Project IST-511599
RODIN
"Rigorous Open Development Environment for Complex Systems"
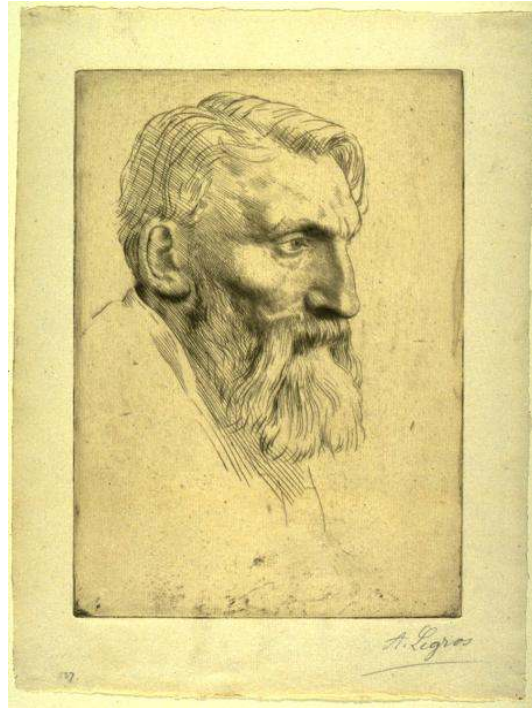
RODIN Deliverable D20

Dissemination and exploitation report

Editor: *Thierry Lecomte - ClearSy*

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http://rodin.cs.ncl.ac.uk/

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1 Introduction

This document aims at exposing the progress made in the RODIN project concerning the dissemination and exploitation of existing results and the raising of public awareness and participation. This document complements *D3 Initial dissemination report* and *D12 Dissemination and exploitation report year 1*. It contains only new information, unless clearly stated.
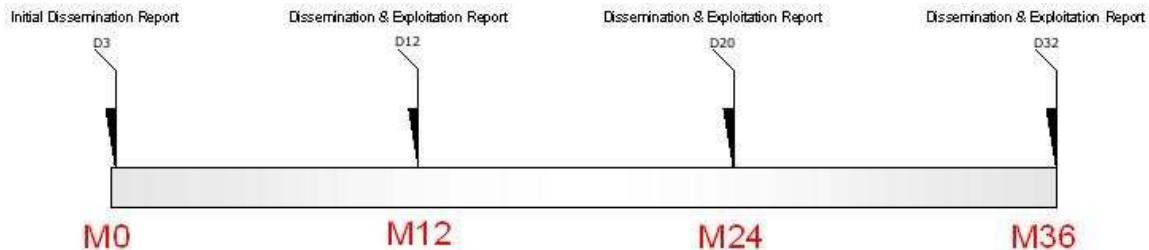
Next release of the Dissemination and Exploitation Report D32 will be provided by M36.

2 Dissemination and exploitation

This section presents our dissemination and exploitation strategy (unchanged since D12), action items undertaken or to be undertaken in order to achieve our objective.

2.1 Strategy (unchanged)

Our objective is to obtain a tested, open platform, fit for use by industry for the development of fault-tolerant systems. This platform should fulfil the "three U rule", ie *Useful*, *Usable*, *Used*. To verify this rule, we consider that the following assertions should hold:
- [A1] The platform has successfully analysed the 5 case-studies of the project. Positive feedback has been collected among project partners.
- [A2] Positive feedback has been collected among IIG members. Some of them have provided plug-in specification and/or complementary case-study, have initiated assessment project, and/or have started to use/contribute to the platform.
- [A3] Positive feedback has been collected from academic world. The platform is explicitly supported by several universities outside the consortium. They will provide for example
  - o tested and packaged releases of the platform in an easy-to-install form;
  - o documentation and examples of use for the platform and selected plug-ins;
  - o creation of basic plug-ins for client tools.

  A pool of developers has been set up and contributes to the platform.

▪ [A4] Some dedicated plug-ins are commercially available and have been sold/are about to be sold to companies.

[A1], [A2] and [A3] are the criteria for assessing the technical interest of the platform. If [A1] is part of WP1, [A2] and [A3] require a specific dissemination policy in order to enlarge the community around the platform as much as possible, and to ensure technical support from the open-source world.
[A4] is the main criterion for building a realistic business plan and envisaging a commercial future for the platform. This criteria would only be checked at the end of the project, as advanced platform will not be delivered before the last year of the project. Though identification of commercial plug-ins should be performed before the last year, in order to have time to develop them.

We will incorporate usability-related metrics (for both individual users and for companies) into the WP 7 work

The following action items are entirely driven by those four criteria [A1], [A2], [A3] and [A4].

2.2   Action items

2.2.1   Internal dissemination.

Zurich Technical workshop. A 3-day technical workshop was organized in Zurich (September 19-21 2005). It was the occasion to:
- expose achievements in case-studies,
- discuss methodology issues,
- present platform specification and design,
- initiate discussion with plug-in developers

This workshop was the first occasion to discuss concrete details of the platform and its use, given that the case-studies were using various other tools (AtelierB, B4Free, proB, …). Feedback and expectations were collected from the presentations that were given.
Moreover, several on-the-fly meetings were spontaneously organised on accurate technical subjects, regarding case-studies and tools being developed. This workshop was definitely a key event, demonstrating that RODIN is really a collaborative project.

Aix en Provence Technical workshop. A 2-day technical workshop was organized in Aix en Provence (April 3-4 2006), centered on the RODIN platform. It was the occasion to:
- present the platform (version 0.5.4) to the case-study practitioners,
- explain how to extend the current platform,
- collect feedback and expectations from developers (a special session was devoted to that issue),
- get feedback and expectations from end-users involved in the different case-studies.

Some support was provided to plug-in developers with the release of "*D15: Description of the RODIN Prototype*".
It appeared that a real tutorial demonstrating how to practically extend the platform was missing and expected by all developers. A dedicated forum was set up on the sourceforge website, to provide some support (this forum is animated by ETH), at least during the writing of that tutorial. Such a tutorial will be provided later on when the Rodin database API is stable and refinement implemented in the platform (expected in October 2006). This tutorial will also ease external dissemination.

All documents written by project members are freely accessible on the BSCW server hosted by Newcastle University.
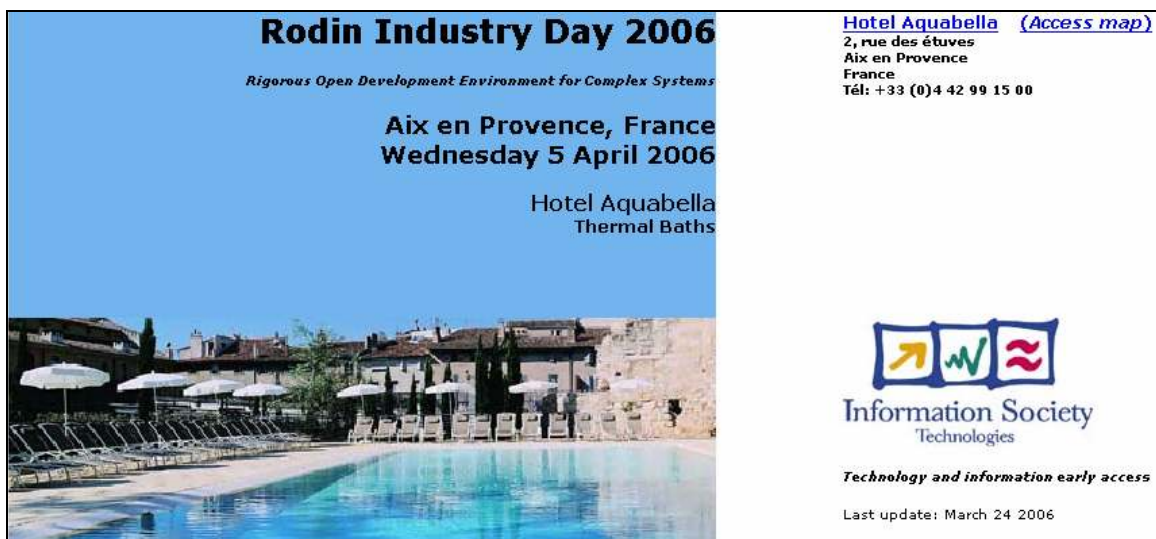The RODIN platform is freely downloadable at sourceforge repository, as well as the UML-B plugin and the predicate evaluator of the animation plugin (Brama), via CVS services. 13 internal developers are now contributing to those tools.

2.2.2   External dissemination.

This action item aims at improving the awareness of the platform among both industry and academic worlds. Envisaged targets are entities involved in the software development, formal methods, mobile agent, fault tolerant systems and/or system-level modeling.

2.2.2.1   Dissemination to technology adaptors.

Industry Day. The main achievement of this year was the first release of the RODIN platform and its presentation to IIG and associates. At that occasion, an industry day was organized in Aix en Provence (April 5 2006).

Our prime objective was to disseminate RODIN results to potential adaptors.

IIG and associates attendees were:

Fernando MEJIA	ALSTOM	Railways
Fabrice BOUQUET	LERIOS	Test case generator
Christophe PONSARD	CETIC	R&D transfer
Sylvain FIORINI	RATP	Railways
Marc BENVENISTE	ST	Microelectronics
Diana Toma	KEESDA	Microelectronics
Dominique Cansell	LORIA	University
Antoine REQUET	GEMPLUS	Smartcard
Jean Louis LANET	GEMPLUS	Smartcard
Jean Frédéric Réal	SYSTEREL	Safety critical software
François BUSTANY	SYSTEREL	Safety critical software
Mathieu CLABAUT	SYSTEREL	Safety critical software
Michael Leuschel	DUSSELDORF	University
Corinna Spermann	DUSSELDORF	University
Jens Bendiposto	DUSSELDORF	University
Philippe COUPOUX	TECHNICATOME	Railways

Agenda is given below:

10h00 **Welcome, presentation of RODIN** (Alexander Romanovski)

- Overview
- Methodology
- Case studies

10h30 **Demonstrations of early prototypes of tools and plugins**:

- 10h30-11h15 The RODIN platform (Jean Raymond Abrial, Laurent Voisin)
- 11h15-11h45 ProB animator/model checker (Michael Leuschel)
- 11h45-12h15 Mobility plugin (Apostolos Niaouris)

13h30 **Demonstrations of early prototypes of tools and plugins (continued)**:

- 13h30-14h00 U2B: combining UML and B (Michael Butler, Colin Snook)
- 14h00-14h20 CompoSys: documentation generator (Thierry Lecomte)
- 14h20-14h40 Brama: graphical animation of B models (Thierry Lecomte)

14h40 **Presentations from IIG members and associates**:

- 14h40-14h50 Antoine Requet (GemAlto): Validation
- 14h50-15h10 Fabrice Bouquet (LIFC/Lerios): Automatic test generation from B model
- 15h10-15h25 Christophe Ponsard (CETIC): From requirements model to formal specification in B
- 15h25-15h35 Marc Benveniste (STMicroelectronics): *to B confirmed*

15h35 **Round table: what services are expected from the RODIN platform ?**

16h00 End of RODIN Industrial Open Day

Early prototypes of tools and plugins (platform, proB animator/model checker, mobility plugin, U$_2$B, CompoSys, Brama) were presented to the 44 participants.
Presentations related to validation, automatic test generation, formal modelling of requirements, hardware specification and design, were given by IIG and associates.

All the slides are available at www.clearsy.com/rodin/industry_day.html.

This industry day was the occasion to collect feedback and expectations from IIG and associates, and to address specific technical/practical issues with head-to-head demonstrations at the end of the day.
Most IIG members and members of the RODIN associates group have downloaded and installed the RODIN platform. To continue to collect their feedback, a dedicated forum, named "Feature request" has been set up on the sourceforge site.
As far as we understood, platform adoption will remain limited until refinement (one major feature of B) is supported by the platform. This support will be included in the new version of the platform to be released by the end of September 2006.

Relations with industry. ClearSy organized a number of dedicated presentations of the RODIN platform and animation plug-in Brama (Alstom, CNES, CNIM, Siemens, STmicroelectronics).
A special meeting was organized with French Prime Minister Office, in relation with EAL5+ Common Criteria certification and the possible election of the RODIN platform as reference for evaluation.
An ongoing R&D project at STmicroelectronics related to the development of embedded software in B, using B4Free, is ready to move to the RODIN platform, as soon as refinement is implemented, thus providing reference for industry strength software development using the RODIN platform.
Jean Raymond Abrial presented the current Rodin results at several occasions:
- Ratp (Paris),
- EADS (Toulouse), focusing on their possible application to EADS embedded software developments,
- Alcatel (Toronto).

2.2.2.2 *Dissemination to software engineering community*

RODIN has been presented at the following occasions:
- J.R Abrial, Formal Methods in Industry: Achievements, problems, future, invited talk, International Conference on Software Engineering 2006, Shangaï
- International workshop on Software Engineering for Large-scale Multi-Agent Systems (SELMAS), ICSE 2006
- A Romanovsky. Complex Systems: Rigorous Open Development Environment for Complex Systems - RODIN. ERCIM News 65. April, 2006. http://www.ercim.org/publication/Ercim_News pp.40-41.

- A. Romanovsky. RODIN. Invited presentation at FRCSS (Future Research Challenges for Software and Services) workshop at ETAPS 2006. April 1, 2006.

At the occasion of the λμ 2006 conference, ClearSy will present "The B formal method for a SIL3 sensor system: the control system of the platform doors, line 13 in Paris subway". It explains how the B formal method coupled with probabilistic calculus was used for the design and safety approval of the control system for platform doors, in operation on Paris line 13 since April 2006. In the scope of tolerable perturbations, the safety of the chosen algorithm was formally proven.

2.2.2.3 *Dissemination to the Formal Methods community*

RODIN members have been presenting RODIN work at all major events (FM 2005, FM 2006, ISOLA 2006, ...) and are very active.
In particular, Jean Raymond Abrial presented Rodin and accompanying research at several occasions:
- Grand Challenge Conference (Zurich): presentation of the idea of a Rodin design database (October 2005)
- Refinement workshop (Manchester): current research in formal design patterns (October 2005)
- David Parnas' group (SQRL) in Limerick (November 2005)
- Formal Method History Panel (London) organized by the BCS, presenting long term involvement in Formal Methods from Z to Rodin (January 2006)
- Atomicity Workshop (Dagstuhl): current research in applying Event-B to concurrent programs (March 2006)
- Workshop (Nancy): presentation of work around Rodin on formal patterns (April 2006)
- Dagstuhl seminar on Rigorous Methods for Software Construction and Analysis: first public presentation of the Rodin platform (May 2006)
- Workshop on formal tool at INRIA-Microsoft laboratory in Orsay (June 2006)
- Dagstuhl workshop on the Challenge of Software Verification (July 2006)

RODIN platform availability has been announced on several places including the B forum, several B websites (ClearSy, AtelierB, Imag B site, B4free), FME and FMNET.

2.2.2.4 *Dissemination to the Agent community*

Newcastle University has joined AgentLink III IST CA (October 2005) and ESF MiNEMA Network (November 2005) to build stronger links with the communities working on ambient and pervasive systems.

Turku and Newcastle took part in Workshop on Software Engineering Challenges for Ubiquitous Computing June 1-2, 2006 - Lancaster, UK (

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http://ubicomp.lancs.ac.uk/workshops/seuc2006/) and gave the following presentations:

- *Towards Rigorous Engineering of Resilient Ubiquitous Systems*. Alexander Romanovsky, Kaisa Sere, Elena Troubitsyna
- *Dependability Challenge in Ubiquitous Computing*. Kaisa Sere, Lu Yan, Mats Neovius
- *Towards Effective Exception Handling Engineering in Ubiquitous Mobile Software Systems*. Nelio Cacho, Alessandro Garcia, Alexander Romanovsky, Alexei Iliasov

2.2.2.5 *Dissemination to the dependability community*

University of Southampton and Newcastle are involved in the ReSIST (Resilience for Survivability in IST) NoE - http://www.resist-noe.org/. Alex Iliasov is presenting RODIN work on CAMA during ReSIST PhD workshop in San Miniato, Pisa (September 5-7, 2006).

We have successfully participated to the organization of Track on Dependable and Adaptive Distributed Systems at the 21st ACM Symposium on Applied Computing. We are now organising Dependable and Adaptive Distributed Systems Track at the 22nd ACM Symposium on Applied Computing.

2.2.2.6 *Links with MDA/UML community*

We have had meetings with:
- Keith Mantell and Alan Hartman (IBM) - Modelware IST project.
- Richard Paige (University of York) - Modelware IST project.
- Wolfgang Mueller (University of Paderborn) – Martes project and SysML standardization.

They are all working on UML/MDA and are interested in Rodin tools.

2.2.2.7 *Links with other IST projects*

Newcastle University has joined AgentLink III IST CA and ESF MiNEMA Network to disseminate RODIN results.

We have established working relations and regular information exchange with representatives of a number of FP6 IST projects, including NoE ReSIST, STREP DeDiSys, NoE AOSD, STREP MADAM, IP Modelware, STREP MODELPLEX and STREP GORDA.

Representatives of AOSD and ReSIST attended the RODIN industry day in Aix.

Together with the representatives of DeDiSys, MADAM and GORDA we have successfully organized Track on Dependable and Adaptive Distributed Systems at the 21st ACM Symposium on Applied Computing, April 23 -27, 2006, Dijon, France (http://www.dedisys.org/sac06/). The co-chairs and the PC members are from these four IST projects. The themes of the track are directly related to the areas of our research. See - Karl M. Göschka, Svein O. Hallsteinsen, Rui Oliveira, Alexander Romanovsky. Editorial message: special track on dependable and adaptive distributed systems. SAC 2006, pp. 668-669. ACM Press, 2006.
Now we are organising Dependable and Adaptive Distributed Systems Track at the 22nd ACM Symposium on Applied Computing (http://www.dedisys.org/sac07/), March 11 - 15, 2007 in Seoul, Korea.

2.2.2.8   Links with IST

RODIN has contributed to the Commission preparation for FP7. A. Romanovsky took part in a Consultation Workshop on Future service platforms and software development technologies in Brussels on December 7th 2005 and was directly involved in the preparation of The Software and Services Challenge (IST) document (January 2006).

In July 2006 Newcastle joined NESSI - Networked European Software & Services Initiative (http://www.nessi-europe.com/).

2.2.3   Internet

Two RODIN Web sites set up during the first months of RODIN have been continuously upgraded to present the current state of the project.

2.2.3.1   The official site.

This site is hosted by University of Newcastle and reachable at http://rodin.cs.ncl.ac.uk/. This site provides access to the background research papers and workshop presentations, as well as to all public RODIN deliverables.

2.2.3.2   *The developer site.*

This site is hosted by sourceforge and reachable at http://rodin-b-sharp.sourceforge.net/. Several packages are available for download. They appear in the list below.

The RODIN Platform has been released in May 2006, and has been downloaded 609 times by now. Maximum monthly download rate was obtained in April 2006, when the platform was released.

Time Period: [Year ▾] [2006 ▾]
Package: [Core: Rodin Product ▾]
Release: [All Releases ▾]
[Change View]

Date (UTC)	Downloads	Bytes Served
Aug 2006 *	28	781.7 MB
Jul 2006	52	1.3 GB
Jun 2006	69	1.7 GB
May 2006	65	1.6 GB
Apr 2006	338	8.2 GB
Mar 2006	57	1.8 GB
Feb 2006	0	0 bytes
Jan 2006	0	0 bytes
Total	609	15.5 GB

* Partial data: End of month not yet reached

Statistics are represented in the 4 following graphs.

Usage Statistics For RODIN
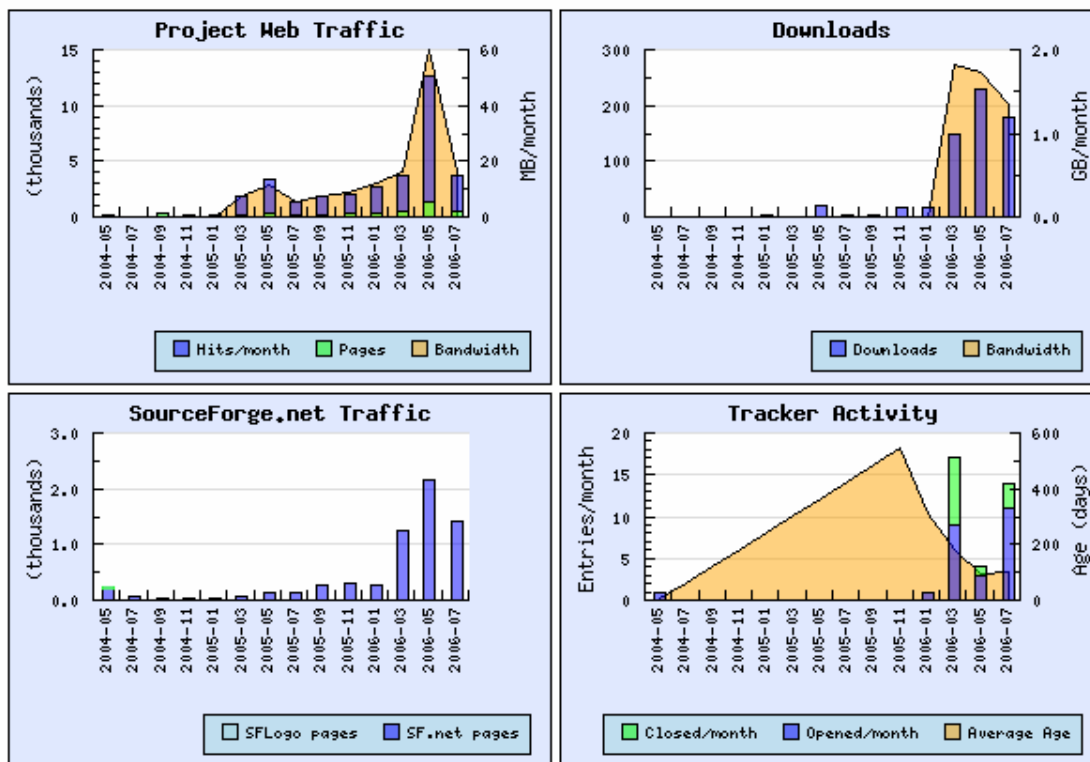
2.2.4 Publications

2.2.4.1 Journal papers and book chapters

The REFT book has been prepared and will be published in December 2006 by Springer in the LNCS series. This book is built on the successful FME 2005 REFT workshop and includes selected and extended workshop papers and invited papers by the experts in the areas related to RODIN. All papers have been peer-reviewed. The book contains 21 chapters, of which 10 are coming from RODIN, 1 from IST DeDiSys Project, 1 from IST AOSD NoE and 4 from the members of the RODIN associates group. The title of the book is Rigorous development of complex fault tolerant system, Co-editors: M. Butler, C. Jones, A. Romanovsky, E. Troubitsyna. LNCS volume number is 4157.

A number of journal papers and book chapters, including those of the REFT book, have been published during year 2 of the project. They include:

- A. Iliasov, L. Laibinis, E. Troubitsyna, and A. Romanovsky. Rigorous development of Fault Tolerant Agent Systems. To appear in M. Butler, C. Jones, A. Romanovsky, E. Troubitsyna (Eds.), Rigorous Development of Complex Fault Tolerant Systems, Springer.
- C. B. Jones (2005), Reasoning about the design of programs, Royal Soc, Phil Trans R Soc A, volume363-1835, p2395-2396
- Cliff Jones, Peter O'Hearn and Jim Woodcock (2006), Verified Software: a Grand Challenge, IEEE Computer, volume 34-4, p93-95
- Coleman, J (September 2005), REFT 2005 Workshop Report in Newsletter of the Formal Aspects of Computing Science (FACS), p11-13.
- D.Ilic, E. Troubitsyna, L. Laibinis, and C. Snook. Formal Development of Mechanisms for Tolerating Transient Faults. To appear in M. Butler, C. Jones, A. Romanovsky, E. Troubitsyna (Eds.), Rigorous Development of Complex Fault Tolerant Systems, Springer.
- J. I. Burton and C. B. Jones (2005), Atomicity in System Design and Execution, Journal of Universal Computer Science, volume 11-5, p634-635
- J. I. Burton and C. B. Jones (2005), Investigating Atomicity and Observability, Journal of Universal Computer Science, volume 11-5, p661-686
- L. Laibinis, E. Troubitsyna, S. Leppanen, J. Lilius, and Q. Malik. Formal Service-Oriented Development of Fault Tolerant Communicating Systems. To appear in M. Butler, C. Jones, A. Romanovsky, E. Troubitsyna (Eds.), Rigorous Development of Complex Fault Tolerant Systems, Springer.
- Lo Presti, S., Butler, M., Leuschel, M. and Booth, C. (2006) Holistic Trust Design of E-Services, in Song, R., Eds. *Trust in E-services: Technologies, Practices and Challenges*.
- M. Butler, C. Jones, A. Romanovsky, E. Troubitsyna (Editors). Rigorous development of complex fault tolerant system Springer LNCS volume 4157, 2006.

- R.Devillers, H.Klaudel and M.Koutny: A Petri Net Semantics of a Simple Process Algebra for Mobility. Electronic Notes in Theoretical Computer Science Volume 154, Issue 3, 19 July 2006, Pages 71-94
- R.Devillers, H.Klaudel and M.Koutny: Net Semantics of the Finite pi-Calculus Terms. Fundamenta Informaticae 70 (2006) 203-226
- Snook, C. and Butler, M. (2006) UML-B: Formal modelling and design aided by UML. *ACM Transactions on Software Engineering and Methodology (to appear)*.

2.2.4.2   *Conference papers*

A number of conference papers have been published during year 2 of the project. They include:

- A. Monod, J. Kienzle, A. Romanovsky. Looking Ahead in Open Multithreaded Transactions. Proceedings of the 9th International Symposium on Object and Component-Oriented Real-Time Distributed Computing, Gyeongju, Korea, April 24 - 26, 2006. Eds. S. Lee, U. Brinkschulte, B. Thuraisingham, R. G. Pettit IV. IEEE Press. 2006, pp. 53 - 63.
- Abrial, J. R., Butler, M., Hallerstede, S. and Voisin, L. (2006) An open extensible tool environment for Event-B. In *Proceedings of ICFEM 2006* (in press), Macau.
- Abstractions for Communicating Processes , In Proceedings of the Sixth International Conference on Application of Concurrency to System Design , Goossens, K. and Petrucci, L.(eds.) IEEE Computer Society pp. 239-250 , 2006
- B. Arief, A. Iliasov, A. Romanovsky. On Using the CAMA Framework for Developing Open Mobile Fault Tolerant Agent Systems. SELMAS 2006 workshop at ICSE 2006. Shanghai, China. May 22-23. 2006. pp.29-36.
- C. B. Jones (2005), An Approach to Splitting Atoms Safely, Electronic Notes in Theoretical Computer Science, MFPS~XXI, 21st Annual Conference of Mathematical Foundations of Programming Semantics, Volume 155, p43-60
- C. B. Jones (2005), Sequencing Operations and Creating Objects, Proceedings Tenth IEEE International Conference on Engineering of Complex Computer Systems, p33-36
- C. Jones, D. Lomet, A. Romanovsky and G. Weikum (2005), The Atomicity Manifesto: a Story in Four Quarks, ACM SIGMOD Record, Volume 34-1, p63-69
- C. Snook, M. Poppleton, I. Johnson, The engineering of generic requirements for failure management, Proc. REFSQ05: Requirements Engineering For Software Quality, 15pp., Jun 2005, workshop at CAISE05, Porto, Portugal.
- Cliff B. Jones (2005), Specification before Satisfaction: the Case for Research into Obtaining the Right Specification (ZB 2005), Lecture Notes in Computer Science, volume 3455, p1-5
- Cliff B. Jones (2006), Reasoning About Partial Functions in the Formal Development of Programs, Proceedings of AVoCS'05, volume 145, p3-25
- Coleman, J (2006) Determining the Specification of a Control System: an Illustrative Example, Proceedings of the Workshop on Rigorous Engineering of Fault-Tolerant Systems, November 2005

- Coleman, J, Jefferson, N and Jones, C (2006) Comments on several years of teaching of modelling programming language concepts, Proceedings of the Workshop on Formal Methods in the Teaching Lab at FM'06.
- Evans, N. and Butler, M. (2006) A Proposal for Records in Event-B. In *Proceedings of Formal Methods 2006* (in press), McMaster, Canada. Nipkow, T. and Misra, J., Eds.
- F. C. Filho, A. Romanovsky, C. M. F. Rubira. Verification of Coordinated Exception Handling. In Proceedings of 21st ACM Symposium on Applied Computing (SAC'2006), Dijon, France, 23-27th April. 2006, pp 680-685. ACM Press.
- Ian Oliver (2006). A Demonstration of Specifying and Synthesising Hardware using B and Bluespec. In: Proceedings of Forum on Design Languages 2006. Darmstadt, Germany.
- Ian Oliver, Vesa Luukkala (2006). On UML's Composite Structure Diagram. SAM'06, May 31-June 2, Kaiserslautern, Germany
- Ian Oliver (2006). Using UML and formal methods in Industry. Nordic Workshop on UML 2006 Keynote Speech. Grimstad, Norway
- K. Damasceno, N. Cacho, A. Garcia, A. Romanovsky, C. Lucena. Context-Aware Exception Handling in Mobile Agent Systems: The MoCA Case. SELMAS 2006 workshop at ICSE 2006. Shanghai, China. May 22-23. 2006. pp.37-44.
- Khomenko, V., Koutny, M. and Niaouris, A.: Applying Petri Net Unfoldings for Verification of Mobile Systems, Fourth International Workshop on Modelling of Objects, Components and Agents (MOCA 2006), Moldt, D. (ed.), Bericht 272 Department Informatik, Universitaet Hamburg, 2006, pp. 161-178
- Kleijn, H. C. M., Koutny, M.: Infinite Process Semantics of Inhibitor Nets , In Proceedings of the Petri Nets and Other Models of Concurrency - ICATPN 2006, Donatelli, S., Thiagarajan, P. S. (eds.), Lecture Notes in Computer Science 4024, pp. 282 - 301, 2006
- L. Laibinis, E. Troubitsyna, S. Leppanen, J. Lilius, and Q. Malik. Formal Model-Driven Development of Communicating Systems. In Proceedings of 7th International Conference on Formal Engineering Methods (ICFEM'05), LNCS 3785, Springer, November 2005.
- Leavens, G. T., Abrial, J. R., Batory, D., Butler, M., Coglio, A., Fisler, K., Hehner, E., Jones, C. B., Miller, D., Peyton-Jones, S., Sitaraman, M., Smith, D. R. and Stump, A. (2006) Roadmap for Enhanced Languages and Methods to Aid Verification. Technical Report 06-21, Department of Computer Science, Iowa State University.
- Leuschel, M. and Butler, M. (2005) Automatic Refinement Checking for B. In *Proceedings of ICFEM'05* LNCS 3785.
- P. Li, Y. Chen, A. Romanovsky. Measuring the dependability of Web Services for use in e-Science experiments. The 3rd International Service Availability Symposium. ISAS 2006. Helsinki, Finland, May 15-16, 2006. pp. 175-185.
- S. Leppanen, D. Ilic, Q. Malik, T. Systa, and E. Troubitsyna. Specifying UML Profile for Distributed Communicating Systems and Communication Protocols. In Proceedings of Workshop on Consistency in Model Driven Engineering (C@MODE'05), November 2005.

- S.Becker, A.Brogi, I.Gorton, S.Overhage, A.Romanovsky, M.Tivoli. Towards an Engineering Approach to Component Adaptation. In Architecting Systems with Trustworthy Components. International Seminar, Dagstuhl Castle, Germany, December 12-17, 2004. Revised Selected Papers Series: Lecture Notes in Computer Science , Vol. 3938. Reussner, Ralf H.; Stafford, Judith A.; Szyperski, Clemens A. (Eds.) 2006. pp. 193- 215.
- V.Khomenko, A.Kondratyev, M.Koutny and V.Vogler: Merged Processes – a New Condensed Representation of Petri Net Behaviour. In Proceedings of the CONCUR 2005 - Concurrency Theory. 16th International Conference, San Francisco, CA, August 23-26, 2005 Abadi, M. and de Alfaro, L. (eds.) Lecture Notes in Computer Science Volume 3653 pp. 338-352 Springer-Verlag 2005

2.2.4.3 Workshop presentations

Several talks were given, in relation with RODIN. They are listed below:

- A. Romanovsky. CA Actions - 10 years after. Invited talk at the 1st International EFTS workshop on Engineering Fault Tolerant Systems. Luxembourg. June 12-13, 2006.
- A. Romanovsky. Coordinated Atomic Actions. Invited Lecture. The 1st Postgrad TrustSoft Summer School. Dagstuhl, Germany, July 17- 21, 2006.
- A. Romanovsky. Dependability-Explicit Computing. SBES 2005 - 19th Brazilian Symposium on Software Engineering. Invited mini-tutorial. October 6, 2005. Brazil.
- A. Romanovsky. Fault Tolerance through Exception Handling in Ambient and Pervasive Systems. SBES 2005 - 19th Brazilian Symposium on Software Engineering. Invited talk. October 6, 2005. Brazil.
- A. Romanovsky. Fault Tolerance through Exception Handling in Ambient and Pervasive Systems. Invited Lecture. The 1st Postgrad TrustSoft Summer School. Dagstuhl, Germany, July 17- 21, 2006.
- A. Romanovsky. RODIN IST Project. Invited presentation at the IV CORRECT project meeting. January 24, 2006. Luxembourg University. Luxembourg
- Colin Snook gave a presentation " Refinement of statemachines using hierarchical states, choice points and joins" at the Refinement Workshop at ICFEM 2005 in Manchester in November 2005
- Colin Snook gave a presentation on UML-B: concept and development at the Rigorous Methods for Software Construction and Analysis Workshop in Dagstuhl in May 2006.
- Divakar Yadav gave a presentation on Rigorous Design of Fault-Tolerant Transactions for Replicated Database Systems using Event B at the Atomicity Workshop in Dagstuhl in March 2006.
- Joey Coleman gave a seminar "SOS is good for you" at Dagstuhl in March 2006.
- Michael Butler gave a presentation on an Event-B development of the Mondex case study at a VSR Workshop (Verified Software Repository) in Abingdon in May.

- Michael Butler gave a presentation on Automatic Refinement Checking for B at the RefineNet Workshop in Southampton in May 2006.
- Michael Butler gave a presentation on rigorous design of systems at the Verified Software Grand Challenge workshop in Dagstuhl in July 2006.
- Michael Butler was a panel member on the Software Repository at the VSTTE conference (Verified Software: Theories, Tools, Experiments) held at ETH Zürich in October 2005.
- Michael Leuschel presented the paper Automatic Refinement Checking for B at ICFEM 2005 in Manchester in November 2005.
- Michael Poppleton gave a presentation "Towards Using Refinement in Feature-Oriented Generic Specification" at the Refinement Workshop at ICFEM 2005 in Manchester in November 2005
- Michael Poppleton presented an invited seminar "Towards Using Refinement in Feature-Oriented Generic Specification" at the University of Leicester on 2nd December 2005
- Neil Evans presented the paper A Proposal for Records in Event-B at the FM06 Conference in McMaster, Canada in August 2006.

2.2.4.4 *Technical reports*

Several technical reports were written, in relation with RODIN. They are listed below:

- C. B. Jones and I. J. Hayes and M. A. Jackson (2006), Specifying systems that connect to the physical world, School of Computing Science, University of Newcastle, Technical report CS-TR-964
- Cliff Jones (2005), Technical Challenges for Formal Methods, Presented at MPI Kaiserslautern
- G. Leavens, J. R. Abrial, M. Butler, C. Jones and al, Roadmap for Enhanced Languages and Methods to Aid Verification, Iowa State University, Department of Computer Science
- J. W. Coleman and C. B. Jones (2006), Guaranteeing the soundness of rely/guarantee rules, School of Computing Science, University of Newcastle Technical report CS-TR-955

2.2.5 **IIG**

The Industry Interest Group is today composed of 14 members:
- Adelard,
- Alstom,
- AWE,

- CETIC,
- DGA,
- Escher,
- Gemplus,
- IBM,
- ICCC,
- Qinetiq,
- RATP,
- Stmicrolectronics,
- Systerel
- VTT.

This group is stable.

Alstom, Gemplus, RATP, Stmicroelectronics and Systerel attended the RODIN Industry Day. Gemplus and Stmicroelectronics gave presentations at that occasion, providing useful feedback.

A PhD, partly funded by DGA, will be hosted by ClearSy in 2006, in relation with the RODIN platform and animation issues (Brama).

2.2.6   Associates

We encourage academic researchers to register as associate, in order to have a privileged access to RODIN information. For the time being, several researchers are registered as associates:

- Carroll Morgan (University of New South Wales, Australia)
- Ron Van der Meyden (University of New South Wales, Australia)
- Nicolas Guelfi Ries (University of Luxembourg)
- Benoit Ries (University of Luxembourg)
- Reza Razavi (University of Luxembourg)
- Jean Louis Boulanger (Université Technologique de Compiègne, France)
- Pierre-Yves Schobbens (Facultés Universitaires Notre-Dame de la Paix / Namur, Belgium)
- Christophe Ponsard (CETIC Applied Research center / Charleroi, Belgium)
- Nicole Levy (University of Versailles, France)
- Jim Woodcock (University of York, UK)
- Dominique Cansell (Loria-Nancy, France)
- Cecilia Rubira (University of Campinas, Brazil)
- Fernando Castro Filho (University of Campinas, Brazil)
- Michael Leuschel (Dusseldorf University, Germany)
- Swapan Bhattacharya (Javadpur University, India)
- Friedrich von Henke (Ulm University, Germany)
- Fabrice Bouquet (Laboratoire d'Informatique de l'Université de Franche-Conté, France)

Michael Leuschel, Swapan Bhattacharya, Friedrich von Henke and Fabrice Bouquet have joined the associates group during the reported period.

2.2.7   Plug-in identification

During the lifetime of the project, we will collect all feedback from the partners of the consortium, from IIG members, from associates and from all other sources available. We will pay a particular attention to requirements for new plug-ins, with the underlying idea of developing, if possible, commercial-quality tools. This requires from us to be responsive and adapt to the demand, given the financial and technical limits of the project.
As a sequel, the platform should be sufficiently flexible to enable the design of specific extensions and the seamless packaging of dedicated application.

Three additional plug-ins have been identified last year:
- **Graphical model animation**.
  As a consequence, two plug-ins are being developed:
    - *ProB* by Dusseldorf University
    - *Brama* by ClearSy.

- **Documentation generation**.
  One application is planned to be ported to the RODIN platform, as a plug-in:
  Composys (http://www.composys.eu)

- **Requirements manager**
  This plug-in is being developed by University of Southampton

and are being integrated to the final platform.

3 Dissemination and exploitation financial plan (unchanged)

The objective of this section is to present a "business plan" for assessing / validating further commercial exploitation, including creating a dedicated subsidiary.

For the time being, the visibility is not sufficient to precisely set-up a business plan, as the platform has not yet proved to be sufficiently attractive to address any existing/potential/future market. External feedback is required to assess the validity of such an approach.

At the end of the project, this business plan should clearly state if the commercial exploitation of the platform is feasible, and under which conditions. The creation of a dedicated subsidiary / association will be envisaged and evaluated in both financial and organisational terms.

This business plan should clearly define the product resulting from the project and its form (packaging similar to Mandrake distribution for example, training, consultancy, …), and should contain an analysis of the market, an operational and a financial description of the entity in charge of the exploitation, if any.