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Business students reclaiming old PCs to build supercomputer

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MUNCIE, Ind. - Discarded personal computers are being used to develop the first supercomputer at Ball State University.

The [Cluster Computer Research Project](#), a network of unwanted PCs located in a former lab in the College of Business, is designed to process complex mathematical problems for faculty research.

Students built the supercomputer at a fraction of the cost of a new one, said Fred Kitchens, management professor and faculty director of the project.

"A new system will cost an average of \$8 million and a lease runs about \$1 million annually," he said. "By using donated computers and having students set it up, the price tag for our unit is about \$500."

The newly created system is based on the Beowulf-class supercomputers, named for the Scandinavian hero in the Old English epic.

"The world's fastest computers, including IBM's Deep Blue, are actually clusters of computers rather than a single unit," Kitchens said. "The Beowulf system was selected because the design accepts any computer, no matter what its speed, configuration or manufacturer."

Beowulf systems are used around the world for weather predictions, nuclear simulations, astronomical calculations, genetic algorithms, economic forecasts and data storage techniques. NASA created the first system in 1994.

The first phase of the project began last fall with a group of five students in Kitchens' management class with building a working model of a Beowulf-class system running the Linux operating system. The second phase is now underway and is working to expand the system, promote community awareness and begin using the system for research.

Future phases of the project will involve software development, and business



Mark Cheeseman, left, a senior from Aurora, Ind., works at the keyboard of Ball State's new supercomputer with the help of Fred Kitchens, management professor. Al Johnson, right, a senior from Greenwood, Ind. (right), installs a portion of the computer complex located in the College of Business.

partnerships.

"This has been a great opportunity to develop this project," said Alan Johnson, a senior from Greenwood who is majoring in management information systems. "So far we've made several presentations to groups on campus and in the community. The response has been overwhelming."

Kitchens said the project is an example of how reconditioning old personal computers may reduce a growing environmental problem. About 80 percent of used computers are sent to various locations in Asia where discarded materials are damaging the local environment.

"In underdeveloped countries, people frequently apply acid to used computer parts to extract small amounts of silver and gold," he said. "The acid and other hazardous materials such as lead, cadmium and mercury make their way into rivers and streams, causing unsafe living conditions."

"Old computers also are destroyed by burning them, releasing toxic chemicals into the air."

(NOTE TO EDITORS: For more information, contact Kitchens at fkitchens@bsu.edu or (765) 285-5305 or go to the project's Web site at <http://www.clustercomputingresearch.com/>.)
By Marc Ransford, Media Relations Manager