SC12 Student Cluster Challenge

Team Venus

A collaboration between University of the Pacific and LLNL along with vendor partner Appro

*Lawrence Livermore National Laboratory is sponsoring **Team Venus**, an all women's team from the University of the Pacific's School of Engineering and Computer Science, to compete in the Student Cluster Challenge at SC12, an International Conference for High Performance Computing, in Salt Lake City, Utah in November 2012. In a non-stop 48-hour challenge, six team members will assemble a small cluster and race to demonstrate the greatest Linpack performance as well as sustained performance across four scientific HPC applications.*

Team Goals

- Serve as role models representing women in STEM
- Gain "real world" exposure to HPC scientific computing
- Establish HPC-focused curriculum at University of Pacific to expand career opportunities for future graduates

Team Members


Camila Carvajal


Theresa Cruz


Nichelle Dismer


Caroline Dozsa


Jess Dudoff


Stephanie Labasan


Phuong Pham


Kathleen Shoga


Justine Tang

LLNL Collaborators: Anthony Baylis, Trent D'Hooge, Erik Draeger, Evi Dube, Koushik Ghosh, Robin Goldstone, Mike Kumbera, Art Mirin, Barry Rountree, Tom Spelce, Becky Springmeyer

Pacific Collaborators: Ryan Bleile, Mike Doherty, Jinzhu Gao, Shawn Kerns, Jeff Shafer, Louise Stark

About Our Cluster

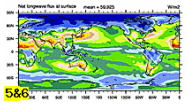
Hardware: The Team Venus cluster is built upon Appro's GreenBlade™ technology, a modular, energy-efficient cluster building block platform optimized for HPC environments. We designed our cluster to deliver the most performance possible within the SCC-specified power budget of 26 amps.

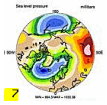
Team Venus Cluster Hardware Specifications	
Subrack	Appro SR5110
Nodes	(8) Appro GB512X
CPUs per Node	(2) Intel Xeon E5-2670 @ 2.6Ghz 166.4 GF/s peak performance
Memory per Node	64GB DDR3 @ 1600Mhz
Interconnect	QLogic 12200 IB Switch
Power Supplies	(4) 1620W high-efficiency PSUs
Peak Performance	**2.6624 TF/s**

Software: Our cluster runs LLNL's HPC-optimized software distribution known as TOSS. TOSS uses RedHat Enterprise Linux 5 as the base operating system. This is augmented with cluster management tools, InfiniBand support, the SLURM resource manager, several versions of MPI, and a variety of compilers including GNU, Intel, and PGI.

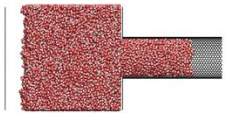
Scientific HPC Applications

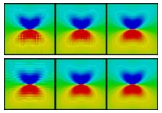
CAM: **C**ommunity **A**tmosphere **M**odel is the latest in a series of global atmosphere models developed for the weather and climate research communities



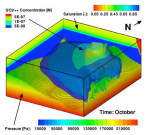


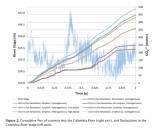
LAMMPS: **L**arge-Scale **A**tomic/**M**olecular **M**assively **P**arallel **S**imulator is a classical molecular dynamics code that models a group of particles in a liquid, solid, or gaseous state



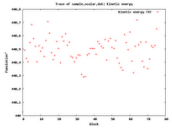


PFLOTRAN: Modeling multiscale-multiphase-multicomponent subsurface reactive flows using advanced computing





QMCPACK: Implements advanced Quantum Monte Carlo (QMC) algorithms for large-scale parallel computers



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