Weakly Hard Real-Time Scheduling on Multiprocessor Systems

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Abstract-Real-time systems or tasks can be classified into three categories.
based on the "seriousness" of deadline misses hard, soft and weakly hard real-
time tasks. The consequences of a deadline miss of a hard real-time task can be
prohibitively expensive whereas soft real-time task systems tolerate "some"
deadline misses. While, in a weakly hard real-time task, the distribution of its
met and missed deadlines is specified precisely. Much of weakly hard real-time
system has been focused on scheduling and schedulability analysis of
uniprocessor system. As a systems demand complex and significantly increased
functionality, multiprocessor scheduling has been given attention and taken into
consideration. In fact, in the multiprocessor, the predictability problems seem
even harder than in uniprocessor: thus, in order to cater the problem, the
sufficient and efficient multiprocessor scheduling algorithm technique
combining with the exact schedulability analysis and weakly hard temporal
constraints is present to provide weakly hard real-time guarantees under static
priority scheduling algorithm. The initial approach to schedule weakly hard
real-time tasks has been proposed where from this approach, it focus to
guarantee the accomplished of timing requirements and timing constraints of the
task in the weakly hard real-time systems is predictable.

Keywords-weakly hard real-time systems: schedulability analysis;
multiprocessor systems: global scheduling; partitioning scheduling