

In this paper, we investigate the data path merging problem (DPM) in reconfigurable systems. DPM is modeled as a graph optimization problem and is shown to be NP-hard. An Integer Programming (IP) formulation of the problem is presented and some valid inequalities for the convex hull of integer solutions are introduced. These inequalities form the basis of a branch-and-cut algorithm that we implemented. This algorithm was used to compute lower bounds for a set of DPM instances, allowing us to assess the performance of two heuristics proposed earlier in the literature for the problem. Moreover, the branch-and-cut algorithm also was proved to be a valuable tool to solve small-sized DPM instances to optimality.