WAP Forum - W3C Cooperation White Paper

W3C Note 30 October 1998

This version
    http://www.w3.org/TR/1998/NOTE-WAP-19981030
Latest version
    http://www.w3.org/TR/NOTE-WAP
Editors:

Johan Hjelm, W3C / Ericsson
Bruce Martin, WAP Forum / Unwired Planet
Peter King, WAP Forum / Unwired Planet

Status of this Document

Version 1.1, September 28, 1998

Abstract

This paper outlines possible areas of cooperation between the WAP Forum and the World Wide Web Consortium (W3C).

The WAP Forum is dedicated to enabling advanced services and applications on mobile wireless devices, such as cellular telephones. The W3C is dedicated to leading and advancing the development of the World Wide Web. This document describes the problem area of mobile access to information on the web, which is common to the two groups.

While the WAP Forum and the W3C have different organizational goals, we share goals for the future of the global information space. We also want to avoid unnecessary divergence between the recommendations and standards of the two organizations.

Direct overlaps in future development occur in the areas of intelligent proxies and protocol design; of XML applications; and in content adaption, e.g through the use of vector graphics and style sheets. Instead of developing diverging sets of solutions, it is the intent of both groups to find common solutions.

1.0 Introduction

1.1 W3C Background

The World Wide Web Consortium (W3C) was founded in 1994 by Tim Berners-Lee, the inventor of the World Wide Web. The web had then outgrown the European Centre for Nuclear Physics Research, CERN, where the web was developed.

From the beginning, Tim Berners-Lee has been the director of the consortium, and has been firmly committed to developing a neutral, open forum for the evolution of web technology.

Today, the W3C has three locations (at MIT in the USA; at INRIA in France; and at Keio University in Japan). The consortium has more than 270 members from industry and academia, and provides a vendor-neutral forum for its members to address web-related issues. Working with its staff and the global web community, the consortium aims to produce free, interoperable specifications; like its partner standards body, the Internet Engineering Task Force (IETF), the W3C is committed to backing its specifications by sample code. Funding from membership dues, public research funds, and external contracts underwrite these efforts. The work in the W3C follow a well-documented process, continuously involving representatives of the member companies in its efforts. More information can be found at the consortium web site.

In the autumn of 1997, it became evident that there was a considerable interest among the members of the W3C for access to the web via mobile and wireless devices. This area appeared to entail several aspects which constrained the usage in manners not considered in the current recommendations.

A workshop on mobile web access was organised in April of 1998 in Tokyo to address these topics, leading to the formation of a mobile access interest group that is chartered with the investigation of the impact of mobile access on the specifications and recommendations of the W3C.

Simultaneously, the W3C was approached by the WAP Forum, and a meeting was set up in June 1998. The results were very positive, and the meeting decided to create this joint white paper, outlining areas of potential cooperation between the two groups.

1.2 WAP Forum Background

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. Recognizing the value and utility of the World Wide Web 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).

The WAP specification initiative began in June 1997 and the WAP Forum was founded in December 1997. The WAP Forum has drafted a global wireless protocol specification for all wireless networks and will contribute it to appropriate industry and standards bodies. WAP will enable manufacturers, network operators, content providers and application developers to offer compatible products and secure services on all devices and networks, resulting in greater economies of scale and universal access to information. WAP Forum membership is open to all industry participants.

The objectives of the WAP Forum are:

> To bring Internet content and advanced data services to digital cellular phones and other wireless terminals.
> To create a global wireless protocol specification that will work across different wireless network technologies.
> To enable the creation of content and applications that scale across a very wide range of wireless bearer networks and wireless device types.
> To embrace and extend existing standards and technology wherever appropriate.

More information on the WAP Forum can be found at the Wap Forum Web server.

In keeping with its goals, the WAP Forum approached the W3C regarding collaboration in the area of WWW technologies in the wireless area.

2. Goals for the cooperation

2.1 Short-Term Goals

> Bring Internet and WWW technologies to digital cellular phones and other wireless terminals, i.e., adapting the Web architecture to the wireless environment.
> Establish productive working relationships between the W3C and WAP Forum in the areas where common organizational goals exist.
> Reduce overlapping technical work between the W3C and WAP Forum.
> Cross-reference technical specifications.
> Joint test-bed and protocol validation work.

2.2 Long-Term Goals

> Work toward a unified information space.
> Work toward common standards and technologies.
> Enable the delivery of sophisticated information and services to mobile wireless terminals.

3. The Technical Problem: Wireless System Requirements on Information Retrieval

Providing Internet and WWW services on a wireless data network presents many

challenges. Most of the technology developed for the Internet has been designed for desktop and larger computers supporting medium to high bandwidth connectivity over generally reliable data networks.

Mass-market, hand-held wireless devices present a more constrained computing environment compared to desktop computers. Because of fundamental limitations of power and form factor, mass-market handheld devices tend to have:

> Less powerful CPUs
> Less memory (ROM and RAM)
> Restricted power consumption
> Smaller displays
> Different input devices (e.g., a phone keypad, voice input, etc.)

Similarly, wireless data networks present a more constrained communication environment compared to wired networks. Because of fundamental limitations of power, available spectrum, and mobility, wireless data networks tend to have:

> Less bandwidth than traditional networks
> More latency than traditional networks
> Less connection stability than other network technologies
> Less predictable availability

Mobile networks are growing in complexity and the cost of providing new value-added services to wireless users is increasing. In order to meet the requirements of mobile network operators, solutions must be:

> Interoperable – terminals from different manufacturers communicate with services in the mobile network.
> Scalable – mobile network operators are able to scale services to customer needs.
> Efficient – provides quality of service suited to the behaviour and characteristics of the mobile network; provide for maximum users for a given network configuration
> Reliable – provides a consistent and predictable platform for deploying services.
> Secure – enables services to be extended over potentially unprotected mobile networks while still preserving the integrity of user data; protects the devices and services from security problems such as denial of service.

3.1 Bearer Limitations

Wireless network bearers operate under several fundamental constraints, which place restrictions on the type of protocols and applications offered over the network:

Power consumption.
> As bandwidth increases, power consumption increases. In a mobile device, this reduces battery life.
Cellular network economics.
> Mobile networks are typically based on a cellular architecture. Cells are a resource shared by all mobile terminals in a geographic area, and typically have a fixed amount of bandwidth to be shared among all users. This characteristic

rewards efficient use of bandwidth, as a means of reducing the overall cost of the network infrastructure.

Latency.

The mobile wireless environment is characterized by a very wide range of network latency, ranging from sub-second round-trip communication time up to many tens of seconds. In addition, network latency can be highly variable, depending on the current radio transmission characteristics (e.g., in a tunnel or off network) and the network loading in a particular area. Latency is further increased by routing, error correction and congestion-avoidance characteristics of a particular network.

Bandwidth.

The mobile wireless environment is characterized by a very wide range of network characteristics, and typically has far less bandwidth available than a wireline environment. In addition, the economics of the wireless environment encourage the conservation of bandwidth to achieve greater density of subscribers.

3.2 Device Limitations

Wireless devices operate under a set of physical limitations, imposed by their mobility and form factor:

Limited power.

Any personal, or "hand held" mobile device will have a very limited power reserve, due to existing battery technology. This reduces available computational resources, transmission bandwidth, etc.

Size:

many mobile wireless are very small (hand-held).

Mobile wireless devices are characterized by a different set of user interface constraints than a personal computer. To enable a consistent application programming model, a very wide range of content scalability is required. In practice, a significant amount of the current WWW content is unsuitable for use on hand-held wireless devices. Problems include:

Output scalability.

Existing content is designed for viewing on PC screens, whereas mobile devices will have a wide range of visual display sizes, formatting and other characteristics. In the near future, this will include voice-only output.

Input scalability.

Mobile devices feature a wide range of input models, including numeric keypad, very few or no programmable soft keys, etc. In the near future, this will include voice-only input.

3.3 Use Case Limitations

Many wireless devices, for example cellular phones and pagers, are consumer devices. These devices are used in a wide variety of environments and under a wide range of use scenarios. For example:

DOCKET ALARM

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips

Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS
Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS
Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS
Sync your system to PACER to automate legal marketing.

fastcase
Smarter legal research.