Chapter 13
Intelligent IPTV Distribution for Smart Phones

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ABSTRACT

Current advances in embedded hardware for mobile devices, jointly with new type of batteries that let smart phones have more power during longer periods of time, allow them to offer new services to customers. Internet Protocol Television (IPTV) is the Internet Protocol (IP) service that is experiencing highest demand. Many mobile telephone companies are adding this service to their supply. In this chapter, the authors show all steps to transmit the IPTV service from the provider to the smart phone. First, they introduce the current hardware and operating systems for smart phones. Then, they describe the main parts of the IPTV architecture and the main protocols used for IPTV transmission in order to show how it works. Next, the authors show where intelligent systems can be deployed in the IPTV network in order to provide better QoE (Quality of Experience) on the end-user side. Then, they discuss the limitations and requirements for IPTV reception on smart phones. Finally, the authors explain the IPTV implementation in smart phones and describe an IPTV player on Android.

INTRODUCTION

The Internet Protocol (IP) is currently the starting point for all integrated services, also known as *Triple play* (Hellberg, et al., 2007) and *Quad play* (inCode, 2006). The Triple play concept in telecommunications' world is a marketing concept that could be defined as the audiovisual content and services integration (voice, data, and television). Unlike traditional phone services, broadband and television are available to users through an independent communications network. Triple-play

DOI: 10.4018/978-1-4666-2833-5.ch013

service is based on providing all services using IP technology by a single connection (e.g., coaxial cable, fiber optic, twisted pair cable, power line communication, or radio). Besides, recent quad play services include mobile facilities to triple-play services.

Users regularly use triple play services in their IP SetTopBox or personal computer. This is a normal procedure to request reception of such data in their handsets. We will see soon a movie in our last generation mobile, although many people think that we will never want to see a movie on the screen of our mobile phone. A recent study has shown that the terminal screen has the same aspect that TV, when we have it at 15-30 centimeters of our face.

Mobile IPTV (Park, et al., 2008) was born going after this business opportunity (see a movie in your mobile phone at any place). It is a technology that enables users to transmit and receive multimedia traffic including television signal, video, audio, text, and graphic services through IP-based with support for Quality of Service (QoS)/Quality of Experience (QoE), security, mobility, and interactive functions. Mobile IPTV users can enjoy IPTV services anywhere even while they are on the move.

Several works of the related literature focus on the study of quality of service in mobile telephony. For example, Florido et al. (2009) study QoS in the HSDPA networks used in 3G telephony. In particular, they propose an admission control algorithm that takes into account that this guard power varies according to the channel conditions of each user. Díaz et al. (2010) analyze video streaming QoS using smart phones on live mobile networks. The goal of their study is to validate current deployments and simulations.

According to the International Telecommunication Union (ITU) (IPTV, 2012), IPTV is the set of multimedia services (television, video, audio, text, graphics and data) which are distributed through an IP network. These services must possess an adequate level of quality service, security, interactivity, and reliability. When it comes to the provider, IPTV includes video acquisition, video processed, and video secure distribution on the IP network infrastructure. The main IPTV characteristics are:

- **Interactive Television (TV) support:** IPTV systems have two channels. These channels let the service provider to distribute interactive TV applications. The live television, High Definition Television (HDTV), interactive games, quick searches on the Internet, etc. are some indicative examples.
- **Time Shifting:** This service can be used to record TV, so the user is able to see these contents later.
- **Personalized Content:** IPTV has two-way communications. This feature allows the user to indicate, what and when does (s)he want to see.
- **Requires low bandwidth:** IPTV technology does not broadcast all channels to each end-user, it allows only sending the channel requested by the user. It only multicasts each channel when the user requests it, otherwise this bandwidth is saved. This is an important feature as it helps to save bandwidth in their networks.
- **Accessibility using several devices:** The IPTV contents can be viewed with several types of devices such as computers or mobile devices, not only with televisions.

In the beginning of 2009, more than 55% of American adults had a broadband connection (Pew Internet, 2008). USA had 50 million broadband lines approximately, while China had 46 million broadband lines. Japan had about 25 million lines, followed by South Korea with about 13 million. China has been the country with greater growth of broadband lines in the last years (Lloret, et al., 2009a). Taking into account all broadband connections (approximately 53.7) million subscribers