Workshop: GENESYS (GENeric Embedded SYStem Platform)

Munich, February 4, 2009

Agenda

- 10:00 – 10:15: Welcome, Introduction
- 10:15 – 10:45: Requirements, M. Goedecke (Infineon)
- 10:45 – 11:00: Introduction of Poster Session
- 11:30 – 12:30: Overview of the Architectural Style, H. Kopetz (TU Vienna)
- 12:30 – 13:30: Lunch & Poster Session
- 13:30 – 14:00: ARTEMIS and GENESYS Architecture, T. Clausen (EC)
- 14:00 – 14:30: Consumer point of view of GENESYS, H. Waris (Nokia)
- 14:30 – 15:00: Industrial point of view of GENESYS, G. Edelin (Thales)
- 15:30 – 17:00: Panel Discussion: To what extent does the architectural style fulfil the ARTEMIS requirements?
GENESYS: Project General Information

Project major partners:
- STMicroelectronics
- Commissariat à l'Énergie Atomique
- Nokia Oyj
- Thalesgroup
- Embedded Systems Institute
- IMEC
- Technical University Darmstadt
- Infineon
- European Software Institute
- Univ. of Bologna
- Volvo Tech.
- Technical Research Centre of Finland
- Verimag
- Centro Ricerche Fiat
- TTTech Computertechnik AG
- Fraunhofer IGD
- TU München
- Vytautas Magnus Univ.
- Ikerlan
- Budapest University of Technology and Economics
- Univ. Politecnica de Madrid
- NXP Semiconductors

Starting Date: January 2008
Ending Date: June 2009
Budget Total/Funding: 2.79 MEUR / 1.85 MEUR
Type of project: Collaborative Project

GENESYS: Motivation, Objectives

- Motivation
  - World of embedded systems is broad and diverse
  - Fragmented technological situation
  - Increasing user expectations for embedded systems
  - Convergence of domains (e.g., car with subsystems ranging from multimedia to control functions)

- Objectives
  - Optimal support for a converging application world
  - Take advantage of the economics of scale in the semiconductor industry
  - Avoid fragmentation through a cross-domain development methodology
Starting Point

- ARTEMIS: European Technology Platform on Embedded Systems
- Working group on generic reference designs and architectures
  - Driven by pan-application domain relevance of embedded systems research
  - Avoidance of fragmentation in embedded systems technologies (e.g., platforms, tools, …)
- Key challenges identified within ARTEMIS will drive the GENESYS project
Overall Technical Approach

• Consolidated cross-domain architectural style
  – architectural principles
  – rules and guidelines for the partitioning of a system and the design of interfaces
• Reference architecture template
  – specification of a comprehensive set of platform services
  – support for integration levels (e.g., chip level, board level, ...)
• Cross-domain development methodology
  – modeling, evaluation and validation of platform services and embedded systems based on the reference architecture template
  – measurable quality characteristics

Cross-Domain Architectural Style

• General principles (e.g., complexity management, component-based design)
• Networking and resource management (e.g., integrated resource management, message passing)
• Robustness and security (e.g., error containment, state awareness)
• System design and evolution (e.g., legacy Integration, model-based design)
Reference Architecture Template

• Core services
  – Communication
  – Encapsulation
  – Common time
  – Security primitives
  – Application management
  – …

• Optional services
  – Domain-specific protocols (e.g., network driver service for CAN in industrial applications)
  – Situation Reasoner in for ambient Intelligence
  – …

Cross-Domain Development Methodology: Modelling Process
Project Status

- Phase 1 – Analysis of requirements/existing architectures (M1-M3)
- Phase 2 – Definition of cross-domain architectural style (M4 to M6)
- Phase 3 – Identification and specification of platform services and methodology framework (M7 to M10)
- Phase 4 – Integration (M11-M11)
- Phase 5 – Feedback and prototype implementation (M12-M18)