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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.

AT A GLANCE

Project title:

Model and Inference Driven - Automated testing of Services architectures (STREP)

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Duration:

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Total cost:

€ 4.3 M

Website: www.midas-project.eu

Rationale

Dependable and secure Services Oriented Architectures (SOAs) are mainly the result of good design and implementation practices, but the stakeholders' trust can be decisively strengthened only by rigorous, sound and open validation and verification processes.

The contract-based, model-driven SOA engineering approach, effectively supports the validation task. SOA key characteristics (reduced control, observability and trust between participants) make actually black-box and grey-box testing the only practicable verification methods. Nevertheless, SOA testing is a heavy, complex, challenging and expensive task.

Objectives and approach

The objective of the MIDAS project is to realize a comprehensive framework able to support **automation and intelligent management of the SOA testing**. The framework supports all the testing cycle activities: test case planning, development and execution, reporting and result analysis, test campaign management and scheduling. Moreover the framework supports the main testing domains such as functional, interactional, fault-tolerance, security and usage-based testing.

In order to provide these features the architecture of the MIDAS framework includes:

- an environment for design time and run time (on the fly) generation of test cases and oracles;
- an environment for SOA automatic testing configuration, initialization and execution

of the Services Architecture Under Test (SAUT); it is based upon the Test and Test Control Notation (TTCN-3) standard;

- probabilistic and symbolic inference based methods and tools for test result analysis and test campaign planning and scheduling.

In order to support the elastic scalability of the testing environment (allocation of huge amounts of computation resources for relatively short test campaigns on very large services architectures) the MIDAS framework is made available as a SaaS on a Cloud infrastructure. Fig. 1 illustrates the architecture of the MIDAS framework.

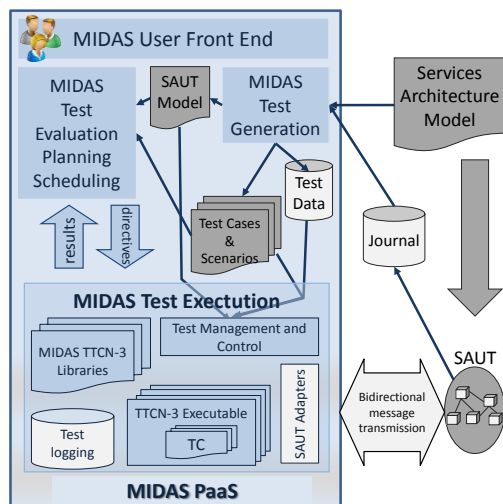


Fig. 1: MIDAS Framework Architecture.

In order to evaluate the effectiveness and the usability of the MIDAS framework facilities, two pilot SOA testing experiences are carried out in different business domains: Healthcare (HC) and Supply Chain Management (SCM).

In HC, the MIDAS framework will be used for building test campaigns upon the HSSP¹ services implementation, provided by the Italian HealthSOAF² research project.

The SCM pilot aims at building test campaigns, according to the MIDAS approach, upon an existing services architecture for IT-based supply chain management³.

Impact

The research on the economic impact of the current inadequacy of SOA testing tools and the evaluation of the testing needs of the existing business solutions allows the MIDAS project to:

- estimate the optimization of the present maintenance and management costs by the availability of advanced verification and testing methods, tools and infrastructures;
- define new business models for testable service and services architecture delivery and for distributing the advanced SOA testing facilities through new channels, such as PaaS on cloud infrastructures.

The potential impact of the MIDAS achievements involves the actual deployment and delivery of dependable and secure services and services architectures. In particular, the MIDAS framework and platform:

- guarantees the general availability of rigorous, sound, powerful and cheap automated testing processes and tools;
- allows the providers to deliver their SOA production environment with integrated service test facilities.

For further information:

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¹ Healthcare Services Specification Project
<http://hssp.wikispaces.com/>

² www.healthsoaf.it

³ www.itchain.es