Introducing High Performance Computing (HPC) in the Baton Rouge Community College (BRCC) Computer Science Curriculum

Debra Miller Borskey[1]

[1]Associate Professor Baton Rouge Community College.

LA-SiGMA — Louisiana Alliance for Simulation-Guided Materials Applications

NSF

Abstract

BACKGROUND:

HPC has become a major focus for Academics and Researchers.
The advancement of computer technology used for research is creating the need to change the way classes are taught in higher education.

By definition, supercomputers are the fastest and most powerful computers available, and at present the term refers to machines with hundreds of thousands of processors. They are the "super-stars" of the high performance class of computers. Additionally, personal computers (PCs) small enough in size and cost to be used by an individual, yet powerful enough for advanced scientific and engineering applications, can also be high performance computers.

BRCC INSTRUCTIONAL OBJECTIVES:

- Understand in a general sense the architecture of high performance computers.
- Understand some of the general concepts of parallel computing and the different types of parallel computers.
- Understand memory access of HPC programs (shared vs. distributed memory).
- Understand the importance of communication overhead in high performance computing.
- Understand how different types of problems are best suited for different types of parallel computers.

7 BRCC Students Attended the 2014 LSU Beowulf Boot Camp

LittleFE "Educational Appliance"

Demonstrate ideas of cluster computing

- 6 node
- 12 processors
- 6 GPU's
- OpenMP, MPI, and CUDA
- Cost with set up approximately $3,000.00

Proposed BRCC HPC Curriculum Modules

Introduction to Unix/Linux

Basic Concepts / Commands
Working with files and folders
Text Editors
I/O Redirection and Pipes
Bash Shell and Scripts

LittleFE

Hardware Components
Basic BCCD OS Install
Booting Diskless Nodes
Basic BCCD Commands
Intro to Parallel Computing

Acknowledgements

LSU

batonrouge COMMUNITY COLLEGE ™