Chapter 2
A New Global Ubiquitous Consumer Environment for 4G Wireless Communications

Ivan Ganchev
University of Limerick, Ireland

Máirtín S. O'Droma
University of Limerick, Ireland

Jený István Jakab
Tecnomen Ltd, Ireland

Zhanlin Ji
University of Limerick, Ireland

Dmitry Tairov
University of Limerick, Ireland

ABSTRACT

A changed wireless environment for 4G and future generations of wireless communications is addressed in this chapter. This change is primarily focussed on making the end user of wireless services more central and more a consumer in the global wireless environment than heretofore. In the 'Ubiquitous Consumer Wireless World (UCWW)'–the descriptive name for this new wireless environment paradigm– the global supply of wireless communications services is founded on the new Consumer-centric Business Model (CBM). This is a radical change and departure from present globally pervasive business model for service delivery based on the user being a subscriber, called appropriately the Subscriber-centric Business Model (SBM). The reasons and background for the drive to bring about this changed wireless environment are reviewed, with the main body of the chapter focusing on descriptions of the technological composition of two of the new core infrastructural enabling elements. These are the third-party authentication, au-

thorization, and accounting (3P-AAA) service, and the service advertisement, discovery, and association (ADA) through newly defined wireless billboard channels (WBCs). The former, 3P-AAA, arises from the need to bring about a separation of the supply of the AAA service from the supply of the communications service, which is necessary to ensure the consumer character of the user and to promote and safeguard all the new benefits that will flow for users, new consumer-oriented wireless access network providers, and other stakeholders through this new wireless environment. As there will be restructuring implications for the operation and location of charging and billing functions, treatment of this aspect is also included. The latter, ADA & WBCs, arises in tandem with this separation of services, the consequent metric of business success changing from 'number of subscribers' to 'number of consumer transactions and service purchases' and the need, therefore, for a new direct 'push' advertisement means for service providers to attract consumers and for consumers to be continually up-to-date on new service offerings. The proposals for protocol interfaces and architectures for both these elements are explored and discussed, with those aspects needing to be addressed in global standardization activities highlighted.

INTRODUCTION

The migration towards next generation mobile communications, often referred to as 'Beyond 3G' (B3G), 4G, or wireless NGN, probably is one of the most challenging research topics of today's wireless world. For some 4G means higher-capacity new radio interfaces. For others it is an 'all-IP' integrated wireless environment. For others again it is being conceived as a new wireless environment encompassing existing, planned and future mobile and fixed wireless networks, both terrestrial and satellite, with harmonious internetworking. Most presume that this internetworking, which of its nature should be heterogeneous internetworking, will be network-driven, and will be seamless and largely transparent to the users. Some others more recently argue the opposite, that it will be user-driven, and seamless and transparent to the networks.

It is becoming difficult, however, to escape the dominant generation-defining category of an order of magnitude, or thereabouts, increase in data rates, with other attributes, e.g., all-IP, heterogeneous network integration, full multimedia service delivery, playing a less significant role in defining a new generation in wireless communications.

For 4G and for all further generations of wireless communications, one may also address the techno-business wireless environment for delivery of wireless services. This is the environment in which all new and existing generations of wireless communications will function, deliver services, make money for their owners, and also reflect, and be responsive to, socio-economic concerns of users and communication services' stakeholders. It is this underlying wireless environment – and its potential to evolve through architectural change in its core foundational infrastructural – which is the theme of this chapter.

The principal network provider goal in the evolution of the wireless world, as may discerned over its lifetime to date, is to sell services to a great common market of mobile users in overlapping local, regional, and global domains. Today, and typically for some this may be referred to as defining 4G, the connectivity and services should be available anytime, anywhere, and anyhow through the best connection to the user. Services should be rapidly deployed on-demand, customized to the user's needs, and adapted to the current wireless and connection environment. Accordingly, system and service integration is regarded as an important step towards the future 4G paradigm of 'Always Best Connected and best Served' (ABC&S)

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