

NGN networks; A new enabling technology or just a network integration solution?

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Source of information: <http://prime.mines.edu/papers/tutorial-wsc05.pdf>

ABSTRACT

Over the last years, developments in telecommunication technologies, bringing possibilities for richcontext communications with multimedia content, has satisfied most of users' demands about always on, rich-content communication ways with high degree of versatility (conferencing, application interactivity).

On commercial level, all these new features have been integrated within the 3G UMTS, a technology which only recently has started being gradually adopted. 3GPP, the standardization body working on UMTS technology definition has so far not only described services categories, but defined consistently ways for delivering them with appropriate Quality of Service (QoS).

Despite the emergence of new fixed and wireless communication technologies, like the WiFi, WiMAX and xDSL, with high bandwidth rates and seamless conformity to the IP, the capability of the new UMTS technology to delivery its services in a "measurable" way and with user-defined QoS has been identified as the main reason for the success of the new multimedia applications on the market.

Wishing to further exploit users arisen awareness about new multimedia communication services and expand possibilities for new profits in the new fixed and wireless network domains, the industry of communications has set a new target, that of creating "ubiquity" in service delivery along with "seamlessness" in keeping steady the "user experience" in terms of service tariffing and QoS satisfaction.

Answers to these problems has come to give the Next Generation Networks (NGN) technology, a new initiative created collectively by ITU, ETSI and 3GPP that aims at delivering all these new communication features on a "network agnostic" or otherwise called "heterogeneous networks"

communication environment, where the only discriminating factors for service provisioning will be the user himself, his selected service types and the desired QoS.

In this respect, the NGN technology shall not only provide a single solution for various network types integration, but must answer globally, on behalf of all communication technologies it embraces (fixed, mobile, wireless), the problems expressed earlier about providing service “ubiquity” and “seamlessness”, dealing with issues such as, zero service disruption for moving, roaming, handover users and QoS guarantee among different technology networks with diverse QoS capabilities.

Over the past few years, evolution of the NGN concept along these lines has led to the definition of the first version of a “network agnostic” communication technology, the IP Multimedia Subsystem (IMS). IMS has become today the main focal point of research efforts and is considered today as the enabler of the future 4G, converged communication technology.

In the reminder of this paper we make an attempt to shed light on the NGN technology by giving an account of its constituent drivers, its aims and recent developments, as expressed in the field of IMS.

Then, we describe the first large-scale experimental IMS network, representing the first approach of Europe to bring NGN, and, to this end IMS, outside the labs and exploit it at corporate level between operators, network component vendors and test equipment manufacturers, forming the first real converged communications European test-bed.

Finally we point out important issues that are hindering factors for the current IMS version and connect them with pathways to the 4G technology.

NGN networks– a new communications ecosystem

Since its official appearance as a method for enabling converged communications, NGN technology has gained the focus, initially of the International Telecommunication Union (ITU) and then the European Telecommunications Standards Institute (ETSI). The first body has published many studies and recommendations and its work is currently being continued with the newly formed Next Generation Network Global Standards Initiative (NGN-GSI). The second body has devoted the workgroup named Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN).

In the ITU-T Recommendation Y.2001, the Next Generation Network (NGN) is defined as a packet-based network, able to provide telecommunication services over a multitude of broadband, QoS-enabled transport technologies and in which service-related functions are independent from underlying transport-related technologies. Main driver of this concept is the requirement for enabling unfettered access for users to networks and to enable competition of service providers, which must offer their services with generalized mobility, allowing consistent and ubiquitous provision to users.

The final aim of NGN is to render service providers of any type, including those providing Internet services, voice and multimedia content providers to deliver their services to end users in a network and terminal agnostic way, using any device connected to any access network. In other words, service providers have now the chance of becoming decoupled from the network infrastructure, which is now conceived as a “homogenized” heterogeneous platform and thus make use of access and core transport network infrastructure in a liberated way with the only aim to deliver their services to end users with the desirable QoS.