Sandia Labs explores the future of computing with HP Moonshot

National research laboratory achieves linear scalability on testbed nodes for proxies of highly complex scientific and engineering workloads on HP ProLiant m400 Server Cartridges

Industry
Science and engineering research

Objective
Explore new technologies to develop advanced architectures for running complex scientific and engineering workloads

Approach
Gain early access to HP Moonshot System with HP ProLiant m400 Server Cartridges to conduct tests on proxy applications (mini-applications) representing the lab's mission applications

Results
- Achieved linear scalability with full performance across all processor cores
- Minimized energy consumption to support exascale computing
- Optimized performance for complex scientific and engineering workloads
- Gained a foundation for developing advanced high-performance computing architectures

"HP Moonshot is a first-of-a-kind system that's enabling us to extend the range of our calculations to solve really complex problems in a highly efficient 64-bit ARM architecture. We tested workloads ranging from molecular dynamics to hydrodynamics and data analytics, and we were able to fully exploit all the cores on the processor to achieve linear scaling. The energy efficiency realized through the use of 64-bit ARM processors is expected to allow us to stay within our power limitations as we approach exascale."

– James Ang, Technical Manager of the Scalable Computer Architecture Department, Sandia National Laboratories

Sandia National Laboratories is a multi-program laboratory with major R&D responsibilities in national security, energy and environmental technologies, and economic competitiveness. The lab continually tests new technologies to develop advanced architectures that hold promise for shaping the future of high-performance computing. In tests of highly complex scientific and engineering workloads on HP ProLiant m400 Server Cartridges, Sandia achieved linear scalability with no memory impedance. Energy consumption was also very low, which is a critical factor in achieving the lab's mission of exascale computing within strict power limitations.

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