E*phone (Sprint)

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1 Introduction

This document describes the overall hardware and software architecture of the e*phone, and its integration into the Sprint WAP architecture. The hardware design is likely to see two versions. The first one, called 2.3, is based on the currently available prototype, shown in Fig. 1. This device has the following features:

- SIP/RTP-compliant Internet device;
- 10 Mb/s Ethernet interface;
- optically isolated digital input for sensors such as alarms or IR presence;
- 16-bit stereo audio codec, with ability to configure one stereo input as an analog sensor input;
- all aspects automatically configured via DHCP;
- automatic time synchronization (no blinking 12:00. . .).

A future version of the hardware will likely have the following additional characteristics:

- higher integration, resulting in lower hardware cost;
- larger LCD (touch) screen, subject to cost constraints;
- USB interface for connection of keyboards and possibly video input;
- possibly a DAA to allow use on analog phone lines in addition to Ethernet.

A wireless portable device, suitable as a replacement for a cordless phone for use in Wi-Fi (IEEE 802.11) home networks, is also planned, based on the same hardware design.

2 WAP Operation

WAP is motivated by two limitations of wireless devices, their small screen and the extremely limited access bandwidth. The latter restriction does not apply here, but the screens available on desk phones are likely to be just as small in many cases as those on cell phones, primarily for reasons of cost. Thus, in our architecture we avoid the complexity of implementing WAP in the e*phone. Instead, a WAP proxy translates the WAP protocol stack, including WML and WMLscript, to a simple "terminal" interface, i.e., the 64-character display on the e*phone and the key press indications from the e*phone. Each display update and keystroke is transmitted as a single SIP MESSAGE request[1].

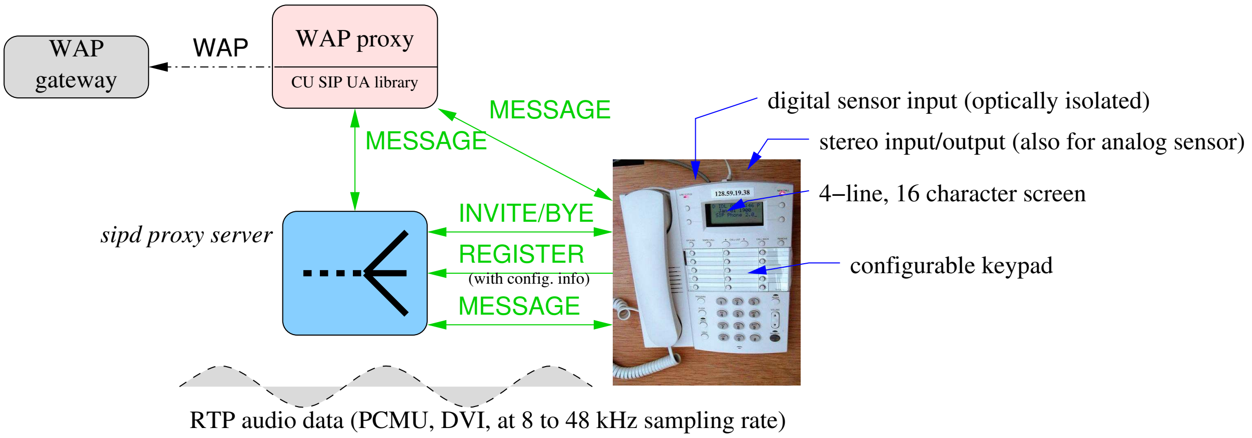

Figure 1: E*phone with WAP capability

By default, the e*phone transmits SIP MESSAGE messages to its designated SIP proxy, which then routes them to a SIP-WAP gateway. Alternatively, the messages can be exchanged directly between the SIP-WAP gateway and the e*phone. The gateway or the server can also send idle messages to the e*phone, which are displayed when no call is in progress, with the ability of the user to select, for example, the service advertised. By using the SIP third-party mechanism [1] or PINT (a SIP profile) [2], voice calls can be directly established to the advertiser.

Just like web browsers have bookmarks, it is also possible to provide a similar functionality in the e*phone. We intend to provide the ability to have the SIP server upload user agent configuration information in the SIP REGISTER response that configures the speed dial buttons. The e*phone has 15 such buttons, so that, with a "shift" key, about 30 URLs can be pre-programmed, consisting of any mixture of SIP URLs or WAP pages.

References

[1] J. Rosenberg, H. Schulzrinne, and J. Peterson, "Third party call control in SIP," Internet Draft, Internet Engineering Task Force, Mar. 2000. Work in progress.

[2] S. Petrack and L. Conroy, "The PINT service protocol: Extensions to SIP and SDP for IP access to telephone call services," Request for Comments 2848, Internet Engineering Task Force, June 2000.

[1]This is only marginally less efficient than traditional telnet usage.