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The Green500 List - November 2010

The Green500 continues to strive towards the goal of raising awareness in the energy efficiency of supercomputing, and in turn, drive energy efficiency as a first-order design constraint - one that is on par with performance (or speed). In this edition, we have the serendipity of having four uniquely green supercomputers at the top of the Green500:

- IBM BlueGene/Q, the "Greenest Supercomputer in the World"
- GRAPE-DR, the "Greenest Exotic Supercomputer in the World"
- Tsubame 2.0, the "Greenest Production Supercomputer in the World"
- EcoG, the "Greenest Self-Built Supercomputer in the World"

The IBM Blue Gene/Q prototype supercomputer is the third installment of a series of energy-efficient Blue Gene supercomputers, following in the footsteps of Blue Gene/L and Blue Gene/P. (In 2004, Blue Gene/L was the supercomputer that supplanted the Japanese Earth Simulator, which in turn, had created a "Computenik" event in 2002 when it shattered U.S. supercomputer hegemony.) While IBM BlueGene/Q prototype supercomputer sits at the top of the heap, accelerator-based supercomputers continue to dominate the remaining top slots of the Green500, holding 8 of the top 10 slots. Accelerators refer to the use of dedicated hardware to perform computations faster than a traditional processor, also known as a central processing unit (CPU). Given that the list, which is released twice a year - once in June and once in November, was similarly dominated by accelerator-based supercomputers in June, one might argue that this year's Green500 was "The Year of the Accelerator."

For the measured systems on the Green500, the accelerator-based supercomputers on The Green500 List produce an average efficiency of 756 MFLOPS/W whereas the other measured supercomputers on the list only produce an average efficiency of 211 MFLOPS/W. That makes the accelerator-based supercomputers on the Green500 nearly 3.5 times more energy efficient than their non-accelerated counterparts on the list.

Listed below are the The Green500's Top 10 most energy-efficient supercomputers in the world as of November 2010.

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