NOR-TECH
People Friendly Technology

Case Study

Southwest Research Institute Takes Advantage of Nor-Tech's Trailblazing Cluster Utility

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Southwest Research Institute CFD Research Engineer

The Client's Situation

Nor-Tech's Senior HPC Account Manager Bob Dreis has been working with Southwest Research Institute (SwRI) to develop and deliver high performance technology since 2015. The most recent order was for a cluster with 12 Intel® Cascade Lake Processors. For this order, SwRI was referred to Nor-Tech by Convergent Science, developers of Converge CFD.

SwRI isn't the first customer that Convergent Science has referred to Nor-Tech. Bob explained, "SwRI had good experiences with Nor-Tech in the past and Convergent Science recommends Nor-Tech because they know Nor-Tech will take care of the client. There is value in the fact that software companies consistently recommend us. They trust us because they are responsible for the performance of whomever they recommend."

Bob worked with SwRI's CFD Research Engineer. "We asked Convergent if they could recommend someone that can handle a big cluster," the engineer said. "Nor-Tech's name came up right away. I also knew about the other clusters that Nor-Tech built for SwRI and we knew that our colleagues were happy."

Our Solution

Nor-Tech designed a single rack with multiple compute nodes. In addition to Converge CFD, SwRI asked Nor-Tech to integrate two other CFD software applications.

SwRI already knew what they wanted. Bob suggested that they also consider Open OnDemand—a trailblazing cluster web portal utility, developed at the Ohio Supercomputing Center. Nor-Tech's VP of Engineering Dom Daninger was an early adopter of Open OnDemand software into the commercial marketplace. Open OnDemand provides a GUI web portal for job submission and access to the cluster (learn more about Open OnDemand later in this case study).

"This was our first deployment of Open OnDemand," Bob explained. "It was kind of a surprise for SwRI—a pleasant surprise—once they saw the functionality that Open OnDemand provided"

Nor-Tech labels interconnects and creates a custom Quick Start Guide (QSG) with pictures of the actual equipment that allowed SwRI to quickly deploy the system on-site themselves. The system is deployed and functioning as desired.

Their Success

"Right now we are using Open OnDemand for running simulations—and it is definitely helpful," SwRI's engineer said. "The Cascade Lake processors have all of the speed we were hoping for; meeting or exceeding our requirements."

Although the client had some initial problems (out of Nor-Tech's control) with internal environmental issues, everything is currently running like clockwork.

"Bob and Nor-Tech's engineers have been very responsive," SwRI's engineer said. "We are planning to add more nodes in the future, maybe next year, and we will definitely contact Nor-Tech for that. I would recommend Nor-Tech because they were both knowledgeable and responsive even before we signed a contract. They were also able to build and deliver the cluster quickly."

About Open OnDemand

Nor-Tech is the only enterprise offering Open OnDemand integration, which makes using an HPC easier; we are also the only company able to integrate it into OpenHPC. This means that even those without HPC expertise can take advantage of the computing power available in a cluster.

The traditional downside of open source platforms has been lack of support. Our engineers, who have decades of open source expertise, provide that support. Open OnDemand benefits include less end-user training to use the cluster—much easier to use than command lines.

Now No-Tech's clients have the option to use low cost/no cost open source cluster management tools like Open HPC, PBS Pro and CentOS to dramatically cut their software licensing costs.

- Open OnDemand is simply configured as a virtual server running on the cluster head node so no extra server hardware is needed--keeping the added cost very low.
- There is zero install on the end-user workstation. Open OnDemand is a single point of entry into the cluster; all users need is a simple browser and a single sign-on--user name, password, and URL.
- Users can easily upload and download files to and from the cluster right through the browser with no special FTP or PUTTY needed.
- Command lines are easily accessible from within the browser session.
- Resource schedulers like PBS Pro, Slurm and LSF are all supported.

A free trial of Open OnDemand is currently available on Nor-Tech's Demo Cluster.

About the Intel® Family of Xeon® Scalable Processors

Intel® Xeon® Scalable processors are workload-optimized to support hybrid cloud infrastructures and the most high-demand applications. Users can drive actionable insight, count on hardware-based security, and deploy dynamic service delivery. Value-added benefits include:
- Optimize Performance: New features such as Intel® Advanced Vector Extension 512 (Intel® AVX-512) improve with workload-optimized performance and throughput increases for advanced analytics, high performance computing (HPC) applications, and data compression.
- Accelerate Critical Workloads: Speed up data compression and cryptography with integrated Intel® QuickAssist Technology (Intel® QAT).
- Operate More Efficiently: High-speed Integrated Intel® Ethernet (up to 4x10GbE) helps reduce total system cost. It also lowers power consumption and improves transfer latency of large storage blocks and virtual machine migration.

- Improve Security: Deploy hardware-enhanced security to protect data and system operations without compromising performance.

Synergy among compute, network, and storage is built in. Intel® Xeon® Scalable processors optimize interconnectivity with a focus on speed without compromising data security.

About Southwest Research Institute

Innovation in science and technology has been a hallmark of Southwest Research Institute since its earliest days. They are committed to advancing science and applying technology to benefit government, industry, and all of humankind. A multidisciplinary, collaborative approach allows them to successfully solve clients' most challenging problems. SwRI is a leader among independent, nonprofit research and development organizations. The staff of 2,602 scientists, engineers, analysts, and support staff members continues to accomplish outstanding fundamental and applied engineering and research for clients from diverse segments of government and industry. They are the first choice for clients seeking solutions for their most complex problems.

About Nor-Tech

Nor-Tech is on CRN's list of the top *40 Data Center Infrastructure Providers* along with IBM, Oracle, Dell, and Supermicro and is also a member of Hyperion Research's prestigious HPC Technical Computing Advisory Panel. The company is a high performance computer builder for 2015 and 2017 Nobel Physics Award-contending/winning projects. Nor-Tech engineers average 20+ years of experience. This strong industry reputation and deep partner relationships also enable the company to be a leading supplier of cost-effective Lenovo desktops, laptops, tablets and Chromebooks to schools and enterprises. All of Nor-Tech's high performance technology is developed by Nor-Tech in Minnesota and supported by Nor-Tech around the world. The company is headquartered in Burnsville, Minn. just outside of Minneapolis. Nor-Tech holds the following contracts: Minnesota State IT, GSA, University of Wisconsin System, and NASA SEWP V. To contact Nor-Tech call 952-808-1000/toll free: 877-808-1010 or visit https://www.nor-tech.com.

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