

ERCIM



NEWS

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Special theme:

Image Understanding

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Context of the European Union's
R&D Strategy

Joint ERCIM Actions:

Julien Mairal Receives the 2013
Cor Baayen Award

Research and Innovation:

SECCRIT: Secure Cloud Computing
for High Assurance Services

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MIDAS: Automated SOA Testing on the Cloud

by Alberto De Francesco, Claudia Di Napoli, Marc-Florian Wendland and Fabio De Rosa

MIDAS is a research project funded by the European Commission under the Seventh Framework Programme. Its goal is to design and build an integrated framework for the automation of Service Oriented Architecture (SOA) testing able to cover the complete lifecycle of software testing (test generation, execution, evaluation, planning and scheduling). The framework will be made available as Testing as a Service (TaaS) on a public Cloud infrastructure, so as to accommodate, in an affordable way, the varying and sometimes unpredictable computational requirements typical of testing activities.

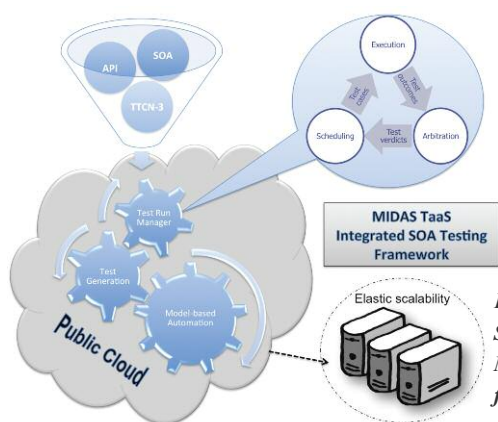


Figure 1: Sketch of the MIDAS TaaS framework

The MIDAS project is a three year European project, started in September 2012, that aims to realize a comprehensive TaaS framework able to support automation and intelligent management of Service Oriented Architecture (SOA) testing. The framework supports all testing cycle activities: test case planning, development and execution, reporting and result analysis, test campaign management and scheduling.

With the spread of Internet and Internet-related technologies, thousands of legacy and new applications, systems and devices are connected and collaborate, allowing the automation of business processes that support daily activities. The SOA design and implementation style is the most relevant technology allowing organizations to put into practice dynamic collaboration of loosely coupled systems in order to achieve flexible, dependable and secure business processes following the contract-based and model-driven paradigms.

In this context, SOA testing plays a crucial role in strengthening stakeholders' trust on the compliance of a SOA-based application with their business needs through rigorous, sound and open validation and verification processes. Nevertheless, SOA key characteristics such as lack of observable behaviour of the involved systems, lack of trust in the employed engineering methods, lack of direct control of the implementation lifecycles, make SOA testing a heavy, complex, challenging and expensive task. There are also additional challenges, including: late binding of systems, fundamental uncertainty of the test verdicts, organizational complexity, elastic demand of computational resources and increasing scale factor of the services architectures.

The MIDAS project will address these difficulties by providing:

- Design-time and run-time generation of test cases and oracles for the functional, interaction, security, usage-based and quality of service aspects of a service's architecture, based on black-box and grey-box testing methods, the only practicable verification methods for SOA,
- An environment for SOA testing allowing the automated configuration and initialization of test scenarios and the automated execution of test runs on a Service Architecture Under Test based upon a Testing and Control Notation version 3 (TTCN-3) distributed engine,
- Advanced methods and tools (probabilistic and symbolic inference-based ones) for the evaluation of test results and for the test campaign planning and scheduling, in order to help the tester to optimize the test campaign management on the basis of testing objectives.

To define detailed test specifications and test cases, the MIDAS platform will rely on TTCN-3 as a strongly typed test technology standardized and maintained by the European Telecommunication Standardization Institute (ETSI).

The MIDAS platform will itself be designed according to the SOA paradigm, and a prototype implementation will be delivered as a TaaS facility. The facility will be deployed on a public Cloud infrastructure providing elastic scalability of the testing environment, and allowing allocation of huge amounts of computation resources for relatively short test campaigns on very large services architectures. The adoption of the Cloud paradigms will also make the MIDAS platform accessible for SMEs that want to test their systems without making the commitment of a large investment. The MIDAS platform will be tested on two target pilots that are two real-world SOA-based applications, respectively in the domains of healthcare and supply chain management.

Moreover, the economic impact of inadequate infrastructures for SOA testing, and the improvements in terms of dependability and security of the "digital economy", coming from the availability of powerful and productive tools and infrastructures for SOA testing, will be evaluated to assess the MIDAS project outcomes.

Initiatives to activate relationships with standardization bodies, such as the ETSI TC-MTS (ETSI Methods for Testing and Specification Technical Committee), CEN (European Committee for Standardization), and the OMG (Object Management Group) will be undertaken with the purpose of assessing the impact and aligning the MIDAS approach and methodology with standardization efforts.

The MIDAS consortium is composed of universities, research centres, small and medium enterprises, and non-profit organizations with the necessary expertise to cover all the aspects outlined in the project.

Link:

<http://www.midas-project.eu/>

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