

Supercomputer offers MATLAB capability

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(PhysOrg.com) -- The Cornell Center for Advanced computing has deployed A 512-core parallel cluster running the scientific language MATLAB as an experimental resource on the TeraGrid.

Scientists and students at Cornell and across the nation can run fast parallel [computer simulations](#) directly from their own desktops using a new computational resource deployed at the Cornell Center for Advanced Computing (CAC), the university's high-performance computing facility.

A 512-core parallel cluster called "MATLAB on the TeraGrid" is accessible now as an experimental resource on the TeraGrid, the nation's high-speed research network.

MATLAB is a high-level technical computing language with applications ranging from nanoscience, engineering and environmental science to health care and biology. One of the languages taught to Cornell engineering freshmen, it is used by students in many departments at Cornell and at other universities. Deploying the language on a high-performance parallel system allows researchers to run applications faster and more easily, by dividing problems into many parts that run simultaneously.

"MATLAB on the TeraGrid will help enable a broader class of researchers who are well versed in MATLAB to reduce the time to solution in a seamless and scalable manner," said Robert Buhrman, Cornell senior vice provost for research. "It will be a valuable tool to

researchers with complex analytic and fast simulation requirements and, at the same time, provide undergraduate and graduate students with a bridge to understanding important parallel programming concepts."

The \$1 million project is supported by the National Science Foundation (NSF) using stimulus funding from the American Recovery and Reinvestment Act (ARRA) and by Dell, Microsoft Corp. and The MathWorks, originators of MATLAB. This is the first NSF-funded experimental MATLAB resource on the TeraGrid, said CAC director and principal investigator David Lifka.

Researchers and students will run programs on the new resource from their own desktops using Microsoft Windows, Apple Macintosh or Linux-based clients. The cluster also will support "Science Gateways" on the TeraGrid, beginning with the nanoHUB gateway at Purdue University, a partner with Cornell in the NSF grant. NanoHUB offers applications for nanotechnology research.

Science Gateways allow researchers to run specialized applications without necessarily having to understand the computing resources behind them or the intricacies of parallel programming.

"This is exciting for research because it allows researchers to go to well developed portals for documentation, training and simulation capabilities," Lifka said. "The pervasiveness of MATLAB as a science and engineering tool makes the potential of MATLAB as a computational backend for Science Gateways especially appealing."

Additional Science Gateways using the MATLAB resource may follow, Lifka said. CAC is working with the Centers for Disease Control and Prevention (CDC) and the Weill Cornell Medical College to develop gateways for epidemiology and medical image analysis. Researchers at the CDC recently used all 512 cores on the MATLAB cluster to model a

hepatitis C virus, a major cause of liver disease worldwide. Ithaca campus researchers from earth and atmospheric sciences, civil and environmental engineering and biomedical engineering also are in the process of modifying their MATLAB programs to run on the parallel resource.

Annual classroom workshops on the use of the system will be held at Cornell and Purdue; virtual workshops will be available online. For more information on the project and to request access to the experimental resource, visit www.cac.cornell.edu/matlab .

Provided by Cornell University

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