May 09, 2017

TERM PROJECT

Parallel Matrix-Matrix Multiplication with MPI

Consider a matrix-matrix multiplication (BLAS3 operation) for various dense matrix sizes. Write a parallel program (C, C++ or FORTRAN) based on MPI (Message Passing Interface) using the following instructions.

Follow the instructions below:

Considering your best serial matrix-matrix implementation,

1. Write a parallel algorithm with MPI and test the matrix sizes ranging from 1000 to 10000 with the increment 1000.
2. Plot a graph showing the wall clock time vs. matrix sizes. (include the serial algorithm wall clock time)
3. Plot a graph showing the wall clock time (measure time for parallelized part of the code) vs. number of processors (cores). (include the serial algorithm wall clock time)
4. Specify and consider the application running architecture (network type, bandwidth, latencies (network and memory), cache sizes, cache line sizes, page size, bus size, TLB, etc.). Explain how they effect on results.
5. Explain briefly the parallel algorithm you write, and discuss the hardware parameters (i.e., caches, cache line sizes, bus size, TLB, latency, bandwidth etc.) and their effect on results.
6. Discuss the results obtained in 2 and 3.
7. Submit your soft copies including project report and source files.

DUE DATE: June 7, 2017

Dr. H. Hakan GÜREL