Co-designing Energy Efficient Systems

Luigi Brochard
Lenovo Distinguished Engineer

Abstract: Energy Efficient Computing has become a critical factor to design systems which have to provide huge performance into a limited power budget. This talk will present how we work on this problem starting at IBM System x in 2010 and now at Lenovo Data Center Group with customers to design the different technologies (servers, cooling, software) which are key to design energy efficient systems. I will start by presenting the innovations we developed for SuperMUC which was delivered in 2011 at LRZ and which is still considered as state of the art in regard of energy efficiency. I will then present the additional work we have done since then and developed for SuperMUC NG which will be installed at LRZ in 2018. This talk will highlight the importance of co-design between companies who master technology and users / data centers who understand the limit of their existing system and what is needed for next generation HPC systems on the road to Exascale.

Bio: Luigi Brochard holds a Ph.D. in Applied Mathematics and an HDR in Computer Science from Pierre et Marie Curie University in Paris, France. He started his career at IBM Research working on performance of parallel algorithms, then joined IBM France designing many large European HPC systems based on POWER SP, Blue Gene and x86 clusters installed at CINECA, BSC, LRZ ... He created the Energy Aware Scheduling technology, part of IBM LoadLeveler and Spectrum Load Sharing Facility and participated to the development of the x86 Direct Water Cooled technology, both key features of SuperMUC, the first energy aware supercomputer installed at LRZ in 2011. Since 2015 at Lenovo, he is leading the HPC application and performance team and the development of the next generation of Energy Aware systems. Luigi became IBM Distinguished Engineer in 2004, now Lenovo Distinguished Engineer for HPC & AI, author of papers and patents on parallel algorithms performance and power and energy of parallel systems.