MOBILE PEER TO PEER (P2P)

A TUTORIAL GUIDE

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MOBILE PEER TO PEER (P2P)
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Numerous parallel disruptions are taking place in the software industry. These include the introduction of truly web-enabled mobile devices, large-scale use of peer-to-peer networking, and the new practice of social software engineering. In the emerging era of web-based, peer-to-peer mobile social software, applications live on the web as services that can be accessed with a mobile device. These services consist of data, code, and other resources that can be located anywhere in the world. The services and applications require no installation or manual upgrades. This makes the deployment of applications and services exceptionally rapid and simple. Ideally, applications also support user collaboration and social interaction, i.e. allow multiple users to interact and share the same applications and data over the Internet or in an ad hoc fashion, depending on their preferred form of communication.

This book has the ambitious goal of making sense of all the different techniques and technologies that fall under the peer-to-peer umbrella. To achieve this, it addresses the different bits and pieces that form the necessary technology basis for mobile peer-to-peer networks, as well as providing concrete examples of how to compose applications that benefit mobile peer-to-peer capabilities.

The book is authored by numerous researchers representing the different dimensions of the field. The chapters cover technology introductions and programming-level considerations, as well as introductory applications that have been implemented using the different technologies. The different dimensions that the authors address are well balanced, and when put together form a coherent story.

Based on my own experiences in all of the fields of technology covered in the book, I feel that this book is a welcome compilation of the different dimensions of the emerging use of mobile peer-to-peer networks. I am confident that it will encourage both researchers and practitioners to examine fresh approaches to application development, as well as being a source of useful information for a new generation of students.

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Preface

Mobile communication has been dominated by centralized architectures over decades. Direct communication among mobile devices was not the focus of researchers and not required by industry for many years. However, as mobile devices are nowadays fully programmable, this book aims to demonstrate the main motivation behind mobile devices clustering and making use of the developments in Mobile Peer to Peer (P2P). Mobile P2P describes the communication between mobile devices. The communication is realized by direct communication links such as Bluetooth or WiFi or via the network operator. It is important to note that the main services are carried out on the mobile device and no longer in the network.

This book presents insights into how to program such communication systems, referred to as mobile peer to peer (P2P), on mobile devices powered by Symbian OS (and one example is addressing JAVA as well). Mobile peer-to-peer communication systems are now receiving much more attention in research and industry than ever before. The direct communication among mobile devices is breaking ground for new services such as social mobile networking or cooperative wireless networking. Leaving behind the centralized world with strict point-to-point communication architectures, mobile communication devices are enriching our daily life. Such a pervasive communication world opens the door for new communication architectures.

About the book

The main motivation for this book project is to share the knowledge we have gained within our research groups in Aalborg and Budapest to build mobile applications leaving the old-fashioned cellular world behind. The book should help students or interested readers to gain the basic knowledge to build mobile peer-to-peer networks. Furthermore, it can serve as a textbook for courses in mobile communication, as the sources for all examples have been made available on the web (see below).

The book is divided into three main parts. The first part gives an introduction to mobile communication in general and some insights into mobile peer to peer (P2P). It is assumed that the reader is already familiar with the great achievements in the general area of mobile communication, which are normally given in the first 10 pages of such books, and therefore no overwhelming market sales information is given here.

The second part explains the basic programming environment and the basic wireless communication technologies such as Bluetooth, WiFi (IEEE802.11), and cellular communication examples. The programming language is mainly Symbian C++, as the Symbian