Report: IBM Supercomputers Are Most Energy Efficient in the World

July 2 2010

IBM supercomputers are the most energy efficient in the world, according to the latest Supercomputing 'Green500 List' announced by Green500.org.

The list shows that 17 of the top 20 most energy efficient supercomputers in the world are built on IBM high-performance computing technology. The list includes supercomputers from China to Germany and the United States that are being used for a variety of applications such as astronomy, climate prediction and pharmaceutical research. IBM also holds 65 of the top 100 positions on this list.

Energy efficiency, including performance per watt for the most computationally demanding workloads, has long been a core design principle in developing IBM systems. IBM systems are the most energy efficient as well as the most affordable. Energy efficient supercomputers allow IBM clients to realize critical cost savings by lowering power consumption and reducing expenses associated with cooling. For example, clients seeking to achieve petascale performance who deploy systems based on IBM Blue Gene/P -- which is over 40 percent more energy efficient than other supercomputers on the market -- can realize savings on energy in excess of $1 million dollars a year.

The most energy efficient systems in the world for the second time are three QPACE systems based on the IBM PowerXCell 8i processor. Germany's Julich Supercomputing Centre, University of Regensburg and University of Wuppertalare are all tied for the top spot on the Green500

list. The systems each produce more than 773 Mflops (millions of floating point operations per second) per watt of energy.

IBM offers the broadest range of generally applicable supercomputers represented on the Green500 List including Blue Gene, Power servers, System x iDataPlex, BladeCenter and hybrid clusters.

Mississippi State University (MSU) operates the most energy efficient x86-only cluster on the list, which ranks 9th overall on the Green500. Housed in MSU's High Performance Computing Collaboratory (HPC2), the IBM iDataPlex-based cluster provides five times the performance of the University's previous, non-IBM cluster while consuming half the power. The University is using iDataPlex together with IBM's Rear Door Heat eXchanger, which actually helps to cool MSU's entire datacenter.

MSU's iDataPlex cluster supports a broad set of multi-discipline research projects from aerospace and fluid dynamics to hurricane modeling in the U.S. Gulf. The cluster is the largest supercomputing resource MSU has ever had and will allow University researchers to tackle more complex problems, such as running code used by the NASA Marshall Space Flight Center for shuttle and propulsion system analysis.

"Our IBM iDataPlex cluster will allow us to accelerate the University's important research -- including collaborations with government agencies and corporate entities -- while minimizing our power and cooling costs and taking up less space," said Trey Breckenridge, high performance computing resources and operations administrator for MSU's HPC2. "This fits with MSU's environmentally conscious mission and ensures we are making the most of the University's resources."

MSU's cluster consists of three complete iDataPlex racks. The average client using three racks of iDataPlex with the IBM Rear Door Heat eXchanger can expect to save $16,000 per year in energy costs.

The Green500 list is published by Green500.org. It takes the top 500 supercomputers in the world from the TOP500 list and ranks them in the order of energy efficiency.

More information about the Green500 List is available at www.green500.org

Source: IBM