

Dynamic priority real-time scheduling on power asymmetric multicore processors

ABSTRACT

The use of real-time systems is growing at an increasing rate. This raises the power efficiency as the main challenge for system designers. Power asymmetric multicore processors provide a power-efficient platform for building complex real-time systems. The utilization of this efficient platform can be further enhanced by adopting proficient scheduling policies. Unfortunately, the research on real-time scheduling of power asymmetric multicore processors is in its infancy. In this research, we have addressed this problem and added new results. We have proposed a dynamic-priority semi-partitioned algorithm named: Earliest-Deadline First with C=D Task Splitting (EDFwC=D-TS) for scheduling real-time applications on power asymmetric multicore processors. EDFwC=D-TS outclasses its counterparts in terms of system utilization. The simulation results show that EDFwC=D-TS schedules up to 67% more tasks with heavy workloads. Furthermore, it improves the processor utilization up to 11% and on average uses 14% less cores to schedule the given workload.