

implémenter

vérifier

TOPCASED

Atelier Développement Open Source

gérer

générer

modéliser

tester

réaliser

Toolkit in OPen-source for Critical Applications & SystEms Development

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TOPCASED

The Open Source toolkit for critical systems

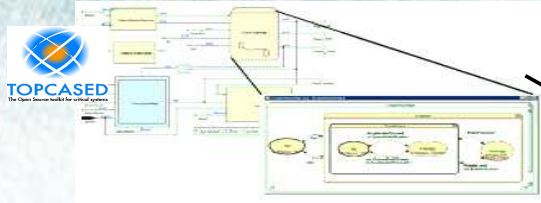
<http://www.topcased.org>

Why ?

- **To reduce development costs for embedded systems (Aeronautical, space and automotive domains) by promote optimised process and tools : maturity, competitiveness and time to market end product. Supports Model Based Engineering**
- **To insure durability of the toolkit through an Open source approach : limited market, very, very long life, editors durability, editors strategy, deployment facilities.**
- **To integrate current academic research results in industrial development process.**
- **To enforce Academics / Industries relationship**
- **To provide student engineers with knowledge of industrial process and related tools**
- **To enforce SMEs / Industries relationship**

Overview of TOPCASED Project : Why, What, Who and How ?

Analyses or Design Model

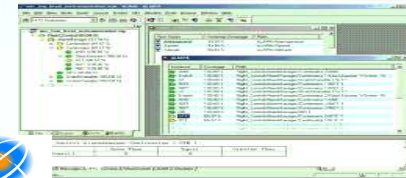
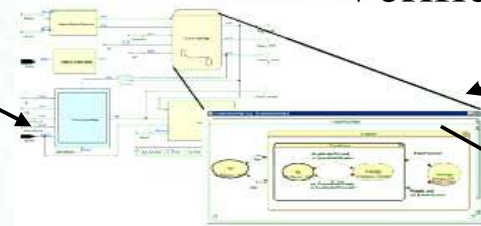


Simulation



Verification loop

Transformation



Formal checking

Transformation



```
Resource - gendoc_gui.py - Plateforme Eclipse  
1 import gtk  
2 import libglade  
3 import GenDoc  
4  
5 fs_xml = None  
6 fs_xml = None  
7 fs_xml = None  
8 xml_wml_xml = None  
9 log_xml = None  
10  
11 def make_menu_item(name, callback, data=None):  
12     item = gtk.MenuItem(name)  
13     item.connect("activate", callback, data)  
14     item.show()  
15     return item
```



Source or Test Code
Documentation



Configuration, Change and Requirement management
tools communication

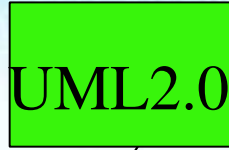


Meta-Modeller

Modelling Languages

Meta-Modelling

Editors



...

Transformation Engine

ATL, KERMETA, ...

Model Transformation



Compilers

Translation

Model-Checkers



...

Simulator

Simulation & Formal Verification

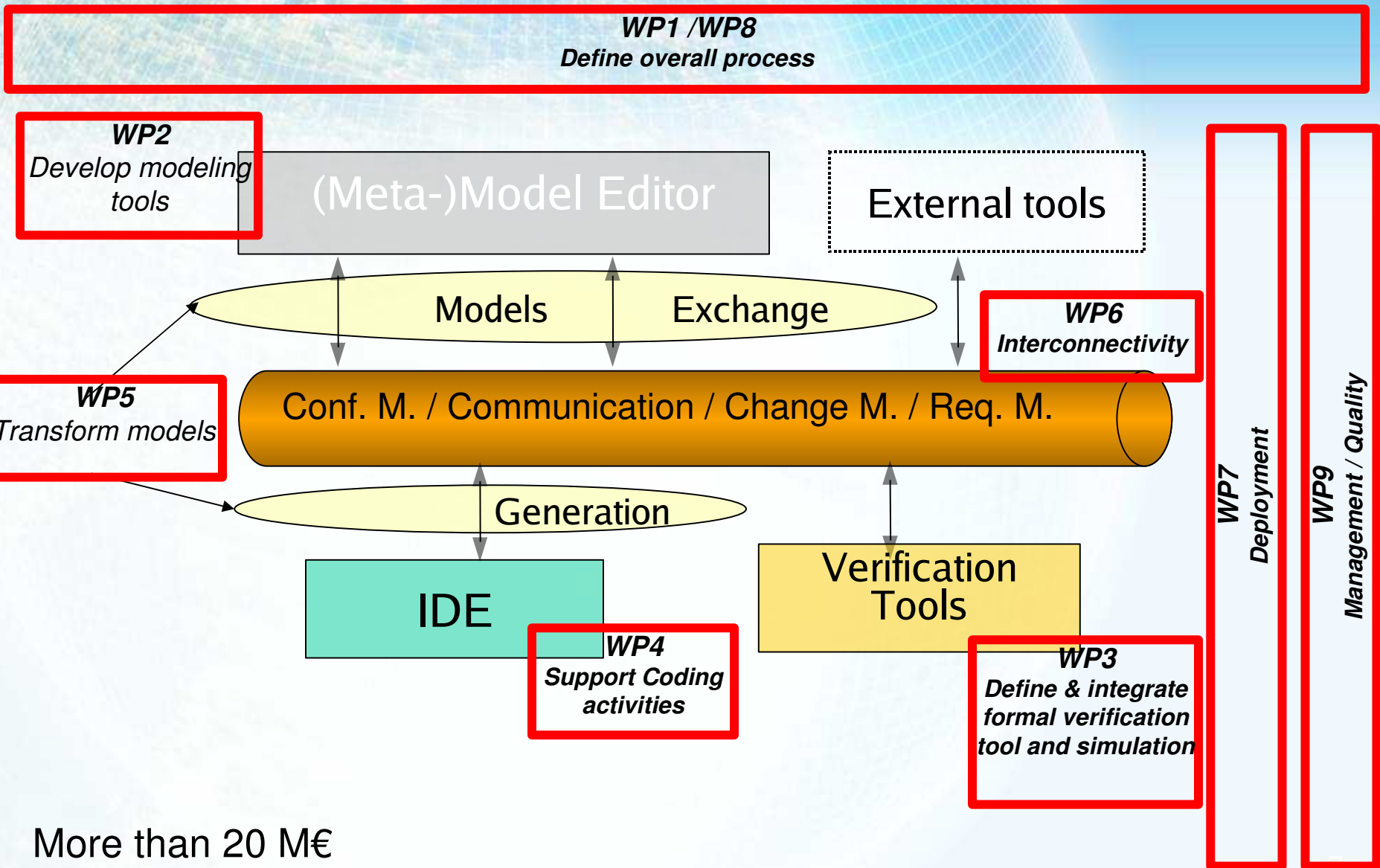
Le langage pivot Fiacre

- Langage (textuel) formel de description issu de V-Cotre et NTIF
- Description du comportement des composants de base
 - Transitions entre états du composant
 - Manipulation de données
 - Communication (messages, variables partagées)
 - Contraintes temporelles (délais, timeouts)
- Description des compositions

Points durs pour la vérification

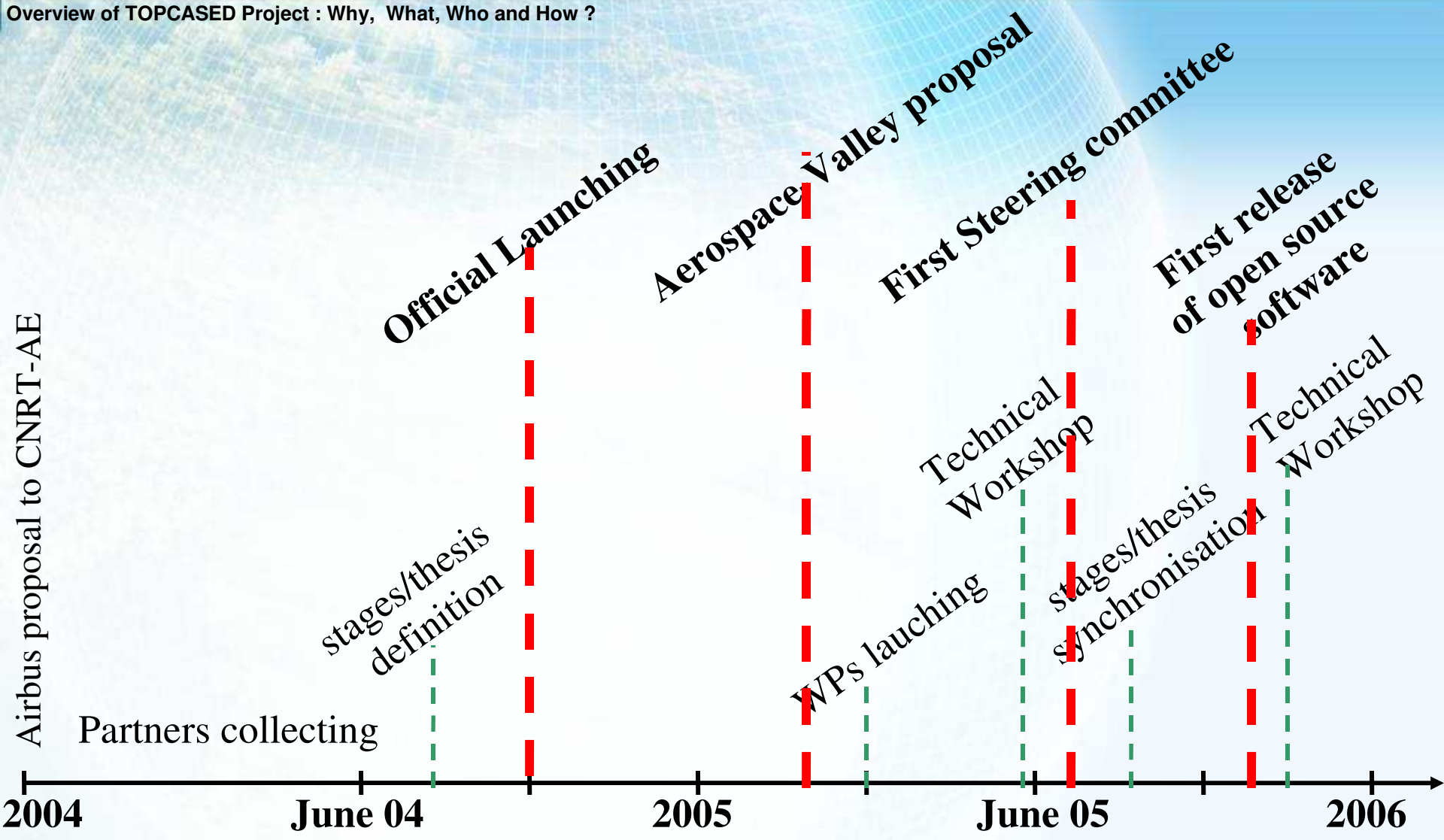
- Représentation finie d'espaces d'états temporels / paramétrés (infinis)
 - Régions (automates temporisés)
 - Classes d'états (réseau de Petri temporels) - Tina
 - Abstraction
- Réduction de l'Explosion Combinatoire
 - Vérification compositionnelle (équivalences / congruences) - CADP
 - Ordres partiels (CADP, Tina), symétries
 - Abstraction
 - Vérification à la volée

Overview of TOPCASED Project : Why, What, Who and How ?



More than 20 M€
for 4 Years

Overview of TOPCASED Project : Why, What, Who and How ?



Where we are, Expected soon

National Funding
01/08/2006

1.0.0M1
Editors for
UML,
AADL,
SysML,
SAM
gPM

1.0.0
Improvements
+
Verification
+ facilities +
Traceability +
GDC + gPM
Instances

2.0.0

Users
Beta Test

Users
Experimentation

2006

2007

2008

2009

Launch National Plateform : Systematics, Minalogic, Aerospace Valley

Overview of TOPCASED Project : Why, What, Who and How ?

WHO ?

Industries

SME

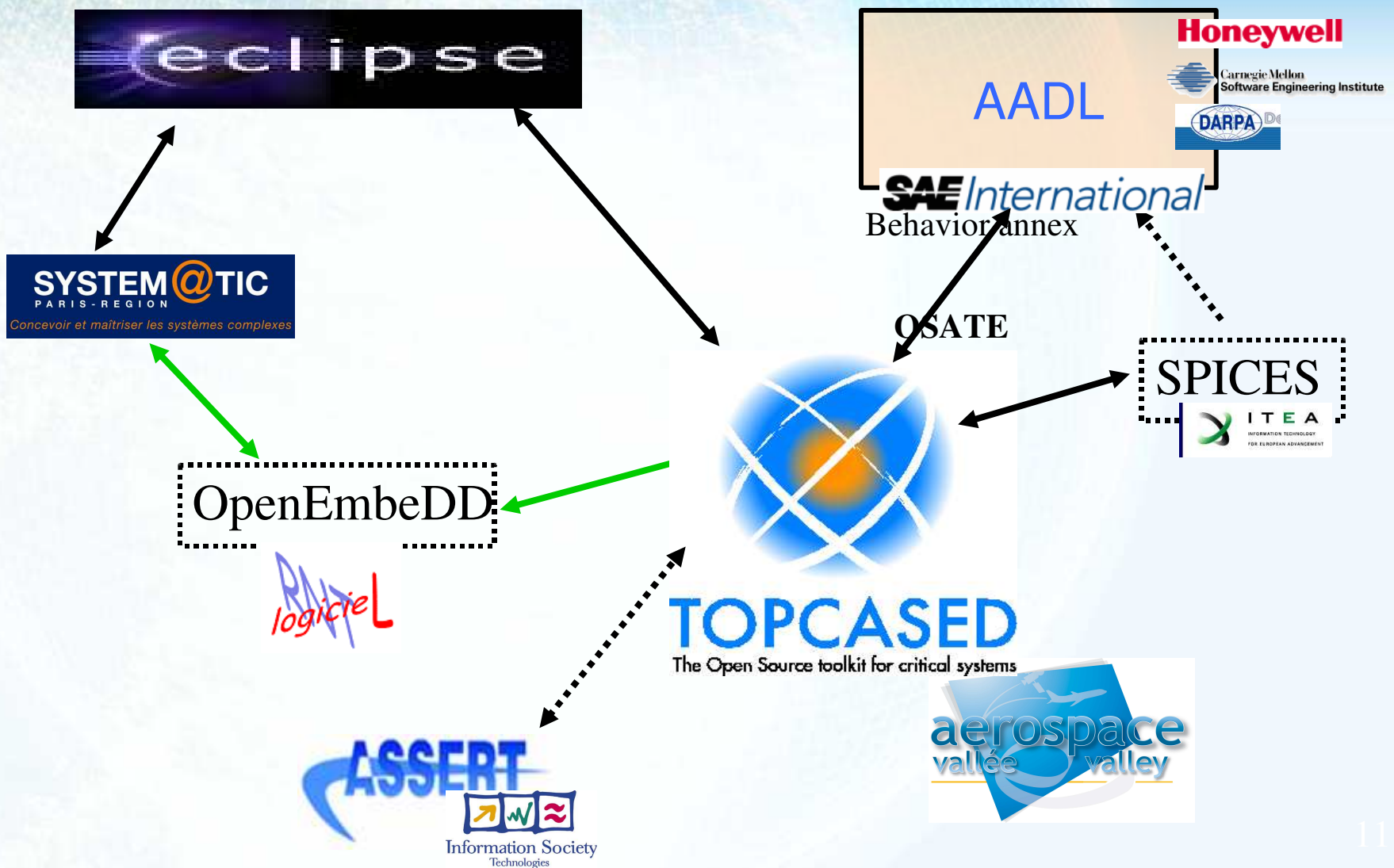
School/Universities

Laboratories

Atlas

Overview of TOPCASED Project : Why, What, Who and How ?

Collaboration with other projects



Where we are, Expected soon

Current Results

- ◆ Two years working together, better knowledge of the target
- ◆ Global studies and survey
- ◆ Industry/Academic/School Coordination on thesis and stages
- ◆ several technical workshops, a lot of publications and conference talks
- ◆ First national funding in November
- ◆ Several releases (from 0.5.0 to 1.0 M1) of Open source tools : meta-editor + 4 instances, toolkit infrastructure, communications means. UML, Sildex like, SysML, OSATE/AADL. Import of Rose and Sildex models.

More than 15000 downloads

Where we are, Expected soon

Expected soon ...

- Other partners : industries (Alcatel Alenia Space, Dassault Aviation, Schneider Electric, EADS Tests et Services, EADS CRC, Honeywell), SMEs (X2i, B2i, OpenWide, Sodius, OBEO, ACTIA), school (SupAero), SSII (Aptus, BT Consulting), editors (IBM/Rational).
- Connecting COTS : Matlab, Scade ...
- The 1.0.0 in June 2007
- New editors dedicated to new modelling language : SysML, LDS, SPEM ...
- Integration of formal verification tools with editor.
- Developing model simulation
- First code generators (structural UML > Java/C/Ada, ...) and document generator
- Solution for Version/configuration management
- A first version of Traceability tool : TramWay
- A National and International cooperation
- A new 2 days National workshop in january and international during 2007