For the Week of June 29, 2009

Spider Up and Spinning Connections to All Computing Platforms at ORNL

'We couldn't phone and order one,' so ORNL, collaborators trail-blaze a file system giant

- Spider, the world's biggest Lustre-based, center-wide file system, has been fully tested to support ORNL's new petascale Cray XT4/XT5 Jaguar supercomputer.
- An extremely high-performance file system, Spider has 10.7 petabytes of disk space and can move data at more than 200 gigabytes a second.
- Ultimately, it will connect to all of ORNL's existing and future supercomputing platforms, as well as off-site platforms across the country via GridFTP.

"What makes Spider different [from large file systems at other centers] is that it is the only file system for all our major simulation platforms, both capable of providing peak performance and globally accessible." – Galen Shipman, Group Leader for Technology Integration at ORNL's National Center for Computational Sciences (NCCS)

Four Supercomputers at Oak Ridge Computing Complex Among World's 25 Fastest

Jaguar XT5 Cray machine remains fastest, most versatile for open science

- Jaguar XT5, ORNL's Cray high-performance computing system, remains the world's fastest supercomputer for unclassified research, according to the latest TOP500 list.
- The TOP500 list named four machines at the ORNL computing complex among the world's 25 swiftest. All told, five Oak Ridge machines made the list.
- The XT5, which has a peak speed of 1.382 petaflops, is part of a larger Cray system, also called Jaguar, that includes a 263-teraflops XT4 component that ranked number 12.

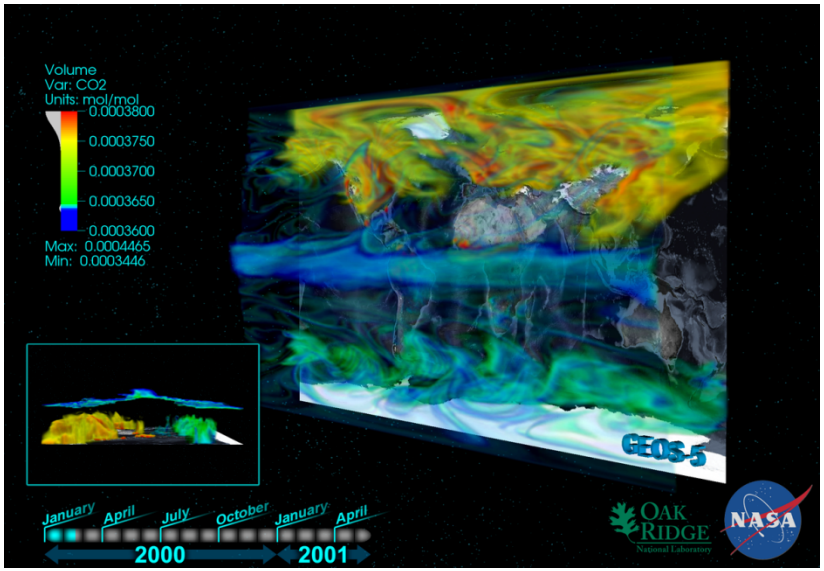
TOP500® SUPERCOMPUTER SITES

"The Jaguar system helps the scientific community gain insight into topics critical to DOE and the nation, such as mitigating and adapting to climate change, making efficient photovoltaic materials, producing next-generation biofuels, and controlling plasma in a fusion reactor."
– NCCS Director Jim Hack

Climate Visualization Team Wins SciDAC Award for ORNL

Daniel, Erickson take prize for climate image

- "GEOS-5 Seasonal CO2 Flux," a climate visualization by two researchers at ORNL, has received an award in the 2009 Outstanding Achievement in Scientific Visualization category from SciDAC.
- Jamison Daniel and David Erickson received the award for their visualization, which describes the seasonal flux of carbon dioxide in the atmosphere over North America.
- The award was announced at the annual SciDAC 09 conference in San Diego, held June 14-18.

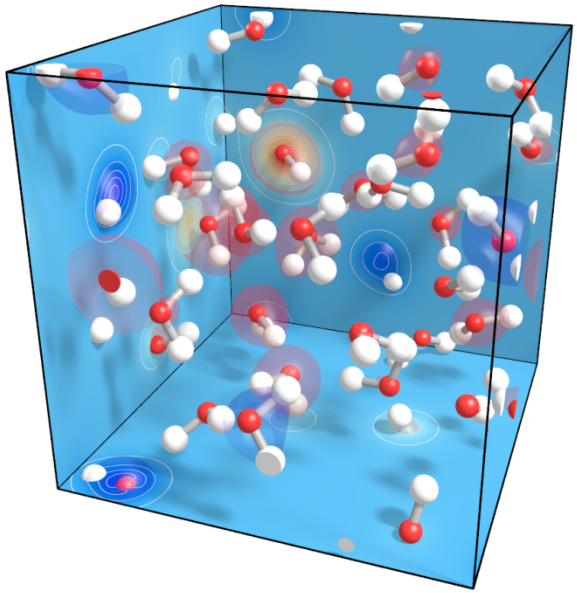


Time evolving atmospheric CO2 concentration in the atmosphere as simulated using the NASA GEOS-5 (Global Earth Observing System) model running on Jaguar at ORNL. The higher CO2 concentrations in the northern hemisphere are due to anthropogenic emissions. This is a joint climate science ORNL-NASA project between David Erickson (ORNL) and Steven Pawson NASA / GMAO (Global Modeling and Assimilation Office)/ (GSFC) (Goddard Space Flight Center).
Visualization by: Jamison Daniel, ORNL

Supercomputing Tests the Waters

Simulations explore mysterious properties of Earth's most abundant molecule

- **Two physicists at the University of Illinois, Urbana-Champaign, will use ORNL's Cray XT Jaguar supercomputer to create one of the most accurate descriptions of water's microscopic properties.**
- **David Ceperley and John Gergely will be able to see where the discrepancies lie between the theoretical models and experimental results of freezing and melting points.**
- **Water's presence in all biological matter and its molecular properties are of interest in many different fields.**



A typical configuration of liquid water. Reds are oxygen, white hydrogen and grey bonds within a molecule. The blue walls show the electron density when a molecule is on the surface of the cube. *Image credit: David Ceperley and John Gergely (NCSA)*

"The goal is to go beyond pure water and do more complex things. In the long term we hope to learn how to do the electronic calculations for any type of system made out of ions and electrons. Because that's what everything is made out of." – co-principal investigator David Ceperly

ORNL Hosts Lustre Part II

Workshop looks ahead to 2015

- Users, engineers, and developers converged on ORNL May 19-20 for part two of the Lustre Scalability Workshop.
- Lustre is an Open Source cluster file system developed and supported by Sun Microsystems and popular in high-performance computing environments due to its scalability.
- The workshop brought together representatives from the world's largest Lustre deployments to identify key scalability issues and develop a roadmap for the future, namely bandwidth in the terabytes per second range and the manageability of exabytes of storage by 2015.
- In all, the conference hosted 30 attendees and was held at ORNL's Joint Institute for Computational Sciences.

"The focus of the workshop was to identify long term, 2015 and beyond, I/O and storage requirements for high performance computing and to discuss how the Lustre file system can meet these requirements," - Galen Shipman, Group Leader for Technology Integration at the NCCS