



# Penn State University

## Penn State University Achieves Up to 60% Applications Performance Improvement with the QLogic Pathscale™ Compiler Suite

### 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

### Products Used

Pathscale 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 academic 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 Compiler Suite 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 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 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.”

*“When we added the Compiler to the system, we saw performance improvements of up to 60 percent for different applications, with an average improvement of around 20 percent.”*

— Vijay Agarwala, Director of High-Performance Computing



## Penn State University

- By focusing on high-performance computing and visualization, the Group is continuing to help finetune 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 Compiler Suite is making a valuable contribution to these programs.

### Substantial Return on Investment

"We know that our investment in the Pathscale Compiler Suite will produce significant computational productivity gains, and our return on investment is likely to be several times the cost of acquiring it," Agarwala added. "The 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."



**3835R East Thousand Oaks BLVD. #315**  
**Westlake Village, CA 91365**  
**Tel 877.230.2837 / Fax 805.435.2500 / [www.ess-direct.com](http://www.ess-direct.com)**