Announcements

- Reading for next class

  Bates, P. C., “Debugging Heterogeneous Distributed Systems Using Event-Based Models of Behavior”, TOCS 13(1), Feb 1995

  Redell, D. D., “Experience with Topaz TeleDebugging”

- Reading for next Thursday

  Netzer, R. H. B. and Miller, B.P., “What are Race Conditions? Some Issues and Fomalizations”, LOPLAS 1(1), Match 1992

  http://www.cs.umd.edu/~keleher/papers/osdi96.ps.gz

- All Readings are available from the program library

Summary of Trends in Hardware

- Latency is a hard problem that will not vanish
  - speed of light is only 1 foot per nano-second
  - round trip latency across USA is 30 msec
  - locality will remain a critical issue to performance
- Bandwidth is getting faster
  - gigabits per second is here today
- Multiple levels of processor parallelism will be used
  - pipeline
  - superscalar
  - multiple processors
- Communication can also be parallel
  - move from bus to interconnection networks
  - support multiple pending communication operations

Term Projects

- Goal: mini-research project
- Project Proposal
  - couple of pages
  - statement of problem to be investigated
  - questions to be answered
  - how will you evaluate your solution
  - proposal due Oct 24 (Thursday) at 6:00 P.M. (my office)
- Projects should be done in teams of 2-3 people
- Work in Progress Talks (in class Nov. 14)
- Final Presentations (in class Dec 5 & 10)
- Project Report
  - due at end of term
  - will report results and provide analysis of the results!

Project Ideas

- Performance Visualization
  - create a visualization to illustrate some type of performance behavior of an application
  - will build on the Paradyn performance tools
- PC as Parallel Computer
  - evaluate high speed networking on a PC
    - ATM vs. Fast Ethernet
    - run benchmark programs to understand results
- Parallel I/O
  - PC (office) vs. Workstation (engineering) workloads
  - scheduling issues in parallel I/O systems
- Performance Prediction
  - given a small run of a program, predict performance for larger dataset or number of processors

Project Ideas (cont.)

- Content Based Linking of Objects
  - how to manage software configuration with many applications sharing several libraries
- Data Parallel Java
  - Java has threads, and some communication support
  - Investigate data parallel extensions to Java
- Simulation of Feedback and Adaptation of Programs
  - if a program can switch libs, algorithms, etc. based on observations, when and how should the changes be made
- Heterogeneous Process Migration
  - investigate migrating traditional C/FORTRAN programs among different processor types