

Irregular Redistribution Scheduling by Partitioning Messages  
Chang Wu Yu, Ching-Hsien Hsu, 游坤明, C.-K. Liang, Chun-I Chen  
Computer Science & Information Engineering  
Computer Science and Informatics  
yu@chu.edu.tw

### Abstract

Dynamic data redistribution enhances data locality and improves algorithm performance for numerous scientific problems on distributed memory multi-computers systems. Previous results focus on reducing index computational cost, schedule computational cost, and message packing/unpacking cost. In irregular redistribution, however, messages with varying sizes are transmitted in the same communication step. Therefore, the largest sized messages in the same communication step dominate the data transfer time required for this communication step. This work presents an efficient algorithm to partition large messages into multiple small ones and schedules them by using the minimum number of steps without communication contention and, in doing so, reducing the overall redistribution time. When the number of processors or the maximum degree of the redistribution graph increases or the selected size of messages is medium, the proposed algorithm can significantly reduce the overall redistribution time to 52%.

Keyword :