WiP: Precise Scheduling of Mixed-Criticality Tasks by Varying Speed of the Processor

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Motivation

1. Rare event.
2. Energy-aware scheduling is less efficient.

Energy Efficient Scheduling in the Mixed-criticality (MC) platform

Worst case

1. Rare event.
2. Energy-aware scheduling is less efficient.

Average case

1. Usual event.
2. Energy-aware scheduling is more efficient.

How to handle the worst case scenario???
Problem Statements

- Energy efficient scheduling for MC tasks.
- Ensuring **full** service to all LO-criticality tasks even in the HI-criticality mode.
- Deriving the minimum speed for the LO-criticality mode, while correctly scheduling all the tasks in each mode of operation.
Our Approach

- All tasks start execution in an energy conserving speed, while after a mode switch speed increases.
Contribution

- Assigning virtual deadline to all HI-criticality task (in LO-criticality mode) and verify its feasibility.
- Deriving schedulability condition.
- Measuring Sub-Optimality w.r.t. Speedup bound and approximation ratio.