The WAP Roadmap

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The **Wireless Application Protocol (WAP) Forum** is an industry group dedicated to the goal of enabling sophisticated telephony and information services on hand-held wireless devices such as mobile telephones, pagers, personal digital assistants (PDAs) and other wireless terminals. Recognising the value and utility of the World Wide Web (WWW) architecture, the WAP Forum has chosen to align certain components of its technology very tightly with the Internet and the WWW. The WAP specifications extend and leverage mobile networking technologies (such as digital data networking standards) and Internet technologies (such as IP, HTTP, XML, URLs, scripting and other content formats) to enable sophisticated telephony and information services for hand-held wireless devices.

The initial thrust of the WAP Forum has been to deliver a pragmatic set of specifications, thereby enabling potential suppliers to develop WAP enabled products and services for early deployment. The WAP version 1 specifications achieved this goal and were made publicly available in April 1998. These specifications provide the basic functions required for the deployment of WAP clients and applications.

However, the work of the WAP Forum is not finished. This WAP Forum has been actively working to ensure initial deployments meet the needs of users and service providers by ensuring interoperable clients, infrastructure and content over a variety of data networks. Further, the WAP Forum recognises that the WAP specifications must evolve as underlying technology changes and user expectations grow.

The WAP Forum intends to address these matters through the WAP Roadmap. There are a number of short long- term goals in the WAP Roadmap. These are described in the remainder of this document.

Short Term Goals for WAP

The short-term direction of the WAP Forum is simple - to deliver the specifications necessary to enhance deployment. This includes the features necessary to deliver a critical mass of bearer independent applications, and to create multiple-vendor handset, server, and application interoperability on any network environment.

The WAP Forum is working on a number of items with the intent to deliver updated specifications addressing the requirements of near-term WAP deployments. The main areas of

effort are:

- **Corrections, clarifications and revisions to the existing specifications.**
  Technical specifications of the size and complexity of WAP version 1 may contain omissions and require clarifications. The WAP working groups have, subsequent to the release of version 1, clarified and corrected the existing specifications as such items are found during implementation of WAP products.

  The corrigenda will be integrated into the specifications as part of a general update of the released specifications. Also, a process of issuing corrigenda will be established for the future.

- **Interoperability.**
  It is important that all WAP client devices, e.g., phones, pagers and smart phones, interact with WAP servers regardless of which commercial supplier provides a given piece of the end-to-end solution. The WAP specification provides flexibility for suppliers to tailor their implementation to suit their perceived customer needs. This in turn makes interoperability a key deliverable from the WAP Forum.

  The working groups have determined most of the salient features in each specification necessary for compliance. Some additional work is being undertaken to formalise the processes and requirements of interoperability. The outcome of this interoperability work will be a set of compliance criteria, a combination of static checks and dynamic tests, ready for verifying WAP product implementations and deployments. Subsequent efforts will extend this effort to test suites and test house recommendations.

  WAP will create the specifications and processes necessary for the delivery of interoperable products based on WAP technologies.

- **New features:**

  - **Security Enhancements.**
    Applications such as e-business, e-commerce and e-banking, where potentially sensitive information is communicated, require particular attention to security. The WAP Forum has previously specified the Wireless Transport Layer Security protocol, permitting transport-level user authentication and encryption of data between the WAP client and the WAP server.

    Smart card technology is widely used, and provides a means to enhance security. Therefore, WAP will integrate SIM and smart card into the WAP security model to benefit from this technology.

    Additional use cases have been identified where enhancements to the WAP security model are required to ensure the end-to-end security of user data. WAP will create an end-to-end security model, allowing the secure and private transmission of data between the mobile terminal and the network application server.

- **Internationalisation.**
  The WAP architecture has addressed many aspects of national language support in version 1, but it has been recognised that the focus has been on European-based character sets and cultural conventions. The WAP Forum recognises the importance of addressing the issues associated with different languages and cultures and is actively working on these issues.

  WAP will extend its specifications to meet the needs of the Asian cultures in the short term and others as soon as the technical issues have been fully identified.

- **Mobile network bearer support.**
  WAP intends to support all mobile networks, and their associated data bearer services, for which there is identified need warranting the protocol development effort. At the time of the version 1 release, WAP included support for PDC, TDMA (IS-136), GSM, IPv4, CDPD, FLEX, ReFLEX, and iDEN. Efforts since this release have addressed other networks, bearers and optimisations, all of which will be released formally as soon as approved, followed by inclusion into the next formal release of the specification suite.

  WAP will continue to identify any additional necessary WDP adaptations and optimisations, and will publish these specifications.

- **Operations and administration.**

  The WAP Forum will address issues of provisioning and billing to ensure successful deployment and operation of services. For the GSM technology, WAP will provide for the storage of microbrowser configuration data in the SIM.

- **Telephony extensions.**
  The WAP specifications released in version 1 did not provide a complete specification of WAP telephony interfaces. The WAP working groups will complete this specification, and an early public release of the specification is anticipated to encourage the realisation of implementations.

  The WAP Wireless Telephony Application Interface (WTAI) will provide interfaces between the mobile phones telephony functions and WAP Application Environment, allowing the development of sophisticated enhanced telephony applications. Examples services that could be developed using the WTAI include enhanced integrated voice/data services, such as intelligent mailboxes, unified messaging, etc.

  WAP will complete the first generation of telephony interfaces, and will enable the delivery of WTA applications.

- **Wireless Applications Environment (WAE) functional extensions.**
  Several use cases have identified the need for functional extensions of the application environment. Identified requirements include:

- **Network initiated content delivery.**
  Network initiated content delivery provides a push application model, whereby new information and/or events in the network are communicated to the client.

- **User agent caching.**
  User agent caching enables better application performance and reduced network loading.

- **Asynchronous application model.**
  The asynchronous application model provides a responsive user experience when operating on high latency bearers or out of network coverage.

- **User agent profiles.**
  User agent profiles enables the generation of device tailored content through knowledge of device capabilities.

- **External working relationships.**

  WAP recognises that proactive working relationships with external organisations are necessary. WAP intends to further working relationships with W3C, IETF, ETSI, ARIB, TIA and other organisations that are active in the area of evolving related technical standards.

The WAP Forum intends to deliver the revised WAP version 1.x specifications in *April 1999.*

Longer Term Goals for WAP

The technology of wireless networks, mobile phones and the Internet is advancing rapidly. The WAP Forum has long recognised the need for WAP to address the current networks and bearer services, which will be available for some time in the future. In addition, WAP has also recognised the need to ensure an evolutive path to address future developments in networking, handset technologies and applications (e.g., 3rd Generation networks with higher speed connections, packet based services, new network services, future Web content standards, new Internet protocols and much more). For example, even with advances in network technology, there is still a need for cost effective, efficient and reliable use of networks and end user independent access to information services.

To achieve these goals, WAP intends to address more fully the issues associated with:

- E-commerce or e-business, providing secure end-to-end links between client and application whether the application is situated somewhere in the Internet or as an extension of the corporate Intranets.

- Accessing richer content types to permit WAP to take advantage of emerging Internet developments, more advanced mobile devices and evolving user expectations.

- Convergence of WAP and the evolution of the W3C, IETF and other initiatives working on the evolution of Internet standards. The WAP Forum will actively work with these organisations to achieve the WAP Forum's goals using these standards, e.g. HTTP-NG, HTML-NG, ECMAScript, etc.

- New networks and bearer services and the opportunities these offer, e.g., third-generation wireless networks and next generation service environments.

Conclusion

The WAP Forum has delivered a pragmatic first release of specifications, and continues with a program to deliver the specifications necessary to permit the successful deployment of WAP-based devices, services and access in the near future.

The WAP Forum is also acutely aware of the rapid developments in the fields of the Internet and mobility. It intends to enhance WAP to take advantage of these developments whilst still keeping to its original goals of providing integrated access to wireless telephony and information services over a wide range of networks, network bearers, and device capabilities.