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Albuquerque, NM -- The National Computational Science Alliance's (Alliance) Linux Roadrunner Supercluster at the University of New Mexico (UNM) is officially open for business as a node on the Alliance Grid.

A prototype of the national information infrastructure of the 21st century, the Alliance Grid is an emerging integrated computational and collaborative environment that links people, resources, and services over high speed networks. Joining the Alliance's arsenal of parallel computing systems located at facilities from Boston to Maui, Roadrunner is a 64-node AltaCluster by Alta Technology Corporation. Each node has two Intel 450 MHz Pentium II processors interconnected via a 1.2 Gbyte bandwidth Myrinet network for high speed communications. The system runs on the Linux operating system. The Roadrunner Supercluster has also been fully integrated with the Globus Infrastructure, a high performance, distributed computing toolkit that allows ready access to geographically distributed resources such as superclusters and supercomputers, data repositories, scientific instruments and visualization suites.

The Roadrunner Supercluster was unveiled at an April 8 dedication at UNM's Albuquerque High Performance Computing Center (AHPCC) and has been in a "friendly-user" mode since June 1, operating as a production research platform with user support services 24 hours a day. More than 50 Alliance users have been test driving this speedy yet cost-effective system since June. Early results from scientists reveal Roadrunner to be a promising option for high-performance computing, especially relative to its price.

UNM Professors David A. Bader and Barney Maccabe are in charge of the efforts to evaluate the performance of scientific applications on Roadrunner, and so far, they have been successful in making codes scale on the nodes of the Supercluster.

"Using the Cactus benchmark in scaling, the Roadrunner Supercluster outperforms all other kinds of clusters," noted Bader. The Cactus code is a modular manageable high-performance 3D tool for Numerical Relativity. Details can be found at <http://www.aei-potsdam.mpg.de/~wehrens/cactus/cluster/>

To further evaluate Roadrunner, MILC, a conjugate gradient algorithm for Kogut-Susskind quarks, was used as a benchmark. "We are pleased to see that the MILC benchmark achieved greater than 60 Mflops per processor on Roadrunner, said Bader. He pointed out that this performance is significant in terms of cost per flop when compared to the 76 Mflop performance per processor of the Cray T3E 900, and the 120 Mflop performance on the SGI Origin2000 using 250 MHz R10000 processors. For more information on MILC, see <http://www.physics.indiana.edu/~sg/milc.html>

Other advantages of the Roadrunner Supercluster include ease of system administration and software availability, often from the public domain. In fact almost all software, including the operating system, schedulers, compilers, and applications, is constantly being rewritten and improved as part of the open system development. Usability and portability are other features of the Linux Supercluster. Dr. Dan Weber, Research Scientist from the Center for the Analysis and Prediction of Storms at the University of Oklahoma, discovered that "Porting code to the Supercluster is transparent. I had models running in less than 30 minutes."

Bader and Maccabe, and Rob Pennington, technical program manager for the Alliance NT Supercluster team, will present a Supercluster tutorial and forum at the upcoming Alliance Chautauquas 99. The Chautauqua program begins August 9 - 10 at UNM, and continues with programs August 23-24 at the University of Kentucky, and September 14-15 at Boston University. For more on the Chautauquas, see <http://www.ncsa.uiuc.edu/alliance/chautauqua/> Bader, Maccabe, and Pennington will also present a workshop on Superclusters at SC99 in Portland OR, November 13-19.

Roadrunner Project Engineer Patricia Kovatch says that academic users may request allocations of up to 4,000 CPU hours at <http://www.alliance.unm.edu> Larger allocations can be requested from the Alliance Allocation Board at <http://www.ncsa.uiuc.edu/alliance/applying/Overview.html> "We're open for business," Kovatch noted, "and we're planning enhancements in the near future, including implementing a high performance, scalable storage subsystem. We sent a survey to the initial users asking for feedback and ideas to improve the supercluster."

The National Computational Science Alliance is a partnership to prototype an advanced computational infrastructure for the 21st century and includes more than 50 academic, government and industry research partners from across the United States. The National Center for Supercomputing Applications at the University of Illinois at Urbana-Champaign is the leading-edge site for the Alliance. The Alliance is one of two partnerships funded by the National Science Foundation's Partnerships for Advanced Computational Infrastructure (PACI) program and receives cost-sharing at partner institutions. NSF also supports the National Partnership for Advanced Computational Infrastructure (NPACI), led by the San Diego Supercomputer Center.

More information about Roadrunner can be found at <http://www.alliance.unm.edu>

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