "We implemented Platform LSF in 2005."

A reliable scheduler

"With the nature and scope of research at OU, HPC success depends on a management solution with the ability to intelligently schedule parallel and serial workloads, while utilizing available computing resources at maximum capacity and capability," Neeman says.

Integrating hundreds of application poses few problems

OSCER's largest cluster is built of 529 dual-socket, quad-core nodes and 2 quad-socket, quad-core nodes. Over 400 users submit batch jobs, using dozens of applications, to the cluster. These include applications that support research on high energy physics, weather forecasting, molecular dynamics, reservoir modeling, and chemistry applications, and many other research areas. Most of the applications are open source, while some have been developed by university researchers and a few are commercially purchased licenses.

Platform LSF is designed to integrate most applications.



Top two images courtesy of the University of Oklahoma

THE UNIVERSITY OF
OKLAHOMA



Image courtesy
of the University of Oklahoma

Real-time storm tracking

Weather forecasting applications are among the heaviest users of OSCER's resources. Masses of data from satellites and radar are amalgamated throughout the day and processed into a forecast for professional meteorologists.

"The forecast has to be produced by a particular time of day," says Neeman. "For example, if the data comes in at midnight, the weather group might have to publish the forecast on their website by 6 a.m. So 'real time' means they have a very specific time window during which the entire process must be completed."

OSCER also provides HPC resources to track and research severe storm patterns in Oklahoma, the surrounding region, and across the United States. During the mid-April to mid-June storm season, additional cluster resources are devoted to the weather forecasting applications. "In spring of 2008, they consumed 15 to 20% of our total resources, all day every day, for two whole months."

Condominium Computing

"Platform LSF facilitates work for people who do anything on the supercomputer," comments Neeman. The cluster is built mostly of Dell machines running Red Hat Enterprise Linux 5. OSCER allows some "condominium computing," where individual departments purchase nodes out of their own budgets and incorporate them into the OSCER cluster. This has sometimes resulted in a bit of a mix of server types.

Balancing competing resource requirements

"There's typically about twice as much work queued up as there are resources available," states Neeman. Balancing resource usage is critical for HPC organizations like OSCER.

"When higher priority jobs come along, we need the ability to shut down lower priority jobs already running, move resources over to the high priority job, and when it's done, have the suspended jobs pick up from where they left off," Neeman comments. Platform LSF is designed to address such complex scheduling.

For most users, who are not very HPC-savvy, Neeman creates example batch scripts that they modify to submit their jobs. "Since we got that crafted, it's been pretty straightforward for them to modify these example scripts to the specifics for their various experiments."

Performance and support from an unbeatable team

Neeman says that past experiences resigned him to the fact that he's in "the broken technology business."

Platform is committed to changing that industry paradigm. When something does go wrong, Platform is eager to step up and fix the problem, which isn't always the case in the HPC business. Like many of Platform's customers know, the quality of service matches the quality of the product.

Platform™

Platform Computing is the leader in grid and cloud computing software that dynamically connects IT resources to workload demand according to business policies. Over 2,000 of the world's largest organizations rely on our solutions to improve IT productivity and reduce data center costs. Platform has strategic relationships with Cray, Dell™, HP, IBM®, Intel®, Microsoft®, Red Hat®, and SAS®. Building on 16 years of market leadership, Platform continues to help data centers be more efficient, responsive and dynamic. Visit www.platform.com.

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