High-performance computing tackles hepatitis

Cornell University

The Cornell Center for Advanced Computing (CAC) has received a High-Performance Computing Innovation Excellence Award from the International Data Corp. "for the outstanding application of HPC (high-performance computing) for business and scientific achievements" for crunching hepatitis C virus data up to 175 times faster on its experimental MATLAB computing resource.

Researchers from the Centers for Disease Control (CDC) used the Cornell resource for computations that provided a better understanding of networks of coordinated amino-acid variation that may enable the discovery of new therapeutic targets for the hepatitis C virus.

The award was presented at SC11, the international conference for high-performance computing, networking, storage and analysis, in Seattle, Nov. 12-18.

MATLAB is a high-level technical computing language widely used in science. CAC has deployed the language on a 512-core parallel cluster that allows researchers to run applications rapidly by dividing problems into many parts that run simultaneously. Scientists nationwide can run applications on the MATLAB cluster from their own desktops via the TeraGrid high-speed research network.

The total lifetime medical cost for 3.6 million Americans with hepatitis will come to $360 billion in today's dollars, researchers said. "The significance of high-performance computing to the private sector will only be fully appreciated when examples such as these are recognized for their economic value," said Cynthia McIntyre, senior vice president for the HPC Initiative at the Council on Competitiveness.

"Research on HCV is just one of the many projects that kept the MATLAB experimental resource saturated," reported David Lifka, principal investigator of the National Science Foundation-funded project that received additional support from Dell, Intel, Microsoft and MathWorks. "Over 500,000 jobs ran on the system in two years, generating new scientific insights and publications in condensed matter physics, gravitational wave detection, biomedical imaging, orthopedics, neuroscience and optics," he noted.

Project partner Purdue University has also enabled the resource to work as a transparent and efficient computational engine for nanotechnology applications, he said.

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[1] http://www.news.cornell.edu/stories/Jan12/MATLABhepatitis.html