Advanced Scientific Computation Center (ASCC)

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OUTLINE

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An NSF-Industry-University Partnership
Opening Celebration – 1999

Advanced Scientific Computation Center
Northeastern University
National Partnerships/Alliances

- ASCC is member of Coalition of Academic Scientific Computation (CASC)
- Interested in developing regional/national alliances.
Facilities: First Upgrade (Sept 2001)

- 4-node, 16-processor Compaq/HP Alpha ES40 Tru64 Unix cluster
- Alpha Processors: From 6 to much faster 16
- Memory: From 4GB to 28GB
- Disk: From 110GB to 700GB
- Backup unit: From 250GB to 750GB
- Memory channel backplane with much higher bandwidth and better scaling
- Overall improvement of a factor of 4 to 6
Second Upgrade (Sept 2004)

- New additional high-end system ‘Zeus’
  - 16-node HP rx2600 Itanium2 HP-UX cluster
  - 32 Intel Itanium2 processors running at 1.5 GHz, world’s fastest single processor SPECFP performance at the time of purchase
  - Total of 100GB of memory across nodes, one dedicated 24GB large memory node
  - 2.0 TB of disk space in RAID 1 configuration
  - Administration by IS
  - Factor of 7 addition to the compute power
Funding

- Started with $1.3 million funding in a three-way partnership between NSF, DEC and Northeastern University
Goals

- High quality research & education
- Provide hardware and software resources for research computing & education
- Provide advice and expert knowledge (Most of this has come from a small group of participating faculty & their research groups)
- Advocate for NU IS to provide resources, especially operation, admin, and assistance
Research Impact

- Impacted research in 20 major Departments, Centers and Institutes at the University involving several hundred projects

- Helped faculty/researchers expand, forge and initiate many new research collaborations within and outside NU; helped strengthen computational aspects of many proposals for external funding.
Research Training Impact

- Made it possible for us to attract a 5-year GAANN program of the Education Dept.
- Master’s Certificate in Scientific Computation & Visualization (SCV)
- Master’s Program in Bioinformatics and Computational Molecular Biology (BCMB)
- Many computational courses assisted
GAANN Fellowship Program

- GAANN (Graduate Assistantships in Areas of National Needs)-- Education Department
- Total of 40 Ph. D. students in Physics, Chemistry, Biology and Math impacted
- Training in scientific computation and visualization techniques at the ASCC
- Total funds, about 1 million $ direct costs for 5 years, 2000-2005
Collaboration with Uni-Geneva on material science (DPMC MaNep)

- Simulation of $\text{La}_{2-x}\text{Ba}_x\text{CuO}_4$
Outlook

- Faculty have been successful and will continue to strive for success
- Due for next HW/SW upgrade
- Better operations, staffing, data-gathering need to be developed/implemented
- We urgently need to find a viable funding model for the ASCC and the overall computational infrastructure on the campus
Concluding Remarks

- ASCC has provided a powerful umbrella for: leveraging our computational resources; putting together many interdisciplinary research and teaching programs.
- Substantial non-equipment resources have come from the participating faculty
- Great need for expanded research and research training resources