Chapter XLV
Open APIs and Protocols for Services and Applications in Telecoms

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ABSTRACT

The role of open Application Programming Interfaces (APIs) and protocols for advanced service provisioning and the corresponding state of the art are the main subject of this chapter. Specifically, the role and the trade-offs in modern telecoms between open APIs and Protocols, that is, OSA/Parlay APIs, JAIN APIs and SIP, are discussed. A technical implementation analysis for each solution is presented, based on a call-related service, in order to set a common basis for the aforementioned technologies, since "voice" is a common denominator for a Fixed or Mobile Operator or an Internet Service Provider. A performance evaluation study regarding the implemented services is also presented and the chapter is summarized by interesting conclusions and related future trends.

1. INTRODUCTION

The demand for telecom services moving towards more and richer value added capabilities is an exceptional revenue opportunity for network operators. Traffic flowing through their networks will increase as more and more services for end-users become available. Network operators, however, are not able to deploy in their network services as fast as demand requires because core network interactions tend to be complex. Integrating new services directly into the network core and, most importantly, administering and maintaining those services after deployment, inevitably becomes a slow and cumbersome procedure. Rapid service creation and deployment is achieved only if service development, deployment and administration are distributed among external service providers. The most efficient way to achieve such a distribution is for network operators to expose parts of their network's core functions to outside providers.

Providing access to core network functions to outside providers requires compromises from both sides, in order to address the concerns raised by both parties. Network operators are concerned about security and stability, so they require control over interactions, while service providers are concerned with the effort required to develop new services and whether their investment in the developed software will be reusable by other operators. In the interests of both, interactions with the network should be simple to comprehend and implement. In addition they should require minimal development and integration effort and the result should be reusable, in order to protect the investment.

The proper way to address these concerns is by designing clear and simple interfaces between operators and providers. These interfaces define a simplified model of core network functions and are standardized to allow reusability and independence from underlying network architectures. Such interfaces can be implemented by choosing from a variety of communication middleware technologies; most notably distributed, object based systems such as RMI, CORBA, SOAP with RPC semantics or messaging frameworks like Java Message Service (JMS).

The primary concern using this approach has always been the performance impact produced by the additional middleware layers compared to the straightforward case of deploying services directly into the network's core. Therefore, a comparison of various middleware technologies supporting open interfaces is an important step before choosing the most appropriate communication middleware that will be used to implement an open interface for a specific value added service. This is the issue discussed in this book chapter; namely, to make a detailed survey, a in-depth investigation and an efficient performance comparison between several similar middleware systems based on open APIs and Protocols for Service Provisioning.

The rest of this chapter is organized as follows. The second subsection defines the role of open Application Programming Interfaces (APIs) and protocols for advanced service provision and the current state of the art in the field. Specifically, the role and the trade-offs in modern telecoms between open APIs and Protocols such as OSA/Parlay APIs, JAIN APIs, SIP and middleware technologies such as CORBA and RMI are addressed. This is followed by the third subsection attempts to set a common basis, in order to make possible a comparison between the different platforms and technologies. A call-related service and how this service can be implemented based on different open APIs and middleware technologies (i.e. OSA/Parlay API, JAIN API and SIP) is described, since "voice" is a common denominator for either Fixed or Mobile Operators or Internet Service Providers. The fourth subsection presents a performance analysis of the implemented services and the fifth and last subsection summarizes the preceding subsections,includes some unexpected conclusions and discusses related future trends.