

Organizations

U.S. Department of Energy
Oak Ridge National Laboratory
Oak Ridge, TN
www.ornl.gov



BMI Corporation
Greenville, SC
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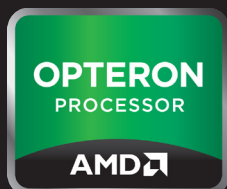
Cray XT™ System Overview

- 84 cabinet quad-core Cray XT4 system and 200 upgraded Cray XT5 cabinets, using six-core processors
- Total of 362 terabytes of high-speed memory
- Peak speed of 2.33 petaflops
- Six-core AMD Opteron™ processors: 37,376



Trailers equipped with this front tray fairing can achieve between 7 and 12 percent improvements in fuel mileage. (Photo courtesy of BMI SmartTruck)

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ORNL'S Cray XT 'Jaguar' Helps BMI Win Award, Nation Save Fuel

A BMI Corp. SmartTruck technology that could save 1.5 billion gallons of diesel fuel and \$5 billion in fuel costs per year has hit the road in record time in part because of simulations performed on the nation's most powerful supercomputer at the Department of Energy's Oak Ridge National Laboratory.

While South Carolina-based BMI Corp. has just won an industry award from Heavy Duty Trucking magazine, the real winners could be trucking companies and the environment. With installation of BMI's SmartTruck UnderTray System to improve the aerodynamics of 18-wheeler (Class 8) long-haul trucks, the typical big rig can achieve fuel savings of between 7 and 12 percent. Those results, which earned BMI one of the publication's top 20 products of the year awards, were made possible because of simulation work performed on ORNL's Jaguar supercomputer.

"We were able to run simulations based on the most complex tractor and trailer models instead of simplified models, and we were able to run them faster," said Mike Henderson, chief executive officer and founder of BMI, an engineering services firm based in Greenville, S.C. The work on Jaguar shortened the computing turnaround time for BMI's complex models from days to a few hours and eliminated the need for costly and time-consuming physical prototypes. In all, running simulations on Jaguar allowed BMI to go from concept to a design that could be turned over to a manufacturer in 18 months instead of the 3½ years they had anticipated, according to Henderson, who noted, however, that more work remains.

"Our first goal was to design add-on parts for existing trucks and trailers to make them more aerodynamic," Henderson said. "By reducing drag we boost fuel efficiency and cut the amount of carbon that's being dumped into the environment."

In time, BMI plans to design trucks that are far more aerodynamic from the ground up. "We hope to soon turn our attention to creating a brand-new highly aerodynamic vehicle with optimum fuel efficiency," Henderson said.

Until then, Henderson noted that if all of the nation's 1.3 million Class 8 trucks were configured with just the minimum UnderTray package, the average fuel economy of 6 miles per gallon could increase to about 6.5 mpg or more, which is significant given the fact 18-wheelers collectively travel some 130 billion miles per year. And from an emissions standpoint, equipped with the aerodynamics package, those trucks would reduce their carbon dioxide emissions by 32.7 billion pounds.

BMI's work with ORNL was made possible through the laboratory's Industrial High-Performance Computing Partnerships Program. Through this effort, BMI was able to access Jaguar, which boasts nearly 225,000 processing cores with a theoretical peak computational capability of 2.3 petaflops (2.3 quadrillion floating operations per second).

Images and more information about the SmartTruck technology can be accessed here: www.SmartTruckBrands.com. A DOE press release about BMI SmartTruck is available at <http://www.energy.gov/news/10056.htm>.anagram

Content courtesy of Oak Ridge National Laboratory. Research sponsored by the DOE Office of Science.