

Architecting, Analyzing and Testing Service-Oriented Systems

Gerardo Canfora and Massimiliano Di Penta
canfora@unisannio.it, dipenta@unisannio.it

RCOST - Research Centre on Software Technology - University of Sannio
Palazzo ex Poste, Via Traiano - 82100 Benevento, Italy

Abstract

The today's diffusion of web services and service-oriented architecture is posing the basis for radical changes in the way of developing, evolving and testing software systems. This tutorial outlines some main research challenges on this topic, and provides guidelines and practical solutions for i) realizing service-oriented systems able to support QoS-aware dynamic binding ii) helping the comprehension of service-oriented systems and iii) testing service-oriented systems.

Keywords: Web Services, Service-Oriented Architecture, Dynamic Binding, Program Comprehension, Service Testing

1 Introduction

During the last few years, the diffusion of web services and related technologies is entailing a perspective's change on software development. Several medium and large-scale companies are investing a large part of their budget on this area. As a result, service-oriented systems become more and more complex, introducing the need for:

1. proper architectures and approaches to support dynamic binding;
2. methods and tools for supporting the comprehension of web services and service-oriented systems;
3. testing approaches suitable for a service-oriented scenarios.

This tutorial will deal with the aforementioned issues from both architectural and software analysis point of view. After providing an overview of the current state-of-the-art, the tutorial highlights some research issues and directions, provides practical solution, and allows the participants to interact with some tools.

2 Tutorial Organization

The tutorial starts with an introduction to web services, briefly describing the most important technologies, such as WSDL, UDDI and BPEL, and providing an overview of advantages and limitations of the Service Oriented Architecture (SOA).

The first session highlights challenges related to service dynamic binding. Then, it presents and architectural solution and a search-based technique to enable QoS-aware composition and dynamic binding. The session concludes with a live demo of our dynamic-binding framework [3].

The second session overviews issues related to program comprehension of service-oriented systems, outlining some possible research directions for the reverse engineering community. As an example, we show an approach and a tool to explore and understand web service interfaces [2].

The third session describes some testing-related issues introduced by SOA and service-related technologies. Then, the session presents approaches and tool for regression testing [1] and Service Level Agreement (SLA) testing.

References

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