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Convey Computer Doubles Graph500 Performance, Develops New Graph Personality

Pound-for-Pound and Watt-for-Watt, Convey's Hybrid-Core Architecture Is Built for 'Big Data'

SEATTLE—November 15, 2011—Convey Computer announced today multiple entries on the Graph500 List that double the performance of prior posted results. Convey cited two reasons for the significant performance improvement—a new “Breadth-First Search” personality and a graph-optimized memory crossbar design.

On the most recent list, announced at SC11, multiple Convey single-node, hybrid-core systems clocked in at between 1.60 to 1.76 GTEP/s (billion edges per second) on problem sizes 27 and 28. Convey has a total of six entries on the Graph500 List including submissions from Lawrence Berkeley National Laboratory/National Energy Research Scientific Computing Center (LBL/NERSC), Sandia National Laboratories (SNL), and Bielefeld University.

Compared pound-for-pound and watt-for-watt, Convey's family of reconfigurable (FPGA) systems provide superior processing power on the Graph500 (www.graph500.org) list.¹ The Graph500 organization establishes and maintains a set of large-scale benchmarks that measure performance of “big data” applications.

The main component of the current Graph500 benchmark is a Breadth-First Search (BFS) of a constructed graph. To accelerate the BFS, and

¹ Based on the November 2011 Graph500.org listing.

demonstrate the performance of the Convey hybrid-core architecture, Convey developed a “personality” specific to the BFS algorithm. The BFS personality leverages Convey’s balanced architecture, which is based on a highly parallel memory subsystem and high-performance reconfigurable compute elements. The personality contains multiple function pipes (implemented in hardware on the system’s FPGAs), and typically has thousands of loads in flight simultaneously. It also manages the synchronization of stores to memory as required by the Graph500 benchmark.

“There is little doubt that memory systems are an ‘Achilles Heel’ of handling big data applications. Today’s commodity systems are optimized for sequential memory accesses, not the random accesses typically found in graph problems. This really hurts performance when processing large-scale analytics applications,” explained Bruce Toal, CEO and co-founder of Convey Computer. “Our hybrid-core solution combines a powerful memory subsystem, which is ideal for massive data analytics, and a graph-friendly architecture capable of managing multi-terabyte graphs with billions of nodes.”

In a computing world where 30 billion pieces of content are shared on Facebook every month,² today’s high-performance computing systems are expected to exploit the relationships between data—and not simply process data. This deluge of “big data” means big business for HPC because new computing architectures are required to handle the “new HPC” applications such as bioinformatics, graph analytics, cyber security, and algorithmic research.

About Convey Computer Corporation

Based in Richardson, Texas, Convey Computer breaks power, performance, and programmability barriers with the world’s first hybrid-core computer—a system that marries the low cost and simple programming model of a commodity system

² McKinsey Global Institute, McKinsey & Company, June 2011, “Big data: The next frontier for innovation, competition, and productivity”

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with the performance of a customized hardware architecture. Convey brings decades of experience and intellectual assets to performance problem solving. Its executive and design teams all come from successful backgrounds of building computer companies, most notably Convex Computer Corporation and Hewlett-Packard. Convey Computer investors include Braemar Energy Ventures, CenterPoint Ventures, Intel Capital, InterWest Partners, Rho Ventures, and Xilinx. More information may be found at: www.conveycomputer.com.

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For more information, contact Bob Masson (bmasson@conveycomputer.com) or Mary Dudley (mdudley@conveycomputer.com). At SC11, please visit Convey Computer in Booth 1313.