Chapter VII

Test Template for Data Mining Publications

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ABSTRACT

The Next Generation Network (NGN) is a very complex environment, where various parties (network operators, services and application providers, integrators, etc.) necessarily cooperate on the provision of advanced converged services. This chapter presents the current status and fundamentals of conventional, converged and bundled value-added services, and then depicts their transformation into distributed NGN services. The characteristics of NGN services are considered with respect to the architecture of the NGN service stratum and the enterprise framework, both standardized by the International Telecommunications Union (ITU). Finally, the implementation and deployment of interoperable NGN services through open interfaces are considered in conjunction with market trends and the standardization efforts of several international organizations or other independent initiatives, forums, alliances, etc.

INTRODUCTION

Next Generation Networks (NGNs) create a homogeneous communication environment providing the ability to interconnect different transport technologies using fixed and wireless, as well as circuit-switched and packet-switched infrastructure. The NGNs integrate broadband fixed and mobile technologies, enabling users to communicate using broadband services regardless of whether they are using a terminal in a fixed location or if they are on the move.

However, the key promise lies in the context of services that might be offered on an NGN service platform. NGNs allow the reusability of existing resources, e.g. software components of existing services, and the rapid and efficient integration of these resources within new services. Hence, they provide the ability to design, implement and deploy innovative and lucrative services. For these reasons, network operators and service providers see NGNs providing a new revenue stream from potentially expanded service offerings. Therefore, it is important to explain how converged NGN technologies and solutions lead to efficient service creation.

This chapter analyses the state of the art for supporting converged and value-added telecommunication services in NGNs. In order to familiarize the reader with research and development trends in telecommunication services, firstly the current status of service provision upon existing wired and wireless telecommunication infrastructures
is described. It sketches out the philosophy of binding, deploying and supporting different telecommunication services and capabilities via the access network, either by individual telecom providers (network providers and operators) or by cooperating telecom and third party providers.

There follows a discussion of the current paradigm shift to converged telecommunications services, as well as all operational and structural primitives formulating these services. Subsequently, on the basis of the converged services, there is an analysis of the architecture and functionality of the NGN services stratum, as specified by the International Telecommunications Union (ITU) and other international standardization organizations, initiatives, alliances, forums, etc.

Moreover, there is an analysis of the NGN enterprise framework, which is well defined by the ITU and which allows the development of both core services by the underlying transport infrastructure providers and value-added transport-agnostic services by independent third party providers.

This chapter also discusses several standardization results concerning the design and implementation of open interfaces that guarantee the seamless and interoperable operation of services designed and deployed by different developers. Finally, it sketches major trends in developing NGN services, and considers two characteristic examples, namely the presence / telepresence service and the home management service.

THE CURRENT STATUS OF TELECOMMUNICATION SERVICES

Covering the communication needs of subscribers continues to be the main business activity in the field of telecommunications. Yet, across the globe, fixed and mobile communications are nearing saturation point, a fact that reduces potential profit margins of carriers and operators whose simultaneous aim is to increase subscriber numbers.

As a result, in recent years telecommunication organizations have focussed on increasing the average revenue per user, rather than the number of subscribers, by introducing new telecommunication services that offer much more than standard voice services. These services are based on the interaction of sound, video and text with unrestricted access to the multimedia, information systems and relevant services, thus providing subscribers with greatly enhanced control over their interactions with the wider world.

These additional services are end-to-end services that operate through dedicated servers and add value to the access network. They are reported as premium pricing services, as their providers have the ability to apply individual deployment and charging policy (premium charging - PRMC) per service, irrespective of the policies applied to the underlying networking infrastructure employed.

The introduction of additional services to fixed and mobile access networks has impelled the providers of the networking infrastructure to provide additional connectivity (premium connectivity) in order to guarantee the required augmented quality per service.

From the point of view of the market, the providers of the additional services cooperate in order to package different premium services offered to the customers as product (bundled service). There follows an analysis of the most important ways in which such additional and bundled services are created and promoted.

Additional Services Created by Telecom Carriers and Operators

With the wide spread of legacy-fixed digital networks (e.g. PSDN, ISDN, GSM) and mobile networks, their operators have independently developed and promoted various additional telecommunications services in addition to the existing standard voice services.

These services mainly exploit the bearer capabilities of the signalling protocols (e.g. SS7) which are employed by the installed legacy telecommunications nodes. They are provided via additional node equipment, mainly special servers, and via special capabilities of the terminals. From an architectural point of view, the total equipment of the additional services comprises an upper (dedicated purpose) network with respect to the existing underlying fixed and mobile legacy networks. The Intelligent Network (IN) best represents these networks. Examples of additional IN services provided by the telecom carriers and operators are:
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