Supercomputing: Past, Present, and a possible future

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Abstract. Supercomputers are the most powerful and fast computing instruments in the world. Expensive, huge, and power hungry, they compete twice a year for their ranking in the Top500 list. Supercomputers also represent the leading edge in computer technology. It can be argued that the computing technology developed for supercomputers is found in desktop environments 10 years later, and in embedded systems another 10 years later. However, even supercomputers have hit the power wall, which is reversing the above observation. Supercomputers today are built from components designed for the desktop environment. In this talk we will review the evolution of supercomputer architectures, discuss some of their current and future challenges, and present a glimpse of a possible future, in which we close the circle and build a supercomputer using embedded technology.

Biography

ALEX RAMIREZ is an associated professor in the Computer Architecture Department at the Universitat Politècnica de Catalunya, and leader of the Heterogeneous Architectures group at BSC. He has a BSc ('95), MSc ('97) and PhD ('02, awarded the UPC extraordinary award to the best PhD in computer science) in Computer Science from the Universitat Politecnica de Catalunya (UPC), Barcelona, Spain. He has been a summer student intern with Compaq's WRL in Palo Alto, California for two consecutive years ('99-'00), and with Intel's Microprocessor Research Laboratory in Santa Clara ('01). He has co-authored over 100 papers in international conferences and journals, supervised 5 PhD students, and participated as principal investigator in the SARC, ACOTES, ENCORE and HiPEAC European Projects. In 2010 he was awarded the first Agustin de Betancourt award of the Spanish Royal Academy of Engineering to a young researcher.