



**Model and Inference  
Driven Automated testing  
of Services architectures**



# MIDAS Newsletter

## EDITORIAL

Dear Reader,

Welcome to our tenth MIDAS Newsletter!

The Project comes to its end and main results are going to be shown in practice. The [EU SHIP project](#), its [Software Testing Innovation Alliance](#) and the [MIDAS EU project](#) announce the creation of the European Software Testing Innovation Alliance. We believe that the MIDAS contribution to the bootstrap of EuroSTIA is the most valuable result that guarantees the promotion of new innovation testing methods and technologies to be applied into European SMEs in practice.

In this tenth Newsletter you will read about:

- Release of D3.7 Final assessment of the component prototypes for the model-driven automated generation of functional testing
- The promotion of EuroSTIA – European Software Testing Innovation Alliance
- Release of D4.6 Final assessment of the components prototypes for the SOA automated test execution environment
- The meeting of the Spanish Alliance for Innovation in Software Testing in Zaragoza
- The new MIDAS Videos section in the website
- Release of D5.6 Final assessment of the components prototypes for the intelligent planning and scheduling of test cases
- Release of D7.5 Supply Chain Management pilot – final prototype
- Release of D9.5 Report on the impact of the MIDAS testing framework on test standards development
- Release of D9.6 Dissemination and collaboration periodic Report
- UGOE Partner

Enjoy your reading!

MIDAS Consortium

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### D3.7 released

Final assessment of the component prototypes for the model-driven automated generation of functional testing, has been delivered

Within this document, we provide a final description of the created test methods and their implementation within MIDAS. To this aim, this document contains a full description of all testing features. First, we summarize the functionality that we implemented for each test method. Then, we give an overview on the concrete MIDAS components that are the result of the development. Afterwards, we discuss the test methods with respect to the pilots to describe the practical experiences we gained so far. The results with the pilots are preliminary and the final evaluations will be presented in deliverables D7.4 and D7.5 for the health care and logistics pilot, respectively.



## EuroSTIA – European Software Testing Innovation Alliance

The [EU SHIP project](#), its [Software Testing Innovation Alliance](#) and the [MIDAS EU project](#) announce the creation of the European Software Testing Innovation Alliance or EuroSTIA for short.

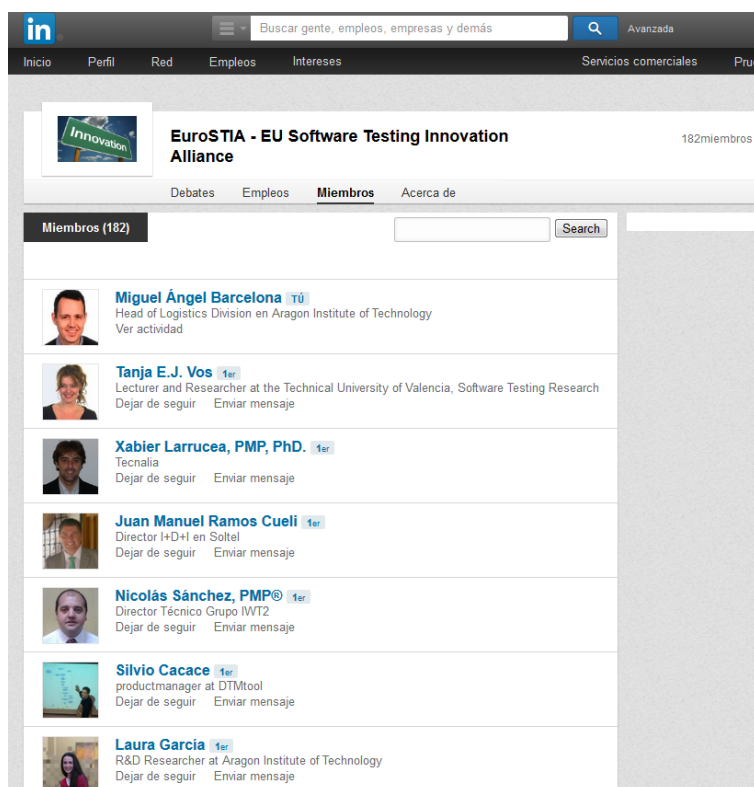
The objective of this EuroAlliance is to bring together key actors in Europe on software testing in order to work together to improve innovation support and technology transfer from universities to companies in the area of software testing. This way we want to solve software testing problems, tackle challenges, remove barriers and execute projects that induce small-step change that has impact in research, in practice, in business or in education. The final results being better software quality.

This alliance emerges from the join of the [Spanish Software Testing Innovation Alliance](#) and the [MIDAS Community](#), as a result of looking for synergies at EU level in order to promote the adoption of software testing into SMEs.

The alliance is open to:

- SMEs: the core of the alliance and main benefit of the adoption of innovation testing methods and technologies in practice.
- Large enterprises: in particular large enterprises in domains such as telecom, nuclear, defense, transportation, Internet of Things, have enormous testing needs in order to develop and deploy dependable and secure critical software and may be users of different testing solutions of the community.
- Academics: there are several EU innovative projects addressing testing topics relevant for the research community, so feedback concerning the project's approaches, the use, the improvement and the realization of innovative and/or standards testing tools, will be crucial for its success. We want to validate EU research at international academic events.
- Developers of testing methods and tools: developers and researchers will have access to different testing platforms and may share their knowledge and advancements in the community.
- Public administrations: innovative testing solutions could lower the integration, testing and maintenance costs of systems such as ones for managing healthcare, social and environmental policies. In some specific domains, i.e. logistics / dangerous goods transportation, there are regulations at local, regional and national level. They may be involved to automatically generate tests that reduces bureaucracy.
- Standardization bodies: to establish international standards in different topics.
- Policymakers: With the spreading of the digital economy on the Internet of Services and Things that will involve all aspects of the citizens' everyday lives, the dependability and security of services will become a must. We will raise the awareness of the policy makers and evaluate the need or opportunity of specific regulations concerning testability and testing.

Join us at <https://www.facebook.com/groups/EuroSTIA/> and <https://www.linkedin.com/grps/EuroSTIA-EU-Software-Testing-Innovation-8437371/about>



## D4.6 Released

Final assessment of the components prototypes for the SOA automated test execution environment, has been delivered

This document summarizes the final assessment of the components that constitute the MIDAS test automation architecture for SOA testing. It consists of the components for TTCN-3 code generation from SCA/SCXML and the MIDAS DSL; the TTCN-3 compilation service; the MIDAS library for TTCN-3-based data fuzzing; the usage monitors and finally, the component for automated TTCN-3 test execution.

## Spanish Alliance for Innovation in Software Testing meets in Zaragoza

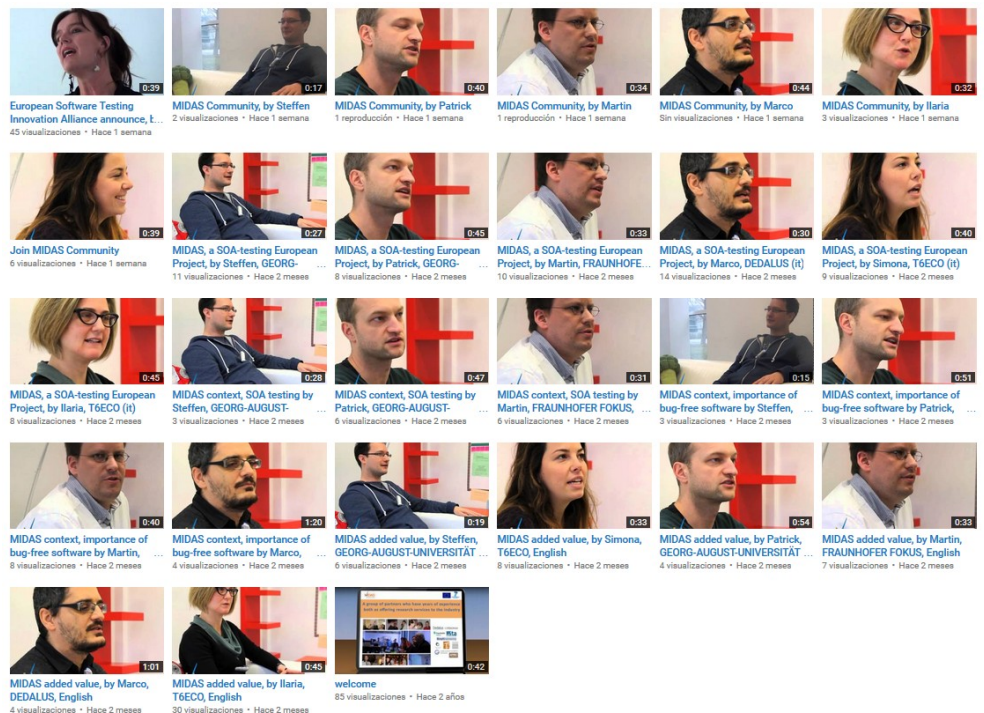
The Spanish Alliance for Innovation in Software Testing ( STIA ) is an initiative created to promote university-business collaboration in the context of software testing . The initiative, framed within the Erasmus + KA2 lines of the European Union , aims to be the focus of discussion of the mechanisms of innovation in Software Testing in the Spanish territory, with a great international projection. ITAINNOVA, a member of the Initiative, organized the third Conference on University-Industry meeting to continue with the meetings started in Valencia last April 2015 and Seville in June 2015.



## MIDAS Videos

A new section is available with a set of videos created by MIDAS members, with these contents:

- MIDAS described by project partners
- What is MIDAS? :: Qué es MIDAS? :: Che cosa è MIDAS? :: Was ist MIDAS? :: Quel est MIDAS? :: Kaj je MIDAS?
- Why bug-free software is required?
- Why is SOA testing a difficult task?



*MIDAS Youtube channel*

## D5.6 Final assessment of the components prototypes for the intelligent planning and scheduling of test cases

The deliverable assess the final results of the deliverables D5.2, D5.3 and D5.4.

This document summarizes the final assessment of the components that constitute the MIDAS test automation architecture for SOA testing. It consists of the scheduling tools for the 3 testing method: the functional, security, and usage-based.

## D7.5 Supply Chain Management pilot – final prototype

This document summarizes activities performed in the Supply Chain Management Pilot according to the Pilots Integration Plan by making use of the technical results and milestones of MIDAS platform and aligned to the Platform Integration Plan activities.

The main purpose is to give a feedback regarding the usage of the MIDAS platform in testing Logistics GS1 LIM compliant service architecture and evaluating the main success factors and key performance indicators from the users' point of view. According to the proposed business value of MIDAS, the pilot has confirmed the initial hypothesis with the following remarks:

Reduction of overall R&D and maintenance cost, compared to Model-Based Testing Approaches (MBTA) and to Traditional Testing Approaches (TTA).

- Compared to TTA, the reduction is achieved in a med-term (not short term), when regression tests are included in the maintenance costs (10% – 40%)
- The cloud infrastructure reduces the barrier for additional costs in hardware elements. But the test-bed environment is a great cost for SMEs. Adding to MIDAS cloud the service to deploy the systems to be tested would reduce the costs and improve the adoption for SMEs.
- MIDAS model tools should be improved to become a commercial tool (in particular the absence of tools for XML modeling is a great barrier). MIDAS licensing costs are required as an evaluation criteria for SMEs. A SaaS model and a pay-per-bug are models valid for companies.

Improvement of Quality of SUT (number of bugs/errors/defects detected in development phase vs maintenance phase), compared to MBTA and TTA.

- Compared to TTA, the quality is improved in terms of bugs detected in development phase (> 15 bugs in a very simplified SCM).
- The main barrier for adding new actors in a supply chain is the high risk to integrate their services in a working supply chain management system. The quality of the SUT in terms of reduction of integration problems (less risk and less time-to-market) is achieved compared to TTA.

The document contains quantitative and qualitative results and other insights derived from the Logistics pilot experience: i) 25% of companies would pay for MBT; ii) GS1 LIM should be certifiable and, iii) SMEs identify as a major barrier the formula to calculate the ROI (when the effort and costs for learning and modeling become an investment).



## Dissemination Report

At process level, the participation in the STIA meetings and the creation of the Aragon regional TesteA initiative, has allowed us to be in touch with lot of external stakeholders, from test developers, SMEs to public administrations and academics. MIDAS has been represented in more than 20 events and workshops and used to test 4 SAUTS developed by external parties.

At activity level, MIDAS has been disseminated in 24 conference proceedings and 6 papers (plus 8 papers which are under revision). MIDAS has participated in 16 events for cooperation and the website has received around 3500 visits. The generation of multimedia content has derived in a bigger number of accesses.

According to final metrics, we can conclude that the main purpose, the MIDAS community, has been achieved due to the joint effort with the innovation alliance EU project. This way, MIDAS community is bootstrapped from the initial Spanish Software Testing Innovation Alliance with more than 200 members.

## D9.5 Report on the impact of the MIDAS testing framework on test standards development

The main objective of this document is to outline contributions and impact of the MIDAS project to standardization practices. The impact is evaluated in accordance to MIDAS standardization framework defined in deliverable D9.3. The document presents the gaps, inconsistencies and potential advancements of current software testing standards and techniques identified during the project execution and presents tangible contributions of the MIDAS project to these testing challenges.

Recently published ISO/IEC 29119 Software testing standard represent the broader scope for software testing techniques and provides one definitive standard for software testing that defines vocabulary, processes, documentation, techniques and a process assessment model for software testing that can be used within any software development life cycle. To the large degree, the MIDAS Domain specific language (DSL), which have been used to formally specify MIDAS testing profiles and System models, have relied on the definitions from ISO/IEC 29119. In developing the MIDAS DSL, we have found inconsistencies in the ISO/IEC 29119 definitions, and the proposal of refined definitions has been prepared within MIDAS project.

MIDAS heavily relies on the model-based testing (MBT) approach and the use of the TTCN-3 test modelling language. The document presents the alignment of the MIDAS MBT workflows with ETSI MBT process definition and its enhancements and extensions. Furthermore, we also discuss and compare the latest ETSI's TDL approach to test modelling with MIDAS DSL based approach.

In designing the MIDAS automated test design workflow, we have been faced with a strong dependency on TTCN-3 commercial tools in the process of test models transformation into executable TTCN-3 test cases. Such dependency could be avoided with the extension of the TTCN-3 multipart standards, proposed by MIDAS partners and accepted by ETSI MTS at the last MTS meeting in October 2015 in a way that the standard support direct transformation of WSDL models into TTCN-3 models. This particular contribution to TTCN-3 standard as well as maintenance activities on TTCN-3 standard has been further presented.

As defined in UTP1.2, MIDAS test framework relies heavily on the utilization of UML based definition of System models. UTP (UML test Profile) has been selected as a base for the definition for of MIDAS DSL profile, which expresses abstract and platform-independent test case specifications that are later on translated into TTCN-3 scripts. Project partners, namely FF and UGOE have made a pioneering work in defining the new OMG standard, namely UTP 2.0 profile. Work performed within MIDAS project had a substantial impact on the development of the UTP 2.0 standard. Here, we briefly outline key impacts of the MIDAS project to the UTP 2.0 standard development.

Let us introduce you...



GEORG-AUGUST-UNIVERSITÄT  
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## Georg-August-Universität Göttingen Stiftung Öffentlichen Rechts

The Georg-August-Universität Göttingen is one of the 9 German elite universities elected in 2007 by the German federal government for special funding. The University was founded in 1737 with an inherent commitment to the critical spirit of the Enlightenment. Today, more than 24,000 students are studying 130 programs of study offered by the 13 faculties of the University. The University staff comprises more than 13,000 employees (researchers and staff). The Institute of Computer Science at the University is responsible for research and teaching in computer science, providing the University with bachelor, master and PhD programs in the field of Computer Science and Computational Sciences. In Göttingen, professors from various disciplines work together on a common theme of research: computer science and its uses in communication systems.

The Institute for Computer Science has extensive collaborations and contacts with industry and academia such as NOKIA, Ericsson, Motorola, German Telecom, Lucent, Siemens, NEC, Alcatel, Nortel, NTT DoCoMo, Panasonic, Samsung, DLR, Fraunhofer FOKUS, France Telecom, Telefonica, BT, and so on. The Institute has been very active in standardisation during the past 20 years, in particular in ETSI, IETF and ITU. The focus of the research in the Software Engineering for Distributed Systems Group at the Institute of Computer Science, headed by Prof. Dr. J. Grabowski, is quality assurance. This includes automatic test generation from models and also the generation of models from traces by means of learning techniques. The group is very active in the development and standardization of the testing languages TTCN-3 and UML testing profile.

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## Our goal

To build an effective solution for SOA testing problem.

With MIDAS, we want to make it easier for companies to benefit from SOA testing.

## MIDAS in a nutshell

The MIDAS project aims to design and build an integrated framework for SOA testing automation that will be available as a Software as a Service (SaaS) on a Cloud infrastructure and that spans all the testing activities: test generation, execution, evaluation and scheduling, on the functional, interaction, fault tolerance, security and usage-based testing aspects. MIDAS is focused on SOA testing, i.e. on black box testing of single services and on grey-box testing of services architectures. The testing methods and technologies that are investigated and prototyped in the project are beyond the state of the art, particularly on model-based testing, model checking of choreographies for sound interaction test scenarios, fuzzing for security testing, usage-based testing, probabilistic inference reasoning about test evaluation and scheduling. Two pilot SOA testing experiences in different business domains (healthcare and supply chain management) are carried out.

## Who we are

MIDAS is led by a group of partners who have years of experience as offering research services to the industry.

MIDAS is funded by the European Community under the FP7 Programme (Project Number 318786).



## MIDAS Consortium



Consiglio Nazionale  
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