LEAP on Linux PDAs

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A Component of *The LEAP Manifesto*

This article is one of a series of articles describing various aspects of the Mobile Messaging industry and the Lightweight & Efficient Application Protocols (LEAP) protocols. For the complete collection of articles see *The LEAP Manifesto* [8], available at `http://www.LeapForum.org/LEAP/Manifesto/roadMap/index.html`. *The LEAP Manifesto* is also available at the Free Protocols Foundation website at `http://www.FreeProtocols.org/LEAP/Manifesto/roadMap/index.html`.

Contents

1 Introduction

This is one of a series of articles that describes the implementation and integration issues involved in incorporating the LEAP protocols into particular PDA environments.

The starting point for incorporation of LEAP in PDAs consists of the Mobile Messaging application, and is based on the Efficient Mail Submission and Delivery (EMSD) protocol [1]. EMSD is the e-mail component of the LEAP family of protocols [2].

A complete description of how EMSD provides everything necessary to enable end-users to benefit from true end-to-end open mobile messaging based on patent-free protocols and open source and free software is provided in the article *Operation Whiteberry* [3]. The present article is part of the more general Operation WhiteBerry model. Before reading this article, the reader is strongly encouraged to read *Operation Whiteberry* so that he/she has a clear understanding of the general implementation framework.

It is our goal to make LEAP widespread on all PDAs. However, the incorporation of LEAP into each platform follows a particular approach and strategy. Each of the articles in this series outlines our strategy for a specific platform.

Windows CE Integration Strategy

A standard mail application called Inbox is bundled with all Windows CE devices. Microsoft has defined a generic mail transport service provider interface underneath Inbox, which allows alternative mail submission and delivery protocols to be integrated with Inbox. Microsoft has also defined a winsock interface which provides access to UDP[10] and TCP[11] by third party applications. These well-defined APIs allow a new mail submission and delivery protocol to be integrated with Inbox in the Windows CE environment.

Our strategy for integration of EMSD in the Windows CE environment has been to provide a complete Mail Transport Service provider underneath Inbox. We have done so by providing EMSD binary distribution packages which end-users can quickly and easily plug in, allowing immediate implementation of the WhiteBerry model.

Additionally, the entire source code package for EMSD on Windows CE is available subject to the Gnu General Public License (GPL). The availability of this software package in source form allows tight integration with wireless modems, and other customizations/enhancements.

The existing open-source implementation is available at http://www.mailmeanywhere.org.

See the article *EMSD on Windows CE* [6] for more details.

Palm OS Integration Strategy

Palm OS is an effective, general purpose mobile computing platform which, among other applications, comes bundled with a simple e-mail application called Mail. In contrast to the Windows CE Inbox application, however, the standard Palm OS mail application has only a very rudimentary set of features and capabilities. Also in contrast to Windows CE, the Palm OS does not include a set of well defined APIs to facilitate the integration of alternative mail protocols.

To complicate matters further, various third party mail user agents have now become widely available for Palm OS (largely because of the inadequacy of the standard Palm OS mail application), with a variety of different user interfaces. Because of this multiplicity of incompatible Palm OS mail applications, each integration of LEAP with Palm OS must be specific to a particular Palm OS mail user agent.

For these reasons our strategy for integration of the EMSD protocol engine in the Palm OS environment is different from that for Windows CE.

We start with a very basic example implementation of EMSD for Palm OS. This example implementation is specific to the standard mail application, based on file access.

Based on the availability of this package in source form, subject to the Gnu General Public License, a variety of Palm mail user agents can become EMSD-enabled very rapidly. To accomodate this further we have selected certain mail user agents which we consider particularly desirable, and we will participate in the integration of EMSD with these mail user agents.

See the article *LEAP on Palm OS* [4] for more details.

2 Integration Strategy for Open-Source PDAs

Reference implementations of the LEAP protocols are available as open-source and free software, subject to the Gnu General Public License (GPL).

It is highly desirable for there to exist useful and complete open-source and free software platforms as alternatives to the commercial PDA platforms such as Windows CE and Palm OS.

At the present time two such open-source platforms are of particular importance. These are:

1. Linux-based PDAs
2. eCOS

Our goal in this article is to accommodate the incorporation of the LEAP protocols, in particular EMSD as a Mail Transport Service provider, on both of the above platforms.

2.1 LEAP on Linux-Based PDAs

Recently there have been numerous announcements of new Embedded Linux support for PDAs and other handheld personal computing devices.

Such development efforts can benefit from efficient protocols which are specifically oriented towards the needs of miniaturized devices and mobile applications. As we have previously argued in the articles *The WAP Trap* [9] and *WAP Scraps* [5], the integration of pseudo-open protocols such as WAP with Embedded Linux is the wrong strategy. We are offering LEAP as an alternative [7].

Given the rapid emergence of Embedded Linux as a major "third alternative" to Palm OS and Microsoft Windows CE for handheld personal computing devices, we view the integration of LEAP with Embedded Linux as having special importance.

For a frequently updated overview of available and developing Linux-based PDA support, visit *The Linux-PDA and PDA-Linux Quick Reference Guide* at http://www.linuxdevices.com/articles/AT8728350077.html.

Because LEAP implementations on Linux and other Unix platforms are already in place, the incorporation of LEAP into Linux-based PDAs is simply a matter of portation.

The integration of EMSD as a Mail Transport Service provider with open-source Mail User Agents is often quite rapid. For example Pine, and GNUS and VM from Emacs, are major user agents for which EMSD integrations have already been completed.

The work of putting ESRO in kernel space, and providing a socket-based interface to ESRO, is currently in progress.

We consider the full and optimized integration of LEAP with Linux to be a strategic goal. We will continue to improve the quality of existing integrations, and the range of platforms for which LEAP and Linux support is provided.

2.2 LEAP on eCos Based Phones and PDAs

eCos is an open-source embedded operating system which is well in tune with the open-source and Linux software development framework. For more information (including source code), see http://sourceware.cygnus.com/ecos

Close integration of LEAP with eCos is highly desirable, because LEAP provides key applications that can greatly increase the utility and value of eCos. Note that on its own, eCos is just an operating system. But in combination with LEAP, eCos can provide Mobile Messaging and other powerful applications.

We intend to integrate LEAP with eCos in the context of a specific embedded hardware platform – specifically, the cell phone hardware platform. A cell phone platform running eCos and LEAP is extremely desirable.

If any such development effort is already underway, we would be pleased to hear about it. We will do all we can to cooperate in the creation of cell-phone-based open-source mobile applications and platforms. Please contact us at the e-mail address shown on the article title page.

3 Invitation to Participate

As described in *Operation WhiteBerry*, the incorporation of EMSD in open-source PDA platforms presents enormous benefits.

We invite the developers of open-source PDA platforms to incorporate EMSD into their software. EMSD protocol engines ready for the Linux environment are readily available, and can be easily integrated with your software. Complete implementations of EMSD in open-source form are available at http://www.mailmeanywhere.org.

References

[1] M. Banan. Neda's Efficient Mail Submission and Delivery (EMSD) Protocol Specification Version 1.3. RFC 2524 (Informational), February 1999.

[2] Mohsen Banan. EMSD: The LEAP E-mail Component. A component of LEAP Manifesto, LEAP Forum, January 2000. Online document is available at http://www.LEAPForum.org/leap.

[3] Mohsen Banan. Operation WhiteBerry. A component of LEAP Manifesto, LEAP Forum, January 2000. Online document is available at http://www.LEAPForum.org/operationWhiteberry/index.html.

[4] Mohsen Banan. LEAP on Palm OS. A component of LEAP Manifesto, LEAP Forum, September 2001. Online document is available at http://www.LEAPForum.org/leap.

[5] Mohsen Banan. WAP Scraps. A component of LEAP Manifesto, LEAP Forum, August 2001. Online document is available at http://www.LEAPForum.org/leap.

[6] Mohsen Banan. *EMSD on Windows CE*. Neda Published Document 103-101-01.02, EMSD Organization, 1998. Online document is available at http://www.emsd.org/pubs/biblio/103-101-01-02/index.html.

[7] Mohsen Banan. *LEAP: One Alternative to WAP*. A component of LEAP Manifesto 108-102-02, LEAP Forum, Bellevue, WA, February 2000. Online document is available at http://www.freeprotocols.org/pubs/biblio/108-102-02/index.html.

[8] Mohsen Banan. *Lightweight & Efficient Application Protocol (LEAP) Manifesto*. Technical Report 108-101-01, LEAP Forum, Bellevue, WA, January 2000. Online document is available at http://www.leapforum.org/LEAP/Manifesto/completeManifesto.

[9] Mohsen Banan. *The WAP Trap.* FPF Published Document 108-102-01, Free Protocols Foundation, Bellevue, WA, January 2000. Online document is available at http://www.freeprotocols.org/wapTrap.

[10] J. Postel. User Datagram Protocol. RFC 768 (Standard), August 1980.

[11] J. Postel. Transmission Control Protocol. RFC 793 (Standard), September 1981. Updated by RFCs 1122, 3168.