Summary of accomplishments, 1996 - 1999

3/14/2000

Lennart Johnsson

Research – Strategic Partnerships

1. Regional high-speed network (622 Mbps) including Rice, Baylor, Texas A&M in Houston, and the Texas Medical Center.

2. The Texas GigaPoP, the Texas gateway to national high-speed networks. The Texas GigaPoP was the third, possibly fourth in the country.

3. Funding for the vBNS, one of the first Universities (1 of 13) to receive such funding.

4. Internet2 Charter Membership. UH Applications representative.

5. Transatlantic high-speed networks. Pursued initiatives that lead to:

   - an upgrade of the transatlantic capacity for the Nordic Universities from 34 Mbps in 1998, to 310 Mbps, to 620 Mbps to become 930 Mbps by end of 2000.
   - NorduNet becoming the first foreign network to reach an agreement with UCAID (University Corporation for Advanced Internet Development) for connecting to its advanced networks (Internet2).
   - NorduNet reaching an agreement with NSF to connect to StarTap, the US gateway for foreign networks connecting to the vBNS.

   (Credit for the above was given in the 1998 Annual Report by the Nordic University Networks)

6. Positioning UH as one of very few Universities to be funded from both NSF funded Partnerships for Advanced Computational Infrastructure (PACI). We are still funded from both NPACI and the Alliance.

7. Participation in the Globus project demonstrating live at Supercomputing '97 a virtual computer with 3,600 processors spread across five continents.

   The Globus project received the Global Information Infrastructure Award in 1998 for Next Generation Advanced Computing Infrastructure. The price was presented by Vice President Al Gore.

8. Founding member of Houston Area Computational Science Consortium (with Rice and Baylor).

9. Founding member of the ASCI funded Los Alamos Computer Science Institute. The Institute was founded in the spring of 1999, and the first of three National Laboratories based ASCI centers.

10. Member of the first (and only) national project in the NSF Next Generation Software (NGS) initiative (with UCSD, USC/ISI, Rice, Univ of Chicago, Indiana Univ., Univ of Illinois Urbana/Champaign, and the University of Tennessee).

11. Other strategic efforts: The Fluidization Institute, (ASCI Level one Center), the Center for Synthetic Environments for Fluid Flow (NSF Science and Technology Center), the Center for Grid Application Development Software (NSF Science and Technology Center), and a Major Research Infrastructure proposal to the NSF. Several White Papers, Preproposals, and average size Proposals (3 - 6 PIs).

Infrastructure - Research and Education

1. The acquisition of a close to $8M IBM SP-2 system with 64 processing nodes with a capacity in excess of 30 billion operations per second, a 200+ GByte RAID system and a mass storage system.

2. A prototype OC-3 ATM network covering Engineering and Science buildings, and the University computing facility.

3. A new wiring infrastructure for the Computer Science Department and its facilities with fiber and category-5 twisted pairs to every office and instructional laboratory.

4. A new departmental network based on a switched Gigabit Ethernet backbone with layer-3 switching at the "edge" and security policies implemented at the switch level.

Educational facilities

During the last three years a number of significant improvements have been made for laboratories and experimental facilities for undergraduate and beginning graduate education in Computer Science. Three years ago, no laboratory facilities existed for Computer Science education; only a few PCs and workstation were in place for homework assignments.

The facilities that have been established are:

1. A multimedia teaching theater with 35 SGI O2's, each equipped with microphones, speakers and video cameras. The multimedia theater is managed through an SGI Origin 200 server. (new facility, nothing of this nature existed).

2. A computer and communication network laboratory with 35 PCs, Layer-3 Gigabit Ethernet switching capability, GigaNet and Myrinet Gigabit speed switching (assembly delayed due to space limitation) (new facility, nothing of this nature existed).

3. A laboratory for digital systems design comprised of 20 PCs. (replacement of outdated facility).

4. A laboratory for introductory classes in computer organization consisting of 35 PCs and both an NT server and a power PC server enabling course offerings for both Intel based and RISC based architectures. (new facility, nothing of this nature existed).

5. A laboratory for a variety of software classes comprising 60 PCs. (replacement and expansion of outdated facility).

6. Mobile technology for education, currently in a planning stage. The intent is to establish a wireless network on campus covering the main library and at least one building with educational and research facilities. The idea is to assess how severe a constraint ultra portable devices, such as pocket and handheld computers present in education and training. Wireless technologies are expected to operate at todays campus wired network rate within three years.

Facilities renovation

Handling of all aspects of renovation of student facilities, including minor construction, painting, electrical and rewiring, and furniture procurement (specifications, procurement, delivery/installation/implementation management). The facilities handled: Multimedia teaching theatre, introductory PC lab, main PC lab, Digital systems lab, Unix lab, networking lab (in progress).

Staffing

Four outstanding faculty hired in an exceedingly competitive recruiting market. There are some 500 open faculty positions in Computer Science.

1. Two junior faculty hired, both of which received NSF CAREER awards during their second year as faculty members.

2. Two somewhat senior faculty (untenured Associate Professors) with excellent prospects.

3. Stabilizing the systems support for the SP-2 through contract with the Royal Institute of Technology, with increased availability as a consequence.

4. Hiring the first (ever) professional systems support person for the Computer Science Department (and creating presistent funding for a second professional systems admin staff).

Funding

Industry support (NSF rules)

- IBM 4,664,794 (in connection with the SP2, in addition to standard university discount).

- HP 356,784 (donation).

- Alcatel 250,000 (in addition to standard university discount, plus three year discount guarantee of about 70%).

- SGI 100,000 (beyond standard university discount).

Total corporate "funding": about $5.4M.

Research grants for which I am or have been PI: About $750k/yr. (Approximately $2.8 - 3M since joining UH).

Computer Science Department student fees for computational infrastructure raised about 70% to a level covering about 30% of capital and operating expenses.

Total: about $8.5 - 9M.

Open opportunities: Offer from Fore Systems to furnish a network lab.

Education

1. Student exchange agreements set up with Uppsala University, Lund University, and the Royal Institute of Technology, covering both NSM and College of Engineering.

2. Hired outside lecturers that helped revitalize one of the compiler courses (Michael Fagan), one of the network courses (David Kramer) and object oriented programming (Venkat Suramanian).

3. Revised data structures and theory courses (Sivakumar).

4. Introduced new graphics and visualization courses (Kakadiaris).

5. Terminated a course in VAX assembler and introduced courses in Intel and RISC based instruction sets.

6. Added a course in Internet computing (Stephen Huang).

7. Added courses in scientific computation and advanced networking (Lennart Johnsson).

8. Extended student access to laboratories (previously managed in a high-school manner).

Department

1. Procurement of PCs for staff, Directors of Undergraduate and Graduate studies, and their assistants, and the Associate Chair.

2. Procurement of Departmental color laser printer (there was no color printer in the department when I arrived. I purchased a total of four color laser printers (two for student use, one for the department and one for research (on external funds))).

3. Procurement of 3 LCD projectors.

4. Procurement of office furniture for new faculty.

In total I recall

- 15 separate equipment procurements

- 5 separate furniture procurements

for which I did practically everything, except fill out the paperwork. And the procurement were made at a cost of 20 - 70% of what UH traditionally has paid for equivalent products or services.

The procurements

- quadrupled and modernized the PC's and workstations available to students

- quadrupled the number of LCD projectors

- trippled the number of black-&-white printers

- introduced color printers

Research - personal

Established and managed a group of about a dozen students and two postdoctorial associates/research scientists. Procurement of office furniture and a small PC Cluster (11 nodes, 30 processors).

Professional Activities

- Member, Executive Committee, The Los Alamos Computer Science Institute, Los Alamos, NM.

- Member, Executive Board, The W.M Keck Center for Computational Biology, Houston, TX 77005-1892.

- Chair, Executive Board, The Houston Area Computational Science Consortium, Houston, TX.

- Participation in the formation of the US Grid Forum.

- Participation in the formation of the European Grid Forum.

- Chair, External Advisory Board, The National Parallel Supercomputer Center, The Royal Institute of Technology, S–100 44 Stockholm, Sweden.

- Chair, the Swedish National Allocations Committee for High Performance Computing, Storage and Visualization, The Swedish Council for Planning and Coordination of Research, S–103 87 Stockholm, Sweden.

- Chair, Scientific Board, The National Parallel Supercomputer Center, The Royal Institute of Technology, S–100 44 Stockholm, Sweden.

- Member, Industrial Advisory Board, West Virginia Experimental Program to Stimulate Competitive Research, Morgantown, WV.

- Member, Steering Committee, Conference series on *Massively Parallel Processing Using Optical Interconnections*.

- NSF Visiting Committees

    - Electronic Visualization Laboratory (EVL) University of Illinois Review Panel
    - National Center for Atmospheric Research (NCAR) Code Assessment Panel

- Several NSF Panels

- General Chair for one Conference

- Served on Organizing and Program Committees for several International Conferences (2 - 3/year)

- Editorial Board member for seven professional journals.

Comment

The Facilities accomplishments would not have been possible without the strong support and commitment of the Vice Presidents for Research, Arthur Vailas, and Information Technology (Chuck Shomper). The recruiting of high caliber faculty in an exceedingly competitive labor market would not have been possible without the support of the leading Computer Science Community, especially the CS and CAAM faculty at Rice. And as we all know, the accompishments were made in the face of broken administrative processes and financial systems in the College, and a passive to hostile faculty.