



# CEA, LIST in OPEES

**The point of view of a public research  
institute**

- Contact : [jan.stransky@cea.fr](mailto:jan.stransky@cea.fr)



# CEA, LIST

---

cea

list

- **LIST is one of the 3 non-nuclear applied research institutes in CEA.**
- **About 600 scientists (400 CEA employees).**
- **“Applied research” means**
  - ✓ **Most of the funding comes from projects ;**
  - ✓ **Strong IP management ;**
    - **Opensourcing is NOT an easy decision !**
  - ✓ **Objective is technology transfer.**



# Why should a techno-provider be in OPEES ?

---



- **Let us give answers based on the example of two technologies developed at LIST :**
  - ✓ Papyrus
  - ✓ Frama-C
- **Both are currently opensourced.**

---

cea

---

list

(1)

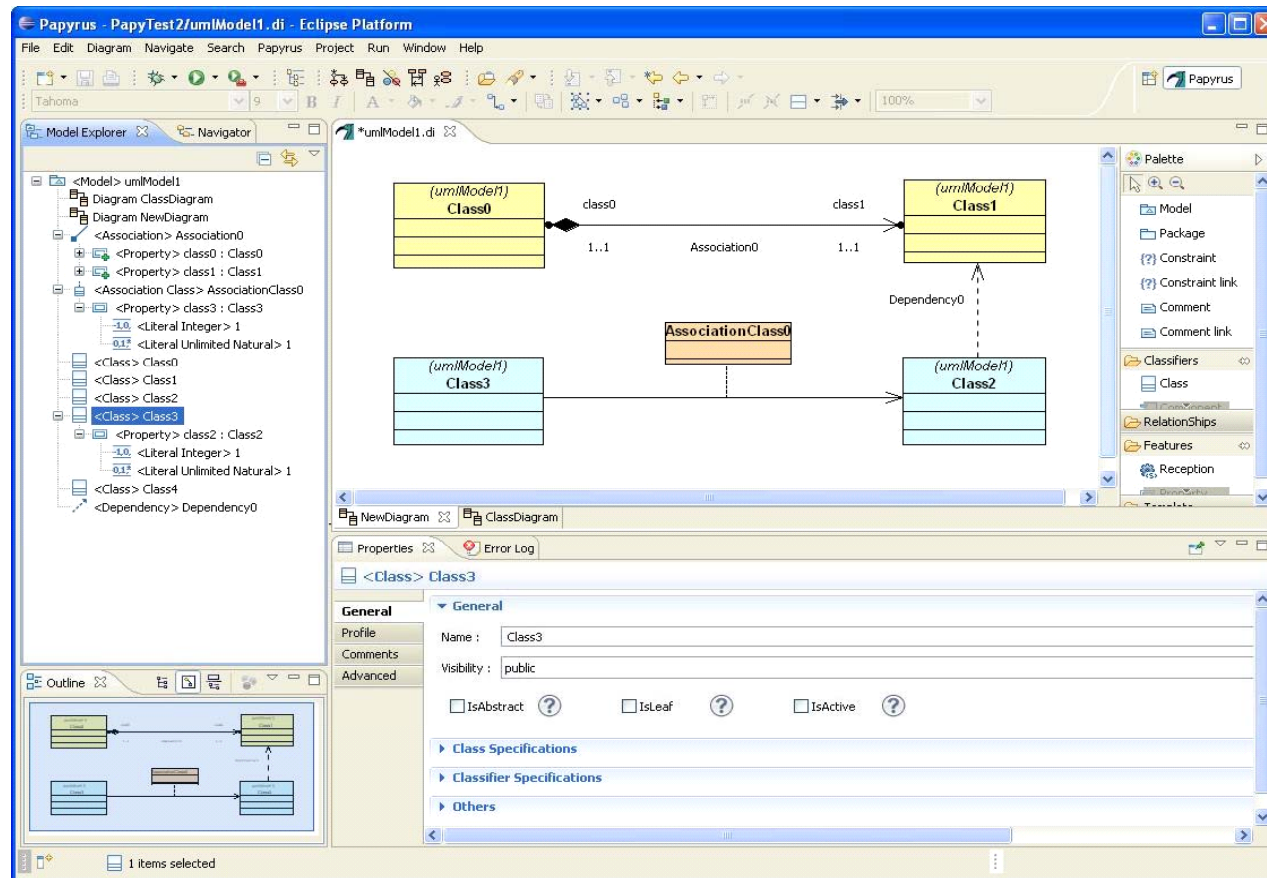
Papyrus



# What is Papyrus ?



➤ A full UML2-compliant UML modeler



## History : why does a research institute develop a modeler ?

---



- **Core domain of the LISE research team:**
  - ✓ MDD of embedded systems by graphic-based languages.
  - ✓ Especially UML profile – based specialization of methods and tools to DSLs.
- **So, we needed a modeler we could control**
  - ✓ To test and show our work on UML profiles,
  - ✓ Not a “toy” modeler, so that our partners could test it.
- **Opensourced, because this is not an “added-value” tool**
  - ✓ Or a least this is what we thought !
- **Published (<http://www.papyrus-uml.org>) , feb. 2007**
  - ✓ ~385 K downloads since this date.
- **“Papyrus II”**
  - ✓ Merges the Papyrus, Topcased and Moskitt projects,
  - ✓ Component of the ECLIPSE MDT project,
  - ✓ To appear in September 2009.



# The situation today

---

cea

---

**list**

- **A well-known technology ;**
- **An active community ;**
- **Needs investment to create an industrial-grade product ;**
- **No business model.**
- **Best use :**
  - ✓ **Create a high added value technology,**
  - ✓ **Make it a Papyrus component,**
  - ✓ **You get a high added value product.**



---

cea

---

list

( II )

Frama-C



Software Analyzers



# What is Frama-C ?

---



- **Framework for Modular Analysis of C :**
  - ✓ A C parser,
  - ✓ A non-ambiguous semantics of C,
  - ✓ A representation of a source code with properties (known or to be proven),
  - ✓ A human-readable language to express the properties (ACSL) with parser,
  - ✓ A plug-in architecture.
- **Some analysis modules already available**
  - ✓ Value analysis with memory model,
  - ✓ Slicing.



# The genesis of Frama-C

---



## ➤ The ancestor : CAVEAT

- ✓ A formal proof semi-automatic tool ;
- ✓ Combines several source code analysis approaches ;
- ✓ DO 178b qualified (2007), in use at AIRBUS.

## ➤ Frama-C is the next step :

- ✓ You could build Caveat with Frama-C
- ✓ ... and then replace the property demonstrator and get a new Caveat.

## ➤ Opensourced, because a lot of the added value is in the community and the new analysis modules.

- ✓ Published May 2008 (<http://frama-c.cea.fr/>)
- ✓ 8 K downloads (probably ~ 2000 regular users)
- ✓ The first version is an INRIA+CEA project.



# The situation today

---



- The technology is known in its scientific community.
- First modules from outside the “INRIA+CEA” group are coming ;
- Needs strong group to support because, as side effect, it creates new “standards” :
  - ✓ ACSL (~JML for Java)
  - ✓ Precise semantics of C.
- Needs investment to qualify for a safety use
  - ✓ Especially in the DO178 constraints ;
- No business model for the Frama-C core.
- Best use :
  - ✓ Create a high added-value C analyzer,
  - ✓ Make it a Frama-C component,
  - ✓ You get a high added value product.



---

cea

---

list

( III )

What do we expect to get in OPEES ?



## From a business point of view

---

cea

list

- **User groups (formal or informal)**
  - ✓ This is a must have !
- **Partners who think of original business models.**
  - ✓ We are not businessmen !
- **A way to share the investment efforts**
  - ✓ By crossing industrial domains ;
  - ✓ Because several partners create « added-value products ».
- **A broader developer community**
  - ✓ Share the development effort,
  - ✓ Lifespan beyond the scientific projects.



## From the scientific point of view

---

cea

---

**list**

- **Feedback ;**
- **New problems**
  - ✓ **With users to evaluate partial solutions !**
- **Motivations to start cross-disciplinary projects.**

---

cea

---

list

Thank you for your attention.

