

Performance analysis of MPI approaches and PThread in multi-core system

ABSTRACT

Comparison among the HPC techniques has been made in order to address the highest and lowest performance of each in terms of execution time, speedup and efficiency when it is used with the HPC multicore system. The matrix multiplication in a variant size is used as a common complex task to examine the performance of each approach. FSKTM server has been used as an HPC multicore system to perform the approaches and tasks. Based on the results, it shows that Hybrid MPI/OpenMP approach is the best in terms of execution time, speed up and efficiency than other approaches when the matrix size is very high ($>1024 \times 1024$ size). Furthermore, the results show that the compiler version has a significant impact over the performance of Pthread. With a new compiler, the performance becomes much better due to the improvement in code translation.

Keyword: Parallel computing; MPI; Open MP; Multithreading; Hybrid