Enabling Mobile Chat Using Bluetooth

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INTRODUCTION

Mobile chat applications can be seen as an alternative and effective way of communicating for people without the need of using the mobile telephony system. Based on the new generation of cellular phones with support for communication technologies, such as Bluetooth and Wi-Fi, it is possible to develop applications to enable mobile chats. Such applications can provide mechanisms to discover and communicate with other devices in a shorter range, but with low or no communication costs.

This article introduces Let's Talk, a mobile chat and relationship application. It allows a Symbian OS Series 60 mobile phone user to create a profile and share it with other users. Also, it is possible to invite other users to a chat in a session. The profile sharing and the chat communication data are transferred over a Bluetooth connection. After creating your profile, a user can search for other profiles in the range of the Bluetooth connection and make your profile available to other users.

In this article, we discuss design and implementation issues related to the application development using a Symbian-based cellular phone and the C++ programming language. The remainder of this article is organized as follows. We first present the technologies used to develop the application: Symbian OS, the Series 60 platform, the Bluetooth wireless technology, and the Cobain Framework. We then present the Let's Talk software and the use of the technologies presented in the Background section. Possible improvements for the application and trends related to the theme are then offered, followed by final remarks in the Conclusion section.

BACKGROUND

Symbian OS

The Symbian OS (http://www.symbian.com/) is an operating system designed for mobile devices; it is an industry standard, used in smart phones of many manufacturers, such as Nokia, Siemens, Motorola, Sansung, and others.

Symbian is optimized for mobile devices that have low memory and processing power, with low runtime memory requirements. It is designed to optimize the device performance and the battery life. It is a multi-tasking operating system, allowing many applications to run concurrently. To reduce recourse consumption, Symbian provides multi-thread support to the programmer through the concept of active objects, which are a lightweight alternative to threads.

The Symbian OS development model is based on an object-oriented architecture using the C++ programming language with optimized memory management for embedded software.

Series 60

The Series 60 platform (http://www.s60.com/) was developed by Nokia, but it is also licensed to other manufacturers. It was built over the Symbian Operating System, providing a configurable graphical user interface library and a set of applications and other general-purpose implementations.

The set of applications includes personal information management (PIM) and multimedia applications, such as calendars, contacts, text and multimedia messaging (SMS,

Figure 1. Series 60 user interface

Figure. 2 Profile form

MMS), e-mail, browsing using WAP or others, and so forth.

Some of the main features of Series 60 are the large color screen with a minimum specification of 172 by 208 pixels, and at least 4,096 colors (64K colors in Series 60 2.x) and many interaction models, such as two soft keys, five-way navigator, and other dedicated keys (Edwards, Barker, & Staff of EMCC Software, 2004). The Series 60 User interface is illustrated in Figure 1.

Bluetooth

Bluetooth (IEEE 802.15.1) is a wireless specification for personal area networks (PANs). It provides a way to connect and exchange information between devices such as personal digital assistants (PDAs), mobile phones, laptops, PCs, printers, and digital cameras via a secure, low-cost, globally available short-range radio frequency (http://www.bluetooth.com/). Bluetooth is available in most Series 60 devices providing connectivity to these devices.

The Cobain Framework

Cobain is an API (application programming interface) that permits the development of Bluetooth applications, simplifying the development process for this kind of application in the Symbian OS (Dahlbom & Kokkola, 2004). It consists of a lightweight ad-hoc networking framework, providing a Unix-like API socket, hiding details of implementation, such as Active Objects handling.

LET'S TALK

Let's Talk is a chat application for Symbian OS Series 60 mobile phones, allowing users to contact another people and establish a conversation. The profile sharing mechanism allows a user to create a profile and share it with other users. The profile contains personal information, such as name, age, and gender. This information is made available to other Let's Talk users that can invite this user to chat after viewing his/her profile. This feature enables the establishment of relationships between users based on the level of interest in their profiles.

The application may be running in two modes: waiting or searching. The searching application can discover all devices running the application in the waiting mode and allows the user to request the profile of any discovered user. The profile request contains the searching user profile data, which will be evaluated by the waiting user.

The waiting mode informs the user that there is an incoming profile request and shows the profile of the requesting user in a form. In response to this request, the user sends the waiting user profile data to the searching application, which shows this profile to the searching user.

In each device, Let's Talk creates a form that contains the profile of the other user using the data sent via Bluetooth. In the Series 60 platform, the forms provide a way for the user quickly and easily to enter or edit many items of data in the application. The form could also be used in *view mode* to display information about the user profile. If a form has a view mode, like the profile creation form, the form focus appears as a solid block as illustrated in Figure 2. Switching to edit mode is achieved by selection of Edit from the Options menu (Edwards et al., 2004).

The profile sharing and the chat communication data are transferred over a Bluetooth connection. The connection is established using the Cobain API that is responsible for: (1) discovering devices available for Bluetooth connection, (2) discovering services available at the selected device, (3) connecting to the given service, (4) sending and receiving

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