THREE FEATURES

4 Operating Systems and Environments for Large-Scale Parallel Processors
   Guest Editor's Introduction Joanne L. Martin

7 Pisces: An Environment for Parallel Scientific Computation
   Terrence W. Pratt
   The Pisces I virtual machine retains sequential programming characteristics, yet allows for experimentation with the parallel languages that will drive the supercomputers of the 1990s.

21 A Parallel Programming Environment
   John R. Allen and Ken Kennedy
   Automated techniques will not entirely free the programmer from thinking about parallelism but will uncover natural parallelism in loops and generate appropriate synchronization primitives to exploit that parallelism.

30 Xylem: An Operating System for the Cedar Multiprocessor
   Perry Emrath
   Based on version 4.2 of Unix, this system is being implemented in an extended version of C and features systems calls to support multiprocessing within individual programs.

39 Parallel Processing in a Message-Based Operating System
   Robert Olson
   As originally designed, the ELXSI System 6400 used messages to achieve parallelism. Shared-memory capabilities were added later—with surprising ease and success.

50 Analyzing Software Performance in a Multiprocessor Environment
   Creve Maples
   Efficient multiprocessing requires new methods of problem decomposition—and new debugging and analysis tools for developing and evaluating asynchronous, parallel programs.

SPECIAL SECTION

65 International Parallel Processing Projects: A Software Perspective
   Industrial and academic researchers provide a glimpse into efforts to develop a faster, more powerful computer through methods beyond purely technological advances.

SPECIAL FEATURE

82 Software Theft
   Robert L. Glass
   Modular decomposition offers a way to ascertain a software theft. Moreover, the method is straightforward enough for a software-illiterate judge or jury to understand.

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