FP7 OFFICE

PROMETEO

Unidad de Innovación Internacional

Current FP7 Projects

November 2007

GENESYS - Generic Embedded System Platform

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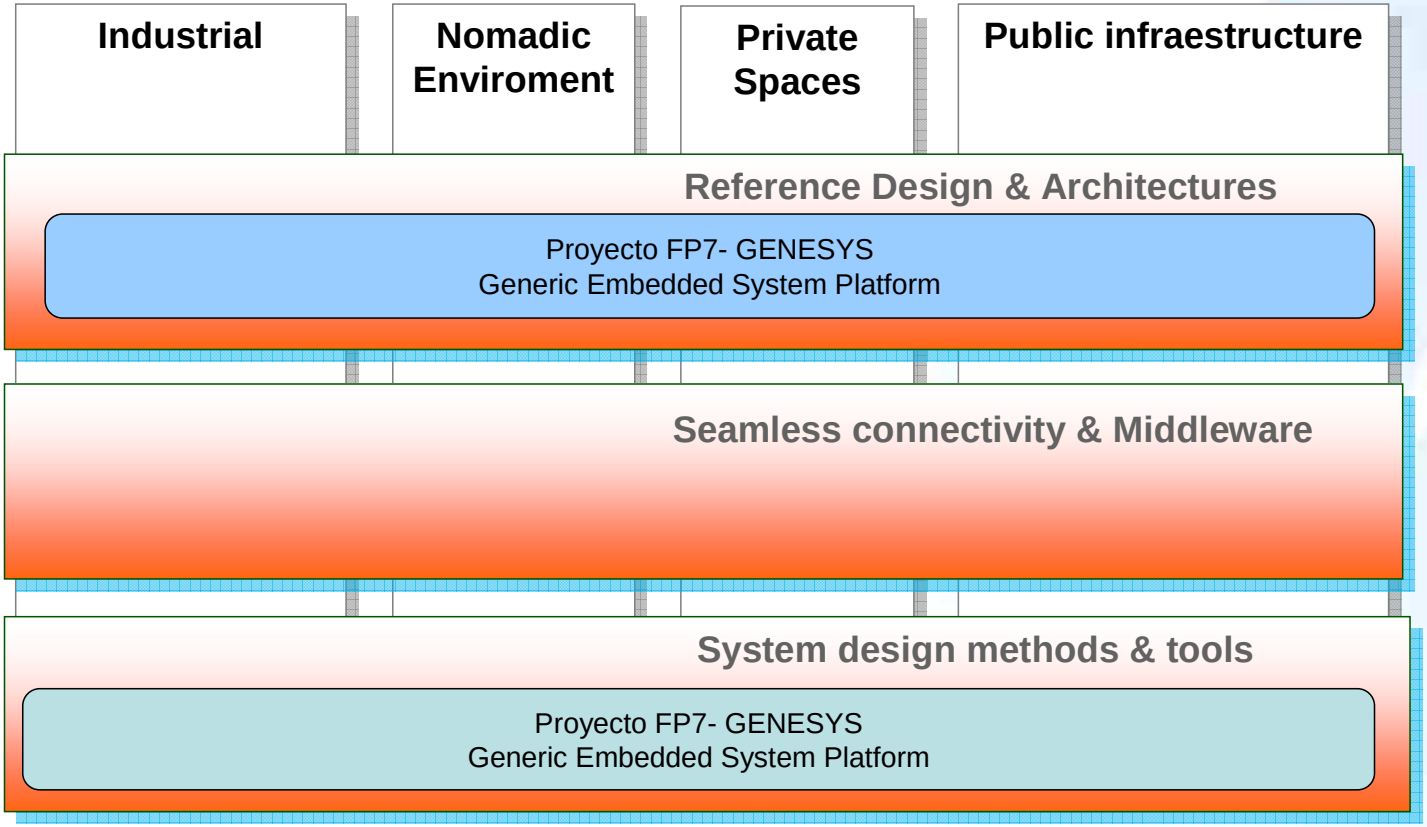
- **Small or medium-scale focused research project ICT Call 1**
  Objective ICT-2007.3.4: Computing Systems
  b) Reference architectures for generic embedded platforms



GENESYS - Generic Embedded System Platform

- Motivation

  The motivation lies in the **reduction of fragmentation between different application domains** and the **support for converging application domains**:

  - Optimal support for a converging application world.
  - Uniform knowledge profiles for embedded systems engineers.
  - Take advantage of the economics of scale in the semiconductor industry.
  - Avoid fragmentation through an ARTEMIS-conformant development methodology that is universally applicable across application domains would bring about the following advantages:
    - **Cross-domain platform services.**
    - **Cross-domain development tools.**

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- Project objetives

  To **develop a cross-domain architectural style for real-time embedded systems**, which will serve as a **basis for a reference architecture template** and a corresponding **cross-domain development methodology**.

  - **The architectures instantiated from the reference architecture template will be compliant with ARTEMIS SRA Objetives :**
    - Composability
    - Networking and Security.
    - Robustness.
    - Diagnosis and Maintenance.
    - Integrated Resource Management.
    - Evolvability.

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- Technical objectives

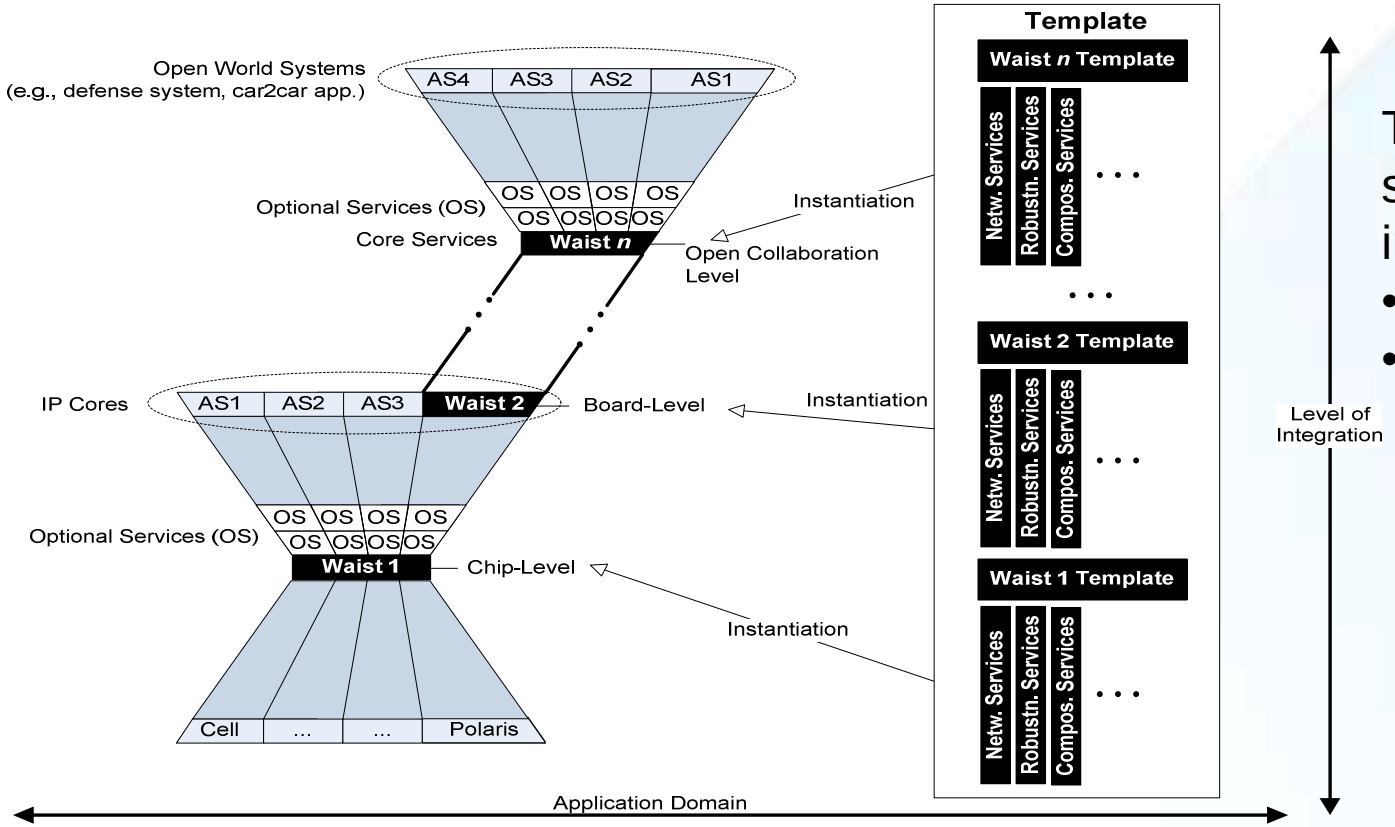
Consolidated cross-domain architectural style.

- Networking and Resource Management
  - MPSoC (Multi Processor System-on-Chip) hardware
  - Fully exploit the concurrency and parallelism exposed by the platform
  - Sub-system of complex Systems-on-Chip (SoCs) communications
  - Power consumption
- Robustness, Diagnosis and Maintenance
  - Acceptable level of service despite the occurrence of transient and permanent hardware faults
  - Active/*passive diagnosis*
- Composability
  - Interface Specification
  - Non-Interfering Interactions
  - Error Containment
  - Fault masking

- Technical objectives

Reference architecture template.

A concise description of platform services that spans the different levels of integration for the considered application domains.



Two types of platform services at any given level of integration:

- ***Core platform services.***
- ***Optional platform services***

- Technical objectives

Cross-domain development methodology.

Adapting and extending Model- and quality-driven development approach by mesurable quality characteristics specific for embedded systems.

- Appropriate techniques and formalisms for representing and handling model descriptions and quality properties of services on the core-services-level and the optional-services-level.
- Formalisms and MoCs at each integration level.
- Design process incremental and iterative; supporting at least by the following sub-processes:
  - Top-down - domain reference (user/domain driven).
  - Bottom-up – modular components (technology-driven).
  - Integration-driven.
- Reuse techniques

Transition and Migration from Today's Solutions

- Optional services for legacy integration and compatibility to existing standards: Glueware.
- Interfacing existing tools and standards
- Identification of a transition path to quality driven architecting methods.

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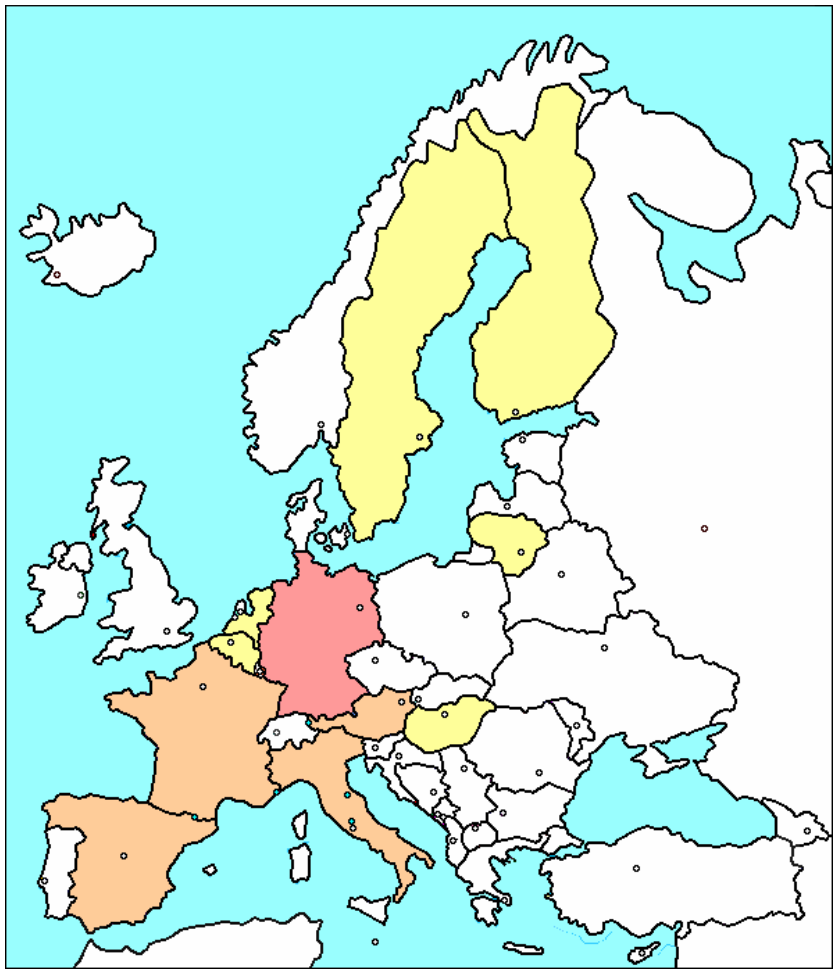
- Consortium



Industries

Safety
- TTTech (AT)
- Infineon (DE)
- Thalesgroup (FR)
- Centro Ricerche Fiat (IT)
- Volvo (SE)

Nomadic
- Nokia (FI)
- NXP (NL)

Microelectronics
- STMicroelectronics (IT)

Technical Research Centers
- IMEC (BE)
- Fraunhofer IGD (DE)
- European Software Institute (ES)
- Ikerlan (ES)
- VTT (FI)
- Commissariat à l'Energie Atomique (FR)
- Verimag (FR)
- Embedded Systems Institute (NL)

Universities
- **Vienna University of Technology (AT)**
- Technical University Darmstadt (DE)
- TU München (DE)
- Universidad Politecnica de Madrid (ES)
- Budapest University of Technology (HU)
- University of Bologna (IT)
- Vytautas Magnus University (LI)

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- JTI Mapping