

COMPREHENSIVE MODELLING FOR ADVANCED SYSTEMS OF SYSTEMS

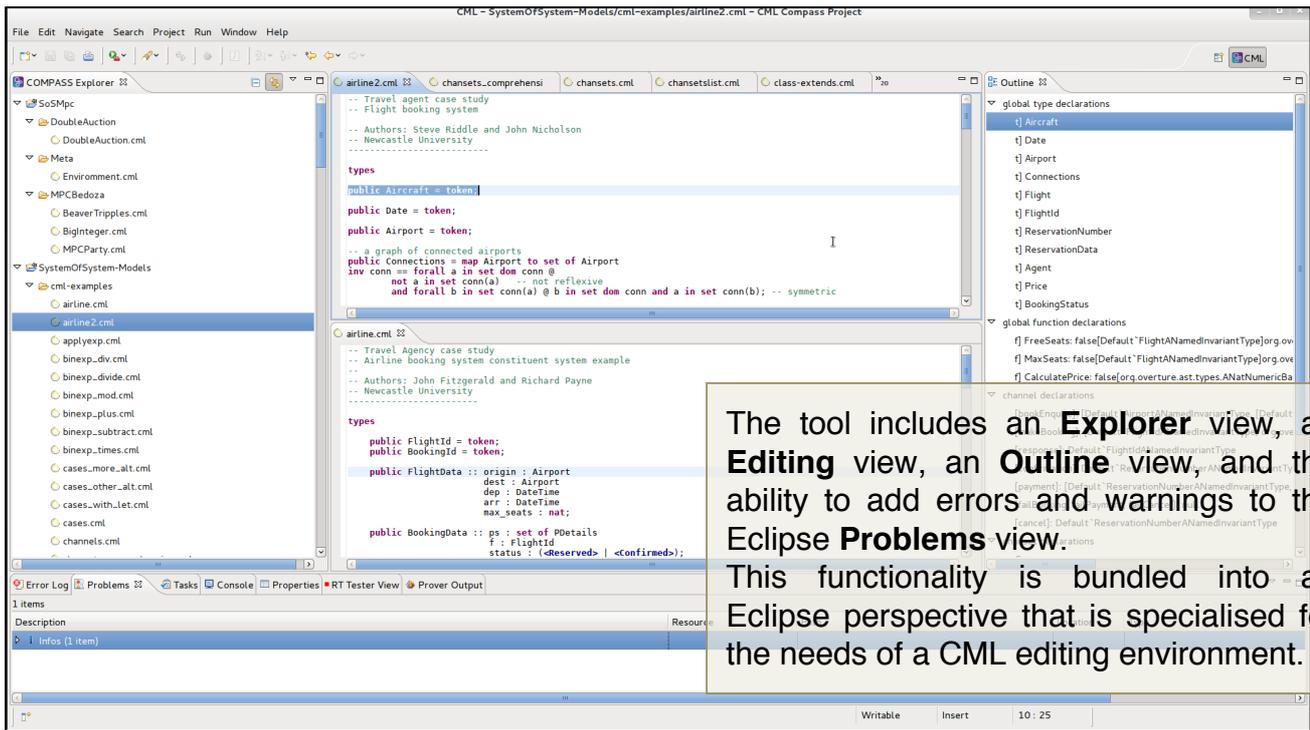


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COMPASS CML Tool: Initial release

We are pleased to announce the initial release of the COMPASS CML tool.

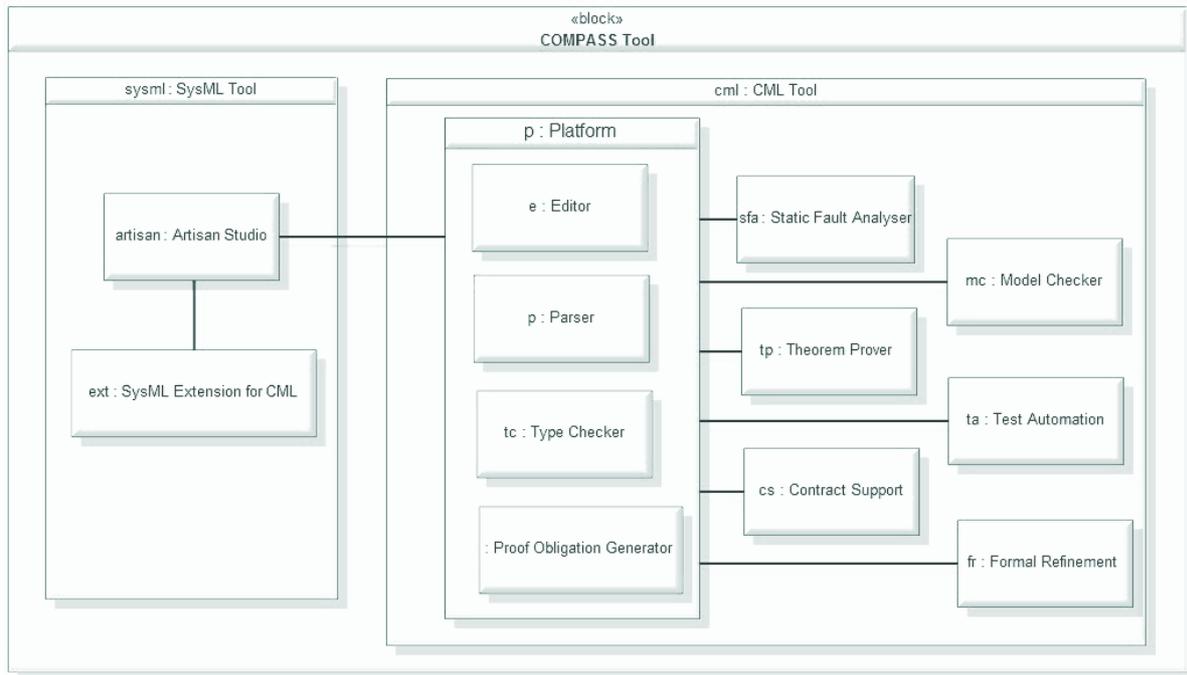


COMPASS is developing methods and tools to support model-based engineering of Systems of Systems (SoS). We do this by integrating well-established modelling techniques, extending them with features needed for SoS development. Our main goal is to allow SoS developers to verify key properties – such as safety, liveness and dependability – of different SoS architectures and designs.

SoS Engineering involves a wide range of stakeholders, and so there is no “one size fits all” notation for modelling or design. The COMPASS technology integrates graphical views of system structure and functionality (in the

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SysML notation) with textual representations of data, operations and communications given in the COMPASS modelling language **(CML)**. CML is inspired by established modelling notations CSP and VDM which, because of their formal semantics, bring the possibility of machine-supported checking of models and verification of SoS properties “under the hood”. Links between the SysML and CML levels will enable users to work with either SysML annotated graphical descriptions, or with the textual CML models, or both.

The COMPASS tools consist of a SysML base, built on Atego’s Artisan Studio tool, and a CML base built on the Eclipse platform (above). We are developing the CML base in parallel with the language itself. CML₀, the initial version, was released in Spring 2012. This sets out the core syntax of the language. The first major release of CML with formally defined semantics, CML₁, was released in the Autumn. The initial CML tool release is a proof of concept. We have initial

versions of all of the core components, implementing about 85% of the language. The Eclipse-based IDE is shown on Page 1. The only CML “phrases” missing from the parser are those that are provided for convenience rather than strict necessity.

The core typechecker covers the subset of CML that is derived from VDM, and provides basic consistency for the CSP-derived portions. The core interpreter for the CML language only provides support for a limited subset of the CSP-derived portions of CML but, as with the typechecker, the VDM-derived parts are completely supported. Use of the interpreter is restricted to the command-line tool, rather than the IDE.

The next tool release

The upcoming winter release, scheduled for late January 2013, is proceeding well. This will integrate the interpreter into the IDE and provide a debugging perspective. We will also include a proof obligation generator

to create the extended consistency checks needed to show interesting correctness properties of SoS models.

The Winter release is the first release aimed at general (albeit early) use for the COMPASS project case studies.

Getting the COMPASS CML tool

All of the source code and releases of the COMPASS CML tool are available on the SourceForge.net open-source hosting platform. The project page for COMPASS is at:

sourceforge.net/projects/compassresearch/

From there one can download pre-built tool releases and obtain the entire source code repository.

Project Update

Over the past 6 months, members of the COMPASS project held a plenary meeting, presented papers at several conferences, and made progress with the technical work.

The June Plenary Meeting brought together representatives of all project partners to present progress on methods, tools, the CML language, Case Studies and CIG challenge problems.

Conference highlights over the summer included the INCOSE Symposium, IEEE SoSE Conference, FM 2012 and associated events (Overture workshop and UTP Symposium), and the PRO-VE conference. COMPASS was well represented at these events,

participating in panel sessions, giving keynote talks and presentations.

The IEEE SoSE conference, in particular, gave an opportunity for detailed review of many strands of COMPASS research. Six papers were presented over two 'special sessions', which introduced the features of CML, the application of VDM-RT to modelling SoS, the COMPASS Tools Vision, SoS Requirements Engineering and Architecture Interface Specification.

All paper presentations were well received, with the paper "Features of CML: a Formal Modelling Language for Systems of Systems" by Jim Woodcock, Ana Cavalcanti, John Fitzgerald, Peter Gorm Larsen, Alvaro Miyazawa and Simon Perry going on to receive a best paper award.

A full list of publications can be found on the COMPASS webpage, at *www.compass-research.eu/publications.html*. This includes links to copies of the papers or proceedings, where available.

Upcoming Conferences and Workshops

The **Int. Conference on Testing Software and Systems** (ICTSS'12) in Aalborg, Denmark in November will include a paper from Jan Peleska on Qualification for Model-Based Testing Tools.

ictss2012.aau.dk

In March 2013, Jan Peleska will give an Invited talk on the State of the Art in Model-Based testing, at the **Model Based Testing** workshop 2013 (MBT 2013) in Rome. **www.mbt-workshop.org**

A paper on Fault-Based Modelling for SoS is in review for the International Symposium on Autonomous Decentralized Systems (**ISADS 2013**) in Mexico in March 2013.

www.isadsmexico2013.mx

Papers are also in review for the International Conference on Software Testing, Verification and Validation (**ICST 2013**), Luxemburg in March 2013.

www.icst.lu

Finally, several papers are currently in preparation for submission to the **IEEE Systems Conference 2013** taking place in April 2013, in Florida. ieeesyscon.org

Public deliverables

Public deliverables from the first 12 months of the project are available from the COMPASS website. These include a report on guidelines for SoS requirements, architectural models, combining SysML and CML, and definitions of CML.

Deliverables to be published over the next 6 months include reports on Guidelines for SoS Systems Engineering, Compositional Analysis of CML models, the next definition of CML and next tool release. These will be available from the COMPASS website once they have been issued.

COMPASS Interest Group (CIG)

Members of the CIG proposed Challenge Problems to help develop and evaluate the COMPASS tools. These problems have been reviewed and a selection will be analysed

using existing methods and tools over the next 6 months. More information about Challenge Problems will be included in the next newsletter. For a current list of CIG members and details on how to join, see the CIG section of the COMPASS website.

Next Issue

The next issue of the COMPASS Newsletter will be published in Spring 2013.

