Visualization of and analysis for hierarchical scheduling
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Summary
Within SAN, we currently have a tool called “RealTime View” [3] that visualizes timelines of sets of tasks given their characteristics and a scheduling algorithm. This assignment concerns (i) the realization of an enhanced version of the tool supporting visualization of and (ii) improvements of existing analysis for hierarchical scheduling. The assignment is expected to result in a publication.

Background and motivation
Reservation-based resource management will become the de facto standard for networked real-time embedded systems. During recent years, a number of analytical approaches have been proposed based on varying assumptions about resource models, task models, scheduling algorithms, and types of servers implementing reservations. We would like to better understand the consequences of these assumptions for both the behavior of the system as well as its schedulability. Visualization means are considered (i) very valuable to better understand the behavior of systems based on hierarchical scheduling and (ii) supportive in exploring schedulability analysis of these systems.

Within SAN, we studied deferrable, sporadic, and periodic servers in the context of hierarchical fixed-priority scheduling. We showed by means of examples that the existing analysis can be improved when either a deferrable or a sporadic server is used in specific situations [1][2]. Unfortunately, improving the analysis is not straightforward. This assignment shall therefore provide visualization means to support further study in this area and could provide improvements of the existing analysis.

References

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