



Breakthrough Project Relies on Nor-Tech for Big Data Analytics

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Gonzalo Merino, University of Wisconsin, Madison

Their Challenge

The IceCube Neutrino Observatory, which examines the cosmos from the vantage point of the South Pole, is the world's largest neutrino detector. It tracks these particles from the most violent astrophysical sources: events like exploding stars, gamma-ray bursts, and cataclysmic phenomena involving black holes and neutron stars.

Its goal is to answer some of the most complex physics puzzles to date. About 300 physicists from 45 institutions in 12 countries make up the IceCube Collaboration. The University of Wisconsin–Madison is the lead institution, responsible for the maintenance and operation of the detector.

The IceCube observatory was finished in 2010; now researchers are currently in the process of analyzing and interpreting the data in order to help validate or invalidate theoretical models and they need Big Data analytics capabilities to do that.



IceCube Sensors Deep Within South Pole Ice

It's not surprising that this project requires an enormous amount of data collection, processing, and storage capacity. While IceCube researchers have been confident in the project's ability to solve physics enigmas, they relied on Nor-Tech to give them the processing power and storage capacity to do that.

Gonzalo Merino, Computing Facilities Manager for the University of Wisconsin, explained, "Our role as far as computing services for IceCube includes processing the real data that streams in continuously from our sensors. We extract scientific results from that data and compare it with models and simulated data. In order to do that, we need a lot of computing power. Our main challenge involving Nor-Tech was that we needed help building custom servers that would be optimized for our needs."

Nor-Tech Account Executive Tom Morton has been working with Gonzalo and other IceCube personnel for more than 5 years. "We have quite a bit of experience with research facilities," he said. "The University of Minnesota was one of our first clients and then it just grew from there. They were looking to us for the expertise and resources to design what really amounts to cost-effective supercomputing capabilities."

Their Success

Over the years, IceCube has purchased a significant amount of GPU nodes, storage servers, and regular compute nodes. For every order, Nor-Tech conducted code-testing and sent a technician to help UW personnel integrate the equipment into their datacenter.

“Their capability of customizing the systems to our needs was important,” Gonzalo said. “I know that Nor-Tech does a lot of work behind the scenes to ensure that our system is always optimized. It provides us with an enormous amount of computing capacity for the budget that we have and I have to say that we are very satisfied. We have not had any performance issues and really no issues at all. Nor-Tech is a key partner for us.”

Gonzalo added, “We have recommended Nor-Tech and will continue to do so. In our community—there are 40 institutions working on this IceCube project. Every time I hear about other experimental physics installations with similar challenges, I do mention that we’ve had a very positive experience with Nor-Tech and their clusters.”

“Big Data analytics is an area that we are aggressively developing,” Tom said. “And with deep roots in the cluster market, a portfolio of leading software partners, and a world-class engineering staff, we are perfectly positioned to do that.”

About Nor-Tech

Winner of Microsoft’s prestigious Most Valuable System Builder Partner award, Nor-Tech (Northern Computer Technologies) is an industry-leading technology builder and reseller best known for providing turnkey, people-friendly high performance computing (HPC) solutions and Ansys HPC integration. In addition to HPCs, their custom technology includes workstations, desktops, and servers for a range of sectors including computer-aided engineering (CAE) and computer-aided design (CAD). Nor-Tech’s engineers average 20+ years of experience. They have been in business since 1998 and are headquartered in Burnsville, Minn. just outside of Minneapolis. Clients include some of the largest organizations in the world. To contact Nor-Tech call 952-808-1000/toll free: 877-808-1010 or visit <http://www.nor-tech.com>.