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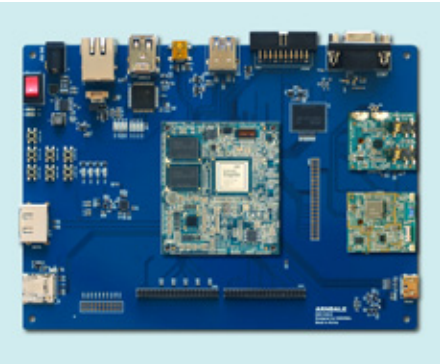
MONT-BLANC PROJECT SELECTS SAMSUNG EXYNOS 5 PROCESSOR

The project continues its research effort towards an energy efficient HPC prototype using low-power embedded technology



The Mont-Blanc European project has selected the Samsung Exynos platform as the building block for powering its first integrated low power- High Performance Computing (HPC) prototype. The aim of the Mont-Blanc project is to design a new type of computer architecture capable of setting future global HPC standards, built from today's energy efficient solutions used in embedded and mobile devices.

Recently, the project has selected the Samsung Exynos platform as the building block for powering its first integrated low power- High Performance Computing (HPC) prototype. The Samsung Exynos 5 Dual is built on 32nm low-power HKMG (High-K Metal Gate), and features a dual-core 1.7GHz mobile CPU built on ARM® Cortex™-A15 architecture plus an integrated ARM Mali™-T604 GPU for increased performance density and energy efficiency. It has been featured and market proven in consumer and mobile devices such as Samsung Chromebook and Google's Nexus 10. This will be the first use of an embedded mobile SoC in HPC, which enables the Mont-Blanc project to explore the challenges and benefits of deeply integrated energy-efficient processors and GPU accelerators, compared to traditional homogeneous multicore systems, and heterogeneous CPU + external GPU architectures.

"The Exynos 5 Dual packs the most powerful ARM processors with a programmable GPU in a low-power mobile device that would normally be in someone's pocket and running on a battery. Its performance density, energy efficiency, and low market price make it an extraordinary building block for prototyping a new generation of HPC systems." says Alex Ramirez, coordinator of the Mont-Blanc project.

During the first year of activities, Mont-Blanc has focused on deploying successfully an HPC system software stack and full-scale scientific applications on ARM platforms, proving that ARM-based architectures are feasible alternatives for HPC. Now the efforts gear towards integration of the Exynos platform in a HPC solution, and software exploitation of the embedded GPU.

The Mont-Blanc project brings together a purely European consortium federating industrial technology providers and research supercomputing centres: Bull, as the major HPC system vendor, ARM, as the world leader in embedded high-performance processors, and Gnodal, as interconnect partner that focuses its new product on scalability and power efficiency. Besides the technology providers, Mont-Blanc brings together the supercomputing centres from the four Tier-0 hosting partners in PRACE with leading roles in system software and Exascale application development: Germany (Forschungszentrum Jülich, BADW-LRZ), France (GENCI, CNRS), Italy (CINECA), and Spain (BSC).

For further information:
www.montblanc-project.eu

THERMAL CHARACTERIZATION AND OPTIMIZATION OF SYSTEMS-ON-CHIP THROUGH FPGA-BASED EMULATION

By Pablo García del Valle
Universidad Complutense de Madrid, Spain
Advisors: Prof. David Atienza Alonso and Prof. José Manuel Mendías Cuadros
June, 2012

Tablets and smartphones dominate the consumer electronics market. Internally, they rely on Systems on Chip (SoCs) to meet the tight design constraints: performance, size, power consumption, etc. In a bad design, the high logic density may generate hot-spots that compromise the chip reliability. Pablo's thesis introduces his FPGA-based emulation framework for easy exploration of SoC design alternatives. It provides fast and accurate estimations of performance, power, temperature, and reliability in one unified flow, to help designers tune their system architecture before going to silicon. Pablo's expertise is focused on embedded devices: Microcontrollers, FPGAs, Real-time OOSS and drivers.