Wayne State University

Institute for Scientific Computing

Presents our Seminar Series

"Green Destiny + mpiBLAST = Bioinfomagic"

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3:00 pm, Room 306 State Hall

Abstract

Green Destiny, featured in The New York Times, BBC News, CNN, and HPCwire and a recent winner of a 2003 R&D 100 Award, revolutionized the high-performance computing community by re-defining "performance" to focus on issues of efficiency, reliability, and availability. Green Destiny is a 240-processor supercomputer that fits in 6 square feet and sips as little as 3.2 kilowatts of power; it does not require any special infrastructure to operate, i.e., no cooling, no raised floor, no air filtration, etc. Thus, several pharmaceutical and bioinformatics institutions, who likewise do not have special infrastructure to house supercomputing clusters, demonstrated significant interest in Green Destiny type of solutions.

The above interactions led to the birth of mpiBLAST, an open-source parallelization of BLAST that achieves super-linear speed-up via a technique called database segmentation. Database segmentation allows each computing node to search a smaller portion of the database, thus eliminating disk I/O and vastly improving performance. When used in concert with Green Destiny, we demonstrate that a 300-kB BLAST query that takes nearly one full day to complete on a traditional workstation takes only minutes on Green Destiny.

Dr. Wu-chun Feng is a technical staff member and team leader of Research & Development in Advanced Network Technology (RADIANT) in the Computer & Computational Sciences Division at Los Alamos National Laboratory (LANL) and an adjunct assistant professor at the Ohio State University. He is also a fellow of the Los Alamos Computer Science Institute and the founder and director of the Advanced Summer Curriculum for Emerging Network Technologies (ASCENT).

Dr. Feng joined LANL in 1998, where he has been conducting research in high-performance networking and computing. In that span of time, he has established a respected record of over 70 journal and conference publications and has given over 20 invited talks and colloquia. He received a B.S. in Electrical & Computer Engineering and Music (Honors) and an M.S. in Computer Engineering from the Pennsylvania State University in 1988 and 1990, respectively. He earned a Ph.D. in Computer Science from the University of Illinois at Urbana-Champaign in 1996.