Contention-Free Communication Scheduling for Irregular Data Redistribution in Parallelizing Compilers

游坤明,Chi-Hsiu Chen,Ching-Hsien Hsu,Chang Wu Yu,C.-K. Liang
Computer Science & Information Engineering
Computer Science and Informatics
yu@chu.edu.tw

Abstract

The data redistribution problems on multi-computers had been extensively studied. Irregular data redistribution has been paid attention recently since it can distribute different size of data segment of each processor to processors according to their own computation capability. High Performance Fortran Version 2 (HPF-2) provides GEN_BLOCK data distribution method for generating irregular data distribution. In this paper, we develop an efficient scheduling algorithm, Smallest Conflict Points Algorithm (SCPA), to schedule HPF2 irregular array redistribution. SCPA is a near optimal scheduling algorithm, which satisfies the minimal number of steps and minimal total messages size of steps for irregular data redistribution.

Keyword：Irregular data redistribution, communication scheduling, GEN_BLOCK, conflict points.