Towards Parallelizing Legacy Embedded Control Software Using the LET Programming Paradigm

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The Challenge

- evolutionary development of automotive powertrain software
- increasing demand for processing power → migration to multi-core
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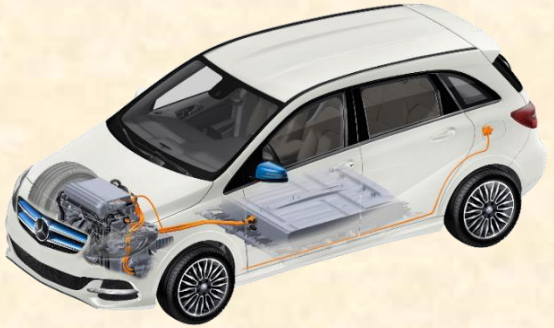
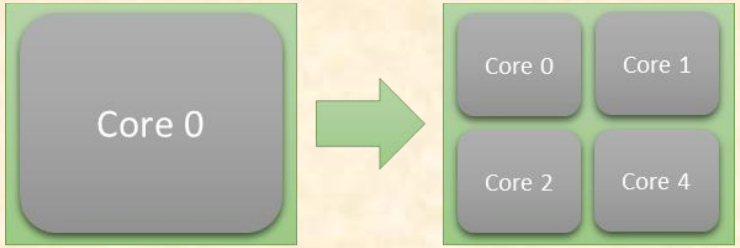
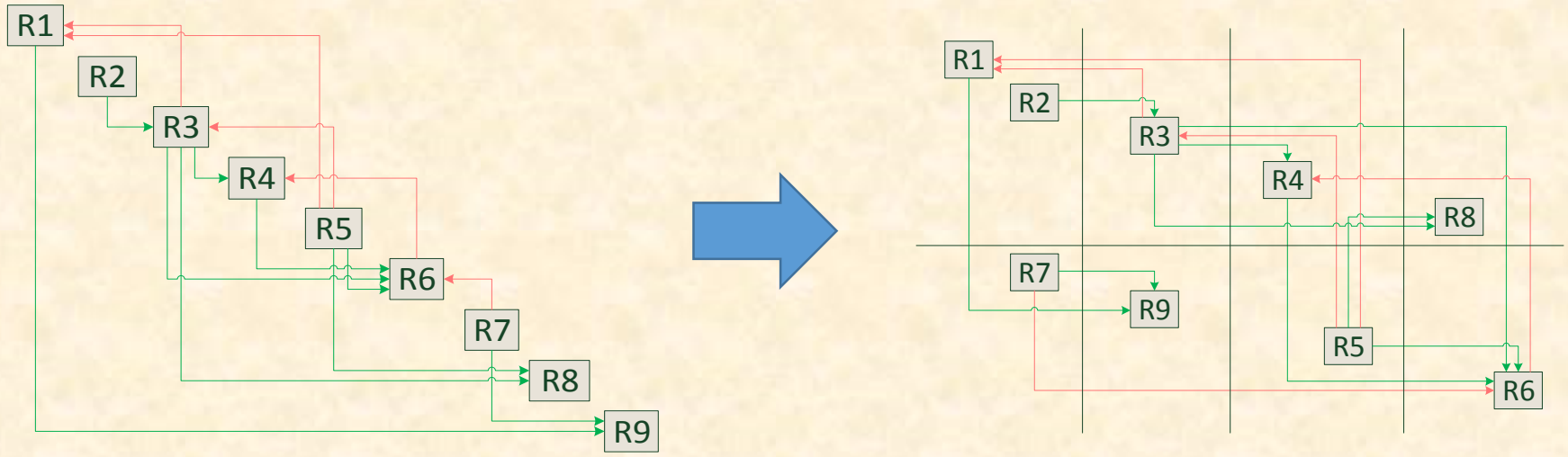


→ migration of CPC-SW from single-core to multi-core
  - minimize changes in application source code and functional behavior
  - intuitive, standard-supported specification of parallel behavior
  - built-in robustness



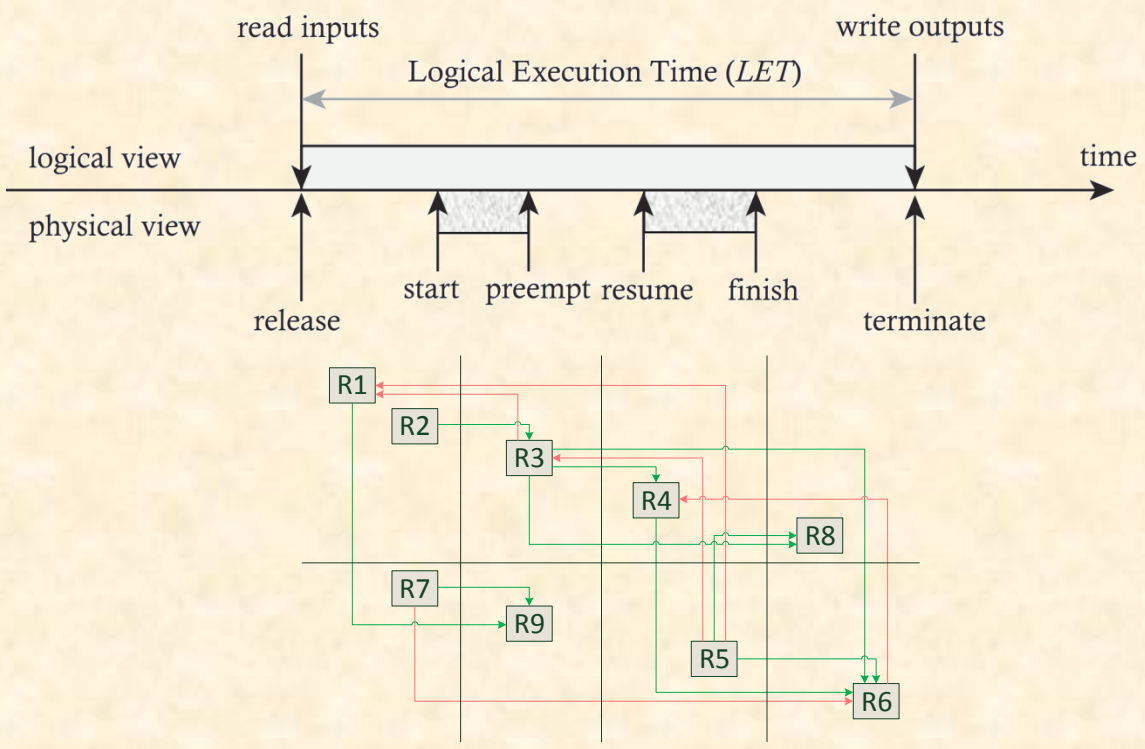
1st Step: Parallelization

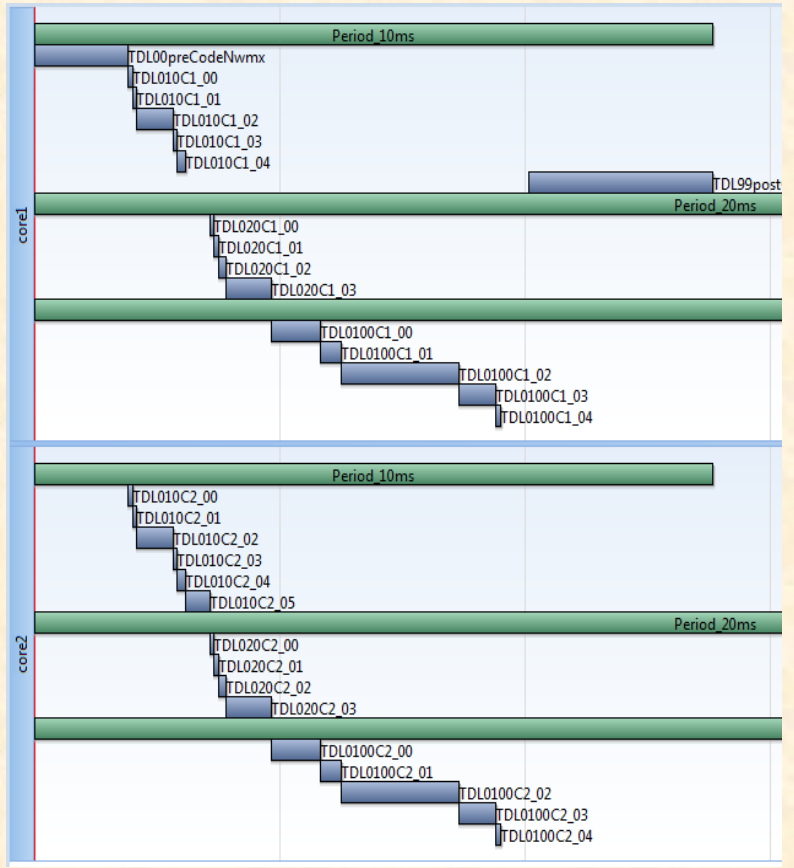
- based on analysis of data dependencies between runnables
- forward dependencies are to be preserved
- some backward dependencies may change to forward



2nd Step: LET-based Implementation with TDL

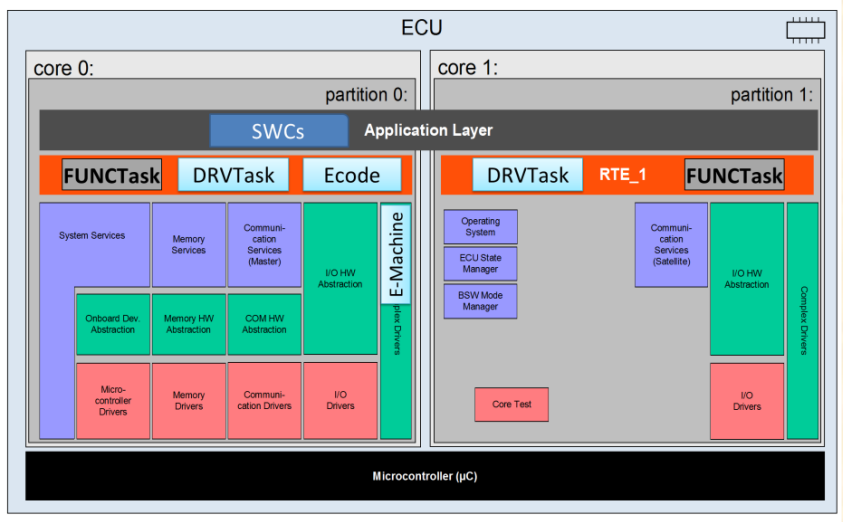
- Logical Execution Time (LET) paradigm for synchronization
- specification with the Timing Definition Language (TDL)



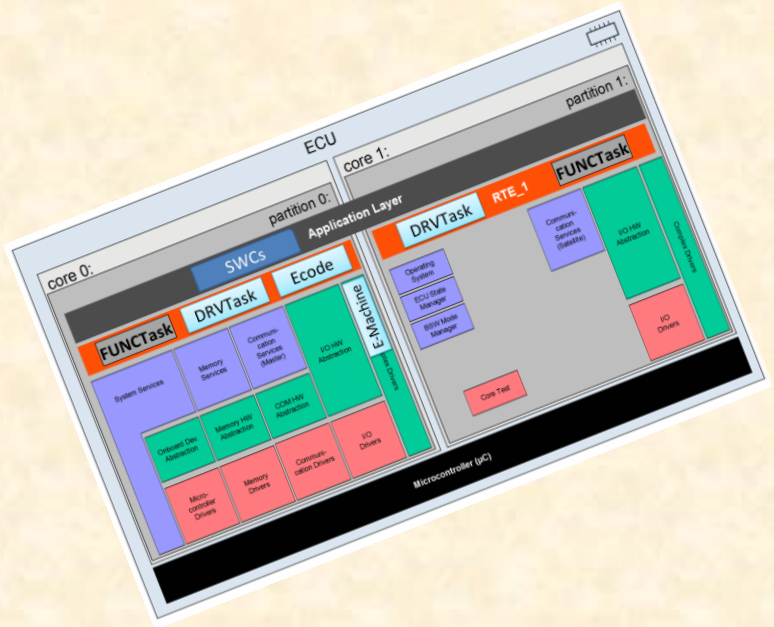


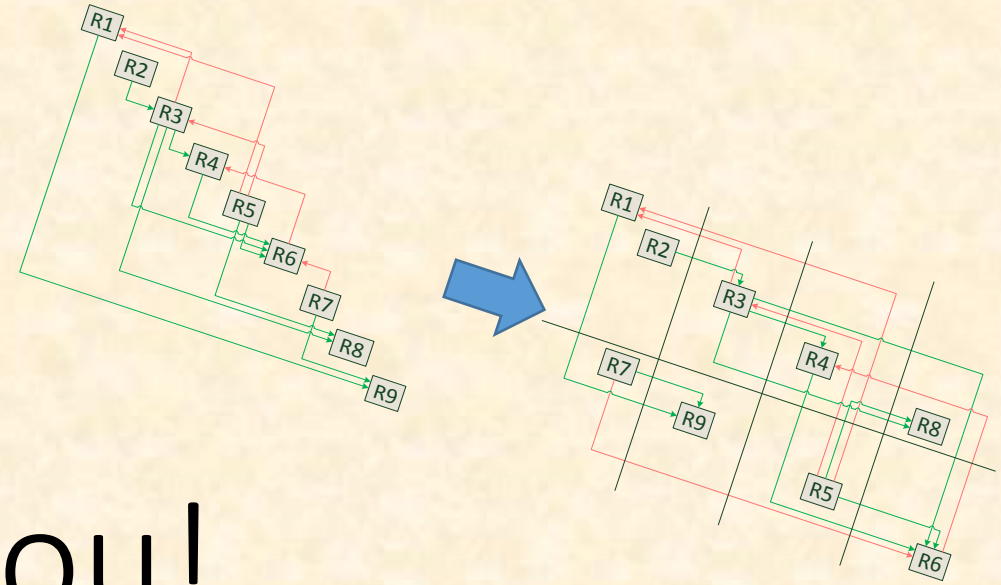
Future Work

- LET integration in AUTOSAR for multi-core
  - first concept already developed for integration of runtime components
  - AUTOSAR interface development under way
  - we are seeking minimal extension of AUTOSAR specification



- evaluation in prototypic implementation
- extension to distributed functions





Thank you!

For further information, come meet us at the poster