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UNH to Acquire Supercomputing Cluster

Contact: [David Sims](#)
603-862-5369
Science Writer
Institute for the Study of Earth, Oceans, and Space

Dec. 8, 2004

DURHAM, N.H. -- The Institute for the study of Earth, Oceans, and Space at the University of New Hampshire has announced that Microway Inc. of Plymouth, Mass., has been awarded the contract to supply a supercomputing cluster for space, atmospheric, and Earth systems research at the university.

A leading manufacturer of custom-configured Linux Beowulf Clusters, Microway was selected because it offered the best designed and best priced solution for the university's specific needs.

The supercomputing system will be used by EOS researchers to simulate processes in space plasmas, to model the spread of pollutants through New England's air and their influence on climate, and to model Earth's ecosystems.

"The acquisition of the cluster will enable us to open new frontiers in the study of Earth's space environment," said space physicist Joachim (Jimmy) Raeder of EOS's Space Science Center (SSC) and Department of Physics.

Raeder, who has led the UNH effort to acquire the cluster, noted that UNH now joins the ranks of a handful of universities in the country with this kind of supercomputing ability. Not only will this greatly enhance research capabilities but it will also help to attract students.

Berrien Moore III, director of EOS, said, "In the past, high-end supercomputing was confined to national labs and supercomputer centers because the cost of these computers, which ran into the tens of millions of dollars, was out of the reach of smaller research institutes. Now, companies like Microway can tie relatively inexpensive node designs together to make extremely powerful, affordable machines."

Whereas a typical desktop PC can perform about one billion operations per second, the cluster will be able to perform more than one trillion operations per second or about 1,000 times as fast as an ordinary PC. Even with such enormous computer power, many of the space, atmosphere, and Earth models used by researchers still require several days to run to completion.

Paul Professor of Space Science Amitava Bhattacharjee, who specializes in the simulation of space plasmas, noted that the new computer will make it possible to "do our work using our high-performance codes without waiting in agonizingly long queues at national supercomputing centers." A supercomputing cluster such as this can reduce the time needed to do complex

mathematical computations from weeks to days.

The purchase of the cluster was made possible by grants from the National Science Foundation through its Major Research Instrumentation Program, and the National Oceanic and Atmospheric Administration (NOAA) for the joint NOAA-UNH Atmospheric Investigation, Regional Modeling, Analysis and Prediction (AIRMAP) program.

AIRMAP's primary mission is to develop a detailed understanding of climate variability and the source of persistent air pollutants in New England. EOS provided additional resources.

AIRMAP director Robert Talbot, whose group will be a major user of the cluster for three-dimensional simulations of atmospheric transport, chemistry, and climate, said, "The cluster will allow us to conduct these studies on time scales of seasons to decades."

This capability will spark new insight into the climate-chemistry connection on regional to global scales, and put AIRMAP on the forefront of research in this area.

Ann Fried, chairperson of Microway commented, "We are gratified that the Institute chose us to manufacture and install this important cluster. We expect it will be a leader in the top performing Linux clusters used for research in space, atmospheric, and Earth systems."

Jimmy Raeder may be reached at (603) 862-3412 or jraeder@unh.edu. Ann Fried may be reached at (508) 732-5555 or ann.fried@microway.com.