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Comprehensive Modelling for Advanced Systems of Systems

C O M P A S S

## **Dissemination Report 3**

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## Abstract

This report summarises the dissemination activities carried out during the third year of COMPASS. This year has included enhancements to the COMPASS website, two webinars in the INCOSE SoS Working Group series, newsletters, white papers and technical publications, recruitment of members of the COMPASS Interest Group, two CIG workshops and the Summer School.

With the successful dissemination that has taken place during this final year, we conclude with a forward look to the COMPASS legacy. This is addressed in more detail in D52.4, Annual Exploitation Report 3.

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## 1 Introduction

This report provides a summary of the dissemination activities which have taken place during Year 3 of COMPASS. Section 2 summarises progress and usage of the website, social media, webinars and publications, including scientific and technical, white papers and newsletters. This is followed by a summary of COMPASS Interest Group (CIG) activity.

Section 3 reviews the achievements from the year, and looks ahead to plans for looking after the COMPASS legacy.

## 2 Dissemination activities in Year 3

The following sections discuss progress in the various dissemination activities over Year 3 of COMPASS.

### 2.1 Website and Social Media

The COMPASS website ([www.compass-research.eu](http://www.compass-research.eu)) is kept up to date with news, publications and public deliverables. Additions which have been made this year include:

- Guide to COMPASS deliverables
- Emphasis given to news and events
- Tutorial videos

The guide to deliverables, illustrated in Figure 1, was added in response to a comment from a COMPASS Interest Group member. The guide summarises key content according to the topics the reader is interested in, rather than by Theme and Workpackage. This helps to promote the accessibility of the key material.

Increased emphasise given to news and events, and social media, on the home page is illustrated in Figure 2. Previously this information was presented at the bottom of the page, which became an issue as more content was added to the page.

Tutorial videos were first added to the site in November 2013. There are now a total of 21 videos covering the core Symphony tool, Theorem proving,

What are you interested in?	Key Deliverables now available	Notes
The COMPASS SoS Engineering Guidelines	D21.3	Final version D21.6 due Sept 2014
SoS Engineering Guidelines: Focus on Requirements	D21.1	Additional information on Guidelines for SoS requirements D21.1 Appendix
SoS Engineering Guidelines: Focus on Architecture (including D&F the COMPASS)	D21.2	Final version D21.5 due Sept 2014.

Figure 1: Guide to COMPASS Deliverables

Model checking, Collaborative modelling, RT Tester and Fault analysis. The videos are hosted on YouTube, which has added to the range of social media outlets on which COMPASS is represented. Analytic data on downloads of these videos is presented in Section 2.1.1.

The twitter account @Compass\_SoS was started in May 2013. The number of followers has grown from 23 at the end of year 2 to 46. Activity around the twitter feed has been greatest during conferences such as the INCOSE International Symposium, IEEE SoSE and IEEE SysCon, with project members writing tweets on their own accounts which are retweeted by COMPASS. In this way the feed has been modestly successful in picking up new followers and driving people to the website.

Figure 2: Home page: News, events and twitter

As mentioned above, COMPASS also now has a YouTube account which is used to host the Tutorial Videos. This brings with it a Google+ account. Newly uploaded videos are promoted with both Twitter and Google+ which also helps to drive traffic to the website.

### 2.1.1 Analytics

Access to the website continues to be tracked using Google Analytics. Figures 3 and 4 show a monthly summary of website access and unique visitors from December 2011 to August 2014.

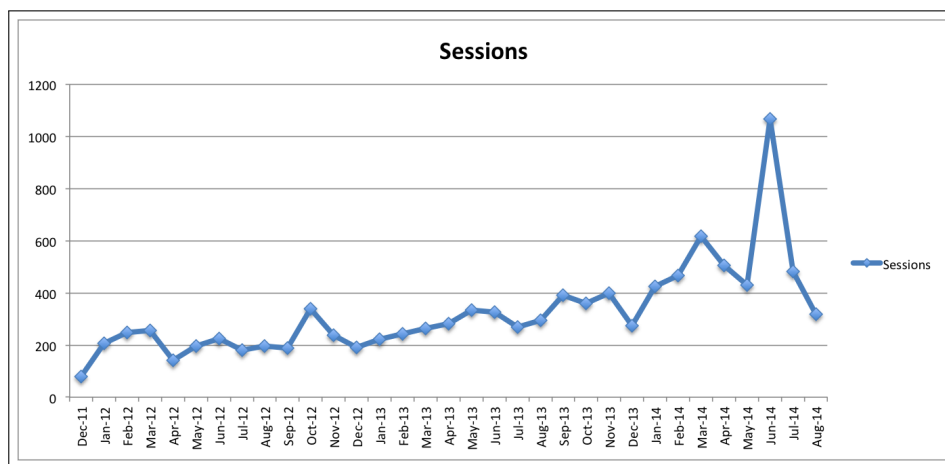


Figure 3: Website sessions by month from December 2011 to August 2014

The figures illustrate a steady increase in sessions and users over the three years, with a noticeable rise in 2014. Most noticeable is a peak in June, which corresponds with the IEEE SoSE conference in Adelaide. It has been reported in previous dissemination reports that the percentage of new visits has held at around 50% for most of the project duration, with small jumps corresponding with conference attendance (INCOSE, SoSE, FM). Figure 5 illustrates that this trend has continued, with new visits (new sessions) increasing in June corresponding with IEEE SoSE. The INCOSE Symposium at the beginning of July has not had a similar effect. Figure 5 also shows that the number of pages per session stays at around 2 - 2.5, but dips in June: it's not surprising that with more new sessions, the average number of pages per session will drop.



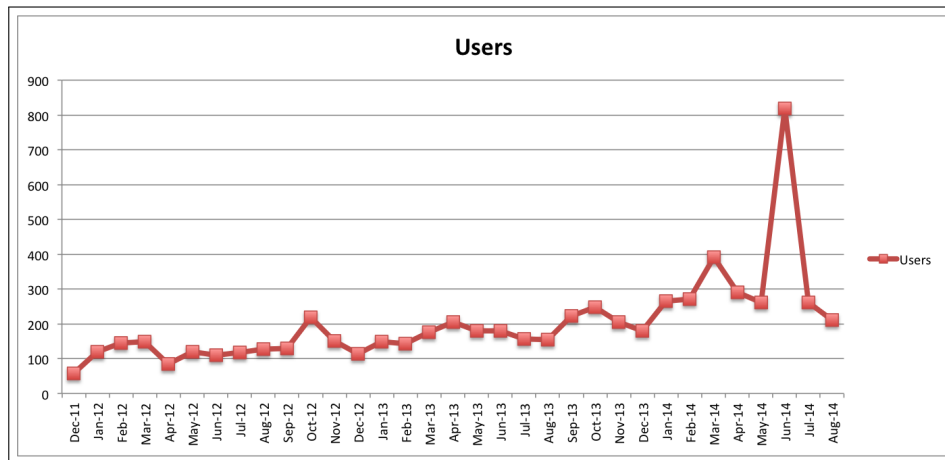


Figure 4: Website unique visitors by month from December 2011 to August 2014

### 2.1.2 Sources

In Year 2, we reported that 54% of traffic to the website came from search engines, with 32% direct traffic and 14% referral from another site. The majority (72%) of direct traffic was to the home page, with 14% direct to the deliverables page. These figures do not exclude traffic from project partners.

In Year 3, direct traffic accounted for 44% of visits, 36% from search and 14% referral. Social traffic is now identified separately, and accounts for 6% of traffic. 40% of direct traffic is to the home page, with 35% heading for the Summer School information and 11% the deliverables.

The top referral site is wikipedia at 18%. Other than project partner sites, other referrers include sourceforge, cordis and the INCOSE UK wiki. Social referral shows that LinkedIn, Twitter and YouTube are the most common sources of visitors to the site.

In conclusion we can see that activity on the website has increased in the third year and shown a clear peak around some conferences. Traffic has been driven from a number of sources, with clear evidence that use of social media, YouTube videos, wikipedia and sourceforge have been effective in driving traffic.

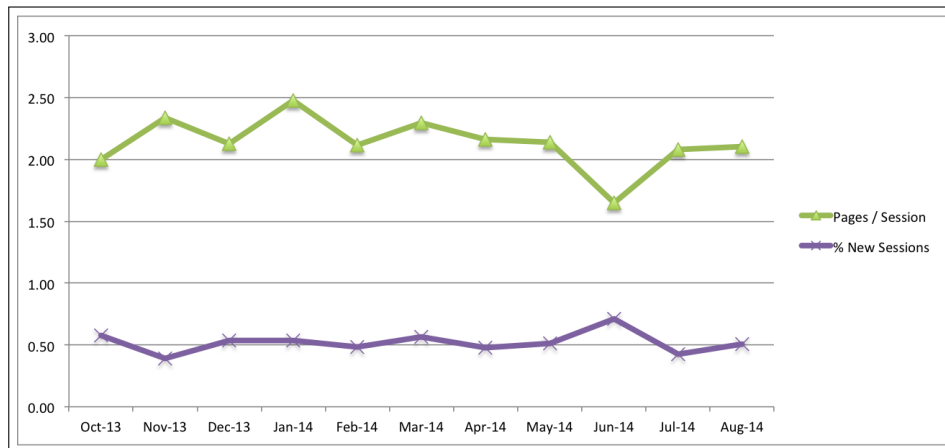


Figure 5: Website pages/session and % new sessions in 2014

## 2.2 INCOSE SoS Working Group

COMPASS has been very active with the INCOSE SoS Working Group in 2014. In addition to attending meetings of the working group, we have contributed a case study to their repository and have taken part in two webinars in the series coordinated by Eric Honour. This followed a successful first webinar in 2013 which introduced the COMPASS project.

In May, Claire Ingram (Newcastle) and Paolo Casoto (Insiel) presented a webinar on the Insiel Emergency Response SoS Case Study. This introduced the case study and summarised the modelling and fault analysis work undertaken on it.

A further webinar in September, presented by Claire Ingram and Richard Payne (Newcastle), focussed on Architectural Patterns. This webinar proved very popular, with more than 60 participants during the talk, and 10 requests for the slides from participants after the talk.

## 2.3 White papers

A further four white papers were published this year, bringing the total to eight. White papers present short entry-level technical reports on topics within the project engineering.

The full list of paper titles is:

- WP01: Guidelines for SoS Requirements, Simon Perry and Jon Holt

- WP02: SysML Blocks in CML, Alvaro Miyazawa, Lucas Lima and Ana Cavalcanti
- WP03: SysML State Machines: a formal model for refinement, Alvaro Miyazawa and Ana Cavalcanti
- WP04: A Dwarf Signal in CML, Simon Foster, Jim Woodcock
- WP05: Modelling Patterns for Systems of Systems Architectures, Claire Ingram, Richard Payne, Simon Perry, Jon Holt, Finn Overgaard Hansen, Luis D Couto
- WP06: An Introduction to Systems of Systems: Underlying Concepts, Claire Ingram, Alexander Romanovsky
- WP07: An Introductory Comparison of COMPASS Case Studies, Claire Ingram, Alexander Romanovsky
- WP08: Traceable Engineering of Fault-Tolerant SoSs, Zoe Andrews, Claire Ingram, Richard Payne, Alexander Romanovksy, Jon Holt, Simon Perry

The white papers can be found on the project website.<sup>1</sup>

## 2.4 Conferences and Publications

COMPASS representation at conferences and workshops has continued to be strong in the final year. Publication venues from the past year are listed below, with citations to the relevant paper in the References section of this report.

Special mention in this section goes to Claire Ingram, Richard Payne, Simon Perry, Jon Holt, Finn Overgaard Hansen and Luis Couto who won Best Overall Paper at SysCon 2014 for their paper, *Modelling Patterns for Systems of Systems Architectures*, and Claus B Nielsen and Peter Gorm Larsen for the Best Paper Authored by a Student, *Collaborative Formal Modeling of System of Systems*, also at SysCon.

- IEEE Systems Journal [HPP<sup>+</sup>14]
- IEEE Systems Conference (SysCon 2014), Vancouver, March 2014 [NL14, IPP<sup>+</sup>14]

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<sup>1</sup>[www.compass-research.eu/whitepapers.html](http://www.compass-research.eu/whitepapers.html)

- Sixth NASA Formal Methods Symposium, Houston, Texas, April 2014 [AOS<sup>+</sup>14]
- Workshop on Engineering Dependable SoS (EDSoS), Newcastle, UK, May 2014 [ABPK14, CFP14, IRALA14]  
This workshop was organised by members of COMPASS as part of the European Dependable Computing Conference (EDCC 2014)
- 19th International Symposium on Formal Methods (FM 2014), Singapore, May 2014 [ASW14]
- 5th International Symposium on Unifying Theories of Programming (UTP), Singapore, May 2014 [FMWC14, FZW14]
- 9th International IEEE Systems of Systems Engineering Conference (SoSE 2014), Adelaide, June 2014 [BFP<sup>+</sup>14, IAPP14]
- 4th IEEE track on Collaborative Modelling and Simulation in IEEE WETICE 2014[NLL14]
- 24th INCOSE International Symposium, Las Vegas, Nevada June 2014 [BFPK14, AIP<sup>+</sup>14]

In addition to these publications, the following keynote talks have been presented in the third year of COMPASS.

- John S. Fitzgerald, Peter Gorm Larsen, Jim Woodcock. *Foundations for Model-Based Engineering of Systems of Systems*. CSDM, Paris, December 2013: 1-19 [FLW14]
- Jim Woodcock. *Engineering UToPiA - Formal Semantics for CML*. FM 2014: 22-41. [Woo14]
- Jim Woodcock. *The COMPASS Modelling Language: Timed Semantics in UTP* Communicating Process Architectures 2014, Oxford, August 2014 [WBCF14]
- Claire Ingram. *Towards a roadmap of modelling and simulation in SoSs*, Workshop on Engineering Dependable Systems of Systems (ED-SoS), Newcastle, UK. May 2014.

A COMPASS article was also included in a special edition of ERCIM News (the newsletter of the European Research Consortium for Informatics and Mathematics), Issue 97, published in April and devoted to Cyber-Physical Systems<sup>2</sup>.

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<sup>2</sup><http://ercim-news.ercim.eu/en97/special>

Planned future dissemination activities include:

- September 2014, Claire Ingram and Ken Pierce, *A Vision for Future Model-Based Support for Dependable Cyber-Physical Systems of Systems* at the Workshop on Tools and Methods for Cyber-Physical Systems of Systems, organised by the EU FP7 Support Action CPSoS, Bertinoro, Italy.
- September 2014, Claire Ingram will give an invited talk on the COMPASS roadmapping outputs at the 3rd European Experts' Workshop on Cyber-Physical Systems Event, organised by the CyPhERS project (Cyber-Physical European Roadmap and Strategy), Stockholm, Sweden
- October 2014, Jim Woodcock, *Contracts in CML*. ISoLA: Leveraging applications in formal methods, Corfu.
- October 28, a tutorial *New Tool Support for Modelling and Analysis of Faults in SysML* will be given at the 4th International Symposium on Model Based Safety Assessment, Munich.
- 6 October, John Fitzgerald will give the opening keynote at the 15th IFIP Working Conference on Virtual Enterprises. The talk *Collaborative Systems of Systems need Collaborative Design* presents results from COMPASS with a focus on cross-disciplinary collaboration needed for next generation SoSs composed of cyber and physical elements [FBLS14]
- 3-7 November 2014, Jan Peleska will present papers at ICFEM in Luxembourg on *Model-Based Equivalence Class Testing and SysML Test Models* [PIHB<sup>+</sup>14]
- 14 November 2014, John Fitzgerald will provide a targeted keynote on the research agenda in contractual model-based methods for SoS Adaptation and Evolution at the workshop organised by DANSE in the 5th Intl. Conference on Complex Systems Design and Management (CSD&M), Paris <http://www.csdm2014.csdm.fr/-SoSAE-.html>
- 18 November 2014, Zoe Andrews will present a poster on COMPASS achievements at the INCOSE UK Annual Systems Engineering Conference, RAF Cosford, Wolverhampton.

## 2.5 Software downloads

The Symphony Tool is hosted at Sourceforge, with development now being hosted on github. Over all releases to date, there have been 524 downloads tracked since 1st May 2013, with the United Kingdom, Spain, US, India and Denmark the top 5 countries. The most recent release, version 0.3.4, has had 72 downloads since release at the beginning of July.

## 2.6 Newsletters

Two newsletters have been released during the year. Newsletter 4, released in November 2013, introduced the first release of the Symphony Tool and reported on an experiment on collaborative SoS development run by COMPASS members. Newsletter 5, released in May 2013, promoted the September Summer School and summarised workshops recently attended. Standing items in all newsletters include upcoming conferences, news updates and recent public deliverables, and information about the COMPASS Interest Group.

Newsletters are distributed to CIG members, sent to project partners for distribution and made available on the web site<sup>3</sup>.

## 2.7 COMPASS Interest Group (CIG)

Members of the COMPASS Interest Group are listed in the third Annual Exploitation Report [PLR14]. There are now 20 members, 5 having joined since year 2. Activity with the CIG this year has included an extra CIG case studies workshop, in Amsterdam, January 2014, and the CIG Challenge Problem Workshop in London in September. The January CIG meeting was an opportunity for non-UK CIG participants to learn more about the COMPASS approach and technology through presentations on the two COMPASS case studies (Audio-Video and Emergency Response).

The Challenge Problem workshop was run in conjunction with the COMPASS Summer School, both reported fully in separate deliverables([Rid14a, Rid14b]).

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<sup>3</sup>[www.compass-research.eu/newsletters.html](http://www.compass-research.eu/newsletters.html)

### 3 Summary and Plans for the COMPASS Legacy

The final year of COMPASS has included several successes and achievements, building on the successes of the previous years:

- Presence at a key SoS and Formal Methods conferences, including SoSE, INCOSE, SysCon, FM, NASA FM Symposium.
- Successful CIG workshop and Summer School events.
- Further enhancements to the website to improve access to key documents and resources.
- Increased numbers of new users on the COMPASS website
- Increased use of social media (LinkedIn, twitter, YouTube) driving traffic to the site.
- Active participation with related projects and working groups, in particular INCOSE SoS working group.

As the COMPASS project concludes, plans for a transition to the legacy of COMPASS are in place. These include the setting up of an Advisory Board, consisting of key members of the CIG and consortium, to promote the continued development of the Symphony toolset, together with associated guidelines for application of the techniques. More detail on the plans for future exploitation is presented in Deliverable D52.4[PLR14].

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