

Chapter 8

Model-Driven Service Creation for a Telecom Service Platform

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ABSTRACT

The current telecommunications scenario requires rapid development of services in the presence of both traditional telecommunications technologies and novel IT technologies. In this scenario, service creation is challenging and should therefore be supported by proper service design notations and service creation tools in a coherent service creation approach. This chapter describes the SPICE approach to service creation. The approach consists of a language that leverages service reuse through platform-independent service composition; tools that support the definition of services, and their deployment to a target service execution environment.

INTRODUCTION

The convergence of (telecommunication) networks, services and content is happening at an ever increasing speed. In this context, the creation of appealing value-added services is key to preventing an operator from being reduced to a “transport only” provider (Schulke, 2006). This new service market is foreseen to be an important battlefield for operators. The attractiveness of the service portfolio is paramount to attract and

retain customers, thereby increasing revenues. At the same time, as the service market is highly competitive with a wider range of potential players, it is necessary to reduce the time-to-market for new services.

Shorter time-to-market requires the effective development of services. More concretely, the service lifecycle process needs to be optimized using a Service Creation Environment (SCE) that supports as much as possible the reuse and the composition of pre-existing consolidated

components (Glitho, 2003; Falcarin, 2008). In fact, most of the business benefits triggered by these facilities stem from the possibility to reuse services, thereby enabling faster time-to-market and lower costs in the service development process. This leads to direct and indirect benefits to service end-users, service developers, platform operators and service providers.

One of the goals of the SPICE (Service Platform for Innovative Communication Environment) project is the design of an SCE to facilitate the development of services over heterogeneous platforms. The IST project SPICE is part of the Wireless World Initiative (WWI).

The approach to service creation in SPICE is driven by the constraint of being able to address heterogeneous target execution environments, where the technologies range from general Information Technology (IT), where, for example, Web Services are one of the leading technology in Service Oriented Architectures (Erl, 2007) to very specific telecommunication technologies (where a plethora of protocols and standards are available, most importantly SIP and IMS). What seems to be clear for telecommunication services is the need to integrate many resources over different protocols and to be able to represent a set of interactions that are not limited to the classic Request and Response paradigm. In such an heterogeneous environment, the approaches to service creation should be as general as possible, supporting a stepwise process that drives the developer from abstract to concrete definitions targeting a specific Service Execution Environment (SEE).

Considering the main challenges of the service creation process, this paper presents a language that allows the specification of telecommunication and IT services and tools that support the definition of services and their deployment to target service execution environments.

THE SPATEL LANGUAGE

To describe SPICE services, a specialized description language named SPATEL has been designed (SPICE Advanced language for Telecommunication services). The approach used is based on the Model Driven Architecture approach (MDA, 2008), as defined by the Object Management Group (OMG, 2008). The purpose of SPATEL is to allow agile development of complex telecommunication services on top of the SPICE architecture leveraging state-of-the-art software engineering techniques such as model-driven engineering and software component technology. Such dedicated formalism supports the Service Oriented Architecture paradigm and includes specificities of the telecom domain like voice dialog support and multimedia data types.

The definition of a domain-specific language for integrated telecommunications services is one of the key elements for improving significantly the agility of the service development process. Various domain-specific languages addressing, for example the orchestration of web services exist nowadays (BPEL, 2003), however, high-level design languages coupling support of state-of-the-art IT technology and telecom specificities are difficult to find.

According to MDA principles, the SPATEL language is “platform independent” (Almeida, 2006), leaving the translation to specific execution engines, terminals and platforms to transformations executed by the SCE in a semi-automated way.

SPATEL specifies two kinds of service representation addressing two categories of service developers: a *developer formalism* and an *end-user formalism*.

The SPATEL formalism for developers is aimed at professional service developers that, expressing

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