PRESTO

Improvements of Industrial Real Time Embedded Systems Development Process

Objectives

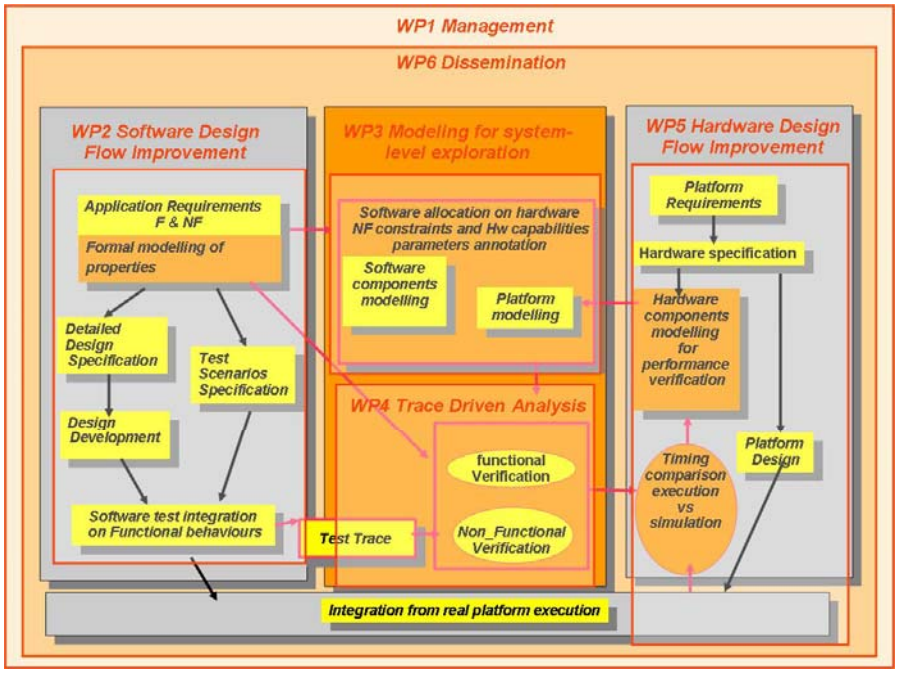
The PRESTO project aims at improving test-based embedded systems development and validation, while considering the constraints of industrial development process. The project is based on the integration of:

a) Test trace exploitation
b) Platform models and
c) Design space exploration techniques

The expected result of the project is to establish functional and performance analysis and platform optimization at early stage of the design development.

Technical Approach and Work Package Structure

The PRESTO approach is modelling the software and hardware allocation and with analysis tools validate the requirements of the system. The modelling utilises various modelling frameworks, like UML profiles and Domain-Specific Languages. The analysis tools cover worst case execution time, scheduling analysis and more abstract system level timing analysis techniques. The platform modelling will be refined from confrontations between the analysis results and real platform results.



- Software Design Flow Improvement (WP2): case studies definition, associated requirements formalization as functional and non-functional properties for the PRESTO technology validation, test traces specification and generation.
- Modelling for System-Level exploration (WP3): methods and tools establishment to facilitate early system-level exploration of combined models of application and execution platform.
- Trace Driven Analysis (WP4): mapping rules definition between trace format specification and the significant events for functional properties and temporal predicates validation, functional and non functional verification techniques to validate properties on the generated traces.
- Hardware design flow Improvement (WP5): Hardware platform modelling, performance and power trace tags recovery from real platform execution comparison of performance analysis results with real platform performance results.

Partners

TELETEL S.A

THALES Communications France

RapitaSystems

VTT Technical Research Centre of Finland

Softeam

THALES Italy

MetaCase

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ARTEMIS

SEVENTH FRAMEWORK PROGRAMME

PRESTO

Market innovation and impact

The embedded system development is undergoing thorough changes due to increase of complexities on all fronts, e.g. number of applications and their functionality, and number of components in modern multi-core platforms. To manage this, PRESTO introduces the design space exploration of different software/hardware allocations and the associated performance analyses at early stages of the system development using the performance exploration / configuration generation tools.

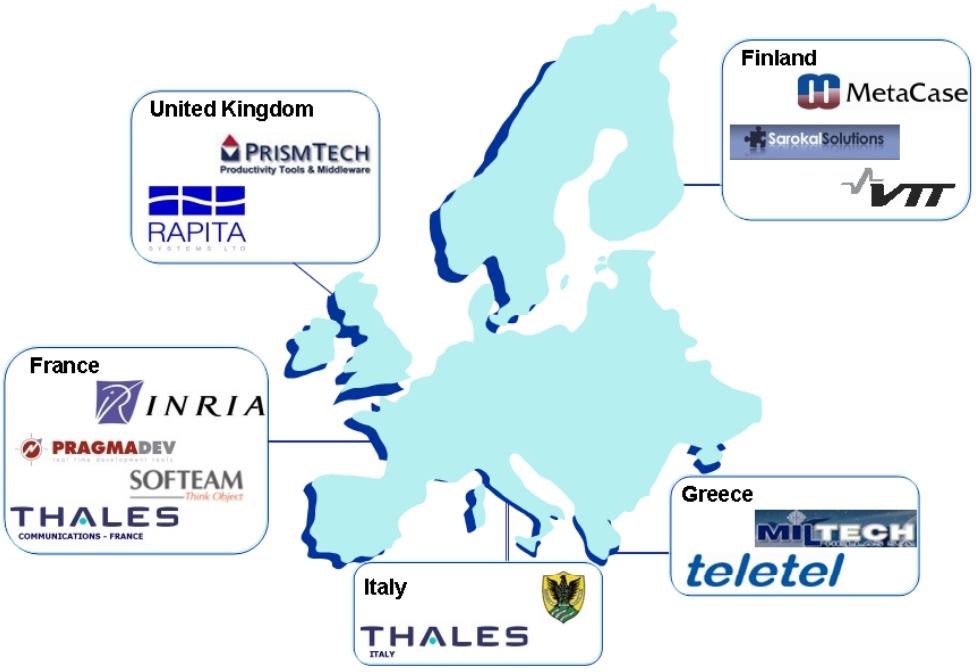
Currently, the software and the hardware development parts are typically separated causing validation problems and leading to over-dimensioned platforms that increase cost and power consumption. As major players in the embedded systems market, the industrial partners of the project will use and evaluate the new methods/tools for the purpose of adaptation of new software applications to different execution platform. The PRESTO project will stimulate the growth and emergence of the solution and tool vendors involved in the project.

Project results and deliverables

The project will provide modelling concepts and tooling based on identified engineering needs and a methodology defined in the project. The project is driven by industrial case studies from communication domain that will demonstrate method and tool developments from requirements formalisation to system modelling and performance analysis. The analysis results will be compared with measurements done from real development platforms.

A particular attention is given to the industrial development constraints which mean:

- Additional specification costs need to be as modest as possible
- The level of expertise must be low
- Tools are simple to use
- The improvement techniques and tools integrate smoothly to the current design process
- Tools are flexible to support different design languages and integration test frameworks
- Analysis results are validated by confrontation with real platform results, and platform modelling for fast prototypes is improved from this confrontation.



Project start
April 2011

Project end
March 2014

Budget
8,6 M€

Web Site
www.presto-embedded.eu

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