Abstract

This paper focuses on the analysis of real-time non preemptive multiprocessor scheduling with precedence and several latency constraints. It aims to specify a schedulability condition which enables a designer to check a priori -without executing or simulating- if its scheduling of tasks will hold the precedences between tasks as well as several latency constraints imposed on determined pairs of tasks. It is shown that the required analysis is closely linked to the topological structure of the application graph. More precisely, it depends on the configuration of tasks paths subject to latency constraints. As a result of the study, a sufficient schedulability condition is introduced for precedences and latency constraints in the hardest configuration in term of complexity with an optimal number of processors in term of applications parallelism. In addition, the proposed conditions provides a practical lower bounds for general cases. Performances results and comparisons with an optimal approach demonstrate the effectiveness of the proposed approach.

References

- Philippe Laborie. Ibm ilog cp optimizer for detailed scheduling illustrated on three

Index Terms

Computer Science Information Systems

Keywords
Real-Time Systems Multiprocessor Scheduling Schedulability Analysis Combinatorial Problems

Latency Constraints