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International Journal of Computer Applications
© 2010 by IJCA Journal

Number 5 - Article 14

Year of Publication: 2010

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10.5120/118-233

{bibtex}pxc387233.bib{/bibtex}

Abstract

As a programmer, one is aspired to solve ever larger, more memory intensive problems, or simply solve problems with greater speed than possible on a sequential computer. A programmer can turn to parallel programming and parallel computers to satisfy these needs. Parallel programming methods on parallel computers gives access to greater memory and Central Processing Unit (CPU) resources which is not available on sequential computers. This paper discusses the benefits of developing 2D and 3D convex hull on mixed mode MPI, OpenMP applications on both single and clustered SMPs. In this experimentation for purpose of optimization of 3D convex hull we merged both MPI and OpenMP library which gives another mixed mode programming method to get optimized results. The job is divided into sub-jobs and are submitted to cluster of SMP nodes using MPI and these sub-jobs are computed in parallel using OpenMP threads in SMP nodes. Experiments on sequential, MPI, OpenMP and Hybrid programming models show that Hybrid programming model substantially outperforms others.

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Index Terms

Computer Science

Parallel Computing

Key words

MPI

HPC

OpenMP

SMP

threads

mixed mode programming