
Makespan Minimization in Data Gathering Networks with Dataset Release Times

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In this work, we analyze scheduling in a star data gathering network. Each worker node produces a dataset of known size at a possibly different time. The datasets have to be passed to the base station for further processing. A dataset can be transferred in many separate pieces, but each sent message incurs additional time overhead. The scheduling problem is to organize the communication in the network so that the total time of data gathering and processing is as short as possible. We show that this problem is strongly NP-hard, and propose a polynomial-time 2-approximation algorithm for solving it. Computational experiments show that the algorithm delivers high quality solutions.

Keywords: Scheduling, Data gathering networks, Release times, Flow shop, Pre-emption penalties.