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Cray Henry: Driving DoD's Supercomputing Enterprise

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At a nondescript office building in Lorton, Va., Cray Henry quietly but effectively manages a sprawling multi-billion dollar nationwide supercomputing enterprise of the Defense department that has advanced technology for U.S. forces and helped save lives.

Providing the resources for highly sophisticated mathematical modeling and computer simulations, Henry's High Performance Computing Modernization Program (HPCMP) has helped scientists and engineers develop weapons systems, such as the Joint Strike Fighter, Unmanned Aerial Vehicles and the Javelin Missile program, find novel ways to test biological agents and achieve greater energy efficiency.

"This is a place where there is still a sense of the frontier," Henry said. "There still are many things that people don't know, and in the computing arena, we have a new set of tools and a chance to answer questions that people could never before have answered."

He said his organization services scientists and computer engineers at more than 150 different locations, providing them with high-speed network communications and "unfettered but secure access" to six different supercomputer centers. The heavily secured centers, he said, hold football field-sized rooms separated by glass walls, providing computing power to develop innovative materials.

"Thanks to Cray and his team, instead of testing something in real life for defense, you can use their computer-generated models, making the tests cheaper and more effective, saving millions of dollars," said Stan Ahalt, director of the Ohio Supercomputer Center. "The team uses updated and very sophisticated computer codes. They have been very innovative and broken new ground in the field."

The supercomputing centers, for example, have spurred the development and rapid deployment of the Hellfire missile, used to target terrorists in buildings, bunkers and caves. The HPCMP also provided the environment for engineers to simulate new armor kits for HUMVEES to better protect American soldiers in Iraq.

The weapons systems and protective gear developed at HPCMPs, however, are only a small part of the supercomputing agenda.

The Navy and Air Force can provide accurate, up-to-the-minute information to ground forces anywhere in the world, thanks to technology advances in weather forecasting developed on HPCMP systems.

And the Pentagon has benefited from HPCMP's capabilities as well. The Defense department's hurricane prediction models are now so accurate that the National Hurricane Center refers to them to predict hurricane paths. The weather forecasts significantly help the agency plan aircraft flights and the Defense department projects it will save \$1 billion in fuel costs over the next 10 years because of the accuracy of the forecasts.

On the civilian side, HPCMP resources were used to assist in the rebuilding of New Orleans after Hurricane

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Katrina hit. Environmental models were developed to provide animated simulations at an unprecedented level of detail. Researchers could consequently analyze water and wind level interactions on land, levees and canals, providing key data for levee redesign.

"I am fortunate to work with an incredibly dedicated group of people who truly believe that computing programs can change our government and the nation," Henry said. "The team has a strong personal commitment and I am constantly motivated by their good nature and hard work on behalf of our nation."

While the cost of operating this cutting--edge technology is expensive, Henry and his team calculated in 2008 that the return on investment in areas such as armor design and development and weather modeling is anywhere from \$6 billion to \$11 billion. In other words, every dollar the HPCMP invested, saved at least six dollars per taxpayer.

Henry has served the government for 27 years, but remains enthusiastic and determined to continue helping computer scientists reach for the outer limits.

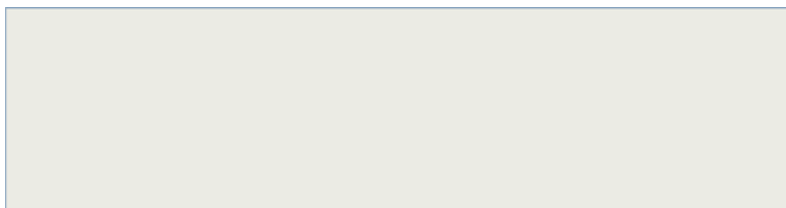
"Developing the technology we need is an ongoing effort--we'll never be finished," Henry said.

This article was jointly prepared by the Partnership for Public Service, a group seeking to enhance the performance of the federal government, and washingtonpost.com. Visit www.ourpublicservice.org for more about the organization's work.

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