Teaching and Learning with Internet2

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Background

Cal Poly

Internet2 and Cal Poly

Education-Oriented Activities

Videoconferencing, Tele-Collaboration

Remote Access to Equipment

Data-intensive Applications

Promoting Internet2

Internet2 Champions

Internet2 Mini-grants; Guests: David Gillette, Enrica Lovaglio

Internet2 Course

Experiences

Future Activities

Conclusions

Credits
Cal Poly San Luis Obispo

California State Univ. campus on the Central Coast
half-way between San Francisco and Los Angeles
about 18,000 students
63 undergraduate programs
25 graduate programs (mostly Master's degrees)
colleges
- Agriculture
- Architecture and Environmental Design
- Business
- Engineering
- Liberal Arts
- Science and Mathematics
- University Center for Teacher Education

Internet2 and Education

videoconferencing and tele-collaboration
guest speakers in classes
joint classes or projects between different campuses
remote access
- special-purpose equipment
  - shake table
  - Cal Poly Avila pier
  - Swanton Pacific ranch http://www.spranch.org
- large data sets
  - GIS
- real-time computation
  - up-to-date data is critical
Example: Cal Poly Avila Pier

- formerly used by Unocal as oil terminal, it was donated to Cal Poly in 2002
- more info at http://www.marine.calpoly.edu (partially complete) and http://polyland.lib.calpoly.edu/topics/florafauna/studentsites/2003a/
- team-taught marine biology course together with Rutgers University, and a Florida university
- live field trips with remotely controlled submersibles in three different ecosystems (sandy continental shelf, coral reefs, rock coast)
- joint research involving shared real-time environmental data from a network of sensors combined with satellite images

Internet2 Champions

- established in March 2002
- more details at main champion Hugh Smith’s page
- representatives from each college and ITS
  - dissemination of information within the colleges
  - education of faculty and staff about the capabilities of Internet2
  - identification of people with suitable interests and applications
    - find people who may have a problem that Internet2 can help solve
    - e.g. GIS server, access to Avila pier laboratory
  - interest groups
    - video conferencing, GIS, remote collaboration
Internet2 Mini-grants

- support from Office of Naval Research, Cal Poly’s Office of Research and Graduate Programs, and Cal Poly’s ITS dept.
- relatively small grants to help faculty and students get started with Internet2 integrate it with existing projects
- first phase in Spring/Summer 2003 7 projects funded
- second phase for the 2003-04 academic year waiting for allocation of funds

Internet2 Mini-grant Examples

- I2-Based Remote Viewing System  Fred DePiero, Electrical Engineering
- Internet2 @ Cal Poly Video Documentary  Franz Kurfess, Jordan Small, Aaron Peckham, all Computer Science
- Collaborative Research in Embedded Microprocessor Design Cal Poly - UC Davis  Diana Keen
- End-to-End Performance Testing  Hugh Smith, Computer Science
- Lumiere Ghosting & CompuPresence Zoetrope Project  David Gillette, English; Enrica Lovaglio, Arts & Design
- VLSI Design and Test with Internet2-Based Tools  William Ahlgren
- Internet2 Map Server for GIS  Walt Bremer, Architecture
Internet2@Cal Poly Documentary

one of the Internet2 mini-grants
produced by two computer science students, Jordan Small and Aaron Peckham, during the Spring and Summer 2003 terms
- total length about 23 min from about 11 hours footage
- Canon ZR-30 digital video camera, Apple iMovie and Final Cut Pro 3 software on a dual CPU 1 GHz G4 Apple computer
- in total about 60 GB project files
on the Web in high, medium, low versions at
- http://mediaserver.calpoly.edu/Engineering/Computer_Science_Department/fkurfess/internet2_high.mov
- http://mediaserver.calpoly.edu/Engineering/Computer_Science_Department/fkurfess/internet2_mid.mov

Internet2 Course

seminar-style course offered in Spring 2003
guest lectures featuring speakers from
- Internet2 consortium
  - Ann Doyle, Charles Yun, Doug van Houweling,
- CENIC
  - Dave Reese
- Cal Poly
  - Rosemary Bowker, Jerry Hanley, Johanna Madjedi,
excursion to CENIC meeting in Santa Barbara
student projects
- Internet2 @ Cal Poly video documentary, virtual collaboration tools, library services, satellite control, optical transmission technology
Experiences 1

Internet2 champions
- good for dissemination, coordination purposes
- direct personal contact seems to work best
  - e.g. presentations at department meetings, brown-bag lunches
- individual commitment required
  - regular meetings (bi-weekly or monthly)
  - contacts with potential users
  - finding out more about Internet2
- interest groups only work if people have significant related activities

Experiences 2

Internet2 mini-grants
- excellent incentive for the exploration or integration of Internet2 capabilities
- springboard for more substantial projects with major funding agencies
- good opportunity to get students involved

Internet2 class
- opportunity for students to interact with community leaders
- requires classroom with I2 access, video conferencing facilities
- moderate overhead for coordination
- backup plans are critical because something will go wrong!
- administrative aspects: registration, credits, electives, ...
Future Work

- second phase of Internet2 mini-grants
  - proposals to other funding agencies in preparation
- Internet2 champions ready to resume proselytizing
  - refreshed after the summer
- Internet2 day under consideration
  - possibly in collaboration with other institutions
- second version of Internet2 course for Spring 2004
  - better marketing to students outside Computer Science, Engineering
  - more careful backup planning

Conclusions

- teaching-oriented institutions can make good use of Internet2
  - guest lectures, co-teaching, access to special resources
  - better teaching through collaboration with researchers
- a core group of people across the institution is critical
  - disseminate information, scout out opportunities, coordinate activities
- student involvement provides additional benefits
  - students may be more curious about new technology
  - some innovative project proposals were initiated by students
  - utilize academic incentives (courses, credit)
Credits

A big thank you to
- the Cal Poly Internet2 champions
- the Cal Poly ITS people behind the scenes
- the Cal Poly faculty and students working on mini-grant projects
- the students and guest speakers from the Internet2 course