The development of critical embedded systems relies on numerous tools on which it is essential to capitalize in order to optimize development costs.

However, the maintenance life cycle is often as long as 10 to 30 years, and today, no software editor is able to commit for such a long time at an acceptable cost.

To counter these risks, the French Competitivity Cluster Aerospace Valley partners have put forward a project which aims to develop an open source CASE environment with the following goals:

- perpetuate the methods and tools for critical embedded system development from system specification to software and hardware implementation through equipment definition,
- minimize ownership costs,
- ensure the independence of development platforms,
- integrate, as soon as possible, advances made in the academic world, and methodological changes,
- be able to adapt the tools to the process, and not the opposite,
- take into account qualification constraints.

Our ambitions

- Develop high quality open source model editors supporting an integrated development process from system specification to product architecture and implementation (including software and hardware components)
- Develop and integrate transformation and formal verification tools by improving existing techniques and theories (model checking, simulation, model transformations, etc)
- Define modelling languages according to process development phases and certification constraints
- Determine the business model for the TOPCASED products (licensing, IP, support, services . . .)

But also

- Provide support for teaching (tools, micro-projects, etc)
- Consolidate cooperation between academic and industrial players
- Rely on the long-term structure of the academic world to ensure project continuity
- Set up a contributory maintenance process
- Federate research projects and ensure the industrialization of their results (collaboration in progress with the Eclipse foundation, IST Modelware, SAE/AADL and AMMA/ATLAS)

Our partners

The following companies and institutions are associated with the project:

- AIRBUS
- EADS ASTRID
- SIEMENS VDO Automotive
- AdaCore
- EADS SINTERS
- THALES
- ANYWARE Technologies
- MICOUNI Systems Engineering
- Atos Origin
- GS
- Tectosages
- CNES
- SOGETI
- FERIA-CNRS
- University Paul Sabatier
- ONERA
- IRIT (Institut de Recherche en Informatique de Toulouse)
- INRIA
- ENSIETA
- ESEO
- consolidates industrial and academic partners
Technical choices

- Based on the Eclipse Platform
- N-tier architecture centered on models
- Adaptable tools (configuration, plugins, etc.), able to manage any kind of model thanks to the meta-modeling approach
- A smooth transition from existing elements (models, verification tools, test plans, etc.) to the new tools and formalisms (UML2, etc.)
- Development based on existing open source software (OSATE, ATL, ...)
- Tools taking into account distributed workbench
- An open system (import/export plugins, data access API)

Common needs

Modeling
- requirements, static and real time architecture
- object-oriented design
- domain-specific meta-models: UML, SysML, AADL, automata, etc.

Verifying
- models
- model transformations
- model checking
- simulation

Managing
- models
- configuration
- process
- requirements
- modifications

Transforming
- models
- documentation
- tests
- code
- data bases

Implementing
- code: C, C++, VHDL, Java, ADA, Python, Perl, Shell, CAML, XML, ...
- debugging

Roadmap

- Processus Definition
- Modeling framework and graphical editors
- Formal Verification of models
- Version control, requirement and modification tracking
- Model transformations

2005 2006 2007 2008 2009