

Berkeley Lab Site Report NLIT Summit 2009

Gregory Bell
Chief Technology Architect, IT Division
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Multi-Program Lab, Interdisciplinary Science



Secure and Sustainable Energy

Harnessing sunlight for transportation energy, reducing the amount of energy being wasted, and improving the models of earth and climate systems for a better understanding of how human activity impacts the planet.



Novel Materials, Ultrafast Processes, Nanodevices

Synthesizing novel materials at the atomic and molecular levels, imaging the chemical and electronic processes that govern their properties, and learning to fashion these materials into valuable nanodevices.



Matter and Force in the Universe

Exploring the interactions between the fundamental particles of matter and force that gave rise to our universe and will determine its ultimate fate.



High Performance Computing and Networking

Tackling the mathematical modeling, algorithmic design, system architecture and other issues whose solutions can open doors to future scientific discoveries and technological breakthroughs.



Biosystems and Health

Addressing major health issues such as cancer, Alzheimer's disease and the deficits associated with aging through the study of biological systems at the molecular and cellular levels.

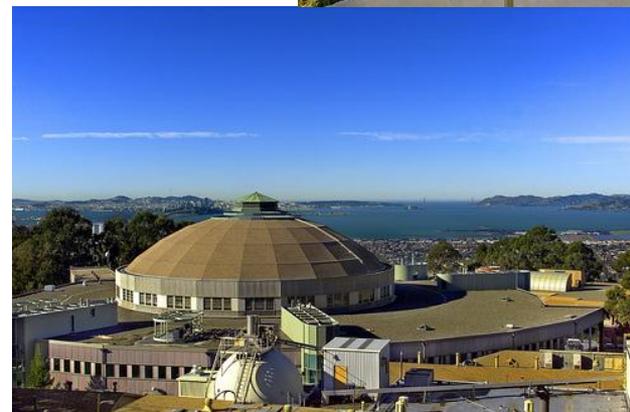


Earth and Climate Sciences

Investigating earth and atmospheric processes that are critical to the environmental safety of our planet, and providing scientific answers to global climate change, pollution, and the disposal of nuclear and other hazardous wastes.

Multi-Program Lab, Interdisciplinary Science

- 4000 scientists, staff, students
- \$600M budget
- neighbor to UC Berkeley
 - hundreds of joint appointees
 - 800 students trained per year
- 6 National User Facilities
 - Advanced Light Source
 - ESnet
 - Joint Genomics Institute
 - Molecular Foundry
 - Ntl Ctr for Electron Microscopy
 - NERSC



IT Highlights: Scientific Computation

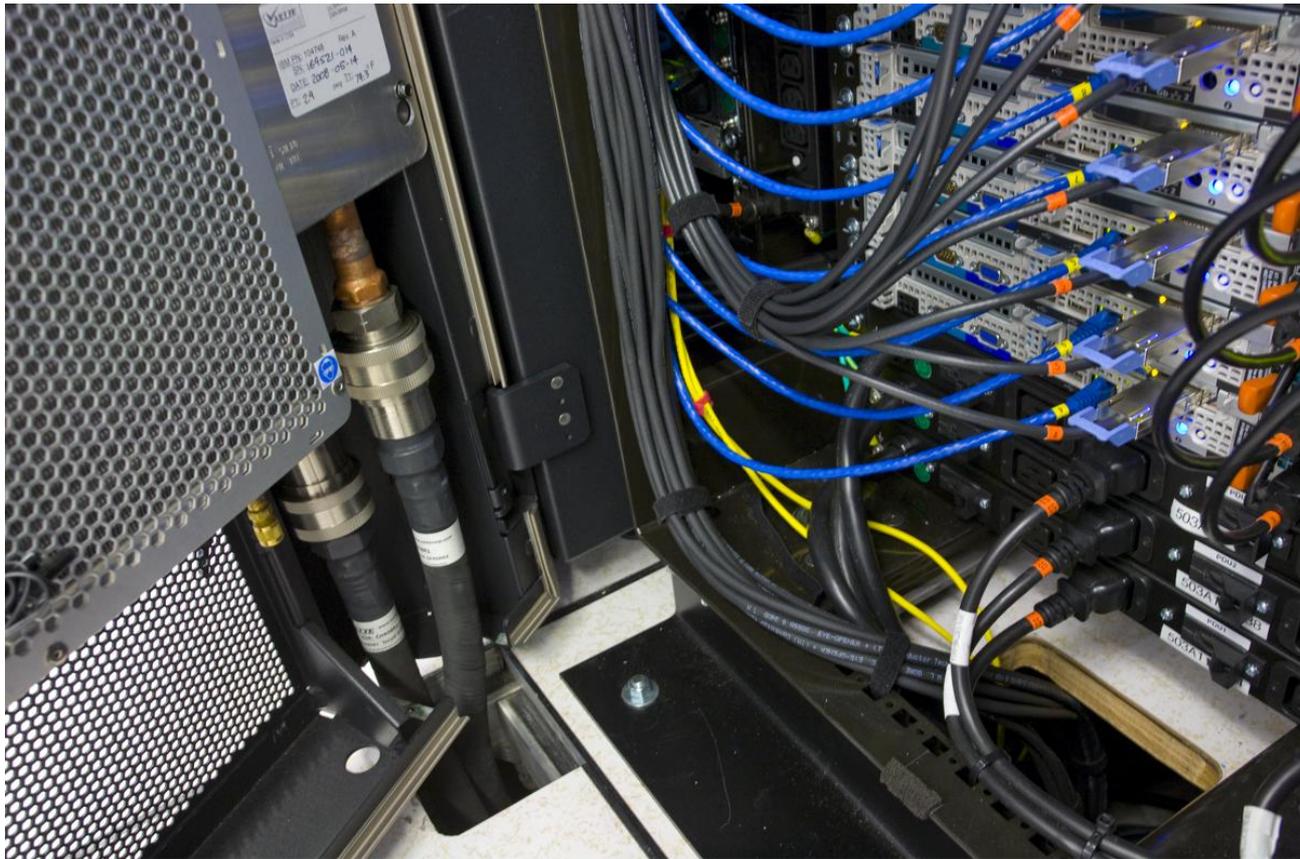
- managing >30 clusters for research teams
- newest cluster, Lawrencium, available to all Lab scientists
 - no cost for computation, user support, storage
 - 1584-core, 12.6 Tflop/s (Linpack)
 - >100 users and growing
 - all scientific Divisions now customers
 - target utilization = 70% (shallow queues for rapid turn-around)



IT Highlights: eSRA Project

- non-DOE funding at Berkeley Lab ~\$140M/year
 - NIH, universities, industry
 - but no system to coordinate sponsored research
- **Electronic Sponsored Research Administration Project**
 - managing sponsored research activities, pre- and post-award
 - improving efficiency, accuracy, timeliness, success rate
 - replacing cumbersome manual processes
 - lowering administrative costs
- **Status**
 - issued RFP
 - evaluating proposals now
 - selection this summer

IT Highlights: Sustainability



IT Highlights: Sustainability

- liquid-cooled rack doors for Lawrencium
 - ‘tower’ water (not chiller)
 - BTU, power meters to measure efficiency
- wireless environmental monitoring system
 - 700 sensor points: temperature, humidity, pressure, current
- real-time efficiency dashboard (in progress)
- ‘freezer curtains’ for airflow management
- exploring modular containers, advanced water cooling



ESnet: Networking Services for Science

- large-scale science requires high-performance networking
- more than bandwidth: services
 - dynamic circuit service lets researchers customize the network for the needs of their science
 - community engagement, requirements-driven design, and strategic partnerships
- \$69M in ARRA funds to accelerate development of 100Gbps networking & build national-scale prototype linking DOE supercomputing centers



Thank you.

Questions?

GRBell@lbl.gov