The
Lightweight & Efficient Application Protocols (LEAP)
Manifesto

Using
Free Protocols & Free Software
to build the
Mobile & Wireless Applications Industry

EXECUTIVE SUMMARY

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Chapter 1

Executive Summary

Until now, the Internet has been largely based upon simple protocols. However, the era of simple protocols is now over. The new Internet reality is that of wireless networks, providing service to legions of miniaturized, hand-held mobile devices. This reality places an entirely new set of requirements on the underlying communications protocols: they must now provide the power efficiency demanded by hand-held wireless devices, together with the bandwidth efficiency demanded by wide area wireless networks.

It is now time for a new generation of protocols to be implemented, designed to address the need for *performance*, rather than simplicity.

The industry-wide adoption of this new generation of powerful and efficient protocols will have enormous consequences. Protocols addressing the correct requirements will become the lynchpin of a huge new industry. The stakes are enormous, and ferocious competition is to be expected within all segments of the industry. All manner of wild claims and misrepresentations are also to be expected. At the time of writing, the main claimant to the protocol throne is the Wireless Applications Protocol, or WAP. However, WAP will eventually prove to be entirely inadequate to the role being claimed for it.

We have designed a set of protocols, the **Lightweight & Efficient Application Protocols**, or **LEAP**, which we believe is destined to displace WAP and become the *de facto* industry standard. These protocols, published as Internet RFC-2524 and RFC-2188, are designed to address all the technical requirements of the industry, and are oriented towards providing the greatest benefit to the industry and the consumer.

This manifesto is about our vision of the future of the Mobile and Wireless Applications Industry. In the remainder of the manifesto we present the details of our vision, and we justify our claims. We justify our assertion that the industry needs a new generation of protocols, we explain why our protocols fulfil this need, and we describe how and why these protocols will achieve dominance.

The protocols are free, open and in place. Open-source software implementations of the protocols are available for all major platforms. The combination of free protocols and open-source software ensures acceptance of the protocols in the Internet mainstream. There can be no stopping this.

1.1 Technological Scope

Most of our discussion throughout this Manifesto is framed in terms of a particular technology, namely, Mobile Messaging. It is important to bear in mind, however, that Mobile Messaging is just one aspect of a broader technology: Mobile Consumer Data Communications. Mobile Consumer Data Communications refers to the general ability of an end-user to send and receive digital data at a hand-held device via a wireless network. This technology includes Mobile Messaging as a special case, but also includes other wireless data transfer capabilities such as general Internet access, web browsing, etc.

Much of the discussion set forth in this Manifesto applies with equal force to all mobile data communications applications, not just that of messaging. However, it is currently well understood that the dominant application for mobile data communications is, in fact, Mobile Messaging, not web browsing or other Internet applications. Therefore throughout this Manifesto we will focus our attention on the messaging application.

Though our discussion will be framed in terms of Mobile Messaging, the reader should bear in mind that the same principles apply to all forms of mobile data communications.

Also, whenever we speak of the Mobile Messaging industry, we are referring to the totality of what is required to accomplish effective mobile messaging capabilities for the end user.

We are not referring to the implementation of mobile messaging on any particular device, such as a mobile phone, PDA, palmtop PC, laptop PC, or two-way pager. Similarly, we are not restricting our focus to any specific technologies or standards, nor are we restricting our focus to a specific market or set of subscriber services.

Rather, we are referring to the entire set of technologies and constituencies which are required to enable Mobile Messaging. This includes: mobile handheld devices and their manufacturers, wireless modems and their manufacturers, wireless data networks and their operators, ISPs and other service providers, and the set of protocols and software implementations required to allow interplay and cooperation among these various consituencies.

Our purpose in writing this Manifesto is very ambitious: we wish to describe our vision of all that is required to build the entire Mobile Messaging industry.

1.2 Efficiency is the Key Requirement

Engineering is the art of making intelligent trade-offs between conflicting requirements. A perennial engineering trade-off is that which must be made between the need for *simplicity*, and the need for *performance*. In the case of wireless data communications, performance means such things as data transfer speed, power efficiency, and bandwidth efficiency.

The 1980s and 1990s were the decades of simple protocols - protocols such as the very aptly named Simple Mail Transfer Protocol (SMTP), and Simple Network Management Protocol (SNMP). A great deal of the success of these and other Internet protocols can be attributed to their simplicity.

The first generation of network engineers and network operators were only able to view network communications in relatively simple terms. It was appropriate to cater to that simplicity with simple protocols. A key reason for the success of these early protocols is the lack of technical sophistication on the part of first-generation network engineers and operators.

Simple protocols are easier to make widespread than "good" protocols (meaning those which have better capabilities and performance), for the basic reason that network engineers and operators are able to adopt and implement simple protocols much more easily than "good" protocols.

However, things have changed. Network communications has now expanded dramatically and forcefully into the wireless and mobile data communications arena, and *wireless applications demand efficiency*. The move to wide-area wireless has significantly shifted the location of the ideal engineering balance between simplicity and performance - moving it away from simplicity, and towards performance.

We therefore need a new generation of high-performance, efficient protocols, to cater to the demands of wireless applications. The point is sometimes made that the need for efficiency in the wireless arena is a temporary one – that advances in wireless engineering technology in the form of third generation (3G) systems will eliminate existing bandwidth limitations, obviating the need for efficient protocols. As long as the capacity of wireless networks remains finite, however, the need for efficiency will persist. Efficient usage is an inherent requirement for any finite resource, therefore the requirement for efficient bandwidth usage and battery longevity is permanent.

1.3 Conventional Origins of Protocols

Where will the required protocols come from? Traditionally, industry-wide protocols have their origins in one of two sources:

1. The major players in the industry itself. In the case of wireless communications, this means the major telecommunications and wireless network companies.
2. Professional protocol and standards producing associations. In the case of wireless communications, this means the IETF, ITU, ISO, ANSI, TIA and others.

Unfortunately, neither of these groups has produced a set of protocols which meets the industry's needs. The first group above, represented by a set of telephone companies, has generated the WAP specification. However, as we will argue in detail later, this specification is grossy unfit for its claimed purpose. Among other things it is poorly designed, not the product of open peer review, and crippled with Intellectual Property Right (IPR) restrictions. It is essentially a business construct, not an engineering one. In the long run WAP cannot possibly survive as a viable solution. In the short run it can only have a destructive effect on the wireless industry.

The second group above, most notably represented by IETF, has likewise failed to produce an acceptable standard. IETF represents the tradition of simple protocols, a tradition which wireless communications has made obsolete. Unfortunately, IETF remains rooted in this tradition, and has not adapted to the new realities of wireless communications. Until it does so, IETF will remain ineffective as a protocols and standards body. In the area of efficient protocols, IETF is simply bankrupt.

1.4 Expect the Unexpected

Fortunately, there are other sources of innovation. One of these is the radical new development that comes out of nowhere, taking everybody by surprise. Typically this originates in the actions of a small group of independent experts, with a deep understanding of the technology and industry, and who are passionate about and committed to its health and vigor.

Note that the World Wide Web itself originated in neither of the traditional sources, but instead came from an entirely different and unexpected direction: a group of physicists at the CERN laboratory in Switzerland. As another example, Pretty Good Privacy (PGP), now the *de facto* standard for electronic data encryption, also came from neither traditional source. It was essentially the creation of a single man: Phil Zimmermann. Armed with a vision and a belief in its value, Zimmermann single-handedly made PGP the dominant consumer encryption application - displacing the IETF alternatives in the process.

The solution to the current wireless application dilemma is also likely to come from an unexpected source – and we believe that we are that source. In the world of the Internet, we have learned to expect the unexpected.

1.5 Our Solution

We have developed a set of protocols which we believe address all aspects of the industry's needs. Beyond their purely technical requirements, a fundamental requirement of all industry-building protocols is that they be completely open and free from patents and other IPR restrictions – either because no patents actually exist, or because reasonably non-restrictive licenses are granted by the patent holder. In the rest of this document, this is what we mean when we speak of "patent-free" protocols.

The presence of patented components within a protocol is extremely undesirable, since this undermines the ultimate purpose of the protocol: its unrestricted adoption and usage. The process that we have followed in developing our protocols has been such as to ensure that they are entirely open and, as far as this can be guaranteed, patent-free. A significant part of this process consists of our full committment to the processes and procedures of the Free Protocols Foundation (FPF).

The FPF is an organizational framework for the development and maintenance of free protocols. It allows developers to declare publicly that the protocols they have developed are intended to be patent-free, and that it is their intention to keep them patent-free into perpetuity. We have made this declaration through the Free Protocols Foundation with regard to our own protocols.

Note that this is in sharp contrast to the WAP protocols, which include severe IPR restrictions. This creates an unfair market advantage in favor of the initial WAP designers. Our intention is to create a protocol which does not favor any one industry player over another, and places competition where it belongs: on the merits of each company's individual products and services.

We have created the general framework for a set of high-performance, efficient protocols which are ideal for mobile and wireless applications. We refer to this general framework as the Lightweight & Efficient Application Protocols (LEAP).

The need for efficient protocols extends across all aspects of wireless data communications, including e-mail, web browsing, and other applications. The LEAP architecture accommodates all of these applications. Our initial implementation, however, is focussed on the Mobile Messaging application, since we believe that this is the dominant application for wide-area wireless networks.

All efficient applications have the requirement for an efficient transport mechanism. For this reason, the initial focus of our protocol development effort has been on creating a general efficient transport mechanism. The resulting protocol is referred to as Efficient Short Remote Operations (ESRO). ESRO is a reliable, connectionless transport mechanism, forming the foundation for the development of efficient protocols when TCP is too much and UDP is too little.

Our Efficient Mail Submission and Delivery (EMSD) protocol is built on top of ESRO, and is designed to address the Mobile Messaging application.

Both of these protocols have been published as Internet RFCs: ESRO as RFC 2188, and EMSD as RFC 2524. RFC publication ensures that the protocols are freely, easily and permanently accessible to anyone who wishes to use them.

Note that this also is in stark contrast to WAP, which is self-published by the members-only WAP Forum. Furthermore, the WAP Forum reserves the right to make unilateral changes to its protocols; each of the WAP protocols carries on its cover page the disclaimer, “subject to change without notice.”

Publication of a protocol as an Internet RFC ensures that the protocol will remain stable and permanently available to anyone who wishes to use it, and for this reason is the mainstream Internet publishing method. The declining of the WAP Forum to publish their specifications as Internet RFCs suggests either that the forum wishes to retain an inappropriate degree of control over the specifications, or that the specifications do not meet the minimum technical standards required for RFC publication.

1.6 A Brief History of LEAP

LEAP originated in 1994 as part of the research and development initiatives of McCaw Cellular’s wireless data group (now AT&T Wireless Services). The development work that would eventually lead to LEAP was initially undertaken in the context of the CDPD network; its scope was later expanded to include the Narrowband PCS network also.

By 1996 McCaw Cellular was fully committed to paging, had recently purchased two nationwide narrowband wireless PCS licenses, and wished to develop an efficient wireless message transport and delivery system. Neda Communications, Inc., an independent consulting company working under contract to McCaw Cellular, played a significant role in the development of the required system. Neda Communications had also been involved from the outset in the development of the CDPD specification.

In 1997 however, soon after the purchase of McCaw Cellular by AT&T, the latter company abandoned narrowband PCS paging altogether. Prior to this event, Neda Communications had secured from AT&T the necessary rights to continue independent development of the protocols. Therefore, recognizing the eventual future need for these protocols, Neda then undertook to continue development of the protocols independently of AT&T. They were eventually completed by Neda, published as RFCs, and now form the cornerstone of the LEAP protocols.

1.7 Making Our Solution Widespread

Our ultimate goal is to make these protocols widespread. Developing and publishing a set of protocols, however, is just the beginning. Protocols become accepted as standards as a result of public review, modification by consensus, and ultimately by standing the test of usage in the industry at large.

To provide a forum for these processes, we have created EMSD.org and ESRO.org. Each of these organizations allows public review of the respective protocol, and provides a mechanism for correction and enhancement of the protocol as a result of collective experience. Any interested person can become a member of these organizations and participate in the further development of the protocols. The only requirement for membership is that participants must adhere to the principles and procedures of the Free Protocols Foundation, ensuring that the protocols remain permanently patent-free.

Note that this also is in sharp contrast to WAP. Participation in WAP, far from being open and public, requires a $27,000 membership fee (as of February 2000), and takes place entirely behind closed doors.

In order for the protocols to become widely accepted, they must be implemented in the form of software solutions that are readily available for deployment by end-users. We have therefore created open-source software implementations of the protocols for most common platforms. Protocol engines are available in the form of portable code which has been ported to a variety of platforms. On the device side, software is available for Windows CE, Palm OS, EPOC, and others. On the message center side, software is available for NT, Solaris, and Linux.

As noted above, our initial emphasis is on the Mobile Messaging application. Protocol engines are only a single component of a larger picture; in order to provide complete solutions to the user it is necessary to integrate these protocols into other existing pieces of software. To that end we have created MailMeAnywhere.org, where fully-integrated solutions in open-source format are made available to the user.

We will initially "prime the pump" by providing free subscriber services through ByName.net and ByNumber.net. This will provide initial support for adoption of the protocols by end-user devices. Usage of the protocols among a sufficient number of user devices will then provide the motivation for usage among the message center systems.

1.8 Complete and Ready

All the components that are needed to accomplish these goals are complete, in place, and ready to go. These components are:

The Protocols. The protocols are well-designed, meet all the technical requirements of the industry, and are published as RFCs – the mainstream Internet publishing procedure. The complete text of RFC 2188 and RFC 2524 is available at:

`http://www.rfc-editor.org`

Open Maintenance Organizations. The protocols are maintained at EMSD.org and ESRO.org, allowing open and non-exclusionary participation in the maintenance of the protocols. For complete details see:

`http://www.esro.org` and
`http://www.emsd.org`

Freedom from Patents. The protocols are patent-free to the best of our knowledge, and are guaranteed to stay that way. This ensures permanent, unrestricted access to the protocols. For more information see:

`http://www.FreeProtocols.org`

Open-Source Software Implementations. These are being made available for a wide variety of of platforms and end-user devices, including: pagers and cell-phones; hand-held PCs (Windows CE, Palm PC) and Palm Pilot; Windows 98, Windows 95, and Windows NT; Pine (UNIX, Windows, DOS). For complete details see:

`http://www.MailMeAnywhere.org`

Free Subscriber Services. These are provided to support initial deployment of the protocols in end-user devices. For complete details see:

`http://www.ByName.net` and
`http://www.ByNumber.net`

Collectively, the above components represent a complete recipe for the success of the LEAP protocols. All the pieces of the puzzle are complete, and there are no missing pieces.

1.9 How to Participate

As noted above, the LEAP protocols are entirely open, and any interested person or organization may participate in their development. To participate in the development of the LEAP protocols in general, visit the LEAP Forum website at http://www.leapforum.org/. To participate in the development of specific members of the LEAP family of protocols, visit the ESRO.org website at http://www.esro.org/, or the EMSD.org website at http://www.emsd.org/.

All of the above websites host mailing lists for commentary and general information exchange regarding the protocols. In particular, ESRO.org and EMSD.org host Working Group mailing lists for active development of their respective protocols.

In addition, we invite participation in the development of *The LEAP Manifesto* itself. We expect that as the LEAP family of protocols grows and becomes implemented on additional platforms, additional articles will be included in the Manifesto. Any person or organization may submit information or articles that they feel are appropriate for inclusion in the Manifesto; any such material will be given due consideration by the Manifesto editor.

In addition, we would welcome the translation of key Manifesto articles into foreign languages. One such translation has already taken place; the Manifesto article *The WAP Trap* is now available in French under the title *Le WAP a la Trappe*. Other key articles that would be greatly desirable in foreign language translations include *LEAP: One Alternative to WAP*, and *Operation WhiteBerry*. Persons interested in writing foreign language translations are asked to contact the Manifesto editor at info@leapforum.org.

We also invite general commentary and criticism of the Manifesto. Please let us know of any errors, omissions or ambiguities you may find in the Manifesto. Any input or commentary should be submitted to the Manifesto editor at info@leapforum.org.

1.10 Who We Are

Throughout the Manifesto, we frequently refer to ourselves in the first person, and we also refer to several organizations and domains that are in some way related to the LEAP protocols. The question may be asked, who exactly are "we"? Who are the authors of the Manifesto, and what is their relationship to the organizations involved in the development of LEAP? Who owns LEAP? In this section we provide the answers to these questions.

Mohsen Banan. Mohsen Banan is the principal editor of *The LEAP Manifesto*; he is also the author of many of its component articles. Several other authors also wrote and/or contributed material to certain component articles; these are acknowledged in the appropriate articles. First-person references throughout the Manifesto refer to the principal editor, Mr. Banan.

Mr. Banan is also the president of Neda Communications, Inc. He is also the president and a board member of the Free Protocols Foundation.

Neda Communications, Inc. Neda Communications, Inc. is a private, for-profit company located in Bellevue, WA. Neda provides consulting services and develops products and services relating to wireless data communications.

Neda has independently led the development of the LEAP protocol specifications since 1997. Neda has also developed a comprehensive set of software implementations of the LEAP protocols, which it intends to subject to the GNU Public License and make freely available.

The LEAP Protocols. The design and development of the LEAP protocols was primarily carried out by several engineers working at Neda Communications, Inc. The development effort was led and coordinated by Mohsen Banan. RFC-2188 was published jointly by Neda and AT&T personnel. RFC 2524 was published individually by Mohsen Banan. As the primary author of both RFCs, patent-free declarations for both protocols were made by Mohsen Banan and on behalf of Neda.

No one owns the LEAP protocols. The protocol specifications reside entirely in the public domain.

The LEAP Forum. The LEAP Forum is a clearing house for information and pointers relating to the LEAP protocols. The LEAP Forum is not a standards organization, it is not a legal entity of any kind, and it is not a membership organization. The LEAP Forum maintains a mailing list for the free interchange of information and commentary regarding the LEAP protocols. Any interested person or organization may subscribe to the mailing list. The LEAP Forum website and mailing list are presently hosted by Neda equipment and network resources, and managed by Neda personnel.

For more information, visit the LEAP Forum website at http://www.leapforum.org/.

ESRO.org and EMSD.org. ESRO.org and EMSD.org are open organizations for the development and maintenance of the ESRO and EMSD protocols respectively. Neither organization is a standards organization, nor a legal entity of any kind, nor a membership organization. They are simply forums to allow information exchange and cooperative effort relating to the LEAP protocols and technology.

Both organizations maintain several mailing lists, to which any interested person or organization may subscribe. The ESRO and EMSD websites and mailing lists are presently hosted by Neda equipment and network resources, and managed by Neda personnel.

In particular, each organization hosts a Working Group mailing list for active development of the corresponding protocol. Mohsen Banan is the current chairperson of both Working Groups, with responsibility for coordinating the Working Group development effort.

For complete information, visit the appropriate website at either
http://www.esro.org/ or http://www.emsd.org/.

Free Protocols Foundation. The Free Protocols Foundation is a non-profit organization whose mission is to prevent the inclusion of patented components within protocols. The FPF has established a set of policies and procedures for protocol development that is designed to ensure that the resulting protocol is patent-free. The LEAP protocols conform fully to these policies and procedures. Free Protocols Foundation board members include Mohsen Banan and Richard Stallman.

For more information see the Free Protocols Foundation website at http://www.FreeProtocols.org.

1.11 About The LEAP Manifesto

The purpose of The LEAP Manifesto is to provide a complete description of the LEAP protocols and their intended role in the development of the Mobile Messaging industry. The Manifesto includes:

- An overview of the Mobile Messaging industry, and a description of the essential factors that are required for its long term success and growth.
- A technical description of the LEAP protocols themselves.
- A description of the process used to develop the LEAP protocols, and how and why this differs from the conventional development process.
- Technical descriptions of key aspects of the LEAP protocols, including their efficiency, and their implementation on Windows CE devices and Palm OS devices.
- An analysis of several closed Mobile Messaging solutions (e.g. WAP), and a description of LEAP's superiority to these closed solutions.
- A description of our strategy for encouraging widespread usage of the LEAP protocols, including the distribution of open-source software implementations of the protocols, and the availability of free subscriber services.

1.11.1 Manifesto Organization

The LEAP Manifesto is organized as a series of largely independent articles. Each of these articles stands on its own, and can be read and understood independently of the others. Together, these articles provide a complete picture of the Mobile Messaging industry and the role of the LEAP protocols. Since each article is intended to be self-contained, some material is duplicated in more than one article.

The LEAP Manifesto consists of the following articles:

- **Executive Summary.** An overview summary of the entire LEAP Manifesto. The Executive Summary provides a brief description of all the major elements of the manifesto.
  First Published: 2000/8/4 Last Updated: 2000/12/5
  Article formats: [HTML] [PDF] [PS] [Text Only]
- **Part I: The LEAP Protocols**
  - **Overview of the LEAP Protocols.** A general overview description of the LEAP protocols.
    First Published: August 4, 2000
    Last Updated: August 8, 2000
    Article formats: [ONE-HTML] [SPLIT-HTML] [PDF] [PS] [Text Only]
  - **The LEAP Protocol Development Model.** A description of the processes used to develop the LEAP protocols, and how and why these differ from conventional development processes. This article also includes a criticism of the IETF protocol development processes.
    First Published: August 4, 2000
    Last Updated: June 16, 2000
    Article formats: [ONE-HTML] [SPLIT-HTML] [PDF] [PS] [Text Only]

  - **Free Protocols Foundation Policies and Procedures** A description of the Free Protocols Foundations processses to ensure the development and maintenance of patent-free protocols.
    First Published: March 29, 2000
    Last Updated: June 26, 2000
    Article formats: [ONE-HTML] [SPLIT-HTML] [PDF] [PS] [Text Only]
  - **ESRO: A Foundation for the Development of Efficient Protocols.** A technical description of ESRO, the transport mechanism component of LEAP.
    First Published: August 4, 2000
    Last Updated: August 9, 2000
    Article formats: [ONE-HTML] [SPLIT-HTML] [PDF] [PS] [Text Only]
  - **EMSD: The LEAP E-Mail Component.** A technical description of EMSD, the e-mail component of LEAP.
    First Published: August 4, 2000
    Last Updated: July 14, 2000
    Article formats: [ONE-HTML] [SPLIT-HTML] [PDF] [PS] [Text Only]
  - **Efficiency of EMSD.** A technical paper analyzing the efficiency characteristics of EMSD and comparing its efficiency to other e-mail protocols.
    First Published: October 23, 1996
    Last Updated: August 16, 2000
    Article formats: [ONE-HTML] [SPLIT-HTML] [PDF] [PS] [Text Only]
  - **A Brief History of LEAP.** A summary of the major events in the evolution of the LEAP protocols.
    First Published: August 4, 2000
    Last Updated: September 20, 2000
    Article formats: [ONE-HTML] [SPLIT-HTML] [PDF] [PS] [Text Only]
  - **The Future of LEAP.** A description of the planned future development of LEAP, including descriptions of several LEAP-based products and services which are currently under development.
    First Published: August 4, 2000
    Last Updated: June 14, 2000
    Article formats: [ONE-HTML] [SPLIT-HTML] [PDF] [PS] [Text Only]

- **Part II: LEAPing Over Closed Solutions**
  - **The WAP Trap.** A detailed criticism of a set of specifications called the Wireless Application Protocol, or WAP. This article demonstrates that WAP is entirely unfit to play the role of a Mobile Messaging industry standard.
    First Published: April 3, 2000
    Last Updated: May 26, 2000
    Article formats: [ONE-HTML] [SPLIT-HTML] [PDF] [PS] [Text Only]
  - **LEAP: One Alternative to WAP.** A point-by-point comparison of the LEAP protocols to the WAP specifications. This article demonstrates that LEAP has all the desirable characteristics of an industry standard protocol that WAP lacks.
    First Published: August 4, 2000
    Last Updated: December 6, 2000
    Article formats: [ONE-HTML] [SPLIT-HTML] [PDF] [PS] [Text Only]

- **WAP Scraps.** A discussion of what can be salvaged from what remains of WAP.
First Published: August 28, 2001
Last Updated: August 28, 2001
Article formats: [ONE-HTML] [SPLIT-HTML] [PDF] [PS] [Text Only]
- **Operation Whiteberry.** A description of how equivalent functionality to the closed BlackBerry mobile messaging solution can be implemented based on a completely open model, using existing open-source software implementations of LEAP, and existing off-the-shelf hardware components.
First Published: February 27, 2001
Last Updated: November 3, 2002
Article formats: [ONE-HTML] [SPLIT-HTML] [PDF] [PS] [Text Only]

• **Part III: Making LEAP Widespread**

- **Strategy for Making LEAP Widespread.** A description of our strategy for encouraging widespread usage of the LEAP protocols, including the distribution of open-source software implementations of the protocols, and the availability of free subscriber services.
First Published: August 4, 2000
Last Updated: August 8, 2000
Article formats: [ONE-HTML] [SPLIT-HTML] [PDF] [PS] [Text Only]
- **EMSD on Windows CE.** A technical paper describing the architecture and implementation of EMSD on Windows CE devices.
First Published: March 3, 1997
Last Updated: August 16, 2000
Article formats: [ONE-HTML] [SPLIT-HTML] [PDF] [PS] [Text Only]
- **LEAP on Palm OS.** A technical paper describing the architecture and implementation of LEAP on Palm OS devices.
First Published: September 27, 2001
Last Updated: September 27, 2001
Article formats: [ONE-HTML] [SPLIT-HTML] [PDF] [PS] [Text Only]
- **LEAP in JAVA.** A technical paper describing the architecture and implementation of LEAP in JAVA.
First Published: February 4, 2003
Last Updated: February 4, 2003
Article formats: [ONE-HTML] [SPLIT-HTML] [PDF] [PS] [Text Only]

  LEAP on Linux Based PDAs. A technical paper describing the architecture and implementation of LEAP on Linux Based PDAs.
First Published: September 27, 2001
Last Updated: September 27, 2001
Article formats: [ONE-HTML] [SPLIT-HTML] [PDF] [PS] [Text Only]
- **Trying out LEAP.** A step-by-step, hands-on demonstration of how the LEAP protocols can be used to turn any Windows CE device into a fully functional Mobile Messaging device.
First Published: June 12, 1998
Last Updated: June 12, 2000
Article formats: [ONE-HTML] [SPLIT-HTML] [PDF] [PS] [Text Only]
- **WhiteBerry and Bluetooth.** A description of how WhiteBerry and Bluetooth can be used in combination to bring new and enhanced messaging capabilities to the mobile professional.

First Published: July 27, 2001
Last Updated: July 31, 2001
Article formats: [ONE-HTML] [SPLIT-HTML] [PDF] [PS] [Text Only]

- **Use of EMSD for Mail Notification.** A description of how EMSD can be used to provide a general Mail Notification service.
  First Published: TBD
  Last Updated: TBD
  Article formats: [ONE-HTML] [SPLIT-HTML] [PDF] [PS] [Text Only]
- **Lessons From History: Comparative Case Studies.** An analysis of the factors which lead to the success or failure of protocols, including discussions of several historical case studies.
  First Published: August 4, 2000
  Last Updated: July 7, 2000
  Article formats: [ONE-HTML] [SPLIT-HTML] [PDF] [PS] [Text Only]

- **Part IV: The Mobile Messaging Industry**
  - **The Mobile Messaging Industry.** An overview of the Mobile Messaging industry, and a description of the essential factors that are required for its long term success and growth.
    First Published: August 4, 2000
    Last Updated: August 10, 2000
    Article formats: [ONE-HTML] [SPLIT-HTML] [PDF] [PS] [Text Only]

1.11.2 Draft Articles

The LEAP Manifesto is a work in progress, and various additional articles are planned for future inclusion in the Manifesto.

Some of these future articles already exist in draft form, and are available for review in the Draft Documents section of the LEAP Forum website at http://www.leapforum.org/draft-leapManifesto/. As these and other articles are completed, they will be incorporated into the Manifesto.

1.11.3 Getting the Manifesto

The LEAP Manifesto and all of its component articles are available in multiple formats, including HTML, PDF, PostScript, and plain text. You can view or download the Manifesto in any of these formats from the LEAP Forum website at http://www.LeapForum.org/leap/index.html. The LEAP Manifesto is also available at the Free Protocols Foundation website at http://www.FreeProtocols.org/leap/index.html.