

Distributed Cluster-based Solution Techniques for Dense Linear Equations*

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ABSTRACT

In many applications, very large matrixes need be solved, however single or multiprocessor system have some limitations on computing resources, this problem was not solved better. This paper discuss a distributed cluster-based solution for dense linear equations, our works included the definitions of notations, Partition of matrix, communication mechanism, improving of the Guassian Elimination and a master-slaver algorithm etc., the computing cost is $O(n^3/N)$, the memory cost is $O(n^2/N)$, the I/O cost is $O(n^2/N)$, and the communication cost is $O(N*n)$, here, n is the grade of matrix, N is the number of computing nodes or processes. We show that our distributed cluster-based solution techniques for dense linear equations could solve the double type of Matrix under 10^6*10^6 effectively.

Keywords: Gaussian Elimination, Cluster-based distributed computing

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