

Challenge

The Van Andel Institute (VAI), based in Grand Rapids, Mich., is nonprofit biomedical research and science education organization that is primarily focused on the origins of cancer, Parkinson's and other diseases and translating those findings into effective therapies. The organization employs 330 scientists, educators and staff, and because of the nature of its research, VAI's computing needs are relatively advanced.



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High Performance Computing Solutions Architect
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Zack Ramjan, Research Computing Architect, runs the IT department at VAI. He was recruited from the University of Southern California to implement a scientific computing platform from scratch, which he says, was, "a very appealing opportunity for me because we had a chance to build something great without a lot of legacy equipment standing in our way."

Depending on the size and historical infrastructure architecture, there are times when a science and research community maybe behind the adoption curve of some commercially available solutions, and Ramjan says VAI was no different. It had virtually no ability to handle big data, and as a result large-scale scientific computing projects with either not processed due to lack of no on-site infrastructure in place to support them, or at times were required to be processed offsite through shared programs with say the NSF.

However, he says, "I was given the charge to build it within a short amount of time, but was also given the resources if necessary to purchase the latest and greatest HPC and scientific computing resources. This was an important initiative for the institute, as this initiative was directly associated with supporting to recruit scientists who are working on terabyte and petabyte scale data projects."

According to Daniel Chow, Silicon Mechanic's CTO/COO and a regular columnist for ComputerWorld, "we are just now starting to see an uptick in hybrid cloud usage amongst the research community. It is because of pioneers like Ramjan that the scientific computing will continue to grow in these avenues with in-house solutions often seen in the enterprise computing arenas."

According to Rajman, the scientific computing community is still 3-5 years behind the purchase cycle of the business community, meaning the technology that is hot right now like cloud, is simply unfamiliar to a percentage of VAI's users. And it won't be in the immediate future, so in the meantime he had find a way to build a hybrid system that allowed for flexibility between cloud and traditional cluster computing, providing his IT management team the ability to dynamically shift on the fly based on user need.

VAI needed a HPC hybrid system build that could handle the above mentioned exploding data requirements for scientific computing researchers, steer clear of system downtime while providing the its advanced users the flexibility and opportunities to experiment without affecting the entire system.



Exceptional Growth Demands Exceptional Service

Solution

With a wide variety of choices, but limited time, what did Rajman do? Fortunately, he had worked with turn-key and custom system integrator Silicon Mechanics while USC, so after he met with them and others at the 2014 Supercomputing conference, he invited Silicon Mechanics to bid for VAI's 2015 build and solution rollout against the likes of Cisco and Seagate, along with its direct competitor Penguin Computing.

"The bid was based on the build," says Ramjan. "But, Silicon Mechanics' sales engineers were already consulting with us by the time we received all of the bids and they just naturally assumed the position as Van Andel's system integrator."

The most important thing about the solution for Ramjan was that he wanted a hybrid approach, where he could analyze VAI's cloud-based users and cluster-based users at same time. Giving him the ability to identify VAI's user mix between cloud and cluster, and then be able to dynamically tweak that number on the fly without massive downtimes or retooling.

"That's what the Silicon Mechanics/Bright Computing solution allowed us to do," he says. "I can see what my users are doing and what the percentages are via my dashboard, and can then adjust with ease."

Results

By engaging with Silicon Mechanics and Bright Computing, Ramjan estimates that the VAI saved two years worth of man-hours, and provided VAI an IT infrastructure that advances both their IT flexibility, but provides their researchers and users leading edge computing technology.

"I could have done this on my own without Bright and Silicon Mechanics and with the right amount of manpower," says Ramjan. "And given the right amount of runway and support, it would have taken me two years versus just a couple of months."

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What about strict cost savings? First, there are the immediate cost savings of going virtual with the cloud. The cloud gives the organization the opportunity to carve out new materials and programs from existing resources, rather than adding ad hoc solutions that require significant development time, and are often ineffective. By going virtual VAI also centralized all of its resources which cuts down on administrative time, providing even deeper savings.

The response from VAI's system users, however, has been mixed.

"The majority of our users are scientists, not technologists," says Ramjan. "They just want to get their work done and that's all they care about. Those users that are tech savvy are excited about the new system because it allows them to do many things that they couldn't do before. They can basically do whatever they want. If they want to bring up some crazy version of Linux and mix that with SQL, they can do that."

With VAI's previous HPC infrastructure whatever was on the system was basically, 'on the system.' If someone wanted to add something new to the system, it had to be vetted, because any system change impacted every other user on the system. "Cloud computing changes all of that. If one of our users wants to do something unique on the new system, who cares? It's on the cloud. And we're fine with it."

VAI evaluated the technology landscape and the changing needs of its researchers and as a result, made a commitment to dynamic technology changes. These changes not only provide its users a more powerful platform, but also a hybrid OpenStack HPC solution with the flexibility to support the Van Andel Institute and its commitment through biomedical research and science education to improve the health and changing the lives of current and future generations.