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The Shoubu Supercomputer at RIKEN in Japan Captures the Top Spot of the Green500

Blacksburg, VA, USA; July 31, 2015 ? The Shoubu supercomputer from RIKEN earned the top spot on the 17th edition of the twice-yearly Green500 List to claim the title of the ?most energy-efficient (or greenest) supercomputer in the world.? The Shoubu supercomputer became the first and only supercomputer on the list to surpass seven gigaflops/watt (billions of operations per second per watt) milestone. This edition of the list also saw the first three supercomputers on the list -- Shoubu at #1, Suiren Blue at #2, and Suiren at #3 -- surpass the six gigaflops/watt mark.

The #1 Shoubu supercomputer at RIKEN is a heterogeneous one; that is, it is a supercomputer with two or more different types of ?silicon brains.? Specifically, the Shoubu supercomputer consists of Haswell CPUs from Intel, new many-core accelerators from PEZY-SC, and an energy-efficient software design. The #2 Suiren Blue supercomputer at KEK is similarly equipped while the #3 Suiren supercomputer uses Intel Ivy Bridge CPUs instead of the Haswell CPUs. All three of these heterogeneous supercomputers were manufactured by PEZY Computing / Exascale Inc.

Overall, heterogeneous accelerator-based systems continue to dominate the top places of the Green500. In the November 2014 edition of the list, the top 23 supercomputers on the Green500 List used accelerators; whereas with this edition of the list, the top 32 supercomputers made use of accelerators, a nearly 40% increase in such systems at the top of the Green500. Across both editions of the list, the accelerators come from four vendors (in alphabetical order): AMD, Intel, NVIDIA, and PEZY-SC.

Similar to Japan?s penchant for building fuel-efficient automobiles, dating as far back as the late 1960s, Japan also appears to be leading the charge in creating energy-efficient (or green) supercomputers. Of the top 20 most energy-efficient supercomputers on this edition of the Green500, eight come from Japan. No other country in the world has more than three in the top 20.

With President Barack Obama?s recent announcement to create a National Strategic Computing Initiative (NSCI), will the future of supercomputing mirror what happened in the auto industry? Or

will this initiative acknowledge and support the critical role that supercomputing (or high-performance computing) plays in today's modern technological society and do so while spurring innovation in energy-efficient supercomputing?

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