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Heterogeneous High Throughput Scientific Computing with ARMv8 64-bit and Xeon Phi

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Electrical power requirements will be a constraint on the future growth of Distributed High Throughput Computing (DHTC) techniques as used in High Energy Physics. Performance-per-watt is a critical metric for the evaluation of computer architecture for cost-efficient computing. Additionally, the future performance growth comes from heterogeneous, many-core, and high computing density platforms with specialized processors. In this paper, we examine the Intel Xeon Phi Many Integrated Cores (MIC) co-processor and Applied Micro's XGene ARMv8 64-bit low-power server system-on-a-chip (SoC) solutions for scientific computing applications.

We report our experience on software porting, performance and energy efficiency and evaluate the potential for use of such technologies in the context of the distributed computing sytems such as the Worldwide LHC Computing Grid (WLCG).

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