NVIDIA helps spark 64-bit ARM systems for HPC

23 June 2014, by Nancy Owano

NVIDIA Tesla K20 GPU Accelerator

(Phys.org) —NVIDIA could not have chosen a better venue for a chosen target: The International Supercomputing Conference, running to June-26 in Leipzig, Germany, is where NVIDIA took center stage, to demonstrate how server vendors are working with NVIDIA technology to push 64-bit ARM cores into the high-performance computing market. The ISC is a key global conference and exhibition for high performance computing, storage and networking. And the announcement is targeted to the kind of professional computing of interest at the event; NVIDIA was there to demonstrate some new ARM development systems. Ryan Smith of AnandTech, in setting the stage for this week's event, wrote that "NVIDIA will be taking to the ISC show floor to announce that their Tesla products will be adding ARM64 host compatibility, enabling them to be used in ARM64 systems."

NVIDIA Tesla GPUs are massively parallel accelerators based on the NVIDIA CUDA parallel computing platform and programming model. Tesla

GPUs are designed for power-efficient, high performance computing, computational science, supercomputing, big data analytics, and machine learning applications. They are said to deliver dramatically higher acceleration for scientific and commercial applications than a CPU-only approach.

The Monday announcement said, "Multiple server vendors are leveraging the performance of NVIDIA GPU accelerators to launch the world's first 64-bit ARM development systems for high performance computing."

CUDA is another key part of the NVIDIA HPC story. In 2012 we wrote about NVIDIA's dressed-up version of its CUDA parallel computing platform and noted that it was good news for engineers, biologists, chemists, physicists, geophysicists, and other researchers who are engaged in fast-track computations using GPUs. The new features were LLVM (low-level virtual machine)-based CUDA compiler, added imaging and signal processing functions and a redesigned Visual Profiler, with automated performance analysis and expert guidance. NVIDIA's new goodies were designed to advance simulations and computational work for such users.

The announcement said, "ARM64 server processors were primarily designed for micro-servers and web servers because of their extreme energy efficiency. Now, they can tackle HPC-class workloads when paired with GPU accelerators using the NVIDIA CUDA 6.5 parallel programming platform, which supports 64-bit ARM processors."

NVIDIA added that "users will immediately be able to take advantage of hundreds of existing CUDA-accelerated scientific and engineering HPC applications by simply recompiling them to ARM64 systems."

Three companies have signed on to use NVIDIA

graphics processors and ARM-based CPU cores to launch the world's first 64-bit ARM development systems for high performance computing. The first GPU-accelerated ARM64 software development servers will be available in July from Cirrascale and E4 Computer Engineering, with production systems expected to ship later this year. The Eurotech Group also plans to ship production systems later this year.

The Cirrascale RM1905D is one of the HPC-focused ARM-based systems. The description is a high-density two-in-one 1U server with two Tesla K20 GPU accelerators. Cirrascale provides blade-based cloud computing and storage infrastructure for conventional and containerized data centers.

From E4, the EK003 was also introduced, described as a low-power 3U, dual-motherboard server appliance with two Tesla K20 GPU accelerators, designed for seismic, signal and image processing, video analytics, track analysis, web applications and MapReduce processing.

More information: *
online.wsj.com/article/PR-CO-20140623-900981.html
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