

MURPA Seminar Friday 20th August 2010 at 9am (please note earlier time - from Illinois)

Venue: Seminar Room 135, Building 26 Monash Clayton

Subject: **Enabling the Next Generation of Scalable Systems**

Speaker: **Prof William Gropp**, Department of Computer Science and Deputy Directory for Research for the Institute of Advanced Computing Applications and Technologies at University of Illinois

Abstract

Clusters revolutionized computing by making supercomputer capabilities widely available as well as providing many of the components for the current generation of supercomputers. But one of the main drivers of that revolution, the rapid doubling of processor clock rates, ran out of steam several years ago. To maintain (or even increase) the historic rate of improvement in computing power, processor designs are rapidly increasing parallelism at all levels, including more functional units, more cores, and ways to share resources among threads. Heterogeneous designs that use more specialized processors such as GPGPUs are becoming common. The scale of high-end systems is also getting larger, with 1000-core systems commonplace and systems with over 200,000 cores already in use. However, the software and algorithms for these systems are still basically the same as when the cluster revolution began. This talk will describe trends in large scale systems, using the sustained PetaFLOPS system, called Blue Waters that will be installed at Illinois, as an example. In the context of these trends, this talk will discuss some of the challenges as scalability becomes increasingly important and reviews some of the developments in algorithms, programming models, and software frameworks that must complement the evolution of computer hardware. Research

Links: <http://www.cs.illinois.edu/homes/wgropp/bib/talks/index.htm>

Bio:

William Gropp is the Paul and Cynthia Saylor Professor in the Department of Computer Science and Deputy Directory for Research for the Institute of Advanced Computing Applications and Technologies at the University of Illinois in Urbana-Champaign. His research interests are in parallel computing, software for scientific computing, and numerical methods for partial differential equations. He is a co-author of "Using MPI: Portable Parallel Programming with the Message-Passing Interface", and is a chapter author in the MPI-2 Forum. His current projects include the design and implementation of MPICH, a portable implementation of the MPI Message-Passing Standard, the design and implementation of PETSc, a parallel, numerical library for PDEs, and research into programming models for parallel architectures. He is a Fellow of ACM and IEEE and a member of the National Academy of Engineering. Web

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