

NEWS RELEASE

More Bang for Less Buck: UB's Supercomputers Go "Green"

Upgrade boosts center's power by 50 percent, yet saves \$150,000 per year

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BUFFALO, N.Y. -- In the world of supercomputers, practical considerations like energy consumption have traditionally been overshadowed by the emphasis on high performance. But as energy costs have increased, computational scientists at the University at Buffalo's Center for Computational Research (CCR) have found a way to do more cutting-edge science while consuming less power.

A new energy-efficiency upgrade to CCR, located in UB's New York State Center of Excellence in Bioinformatics and Life Sciences, will realize energy savings of approximately \$150,000 per year, while boosting the center's total capacity from 13 Teraflops (trillion floating operations per second) to 20 Teraflops.

The upgrade was made possible by a \$300,000 contract from the New York State Energy Research and Development Authority (NYSERDA) and a \$150,000 investment by UB.

"Current trends in data centers have led to a crisis in terms of electrical and cooling capacity, where it is increasingly difficult to meet the expanding power requirements of supercomputers," said Thomas Furlani, Ph.D., director of CCR and principal investigator on the NYSERDA contract. "Over the next year, CCR, a leading academic supercomputing center, will replace one-quarter of its old servers with state-of-the-art energy efficient servers that will not only dramatically reduce CCR's power and cooling requirements, but will also increase its compute capacity by more than 50 percent."

Installation of the new high efficiency servers will take place during the spring 2009 semester.

The UB/NYSERDA investment will pay for itself in about three years, with UB recovering its investment in the first year.

"This joint NYSERDA/UB demonstration project will raise the public's awareness of the significant energy savings achievable in data center upgrades," said Robert G. Callender, NYSERDA vice president for programs. "Installation of high efficiency servers and cooling technology in business and institutions is a critical focus area for NYSERDA.

"Given the state's increasing dependence on information technology, both as an economic engine and as an essential tool for knowledge discovery, it is expected that the project will generate substantial interest, as both academic, governmental and industrial organizations struggle to balance the need for additional computing and storage power with the costs associated with running energy-hungry data centers," said Bruce Holm, executive director of UB's New York State Center of Excellence in Bioinformatics and Life Sciences and UB professor of pediatrics, gynecology and obstetrics, and pharmacology and toxicology.

According to Furlani, the increasing computational power offered by rapid advances in processor design and fabrication has been offset by limitations in the ability to power and cool the high-



UB's Center for Computational Research will soon be installing new high-efficiency servers that will boost the center's capacity to 20 Teraflops yet consume far less energy.

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density computer racks, even as demand for high performance computing (HPC) infrastructure continually increases.

"Information technology in general and HPC in particular are critical technologies for research, product development and commerce," Furlani said. "Therefore, addressing these concerns is of critical importance to the United States and its citizens,"

The project will replace a minimum of 256 of CCR's existing high-performance computing servers with high-efficiency models that not only conserve a significant amount of power and cooling, but also expand the scientific, engineering and industrial outreach capabilities of the center.

Furlani noted that this will be welcome news for the researchers currently utilizing CCR because the center's computing resources are typically heavily oversubscribed. He added that this increased computing capacity will allow scientists and engineers from UB, Roswell Park Cancer Institute and the Hauptman-Woodward Medical Research Institute to carry out state-of-the-art research in such areas as medicine, genomics, proteomics, chemistry, molecular structure determination, aerospace engineering, combustion modeling, medical informatics and chemical engineering.

"Access to the advanced computing infrastructure will not only have a significant impact on science in Western New York but also will result in the award of increased federal funding to support this research," he said. "To date, more than \$50 million in external federal funding has been awarded to UB and Western New York scientists carrying out research utilizing CCR's resources. These research dollars have a significant economic impact in our region."

CCR staff and the scientists who use the center work closely with the UB 2020 strategic strength in Information and Computing Technology.

The center's expanded computing power will also result in significant economic development in Western New York by providing its industrial partners with a competitive advantage they could not otherwise afford to maintain on their own.

Currently, CCR partners with a diverse range of companies in the region, providing them with access to the center's state-of-the-art computing and visualization facilities.

The NYSERDA contract was competitively selected for funding after being developed jointly by CCR and staff from UB's Facilities and Planning Department, including Lawrence Poturalski, facilities engineer; Kevin Thompson, director of facilities planning and design, and Michael Dupre, associate vice president for university facilities. From CCR, Matt Jones, Ph.D., CCR lead computational scientist, served as co-PI.

The New York State Energy Research and Development Authority (NYSERDA) was established by law in 1975 as a public benefit corporation. NYSERDA provides energy-related technical and financial packaging assistance to businesses and institutions to promote energy efficiency and economic development, as well as providing energy research and development programs that promote safe and economical energy production efficiency technologies in New York State.

The University at Buffalo is a premier research-intensive public university, a flagship institution in the State University of New York system, and its largest and most comprehensive campus. UB's more than 28,000 students pursue their academic interests through more than 300 undergraduate, graduate and professional degree programs. Founded in 1846, the University at Buffalo is a member of the Association of American Universities.