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Intel Delivers New Architecture for Discovery With Intel® Xeon Phi™ Coprocessors

Combination of Intel Xeon Processors and Intel Xeon Phi Coprocessors Promises to Drive High Performance Computing Innovation

NEWS HIGHLIGHTS

- Intel® Xeon Phi™ coprocessors, when combined with the Intel® Xeon® processor E5 family, will deliver unprecedented parallel performance, increasing the productivity and efficiency of high-performance computing.
- Efficient performance and a familiar programming model foster a thriving development community and extensive industry support from key OEMs, making high-performance computing easier to access for content creators, developers and scientists.
- Optimizing applications with tools such as Intel Cluster Studio XE 2013 helps achieve industry's best performance per watt for high degrees of parallelism on Intel Xeon Phi coprocessors as well as a significant increase in productivity on Intel Xeon processors E5 product family.
- Ninety-one percent of all newly listed systems on the recently announced Top500 list of the world's most powerful supercomputers are powered by Intel processors. Intel Xeon Phi coprocessors are already featured in 7 systems including the most power-efficient supercomputer on the list –"Beacon" delivering 2.44 GFlops/Watt.

SALT LAKE CITY--(BUSINESS WIRE)-- Marking a new era in high-performance computing, Intel Corporation introduced the Intel® Xeon Phi™ coprocessor, a culmination of years of the research and collaboration, to bring unprecedented performance for innovative breakthroughs in manufacturing, life sciences, energy and other areas. The ability to quickly compute, simulate and make more informed decisions has propelled the growth of high performance computing (HPC) and analytics. This has been driven by global business and research priorities to more accurately predict weather patterns, create more efficient energy resources, and develop cures for diseases among many other pressing issues. With the breakthrough performance per watt and other new attributes of Intel Xeon Phi coprocessor, the industry will have even greater reliability in generating accurate answers, help proliferate high-performance computing beyond laboratories and universities and achieve maximum productivity.

"Intel Xeon Phi coprocessor represents an achievement in Intel innovation that will help propel us to new heights in research and discovery, and reaffirms our commitment to Exascale-level computing," said Diane Bryant, vice president and general manager of the Datacenter and Connected Systems Group. "The combination of the Intel Xeon processor

family and the Intel Xeon Phi coprocessor will change the scope and scale of what highly parallel applications can accomplish, by delivering unprecedented performance, efficiency and programmability. With this technology as a new foundation for HPC, solving real-world challenges from accurately predicting weather patterns 21 days in advance, to developing new cures for diseases will become increasingly possible."

Based on the Intel® Many Integrated Core (Intel® MIC) architecture, Intel Xeon Phi coprocessors will complement the existing Intel® Xeon® processor E5-2600/4600 product families to deliver unprecedented performance for highly parallel applications. The Intel Xeon processor E5 family is a high-performance computing workhorse that has powered numerous Top500 systems to Petascale performance (1 quadrillion floating point operations per second). Now with Intel Xeon Phi products handling much of the "highly parallel" processing to help supercomputers produce answers for a wide range of scientific and technical disciplines such as genetic research, oil and gas exploration and climate modeling, Intel believes that this powerful combination will help blaze a path to Exascale computing, which would mark a thousand-fold increase in computational capabilities over Petascale.

Saving Time and Resources with World's Most Popular Programing Model

The Intel Xeon Phi coprocessor takes advantage of familiar programming languages, parallelism models, techniques and developer tools available for the Intel® architecture. This helps ensure that software companies and IT departments are equipped with greater use of parallel code without retraining developers on proprietary and hardware specific programming models associated with accelerators. Intel is providing the software tools to help scientists and engineers optimize their code to take full advantage of Intel Xeon Phi coprocessors, including Intel Parallel Studio XE and Intel Cluster Studio XE. Available today, these tools enable code optimization and, through using the same programming languages and models shared by Intel Xeon Phi coprocessors and Intel Xeon processors E5 product family, help applications benefit both from tens of Intel Xeon Phi coprocessor cores and also from more efficient use of Intel Xeon processor threads.

Introducing Two New Intel Xeon Phi Product Families

Built with Intel's most advanced 22-nanometer, 3-D tri-gate transistors, Intel is introducing two new Intel Xeon Phi coprocessor families that provide optimal performance and performance-per-watt for highly parallel HPC workloads.

The Intel Xeon Phi coprocessor 3100 family will provide great value for those seeking to run compute-bound workloads such as life science applications and financial simulations. The Intel Xeon Phi 3100 family will offer more than 1000 Gigaflops (1 TFlops) double-precision performance, support for up to 6GB memory at 240GB/sec bandwidth, and a series of reliability features including memory error correction codes (ECC). The family will operate within a 300W thermal design point (TDP) envelope.

The Intel Xeon Phi coprocessor 5110P provides additional performance at a lower power envelope. It reaches 1,011 Gigaflops (1.01 TFlops) double-precision performance, and supports 8GB of GDDR5 memory at a higher 320 GB/sec memory bandwidth. With 225 watts TDP, the passively cooled Intel Xeon Phi coprocessor 5110P delivers power efficiency that is ideal for dense computing environments, and is aimed at capacity-bound workloads such as digital content creation and energy research. This processor has been delivered to

early customers and featured in the 40th edition of the Top500 list.

To provide early access to new Intel Xeon Phi coprocessor technology for customers such as Texas Advanced Computing Center (TACC), Intel has additionally offered customized products: Intel Xeon Phi coprocessor SE10X and Intel Xeon Phi coprocessor SE10P. These offer 1073 GFlops double precision performance at a 300W TDP with rest of the specification similar to Intel Xeon Phi coprocessor 5110P.

Broad Industry and Customers Adoption for Intel Xeon Phi coprocessor

More than 50 manufacturers are designing solutions based on the Intel Xeon Phi coprocessors, including Acer, Appro, Asus, Bull, Colfax, Cray, Dell, Eurotech, Fujitsu, Hitachi, HP, IBM, Inspur, NEC, Quanta, SGI, Supermicro and Tyan.

Professor Stephen Hawking and the Cosmos Lab at the University of Cambridge have been given early access to Intel Xeon Phi coprocessor technology for use in their SGI supercomputer. “I am delighted that our new COSMOS supercomputer from SGI contains the latest many-core technology from Intel, the Intel Xeon Phi coprocessors,” said Hawking. “With our powerful and flexible SGI UV2000, we can continue to focus on discovery, leading worldwide efforts to advance the understanding of our universe.”

Majority of Top500 Supercomputers Chose Intel as the Compute Engine

More than 75 percent (379 systems) of the supercomputers on the 40th edition of the Top500 list are powered by Intel processors. Of those systems making their first appearance on the list, Intel-powered systems account for more than 91 percent. The November edition of the list had recorded seven systems based on Intel Xeon Phi coprocessors, including initial deployment of TACC’s “Stampede” system (2.66 PFlops, #7 on the list); “Discover” system at NASA Center for Climate Simulation (417 TFlops, #52); Intel “Endeavour” system (379 TFlops, #57); “MVS-10P” supercomputer at the Joint Supercomputer Center of the Russian Academy of Sciences (375 TFlops, #58) “Maia” system at NASA Ames Research Center (212 TFlops, #117); “SUSU” system at The South Ural State University (146 TFlops, #170); and the “Beacon” supercomputer at The National Institute of Computational Sciences at the University of Tennessee (110 TFlops #253) that is also the most power efficient supercomputer on the list and delivers 2.44 GFlops per watt. The complete report is available at www.Top500.org.

Pricing and Availability

The Intel Xeon Phi coprocessor 5110P is shipping today with general availability on Jan. 28 with recommended customer price of $2,649. The Intel Xeon Phi coprocessor 3100 product family will be available during the first half of 2013 with recommended customer price below $2,000. Additional information on availability and ordering Intel Xeon Phi coprocessor 5110P can be found at www.intel.com/xeonphi

More information on SC’12 announcement including Diane Bryant’s presentation, additional documents and pictures are available at Intel Newsroom.

About Intel

Intel (NASDAQ: INTC) is a world leader in computing innovation. The company designs and builds the essential technologies that serve as the foundation for the world's computing devices. Additional information about Intel is available at newsroom.intel.com and blogs.intel.com.

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