Hardware advances reflected in World Computer Chess Championship

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If a program didn’t run on more than one computer, or if a program didn’t use special-purpose hardware, then it didn’t finish in the top four places in the recent World Computer Chess Championship held in Cologne, Germany.

Cray Blitz, the winner of the five-round Swiss-style tournament ran on two processors of a Cray 2 for the first three rounds and on all four processors of a Cray XMP for the last two rounds. Executing 420 million instructions per second, Robert Hyatt, Burt Gower, and Harry Nelson’s Cray Blitz examined trees having as many as 25 million nodes while deciding upon a move.

The second-place finisher, Hitech, ran on a Sun workstation with a specially designed VLSI move generator and position scorer attached. It, too, examined very large trees and perhaps played the best chess of the tournament, but a last-round loss to the winner cost the program the title. The program, developed at Carnegie Mellon University by a team headed by Hans Berliner, has competed in several tournaments with strong humans this year and has received performance ratings just short of a Grandmaster.

The third-place finisher, Bebe, developed by Tony Schaeffer’s Phoenix, broke the previous record of eight computers searching together as a team (held by Ostrich, which was developed by this reporter) by competing with 20 Sun workstations which searched the chess trees in parallel.

All four programs actually finished tied with four out of five points, but the tie-breaking rules led to the ordering indicated.

Twenty three programs competed in the championship, five from the USA, four each from West Germany, England, and The Netherlands, three from Canada, and one each from Hungary, Denmark, and Sweden. Six programs were running on computers in North America and connected via satellite to the tournament hall.

Erratum
In the September issue of Computer, some equations in the article "A Proposed Standard Format for RSA Cryptosystems" by Philip Zimmermann were inadvertently printed with errors. The equations in the center column of page 23 should read:

\[ p_2 = ((C \bmod p)^d \bmod (p-1)) \bmod p \]
\[ q_2 = ((C \bmod q)^d \bmod (q-1)) \bmod q \]

If \( p_2 = q_2 \), then \( M = p_2 \), and the algorithm halts. Otherwise,

\[ p_2 > q_2 \text{ mod } p \]
\[ M = q_2 + (q_2 \text{ mod } p) \]