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HPC NEWS

Hybrid cluster for Barcelona facility

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Barcelona Supercomputing Center (BSC) is to install the first hybrid accelerator cluster composed of ARM Cortex-A9, Nvidia Tesla K20 GPU, and Mellanox QDR InfiniBand.

Co-funded by the Partnership for Advanced Computing in Europe (PRACE) initiative, the cluster will be named Pedraforca and will be built at BSC premises. BSC and the European HPC manufacturer Bull are in charge of the industrial coordination and integration of the project, while the Italian E4 Computer Engineering company is providing the computing nodes.

Pedraforca enables the use of InfiniBand networks and direct GPU to GPU communication through RDMA on ARM. It features a low-power Nvidia Tegra 3 (4-core Cortex-A9) to run the operating system and drive both the Tesla K20 accelerator and the QDR InfiniBand at the minimum power consumption.

The benefits of this new system include superior energy efficiency for applications that run almost exclusively on the GPU, and a high-bandwidth QDR InfiniBand that enables remote GPU off-loading of highly parallel tasks, decoupling the homogeneous high-performance cluster from the GPU accelerators.

'Prototypes are critical to accelerate software development, both system software and applications. Pedraforca introduces multiple innovations to the ARM software stack, leading to a more energy-efficient platform for those GPU-centric applications that match the characteristics of the cluster,' said Alex Ramirez, leader of the heterogeneous architectures research group at BSC.

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