



Penn State University Achieves Up to 60% Applications Performance Improvement with PathScale EKO Compiler Suite



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-- Vijay Agarwala, Director of High-Performance Computing

Organization:

Pennsylvania State University High-Performance Computing and Visualization Group, a unit of Information Technology Services

Industry:

Education, Academic and Sponsored Research

Location:

State College, PA

Applications:

Astronomy, Biology, Chemistry, Science, Mathematics, Fluid Dynamics, Structural Analysis

Solution Set:

80-Node 2.4 GHz Dual-CPU AMD® Opteron™-based Linux Cluster

PathScale Products Used:

PathScale EKO™ Compiler Suite



BUSINESS CHALLENGE: The Graduate Education and Research Services (GEaRS) Group at Penn State provides high performance computing resources to about 500 researchers solving complex computational problems across many academics disciplines including biology, chemistry, engineering, science, and physics.

The group pursues cutting-edge advances in research computing technologies through partnerships with faculty members as well as various technology companies and institutions. Reduced time to discovery and optimal use of hardware resources are of critical importance.

"We must provide all researchers the highest performance at all times and simultaneously maximize the use of available compute resources," said Vijay Agarwala, director of the group, which recently implemented a new dual-CPU, 80-node AMD® Opteron™-based Linux cluster.

OPTERON / PATHSCALE SYNERGY:

Penn State is one of the nation's largest research universities with academic and sponsored research programs across many disciplines. As with all technology acquisitions, a careful and thorough analysis was made of a broad set of available hardware and software options.

Based on industry-standard benchmarks and tests with their own applications, Agarwala's team found that the combination of Opteron processors and the PathScale EKO Compiler Suite provided the best price/performance option.

"After extensive testing, we determined that an Opteron-based cluster would provide us with the greatest price/performance for our applications," Agarwala explained. "And when we added the PathScale compiler to the system, we saw performance improvements of up to 60 percent for some applications, with an average improvement of around 20 percent. This new Opteron-based system with the PathScale compiler suite is now the highest performance computing resource that we have on our campus."

Penn State's High-Performance Computing and Visualization Group is continuing to help fine-tune the compute-intensive applications being developed and run by academic researchers in different departments. The scientific payoff for many of these efforts is potentially quite large in terms of making life better, and the PathScale EKO Compiler Suite is making a valuable contribution to these programs.

SUBSTANTIAL RETURN ON INVESTMENT:

"We know that our investment in PathScale's compiler will produce significant computational productivity gains, and our return on investment is likely to be several times the cost of acquiring the EKO compiler suite," Agarwala added.

"The PathScale compiler helps us maintain a cutting edge and get the best possible performance from our Opteron-based cluster system at all times to support the ambitious research programs we have here at Penn State."