

## Customer Snapshot: Life Sciences Cedars-Sinai Medical Center

### Computational Power of Sun Compute Grid Helps Researchers Uncover New Ways to Treat Diseases

One of the largest academic medical centers in the United States and a leader in clinical research, Cedars-Sinai Medical Center has made advances in healthcare that have impacted hundreds of thousands of lives. Its physicians bring advancements in medicine directly from the laboratory to the bedside. Researchers at Cedars-Sinai are using a Sun high-performance computing grid to make discoveries that could lead to personalized medical treatments for life-threatening and chronic diseases.

#### Business Issues

- Analyze vast amount of proteomic data from patient blood samples
- Minimize the amount of time required to crunch data
- Discover correlations among highly complex data sets
- Maximize use of limited data center floor space
- Minimize energy costs

#### Solution

A Sun Grid Rack System for High Performance Computing, comprised of 400 Sun Fire X2100 servers, was integrated by the Sun Customer Ready Systems program. This solution—which was ranked number 412 on the 27th TOP500 List of supercomputing sites in the world—will be used to process and analyze vast amounts of complex data for a major medical research project. The project's goal is to develop personalized predictive medical treatments to better manage chronic diseases and to help patients overcome life-threatening diseases. In addition, the three-tiered Sun Content Infrastructure Solution (CIS) helps provide backup for the project data.

#### Business Results

- Two terabytes of data analyzed daily
- Complex data analyzed in days rather than weeks and months
- 67% power reduction when systems are not in use provides cost savings
- Saved \$60,000 and two months time with pre-assembled grid by the Sun Customer Ready Systems program
- High throughput and performance delivers intensive computational capability
- Machine learning and intensive computation enables discovery of protein patterns that correlate to clinical outcomes
- Manage the additional 400 servers with no additional IT staff
- Small footprint accommodates data center

#### Products/Services/Solutions

- Sun Fire X2100 Server
- Sun N1 System Manager
- Sun StorageTek 3511 SATA Array
- Sun Customer Ready Systems (CRS) Program

#### Success at a Glance

David Agus, MD, has a vision for changing the way the medical profession treats patients with diseases, such as cancer, heart disease, epilepsy and heart disease—and he plans to achieve it a few drops of blood at a time. As the director of the new Spielberg Family Center for Applied Proteomics at Cedars-Sinai Medical Center in Los Angeles, Dr. Agus works with 40 colleagues at the leading edge of medical research in the area of proteomics, the large-scale study of proteins. By doing highly complex analyses of the proteins in patient blood samples, Dr. Agus and his team hope to discover patterns that will help researchers and physicians develop treatments—for cancer and other diseases—that are based on an individual's biochemical makeup and medical history.

The undertaking requires a massive amount of computational capability and data storage. Researchers

sought a supercomputer able to quickly process multiple terabytes of raw data daily, as well as 300 gigabytes of existing data, and able to analyze complex data sets to reveal patterns that could be correlated to clinical outcomes. Space constraints in the data center required a small footprint and the number of CPUs required to crunch the data made energy conservation an important consideration.

*“ We have a remarkable relationship with Sun. The passion of the employees goes far beyond selling equipment. They offer to come in on weekends to help us. The enthusiasm and dedication is something I haven’t experienced with any company—ever. ”*

— Dr. David Agus, Director, Spielberg Family Center for Applied Proteomics, Cedars-Sinai Medical Center

Cedars-Sinai chose Sun as the best solution for its processing, storage and backup requirements. The 400 Sun Fire X2100 servers comprising the grid offered outstanding floating point computational capabilities, provided enormous computing power in a compact footprint and were highly energy efficient. Cedars-Sinai was also impressed with Sun’s desire to partner closely with the research team.

The 400 Sun servers form a supercomputer that runs statistical, data analysis and proprietary applications. Sun N1 System Manager provides central monitoring and management of the grid compute nodes. A Sun Fire X2100 server also supports a Web portal for information sharing with colleagues. Researchers smoothly deployed the plug-and-play solution, thanks to the Sun Customer Ready Systems program, which pre-assembled and tested the grid for Cedars-Sinai. In addition, a three-tiered Sun Content Infrastructure Solution based on Sun StorageTek 3511 SATA disk arrays and L500 tape libraries inter-operate with third-party storage systems to provide a hierarchical data backup system for project-related data.

Researchers are amazed by the computational strength of the Sun solution and the dedication of Sun’s scientists and engineers. The project is expected to generate four terabytes of data daily by 2007—four times what is now processed by the grid—and eight terabytes daily by 2008. The processing power enables researchers to analyze complex data sets in days rather than weeks or months and cross-compare data to uncover new disease connections. Leveraging machine algorithms developed at Sun, researchers are uncovering complex patterns in proteins that will help them predict a patient’s response to a course of treatment and successfully treat patients on a case-by-case basis. Passion is also part of the equation for success. Sun engineers and technology experts offer their expertise to the project to optimize the solution and resolve issues quickly.

With a small form factor, the racked servers fit well within the 600 square-foot data center. When not active, the energy-efficient servers provide further cost savings by scaling down to one-third their normal power. The existing IT staff can easily manage the new grid using N1 System Manager. Additionally, Cedars-Sinai estimates that it saved \$60,000 and two months time by having the Sun Customer Ready Systems program assemble the grid.

Agus envisions the research continuing for decades and expanding to thousands of grids in institutions across the country. Sun’s technology and dedication will continue to power the transformation of research into radically improved medical care.