A Cluster That Builds Community

CASE STUDY

Just a mile away from the Hampton Roads Center North, the scientists at Virginia's NASA Langley Research Center are famed for having developed the inaugural man-in-space program, some of the first wind tunnels and much more. With the deployment of a high-speed supercomputer cluster at the new Hampton Research and Science Park, however, some of the most innovative and breakthrough discoveries in the area are still to come.

National Institute of Aerospace Positions Hampton Research and Science Park as a Leading-Edge HPC Environment With Bright Cluster Manager

The Customer

The National Institute of Aerospace (NIA) is a non-profit research and graduate education facility. A partner of the NASA Langley Research Center, it also works with post-secondary institutions such as Georgia Tech, University of Maryland, North Carolina A&T, North Carolina State, Virginia Tech and the University of Virginia. The NIA's research mandate covers everything from atmospheric and vehicle sensor systems to aerodynamics and radiation science. Beyond that, however, the NIA's mission is to help develop and inspire the next generation of engineers and scientists.

The Challenge

In late 2013, the NIA was tasked by the local Hampton Economic Development Authority to design, procure, deploy, and provide ongoing management for an HPC cluster that would become a shared resource for local researchers and students. As a centerpiece of the Hampton Research and Science Park, the cluster was also intended to help position the area as an attractive location for companies to commercialize intellectual property, grow the high-tech sector and provide valuable jobs. The NIA had less than a year to launch the cluster, which was expected to serve a wide range of users who want to reduce the time and expense required to perform highly sophisticated simulations and data analysis. The cluster also provides a valuable free resource to educational institutions.

The Solution

For a project this public-facing and important to the local community, the NIA decided to avoid commodity-grade hardware such as Beowulf clusters or Rocks, and needed software that would, in the words of its IT director Wendy Murray, deliver "more bang for the buck." The organization chose Bright Cluster Manager, which provided the full breadth of features at an affordable price point, particularly when hardware costs put pressure on the budget.

"Even with an open source installation, I would have had to procure umpteen different software packages. That would have skyrocketed the cost," Murray said. "From a hit-the-ground-running point of view, Bright just had everything we needed."

Bright Computing

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The Results

The Hampton Research and Science Park's HPC cluster went live in April 2014, and is already providing free compute resources to a wide variety of researchers who turn to it for running highly intensive applications to study changes in the atmosphere or weather patterns in a matter of hours, rather than a month ore more on a traditional workstation.

The NIA has also seen the following results:

Cost savings: The NIA "hit the wall" on hardware costs for the cluster, Murray said. Bright Computing ensured procuring Bright Cluster Manager didn't add to those problems. "They went out of their way to work with me to get the software at an affordable price that would meet the needs of our organization. They bent over backwards and when the software renewal came up, they did it again," Murray said. "It's a unique experience to have a vendor try that hard."

Increased speed: The minimum expectation for the cluster from the Hampton Economic Development Authority was a speed of 16 teraflops. With help from Bright Cluster Manager, the NIA has delivered 19 teraflops.

Reliability: Bright Cluster Manager's ability to monitor the health and performance of the cluster gives the NIA metrics it wouldn't have otherwise. This includes core processing time, testing on a node and performance results on a node.

Problem resolution: "Bright's tech support is awesome," Murray said. "Its team is highly responsive with a quick turnaround. If we sent them an email, we get an answer. They're not afraid to 'remote in' and take a look."

> "Bright's tech support is awesome."
> — IT director Wendy Murray

Murray suggested that any organization developing something like the Hampton Research and Science Park's HPC cluster should be careful about choosing technology providers who are willing to create a true partnership over the long-term.

"I've dealt with a lot of vendors over the years," she said, "and Bright Computing has gone above and beyond."