

# **GENERAL INTRODUCTION**

## 1. Motivation :

Peer-to-Peer programming (P2P) has in recent years become a widely explored research area and gets a lot of attention in both media and the computer industry. It has changed the way we communicate, collaborate and share resources. Implementations such as MSN Messenger or Skype have become almost mandatory for internet users, enabling instant communication in a way that makes E-mail appear antiquated. Internet traffic is now mainly dominated by P2P networks for file sharing, such as Gnutella and BitTorrent.

Personal wireless devices such as mobile phones have evolved from pure cellphones to small all-in-one devices that, in addition to being phones, contain camera, radio, mp3 player and the ability to connect to the Internet. The computing resources are constantly increasing, unlocking a great potential; to have personal wireless devices participate as Peers on a Peer-to-Peer network!

The obvious possibilities of instant messaging and file sharing can very likely become as popular as they have on a traditional P2P network, but an additional property will lead to new possibilities; the mobile phone is a personal device. It is always with us, it defines us and represents us at all times, wherever, whenever. This can be exploited in many ways, for instance in collaboration over large distances to solve a common problem, or personal monitoring in medical situations.

## 2. Problem specification :

P2P programming paradigm is increasingly becoming a dominant mode of resource sharing and cooperative problem solving. Traditionally, a peer is a computing device with substantial amount of computing power and resources. However, it will be an interesting idea if small wireless devices (such as mobile phones and wireless sensors) are also made peers. In this context, programming wireless devices has many challenges. The primary objective of this thesis work is to build a P2P system consisting of wireless devices only. In particular, we plan to investigate the following problems:

1. How do the limitations of the wireless devices (such as total power remaining in the battery, losing communication with other peers at any time, small displays, and limited CPU power and memory) affect the solutions to a problem, and how do they affect the program logic?

2. In dynamic emergency situations, how is programming or computing distributed amongst the other wireless peers so that in case of power failure or disruption in communications, the network can ensure a graceful degradation?

We propose to create a mobile P2P scenario and build a prototype in ActionScript 3 API based on the system design using phone emulators.

### **3. Objectives :**

The main objective of this thesis is to build a Peer-to-Peer system for wireless devices. The system design will be based on an open, the protocol-based of P2P platform called RTMFP, which enables the developer to focus on the end-system instead of the extensive task of creating the P2P network. The prototype will be developed in ActionScript 3 for the Adobe AIR platform.

Firstly, Adobe Flash Player, P2P networking and the RTMFP technology will be investigated. Based on this a Mobile Peer-to-Peer system will be designed a prototype will be implemented using phone emulators.

Next, the application will be tested to see how it performs in a scalable network and how it performs when transferring large files.

### **4. Structure :**

In first chapter we will give a short overview of today's Smartphones and limitations.

In the second chapter we review different architectures of peer-to-peer networks and compare those to the traditional client/server architecture.

In the third chapter we discuss a generalization of the RTMFP.

The first part of the fourth chapter describes a case study and an overview of our system and the second presents the modeling.

The last chapter presents the work tools and the implementation of this application.