

EYYW – Software Department

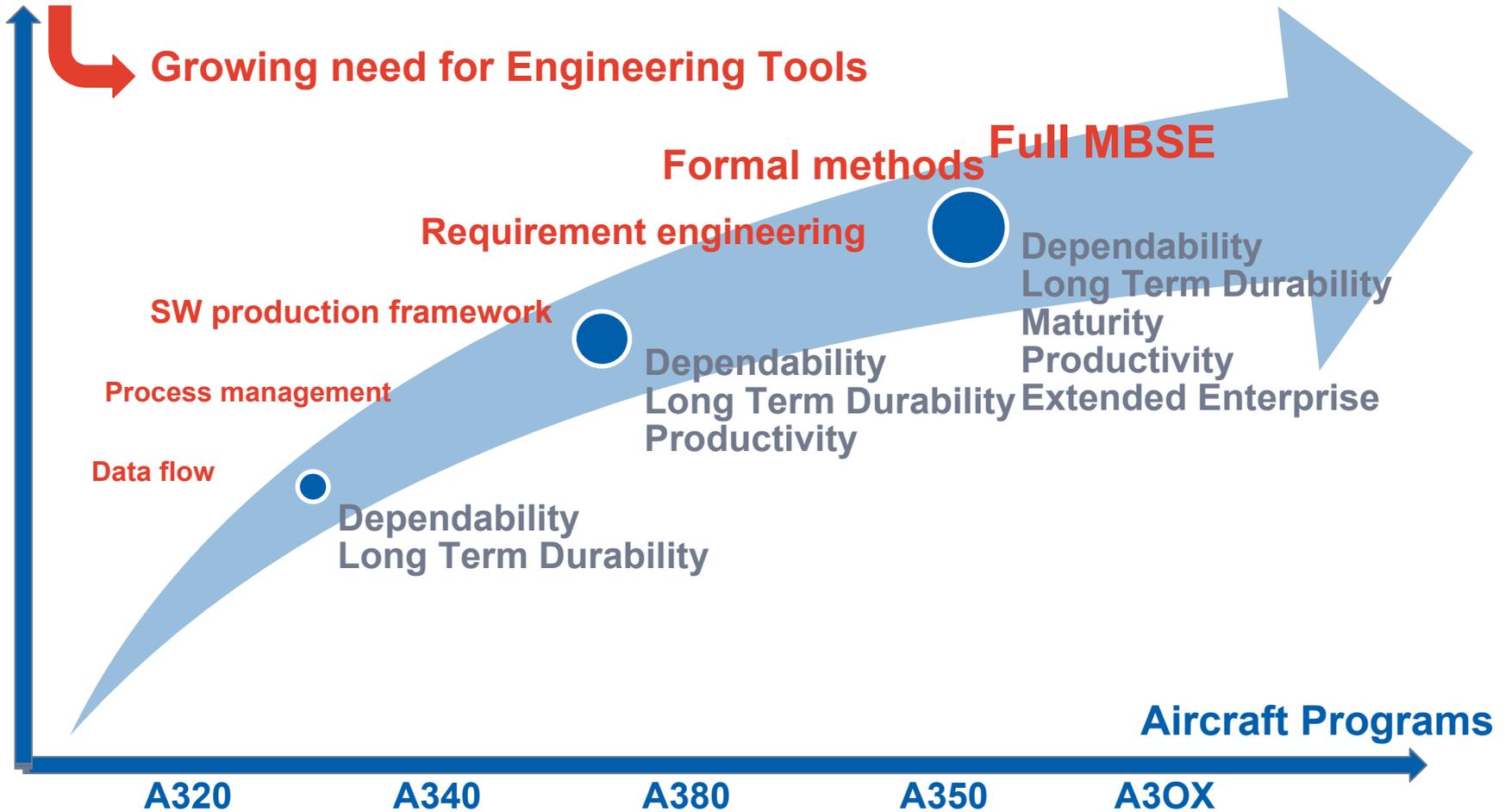
From TOPCASED to Polarsys

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Software Development Tools

A more and more complex context

Growing complexity of embedded SW



Software Development Tools

A brief History

“In-House” development

- Process and conf. mgt: *MARCEL, PALLAS*
- Design support : *PICL, SAO*
- Requirements traceability : *TabTrace, Gmat, Ouate*
- Test environment : *AUTAN*
- Code Generation : *CLARA, CAPITOLE ...*
- Rules verification : *VerifNRC*

- Developing tools requires specific skills
e.g. : ergonomic HMI, complex mathematical basis, collaborative support...
- Heavy costs of developpt / maintenance
- **Clearly out of Airbus core business**

A320

A340

A380

A350

Commercial tools

- Process and conf. mgt : *Clearcase*
- Design support : *STOOD, SCADE, ObjectGeode, Rose*
- Requirements traceability : *RTM, DOORS, Reqtify*
- Test environment : *RTRT, System Test*
- Code Generation : *SCADE/KCG ...*
- Rules verification : *Prolint*

- Risk of **vendor lock-in**
- Customization to support our process is required and deployment in extended enterprise is often expensive
- **Long term availability** not guaranteed

Open Source

A possible Solution for Engineering Tools?

Requirements

- Master tools
- Ensure tools durability in line with aircraft product lifecycle
- Adapt tools easily to the specificities of our process
- Use Open Standards for interoperability and data mgnt
- Lower vendor lock-in
- Lower license deployment costs in extended enterprise
- Optimize Evolution & Maintenance costs
- Deploy Training & Knowledge

Open Source Strengths

- Availability of source code
 - Community of Users and Contributors
- Based on Open Standards
- Low Deployment Cost
 - Involvement of Universities/Schools

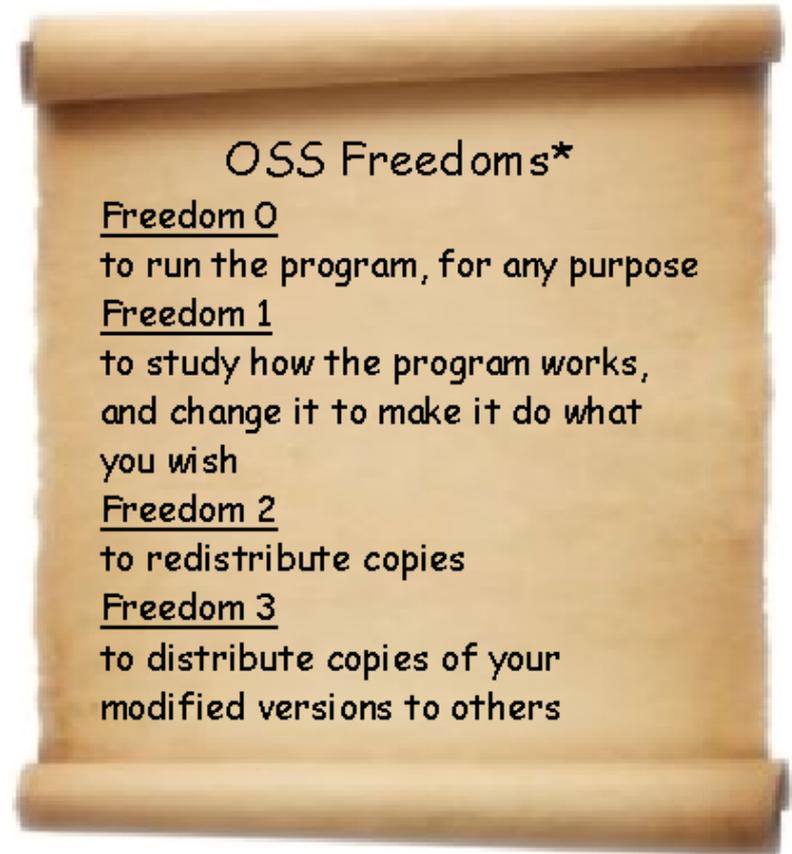
Success Conditions

- Build a viable community
- Organize the Support

Open Source

A matter of Copyright

- Based on *Copyright*
- *Open Source* is not the public domain
- *Open Source* = Free Software (free as in freedom)
- A software is considered as *Open Source* when it is distributed under a license giving the user the OSS freedoms*
- *Open Source* licenses fall into 2 categories :
 - Copyleft (any resulting copies or adaptations are also bound by the same licensing agreement)
 - Non Copyleft
- Licenses may also impose some obligations on the distribution



(*) As defined by the Free Software Foundation

TOPCASED Set Up

A matter of collaboration

- Exchanges in our various networks (2000-2005)
 - With our suppliers and partners
 - Within EADS R&T network
 - With academics and industrialists from the area (cluster Aerospace Valley beginnings)



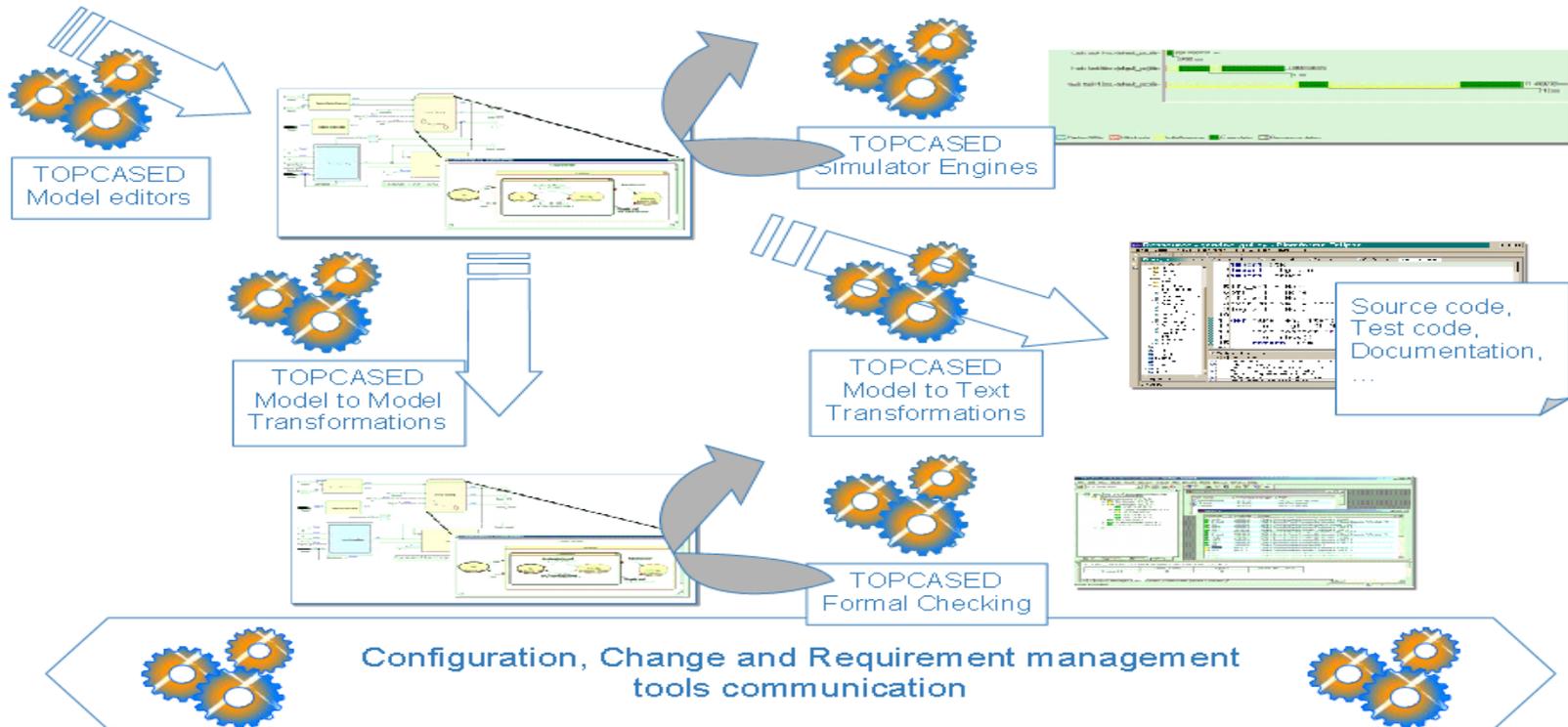
largely shared Interest

- Decision to launch a collaborative project to develop an engineering toolkit
 - Suitable to support critical systems development
 - Based on existing open source components

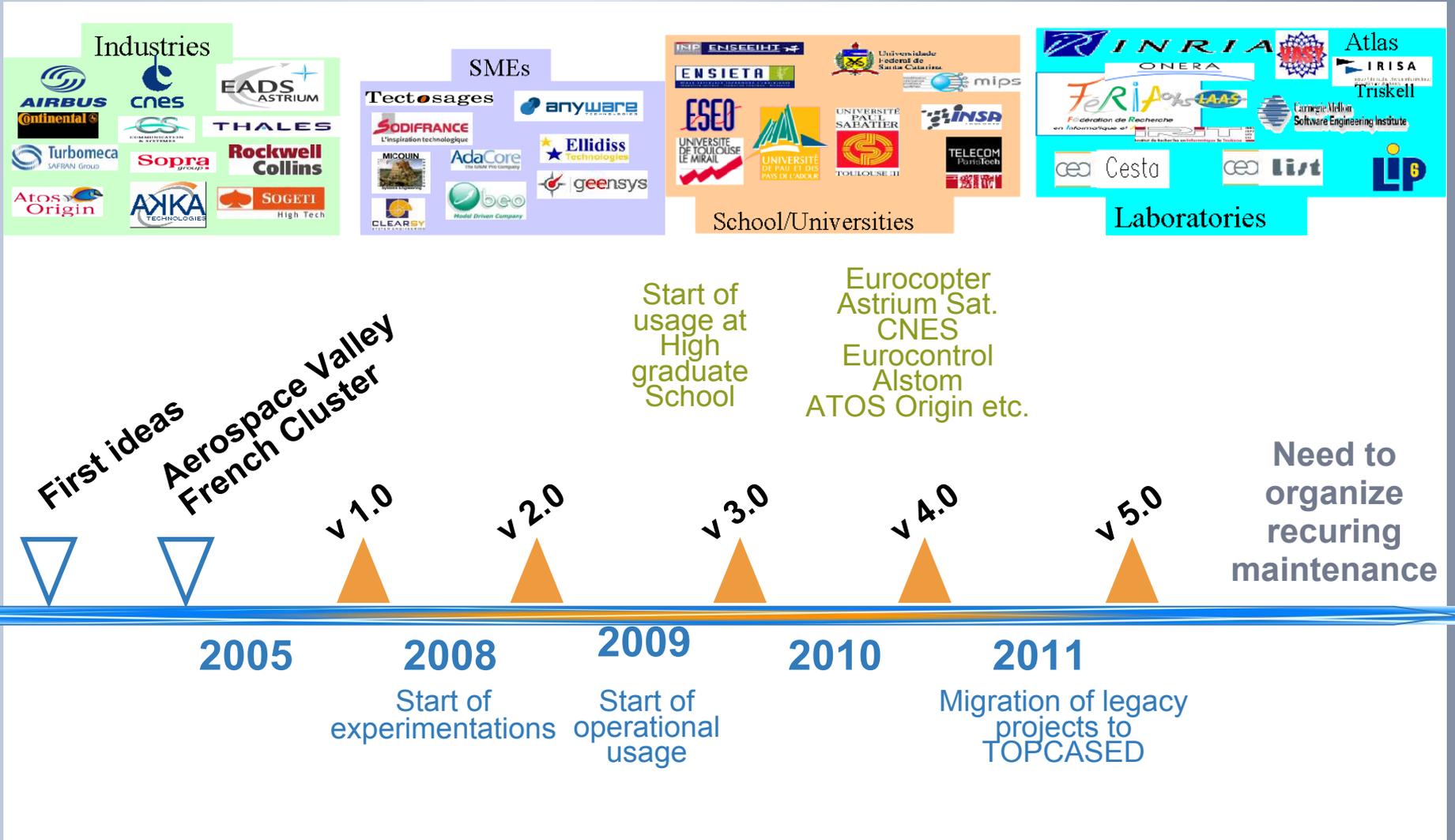


TOPCASED Goals

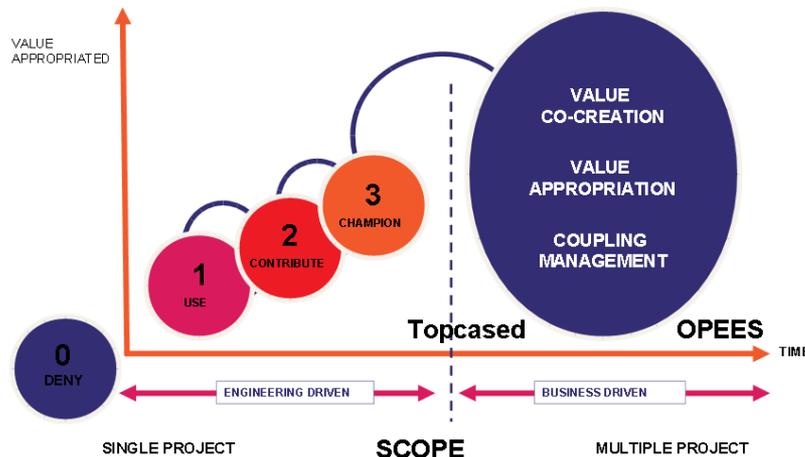
- A modular Model Based System/Software Engineering Tool Set
- Preparing the Long Term Availability of these engineering Tools
- Reducing embedded system development cost and improving maturity
- Integrating cutting edge research results
- Enforcing relationships between Academics, Industries and SMEs
- Deployed in graduate schools



TOPCASED History & Future



ITEA OPEES – 2009 / 2012



• Mission

- Ensure **very long-term availability** of critical/embedded systems engineering technologies including Topcased and other projects (Geneauto, Framac-C, etc.)
- **Towards a federation of Industrial Users, Service Providers and Academics**
 - Build a **sustainable ecosystem** around OPEES technologies: share components and core services
 - Avoid the creation of one ecosystem per industrial user: share roadmap and maintenance costs

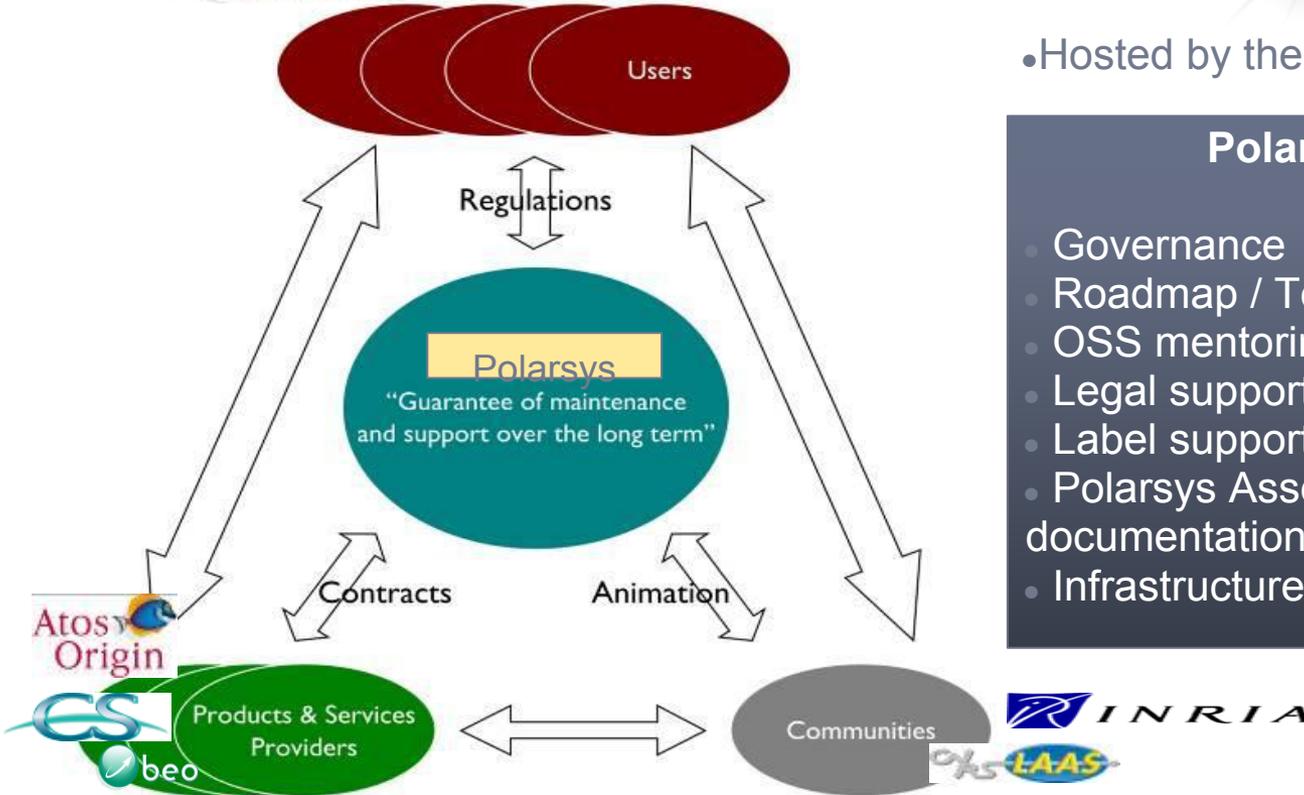


Polarsys

an Eclipse Industrial Working Group



• Hosted by the Eclipse Foundation



Polarsys Services

- Governance
- Roadmap / Technological Survey
- OSS mentoring for R&T projects
- Legal support
- Label support
- Polarsys Assets (qualification kit, documentation, customized builds)
- Infrastructure

Weakly connected actors & users: Valtech, etc.

TOPCASED & OPEES

Results of the Research Projects

- Demonstrate the feasibility of building an open source community in the embedded systems field and its added-value: mutualization of development costs, sharing of standards choices, technology & innovation
- POLARSYS Organization Created in late 2011



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