Mobile and embedded-based HPC

As mobile technology is highly integrated, cheap and energy efficient, we explore how to reduce space, costs and power use by using mobile embedded technology in HPC. We deploy clusters of ARM-based SoCs equipped with a functional HPC software stack exploring innovative architectures.

Summary

As mobile technology is highly integrated, cheap and energy efficient, we explore how to reduce space, money and power using mobile embedded technology in HPC environment. This translates in deploying clusters of ARM-based SoCs equiped with a functional HPC software stack that we can use in order to explore and extrapolate future HPC architectures. Also we coordinate the Mont-Blanc project, a FP7 European Project involving 12 European industrial and academic partners that evaluate mobile embedded technology for scientific and HPC computation. The group successfully deployed the full Mont-Blanc prototype consisting of 1080 ARM-based compute nodes based on Samsung Exynos 5 dual SoC interconnected through Gigabit Ethernet with total power consumption below 3 kWatts. The group also performed extensive studies of evaluation of the Mont-Blanc prototype as well as a reliability study of the mobile technology used in the prototype.

Objectives

- To understand and overcome the challenges in the design of next-generation memory systems for large-scale HPC clusters.
- To propose and develop novel design methodologies that enable researchers to explore the huge design space represented by future computer architectures.