Communication Web Services and JAIN-SLEE Integration Challenges

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ABSTRACT
Meshing up telecommunication and IT resources seems to be the real challenge for supporting the evolution towards the next generation of Web Services. In telecom world, JAIN-SLEE (JAIN Service Logic Execution Environment) is an emerging standard specification for Java service platforms targeted to host value added services, composed of telecom and IT services. In this paper we describe StarSLEE platform which extends JAIN-SLEE in order to compose JAIN-SLEE services with Web services and the StarSCE service creation environment which allows exporting value added services as communication web services, and we analyze open issues that must be addressed to introduce Web Services in new telecom service platforms.

Keywords: CASE tools; distributed systems, JAIN-SLEE; special purpose languages; telecommunications; Web services

INTRODUCTION
Nowadays telecom service providers are seeking new paradigms of service creation and execution to reduce new services’ time to market and increase profitability. Furthermore, convergence of networks, services and content is taking place at an increasing speed. Convergence is increasingly speeding up the introduction of new and converged services.

New market opportunities like integration of voice, video and data services are emerging from this trend; as a consequence, the main goal of telecom service providers is the development of Value Added Services, or next generation services (Licciardi, 2003) that leverage both on the Internet and on telephony networks, that is, the convergence and integration of services offered by IT providers with telecom operators ones.
The creation of appealing value added services seems to be a key feature to avoid an operator being reduced to a “transport only” provider. The attractiveness of the service assortment offered seems to be the key to attract customers, and to increase revenues (Schülke, 2006).

The reuse and integration of existing IT services in value added ones is even made difficult both by the increasing software systems complexity and the different middleware standards used for communication.

To overcome these constraints the current vertically integrated networks are currently migrating to horizontally layered structures offering open and standard interfaces, that is, a service platform, based on shared services and network enablers, which can be easily composed in a loosely coupled manner (Pollet, 2006).

Therefore, these goals pose new requirements on the software development process, on the platforms hosting these services, and on the middleware enabling communication among services.

JAIN-SLEE (JAIN - Service Logic Execution Environment) standard specification (JSR-22, 2007) is emerging as a new event-based service platform targeted to telecom domain, aiming at overcoming the performance limitations of J2EE-like application server, mainly designed for enterprise services, based on typical request-response interaction style.

In fact, communication services have strong real-time requirements (e.g., high throughput, low latency time), support mainly asynchronous interactions (e.g., voice-mail, call forwarding), and leverage efficiently on native protocol capabilities.

Web Services standards are emerging as a new middleware standard for providing, composing and integrating IT services (Chung, 2003), but their introduction in the telecom domain means facing up with some open issues.

Generalizing telecom functionalities to more abstract standard interfaces, like Web Services interfaces (WSDL, 2007), is often necessary to allow IT developers to reuse telecom services without mastering all technical issues related to telecom protocols; thus exposing telecom resources as Web Services means losing some of the technical details of the underlying proprietary interface.

Based on the former ideas, a Communication Application Server (named StarSLEE) inspired to the JAIN-SLEE specification has been developed, together with a graphical Service Creation Environment (StarSCE) for helping IT-developers in creating Value Added Services and Communication Web Services (Venezia, 2006).

The service lifecycle process is sped up by means of a Service Creation Environment (SCE) that supports as much as possible the reuse and the composition of pre-existing consolidated components deployed in the telecom platforms, and third-party Web Services.

An SCE must offer an intuitive interface enabling graphical composition and easy configuration of value added services, and it must automatically deploy value added services in the shape of service description languages which can be used to orchestrate and execute services running in a service execution environment.

This paper aims at analyzing the current challenges encountered during a prototyping activity carried on to provide an effective composition and integration of Web Services and Value Added Services deployed on a JAIN-SLEE platform.

In the following sections we describe the JAIN-SLEE standard architecture, the issues regarding the integration of Web Services in JAIN-SLEE, the problems of exporting a JAIN-SLEE value-added service as a communication web service, and the current issues for moving such telecom platform towards telecom service oriented architecture.

**VALUE ADDED SERVICES IN JAIN-SLEE**

A value added service aims at encompassing either communication or enterprise service components (Glitho, 2003).

The following is an example of a simple information retrieval target service:
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