



The Roadrunner SuperCluster computer, located in the UNM High Performance Computing Education and Research Center is powered by 128 off-the-shelf computers connected together.

Kristopher Parra

CATCHING UP WITH THE *Roadrunner*

by Jessica Schneider
Daily Lobo

In a flurry of camera lights, men and women in suits, and even a U.S. Senator, UNM's newest supercomputer joined a national grid of other supercomputers.

At the dedication ceremony Thursday afternoon, which included appearances by Senator Pete Domenici, UNM President Bill Gordon, and delegates from other

■ Researchers at High Performance Computing Center plug in, turn on new supercomputer

universities, the Albuquerque High Performance Computing Center officially connected the supercluster computer, called Roadrunner, to the national grid. The computer is the first 128 node commodity supercluster high performance computer. In essence, it is 128 off-the-shelf computers connected together through high speed networking.

About 300 people gathered at the dedication ceremony of the new supercluster. Sen. Pete Domenici

said he was pleased that UNM's science capabilities are falling in step with that of the national laboratories.

"I believe, because we have the private sector and the national labs working together, this kind of information center will be the best in the world," Domenici said.

Ken Summers, a research assistant working in the visualization lab at the computer center, said the center already provides computer support for research at the University and in the community. He said science and engineering disciplines often need to do massive simulations, visualizations or data processing. Businesses and University departments can get an account with the center that allows them access to time on the supercluster to solve computational problems.

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Networking allows the supercluster to manipulate massive amounts of data at a fraction of the cost of a regular supercomputer, Summers said.

The technology is important for UNM and universities across the nation because it will allow researchers to access cost-effective high performance computing, Gordon said.

"UNM is extremely proud to be associated with this endeavor," Gordon said.

A tour of the Roadrunner and the visualization laboratory in the computer center was included in the dedication ceremony.

Summers described a demonstration image as a molecular dynamic simulation of water. He said that, with a simulation such as this, researchers could study the interaction between the molecules as they pass by each other.

"We're able to see what's happening — not just look at numbers on a screen," Summers said.

Jason Mastaler, an undergraduate student in management information systems, was responsible for installed, configured and keeps the software on the Roadrunner running. He described himself as "the guy in the trenches." With the help of Ken Segura, an undergraduate in computer science, they managed to get the supercluster running for Thursday's dedication.

The Roadrunner is connected to the National Computational Alliance, a National Science Foundation-funded partnership.

The Alliance connects supercomputers into a national grid.

"The band-width for the connection of the superclusters is 10,000 times better than what is used in a home computer," said Larry Smars, the director of the alliance.

Researchers can use the Roadrunner, along with other supercomputers, from almost anywhere, Summers said.

Now that the Roadrunner is connected to the alliance network, Mastaler said it might be used to solve "grand challenge" problems, which are fundamental questions that the government decided need to be solved, he said. A collision of black holes and its gravitational effects is one example, he said.

Mastaler said the network cards were the most expensive part of the Roadrunner. He said the internodal connection was Myrinet, a system that is approximately 1,000 times faster than Ethernet. The operating system for the Roadrunner is Linux. Segura said the main reason to use Linux was its open-source code, which allows access to fix any bugs.

"You can't go to Microsoft and get the code for Windows NT," he said. "If there's a bug, you have to wait until Microsoft fixes it," Segura said.

Mastaler also added that the Linux operating system was free, as was most of the software used on the Roadrunner.

"That's partly why it's so cost effective," he said.