



Customer: Seer Technology
Web Site: www.seertechnology.com
Customer Size: 25 employees
Country or Region: United States
Industry: Technology
Partner: Cray Inc.
Partner Web Site: www.cray.com

Customer Profile

Seer Technology, based in Salt Lake City, Utah, was founded to take advantage of the largely unexploited chemical detection market.

Software and Services

- Windows HPC Server 2008
- Third-party products
 - MathWorks MATLAB

Hardware

- Cray CX1 supercomputer

For more information about other Microsoft customer successes, please visit:
www.microsoft.com/casestudies

Startup Saves \$7 Million, Cuts Time to Market by 83% with High Performance Computing

“We’re scientists; we don’t care about the hardware and software. We simply chose what works better. With Microsoft and Cray, we didn’t have to think about the computer—or touch it—after we deployed it.”

Kurt Dobson, Scientist, Seer Technology

Seer Technology tackled a gas chromatography problem that industry experts said was impossible, but it was undeterred—even when each iteration of the MATLAB algorithms took 26 days to run. The company turned to Windows® HPC Server 2008 and Cray CX1 hardware, and cut the time to eight hours, enabling Seer to complete product development five months faster and send units to market. The company saved approximately U.S.\$7 million in development costs and gained millions in initial revenue contracts.

Business Needs

Necessity is the mother of invention, Plato said, and one of the sad necessities of the modern era are tools to detect threats of chemical or biological acts of terror. Enter Seer Technology, a startup company formed to invent just such tools for field use by law enforcement and military organizations. Seer’s challenge was to beat the competition to market, while making every dollar of its startup budget count.

For five years, Seer scientists had been developing AccuSense™, a miniaturized

laboratory gas chromatograph product that was field deployable, required no “carrier gasses” for continuous operation, and was affordable to first-responder and military customers. But the problem of separating and identifying multiple chemicals at once, especially “confuser chemicals,” which mask signatures of the true bad chemicals, had proved elusive.

Seer experimented with an innovative chemical scrubbing concept—but then a new difficulty arose. “Once we created an instrument to implement the chemical

scrubbing, we realized what a massive math problem we faced,” says Kurt Dobson, Scientist, Seer Technology. “With just 16 chemicals, we had to be able to account for 65,000 mixes of various concentrations. We brought in top scientists and were told that the problem was not solvable.”

But Seer didn't give up. It used the popular MATLAB technical computing language from the MathWorks to create the algorithms necessary to help identify the chemical compounds. A proof of concept showed it was on the right track—but the algorithms it developed, based on neural network technology, were so complex that it took 26 days on a quad-core PC to complete one iteration. Seer needed the algorithms to run within a few hours. At 26 days, there was no practical way to continue software development.

Solution

The traditional solution for Seer's problem would have been to move to a Linux-based supercomputer. But that didn't appeal to Dobson and his colleagues. “I've worked with large Linux systems, and I know they can work well, but they also require a system administrator—a guru, really—to keep everything running smoothly,” says Dobson. “We're a startup and every dollar counts. We didn't want to incur the expense.”

Instead, Seer turned to a nontraditional solution: MATLAB running on Windows® HPC Server 2008, the high-performance computing solution from Microsoft and the successor to Windows Compute Cluster Server 2003, and the Cray CX1 supercomputer—the first Intel-based supercomputer from Cray to run the Windows Server® operating system. The Cray, which plugs into two 120-volt circuits, consists of six blade computers in a single chassis, each

blade having two quad-core processors, 32 gigabytes of RAM, and 2.7 terabytes of disk space.

Cray and Seer set up the computer in half a day in January 2009. To administer the system, Seer worked with the part-time technician it was already using to maintain its computers running the Windows operating system. Because Seer's MATLAB application was abstracted from the processor layer on which it ran, Seer could move it directly from the original PC to the Windows HPC Server 2008-based Cray and, as Dobson says, “press a button and have it run.”

“The first day, everything came up and ran, and it's been rock-solid reliable every since,” says Dobson.

Dobson and his colleagues access the system directly on the network and by using Windows Remote Desktop over a virtual private network from their homes in the evening. They ran their algorithms on the Cray CX1 and Windows HPC Server 2008 combination in eight hours, compared to 26 days on the traditional PC. One month after moving to the new system, the company began to ship demonstration versions of its product to customers. The company envisions placing more than 1,000 systems in its first year, significantly enhancing public safety.

Benefits

Seer needed to get to market quickly to preserve its competitive advantage. The MATLAB software running on the Microsoft and Cray high-performance computing system delivered that benefit. “We went from not having any solution at all, to having a proof of concept, to shipping our first demo unit in about 30 days,” says Dobson. “It

would have been six months with our old hardware solution and Linux, and I don't think we would have done it.”

That 83 percent faster time-to-market saved Seer about U.S.\$7 million. But that's the least of the financial impact. The company expects to earn millions in revenues during the initial six-month period—revenues that would have been at risk had it delayed coming to market. “That's the difference between a PhD project and having a business,” says Dobson.

Dobson has little doubt about where to place the credit for the faster time-to-market. “We were up and running faster because of Windows high performance computing,” he says. “Setting up Windows HPC Server was as simple as setting up any other Windows-based system.”

Dobson also credits the solution with boosting his personal productivity and that of his colleagues. “I'm highly comfortable and more productive with Windows,” he says. “We would have had a long learning curve for a Linux machine. Overall, we were 70 percent more productive because of Windows.

“We're scientists; we don't care about the hardware and software. We simply chose what works better. With Microsoft and Cray, we didn't have to think about the computer—or touch it—after we deployed it. It was easy to acquire, to set up, and to use.”

Nor did Seer incur the continuing expense of a dedicated Linux administrator. “We saved \$100,000 per year in personnel costs by going with Windows HPC Server over Linux,” says Dobson. “That pays for another entry-level scientist. For a startup company, that's a big deal.”