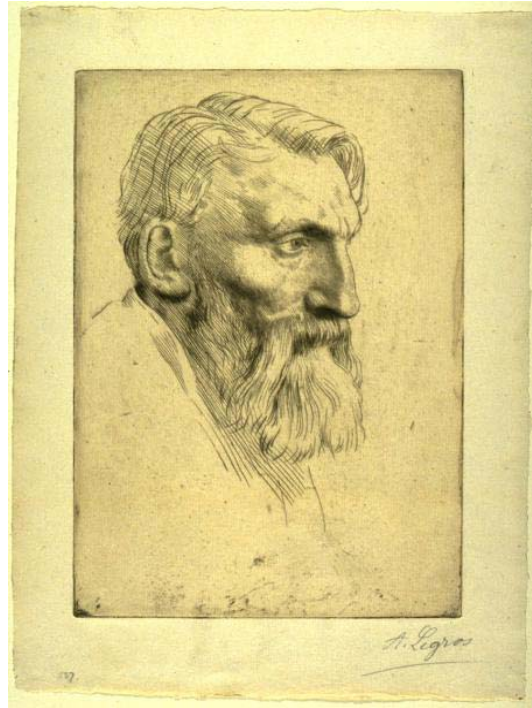


D12 Dissemination and exploitation report (Year 1)



Project IST-511599
RODIN

“Rigorous Open Development Environment for Complex Systems”



RODIN Deliverable D12

Dissemination and exploitation report

Editor: *(Thierry Lecomte - ClearSy)*

Public Document

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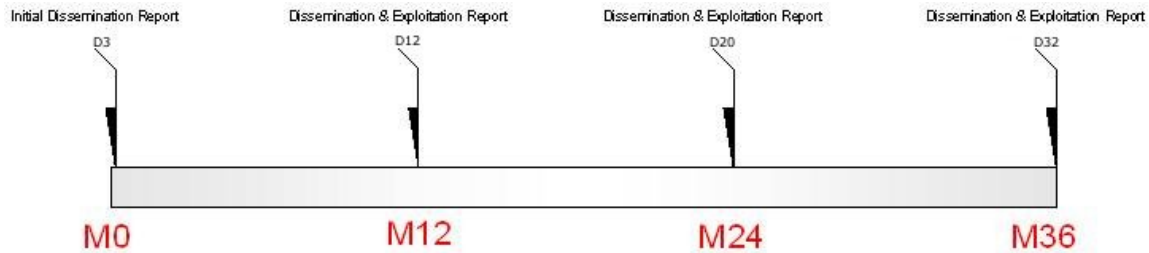
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1 Introduction

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 contains only new information, unless clearly stated.



Next releases of the Dissemination and Exploitation Reports (respectively, deliverables D20 and D32) will be provided months M24 and M36.

2 Dissemination and exploitation

This section presents our dissemination and exploitation strategy (unchanged since D3), action items undertaken or to undertake 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
 - tested and packaged releases of the platform in an easy-to-install form;
 - documentation and examples of use for the platform and selected plug-ins;
 - 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*

As the platform has not been released yet, our focus is more on disseminating information than expecting some feedback/contribution from the external world.

2.2.1 Advertisement

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

2.2.1.1 Internal dissemination.

During the RODIN kickoff meeting (October 4-6, 2004) in Newcastle the exec board decided to organize a 3 day workshop with the aim to synchronize and speed up the project work on different case studies and to establish the common understanding in this work by bringing together people involved in them. During this workshop Jean-Raymond Abrial (ETHZ) introduced the concepts of practical system modelling and formal methods (focusing mainly on Event-B), as well as discussed a disciplined and practical approach to constructing a thorough requirements document, starting with a clear taxonomy of the requirements, followed by systematic definitions of the requirements with respect to the taxonomy. The workshop finished by practical exercise and several separate meetings discussing individual case studies. The workshop was held in Southampton (December 6-8, 2004), was attended by 22 people from 7 Rodin partners and was clearly a success.

BSCW server has been set up to enabling quick and efficient document sharing among RODIN members. This web server hosts all written documents written by members for the project during its lifetime.

2.2.1.2 External dissemination.

Information. The project plans to organize several workshops, in connection with international conferences. These conferences will be carefully chosen in order to maximize dissemination and to address targeted application domains.

- RODIN is organising the “*Workshop on Rigorous Engineering of Fault-Tolerant Systems*” at FM’05 in Newcastle on 19 July 2005¹. The proceedings of the workshop are published²: M. Butler, C. Jones, A. Romanovsky, E. Troubitsyna. Proceedings of the Workshop on Rigorous Engineering of Fault-Tolerant Systems (REFT 2005). School of Computing Science, Technical Report Series, CS-TR-915, University of Newcastle upon Tyne, UK, 2005. ISSN 1368-1060.

General description of RODIN has been published in:

- Fact-sheet on RODIN Project. Contribution to a folder with information on the main projects. D.3 unit. The Directorate Network and Communication Technologies. IST. April 2005.
- A. Romanovsky. RODIN: Rigorous Open Development Environment for Complex Systems. Presented at the Joint meeting with Luxembourg National CORRECT ([Rigorous Stepwise Development of Complex Fault Tolerant Distributed Systems: from Architectural Description to Java Implementation](#)) Project (November 24, 2004). University of [Luxembourg](#)

RODIN has been presented at the following occasions:

- The Verified Software Repository / BCS-FACS Christmas Meeting in London on 21 December 2004.
- B. Randell. RODIN: Rigorous Open Development Environment for Complex Systems. Presented at the 47th Meeting of IFIP Working Group 10.4. Rincón, Puerto Rico, USA, January 26 - 30, 2005.
- E. Troubitsyna. [RODIN \(Rigorous open Development Environment for Complex Systems\)](#). Presented at the Project Track of the Fifth European Dependable Computing Conference: EDCC-5. Budapest, Hungary, April 20- 22, 2005.
- Emtech SME Event (supported by the ARTEMIS Technology Platform for Embedded Systems and the European Commission) in Paris on 29 June 2005 (Design tools/co-design session).

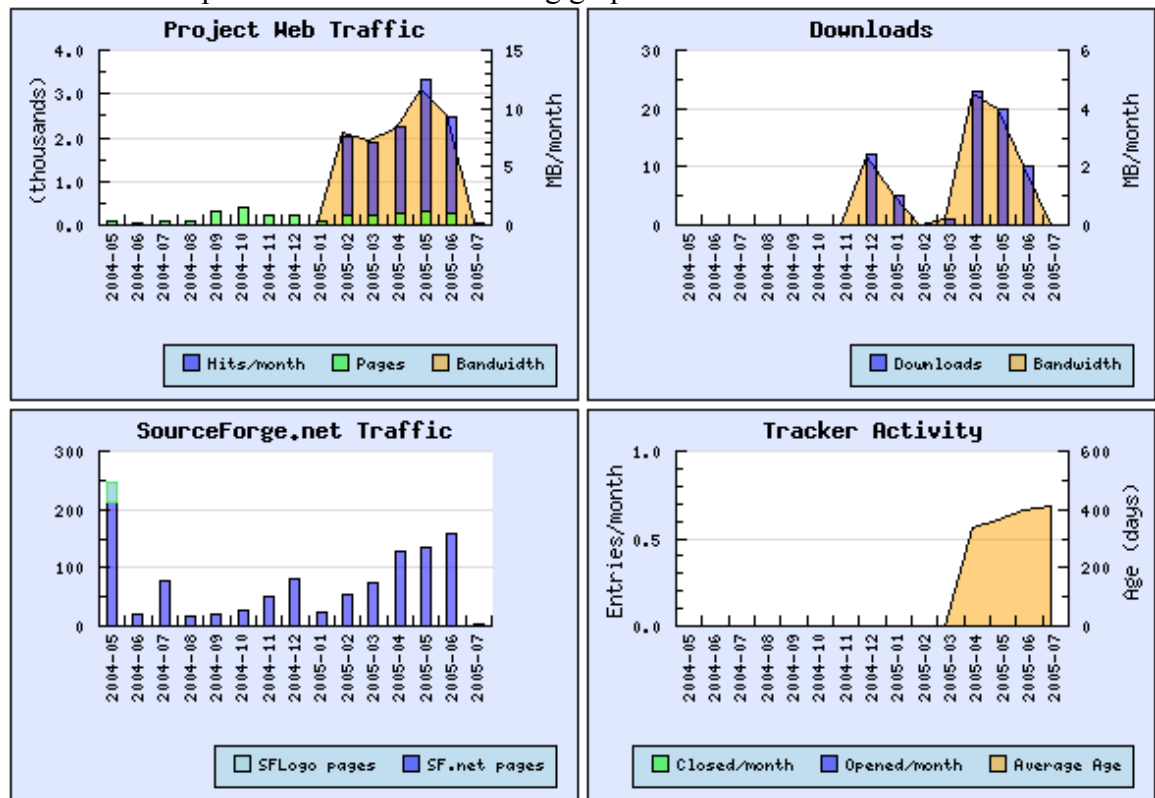
¹ http://www.csr.ncl.ac.uk/fm05/main_workshops.php?mode=info&language=english&workshop=10

² <http://www.cs.ncl.ac.uk/research/pubs/trs/papers/915.pdf>

Cliff Jones gave a talk on "Dynamically creating objects and sequencing operations" at the IFIP WG2.3 Meeting in Niagara, Canada. (Several researchers in the RODIN Project are members of this "Programming Methodology" Working Group)

Internet. Two RODIN Web sites have been set up:

- the official site, hosted by University of Newcastle and reachable at <http://rodin.cs.ncl.ac.uk/>. This site has been populated with background papers and is enriched with documents written in the consortium during this period (D1, D2, D3, D4, D5, D7).
- the developer site, hosted by sourceforge and reachable at <http://rodin-b-sharp.sourceforge.net/>. Some files have been released on this site (B latex mode). Statistics are represented in the 4 following graphs.



External resources. The project has gained a new external resource, registered on the developers' website:

- Andreas Enbacka from Turku University.

Publications. Several articles have been published or are in preparation, since D3. They are listed below:

- M. Butler, M. Leuschel, C. Snook [Tools for system validation with B abstract machines](#). presented at ASM 2005 - International Workshop on Abstract State Machines, Paris, 2005.

- M. Butler, M. Leuschel, C. Snook [Tools for system validation with B abstract machines](#). presented at Workshop on System-Level Verification and Validation. Co-located with DATE 2005, Munich, 2005.
- J. Coleman, C. Jones, I. Oliver, A. Romanovsky and E. Troubitsyna. [RODIN \(Rigorous open Development Environment for Complex Systems\)](#). In Fifth European Dependable Computing Conference: EDCC-5 supplementary volume. Budapest, Hungary, April 20- 22, 2005. pp. 23-26
- A. Iliasov, A. Romanovsky. [Exception Handling in Coordination-based Mobile Environments](#). In Proc. 29th Annual International Computer Software and Applications Conference (COMPSAC), Edinburgh, Scotland, July 26-28, 2005. IEEE CS Press. 2005.
- A. Iliasov, A. Romanovsky. [CAMA: Structured Coordination Space and Exception Propagation Mechanism for Mobile Agents](#). Presented at ECOOP 2005 Workshop on Exception Handling in Object Oriented Systems: Developing Systems that Handle Exceptions. July 25, 2005. Glasgow, UK.
- A. Gorbenko, V. Kharchenko, P. Popov, A. Romanovsky. [Dependable Composite Web Services with Components Upgraded Online](#). In R. de Lemos, C. Gacek, A. Romanovsky (Eds). Architecting Dependable Systems ADS III. LNCS 3549. 2005 pp.96-128
- T. Anderson, M. Feng, S. Riddle, A. Romanovsky. [Error Recovery for a Boiler System with OTS PID Controller](#). In Proc. 10th IEEE International Workshop on Object-Oriented Real-Time Dependable Systems (WORDS 2005), Sedona, Arizona, 2-4 February 2005, pp. 113 - 120. IEEE CS Press. 2005.
- A. Romanovsky. [RODIN - Rigorous Open Development Environment for Complex Systems](#). ACM Software Engineering Notes. 30 (1) January 2005. p.3
- V. Khomenko, A. Kondratyev, M. Koutny, W. Vogler: [Merged Processes - a New Condensed Representation of Petri Net Behaviour](#). Proc. of CONCUR'2005, Abadi, M., Alfaro, L. de (Eds.). Springer-Verlag, Lecture Notes in Computer Science, to appear. 2005.
- V. Khomenko: [Computing Shortest Violation Traces in Model Checking Based on Petri Net Unfoldings and SAT](#). Technical Report CS-TR-841, School of Computing Science, University of Newcastle upon Tyne (2004).
- C. Snook, M. Poppleton, I. Johnson. [The engineering of generic requirements for failure management](#). In Proc. REFSQ05: Requirements Engineering For Software Quality, 15pp., 13-14 June 2005, workshop at CAISE05, Porto, Portugal.
- C. Snook, M. Poppleton, I. Johnson. [Towards a methodology for rigorous development of generic requirements patterns](#). In Proc. REFT05: Rigorous Engineering for Fault-Tolerance, 19 July 2005, workshop at FM05, Newcastle, UK.

RODIN members have presented several papers at the occasion of the [REFT](#) workshop:

- Linas Laibinis, Elena Troubitsyna, Sari Leppanen, Johan Lilius, Qaiser Malik. [Formal Service-Oriented Development of Fault Tolerant Communicating Systems](#)
- Colin Snook, Michael Poppleton, Ian Johnson. [Towards a methodology for rigorous development of generic requirements patterns](#)

- Alexei Iliasov, Linas Laibinis, Alexander Romanovsky, Elena Troubitsyna. [Towards Formal Development of Mobile Location-based Systems](#)
- Joey Coleman, Cliff Jones. [Examples of how to Determine the Specifications of Control Systems](#)
- Dubravka Ilic, Elena Troubitsyna. [Modelling Fault Tolerance of Transient Faults](#)
- Divakar Yadav, Michael Butler. [Application of Event B to Global Causal Ordering for Fault Tolerant Transactions](#)
- Joey Coleman. [Examining BPEL's Compensation Construct](#)
- Alexei Iliasov, Victor Khomenko, Maciej Koutny, Alexander Romanovsky. [On Specification and Verification of Location-based Fault Tolerant Mobile Systems](#)

2.2.2 Synergy

Our objective is to build synergy with other projects, which could complement / strengthen our activities.

RODIN partners have been working on setting joint cooperation and dissemination with a number of Call 2 IST projects. In particular :

- RODIN representatives took part in the Project Launch Event (November 4, 2004) and the Concentration Meeting (July 12, 2005) organized by IST in Brussels.
- RODIN is involved with representatives of DeDySis, GORDA, and MADAM projects in the organisation of the Track on Dependable and Adaptive Distributed Systems at the ACM Symposium on Applied Computing, Dijon, France, April 23-27, 2006. (<http://www.dedisy.org/sac06/>)
- Prof Shmuel Katz (Head of Formal Method Lab of AOSD) was invited to give a talk at the REFT workshop (Newcastle, UK, July 19, 2005)
- A. Romanovsky is attending a one-day workshop organized by AOSD (July 24, 2005 Glasgow, UK).

Newcastle is involved in CORRECT Luxembourg National Project on Rigorous Stepwise Development of Complex Fault Tolerant Distributed Systems: from Architectural Description to Java Implementation (2004-2007), led by Prog. N. Guelfi (University of Luxembourg) - <http://se2c.uni.lu/tiki/tiki-index.php?page=CorrectOverview>. Two representatives of CORRECT are members of the RODIN associates group. A. Romanovsky took part in two CORRECT plenary workshops. CORRECT work is very much relevant to RODIN topics. It is hoped that this cooperation will result in strengthening RODIN, in making RODIN methodology more applicable to designing systems using UML-based methods supporting Coordinated Atomic actions and, possibly, in developing a new plug-in.

Newcastle has established a close cooperation with the group of Prof C. Rubira (University of Campinas, Brazil), collaborating on the topics of formal modelling of fault tolerant software architectures. A researcher from this group, Fernando Castor, is visiting Newcastle (June 1 - September 30, 2005), working on Alloy modelling and verification of the fault tolerance properties of systems developed using atomic action and exception handling mechanisms.

2.2.3 IIG

The Industry Interest Group is today composed of 14 members: Adelard, Alstom, AWE, CETIC, DGA, Escher, Gemplus, IBM, ICCG, Qinetiq, RATP, Stmicroelectronics, Systemerel and VTT.

Qinetiq, CETIC and Systemerel have joined since October 2004.

ClearSy and CETIC met in Aix en Provence and in Charleroi. CETIC provided a training session related to the *Objectiver* tool (requirements engineering). Combination of B, Objectiver and RODIN is envisaged. CETIC has presented a paper during the [REFT](#) workshop.

DGA proposed to support RODIN by completely funding at least one PhD in 2005, in relation with simulation and RAMS³ studies, but ClearSy failed to find a good candidate for that PhD. ClearSy will proceed to an other attempt in 2006.

Active search for new members will be launched when concrete results (ie demonstrator) are available.

2.2.4 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)
- Ron Van der Meyden (University of New South Wales)
- Nicolas Guelfi (University of Luxembourg)
- Reza Razavi (University of Luxembourg)
- Jean Louis Boulanger (Université Technologique de Compiègne)
- Pierre-Yves Schobbens (Facultés Universitaires Notre-Dame de la Paix / Namur)
- Christophe Ponsard (CETIC Applied Research center / Charleroi)
- Nicole Levy (University of Versailles)
- Jim Woodcock (University of York)
- Dominique Cansell (Loria, Nancy)
- Cecilia Rubira and Fernando Castor (University of Campinas, Brazil)

Nicole Levy, Jim Woodcock, Dominique Cansell, Cecilia Rubira and Fernando Castor have joined the associates group during the last period.

³ Reliability, Availability, Maintainability, Safety

2.2.5 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:

- Graphical model animation
- Documentation generation
- Requirements manager

And be will integrated to the final platform.

Moreover, RATP has ordered the development of a trackside data verification software (initially based on model-checking) which will embed part of RODIN platform (predicate parser and type-checker) within Eclipse platform.

This plugin may be eventually ported to the RODIN platform when available.

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.