

Data Age Analysis of Embedded Control Applications applying the Logical Execution Time Concept

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Three Execution Models for Data Transfer between Tasks: LIB/LET/RTA

Latest-is-best (LIB):

Input of task is read at start time of execution, output is provided after finishing task's execution.

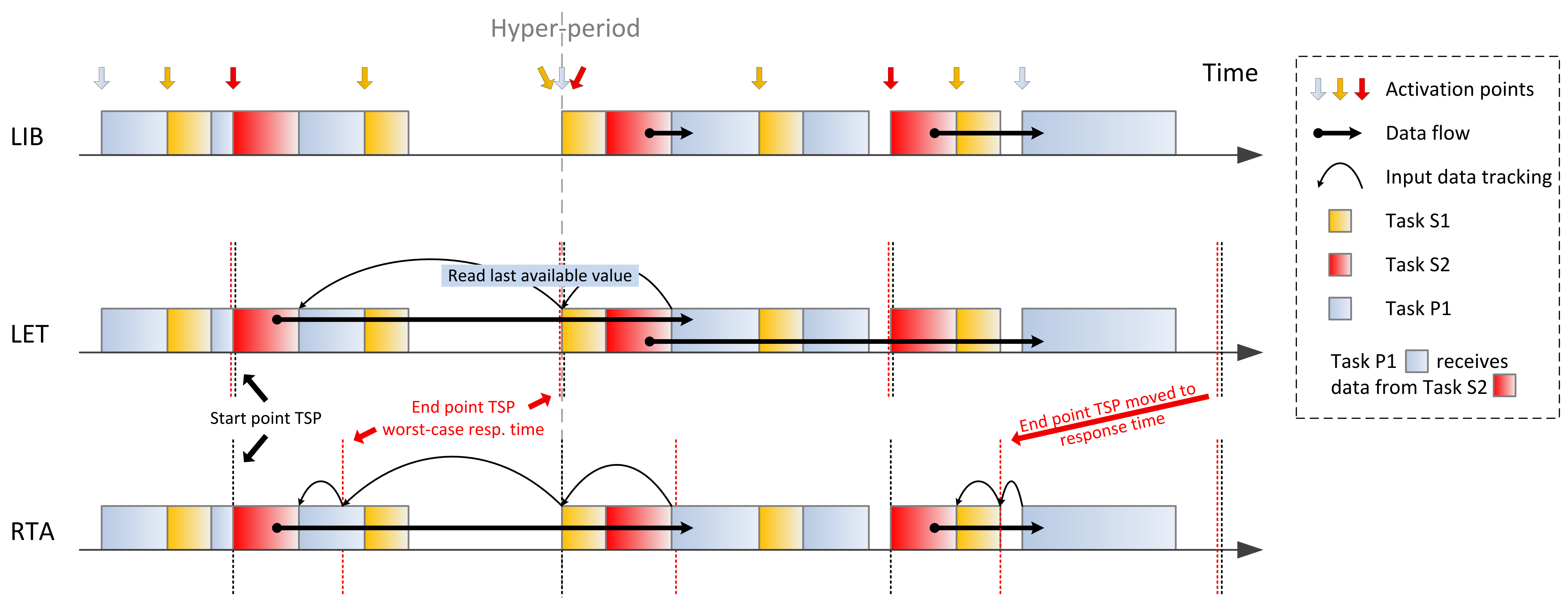
Logical execution time (LET):

Input of a task is read at start point (arrival time), output is provided at end point (deadline). Between these two points, output has value of previous execution.

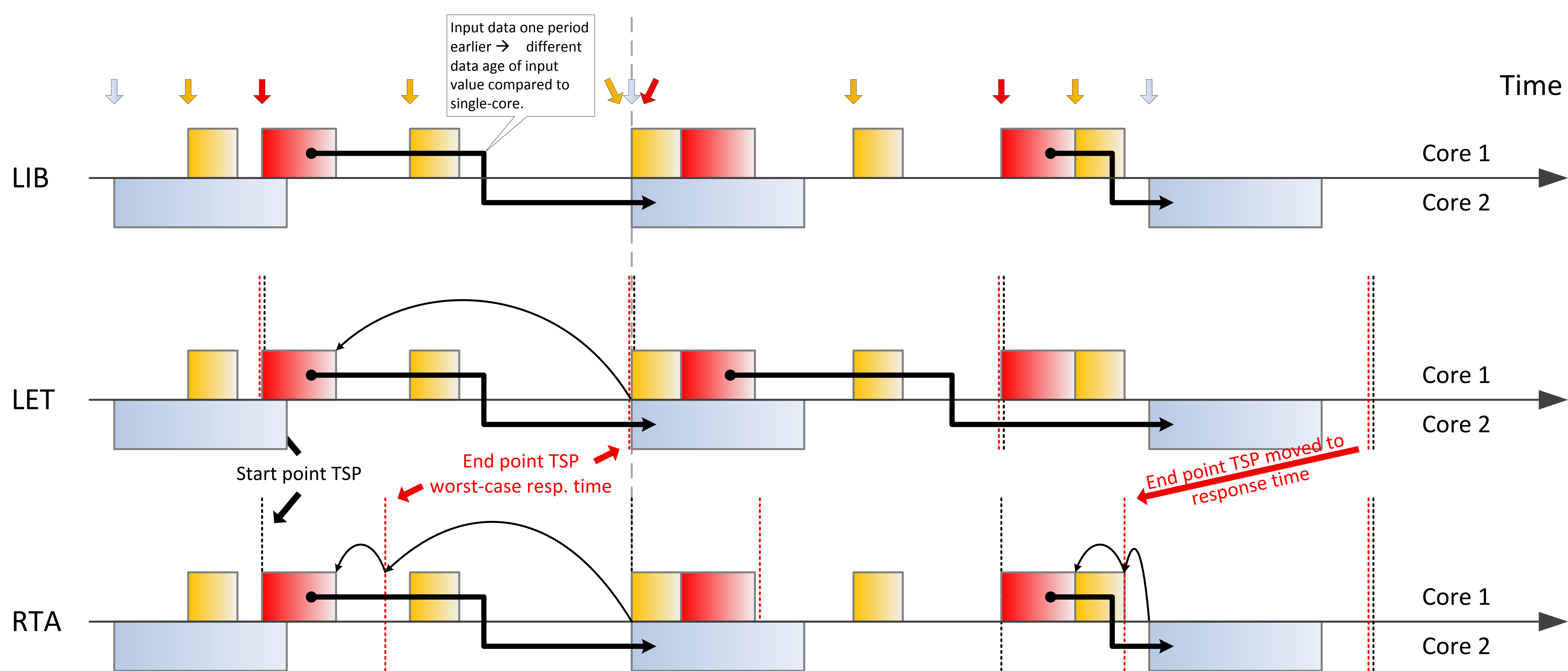
Response time analysis (RTA):

Like LET, but end point equals worst-case response time of particular task.

Comparison of LIB / LET / RTA Approach on Single-core



Comparison of LIB / LET / RTA Approach on Multi-core



Applying LET or RTA, data ages on single-cores are equal compared to multi-cores. This does not apply for LIB: LIB data is more up-to-date than LET data. Compared with LET, RTA may work on just as up-to-date data as LIB. RTA data ages are equal when migrating from single- to multi-core.