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Introduction

We are currently witnessing an unbelievable technological development, some may even say a breakthrough. Over the last decade, the likes of DVD players, palmtops and, in particular, cell phones have become obvious everyday-use items. There has also been a rapid growth in the personal consumption of media. Services like pay-per-view and video-on-demand are becoming more and more common and are changing the way we look at multimedia – now users can choose whatever media they want, whenever and wherever they want.

The greatest phenomenon of all is an ‘ordinary’ cell phone. Alongside technological evolution, an amazing growth in mobile telephony has been experienced. The number of mobile subscribers reached over 3.3 billion by the end of November 2007 [1] and is predicted to rise to 4 billion by the end of 2008. If the growth rate remains at this level, we may anticipate around 6.2 billion mobile subscribers globally by 2011. This implies that around 94% of the world’s population will be using a cell phone by then. Along with this, more than 1.15 billion cell phones were sold in 2007, with unit growth of around 12% expected in 2008, giving estimated sales figures of 1.29 billion units [2].

Over time, newer and newer features and additions have been introduced to the terminals. Vendors take part in a constant race to put new, more advanced and more capable cell phones on the market. So we get mobile terminals packed with technology that broadens their functionality. We can speak about convergence; one

single device may have all the additional functions, such as a camera, video camera, calendar, organizer, portable radio, music player, games console, GPS and, now, television. All of this automatically affects user demands concerning the services provided. The more functions are offered by the handhelds, the more advanced and sophisticated services are expected by the customers.

When we consider multimedia services (such as television, as mentioned previously, or large file downloads), we realize that the increasing traffic and congestion in the radio spectrum caused by these can lead to degradation of the quality of service. Providers have to live up to the users' expectations, offering rich, innovative, interactive services, but at the same time have to struggle to improve the user experience or at least keep it at the same, satisfying level. It quickly becomes obvious that the existing network technologies cannot handle this. We can compare this to the rapid growth of the number of Internet users in the mid-1990s. The network would have collapsed long ago by now if some measures had not been taken. New ideas and adjustments had to be implemented. Scientists came up with network technologies such as VLSM (Variable Length Subnet Mask), CIDR (Classless Inter-Domain Routing) and NAT (Network Address Translation) which helped to overcome the crisis and are now commonly used. Right now, however, the situation has pretty much gone full circle and implementation of new solutions is inevitable.

Let us get back to the television issue. When we consider a cell phone as a TV terminal, it becomes apparent that the place of viewing is no longer limited to the television set back at home or even in the car. Instead, personal viewing of television is possible at any time and in any place, which makes perfect sense since most of our time is spent away from home or traveling. It was cellular networks that brought television to handhelds. However, providing the service that way was expensive and proved unfeasible. 2.5G telephone technologies, such as EDGE General Packet Radio Service, may theoretically provide a maximum rate of 473 kbit/s, but using them for TV transmission certainly would not be cheap. What is more, content distribution is also expensive, as telephone networks use point-to-point connections. As a result, mobile telecommunication technology is mainly used for personal communication.

It would be much more effective to use a point-to-multipoint architecture. In other words, the answer to these problems is multicast. This addresses the idea that it is far more effective to deliver the

content to users simultaneously using a shared multicast path. That way, the data transmissions are not duplicated. We can also consider this from another point of view. When we talk about television, we assume broadcast. And while mentioning mobiles, a natural successor here is multicast. Broadcast is not a good solution as we do not want to send the content to everyone, only to some group that has ordered it and is willing to pay for it. To sum up, multicast enables the distribution of multimedia content cheaply to large groups of users.

Currently, several initiatives are undergoing a process of constant development, standardization and commercialization. At the same time, they are competing to emerge as the dominant technology standard in mobile broadcast television. We believe that two of these technologies, IPDC (Internet Protocol Datacasting) and MBMS (Multimedia Broadcast/Multicast Service), are the leading broadcast contenders. Although these originate from different backgrounds – digital television and third-generation cellular networks – both promise to provide truly multicast (meaning point-to-multipoint) services. On the following pages we are going to present both technologies, albeit with a little weighting towards IPDC. We will also try to answer the question of what users think about the technology, these new possibilities and whether it will deliver the new *killer application*. Of course, the other competing technologies will also be discussed briefly.

The book is organized in the following way. This chapter gives a general overview of the book and also introduces the subject matter. Chapter 2 provides information about multicast in general, describing the common issues concerning the technologies mentioned later on. Chapter 3 focuses on IPDC, giving a thorough analysis of the architecture, technical details, capabilities, offered services, etc. Chapter 4 has a similar construction to Chapter 3 but in it we present MBMS. In Chapter 5 we will continue the technical discussion, evaluating selected alternative technologies. Next, Chapter 6 tackles an issue particularly important for all technologies, which is protecting the delivered content from unauthorized access. In other words, we will get in-depth insights into DRM (Digital Rights Management) systems. Following this, in Chapter 7, we will move to the business aspects of the technologies, discussing the most probable value chains and presenting all the parties engaged and the possible benefits for each of them. Here, we will also tackle the important issue of charging, including the proposed charging schemes. Then, Chapter 8 will take a closer look at some of the existing implementations of

the technologies and also ongoing trials. Chapter 9 will be a summary of our market research, focused on evaluating the acceptance of the new services, costs that the customers are willing to indulge and the best-acknowledged form. Finally, Chapter 10 serves as the conclusion of the book, summarizing the main aspects covered.

REFERENCES

- [1] ‘Global cellphone penetration reaches 50 pct,’ Reuters UK, 26 November 2007, <http://investing.reuters.co.uk/news/articleinvesting.aspx?type=media&storyID=nL29>.
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