Abstract for presentation at HPEC 2016

Hardware Accelerators for High Performance Computing

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A vital part of newer supercomputers as they advance toward exascale is the incorporation of hardware accelerators. Hardware accelerators, such as general purpose graphics processing units (GPGPUs) and Intel Many Integrated Core (MIC) coprocessors, such as Intel Xeon Phis are incorporated into heterogeneous computing systems also containing traditional central processing units (CPU) to provide advanced computational capabilities, especially on highly parallel applications. These systems also can operate at reduced power and cost, compared to traditional CPU-based systems. The use of hardware accelerators in systems at the Air Force Research Laboratory DoD Supercomputing Resource Center and their computational benefits to the DoD community will be discussed.

Approved for public release, Distribution unlimited: 88ABW-2015-4678