

A Comparative study of different mobile web browser

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ABSTRACT

As web is the largest information repository for knowledge reference. Web pages are semi-structured, Web information tends to be diversity in meaning. Traditionally, access to the Web has been via fixed-line services on large-screen laptops and desktop computers. However, the Web is becoming more accessible by portable and wireless devices. To Display Web content most effectively for small screens on portable devices mobile browser are designed. A mobile browser, also called minibrowser, or wireless internet browser (WIB), is a web browser designed for use on a mobile device such as a mobile phone or PDA. Mobile browser software must be small and efficient to accommodate the low memory capacity and low-bandwidth of wireless handheld devices.

This paper defines different type of mobile web browser with its feature, layout engine and operating system. How information is processed via browser engine and via rendering engine.

KEYWORDS: Mobile Browser, Webkit, pestro etc.

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Mobile Browser

A mobile browser is a web browser designed for use on a mobile device such as a mobile phone or PDA. Mobile browsers are optimized so as to display Web content most effectively for small screens on portable devices. The mobile browser usually connects via cellular network, or increasingly via Wireless LAN, using standard HTTP over TCP/IP and displays web pages written in HTML, XHTML Mobile Profile (WAP 2.0). Websites designed for access from these browsers are referred to as Mobile Web. Mobile Web access today still suffers from interoperability and usability problems. Despite these shortcomings, many mobile developers choose to create apps using mobile Web.

The first mobile browser for a PDA was Pocket Web for the Apple Newton created at TecO in 1994, followed by the first commercial product Net Hopper released in August 1996. The first deployment of a micro browser on a mobile phone was probably in 1997 when Unwired Planet (later to become Open wave) put their "UP.Browser" on AT&T handsets to give users access to HDML content.

Different Mobile Web Browsers with its feature, layout engine and operating system

Mobile web browsers differ greatly in terms of features offered an operating systems supported. The best can display most websites and offer page zoom and keyboard shortcuts, while others can only display websites optimizes for mobile devices. Mobile devices running the Symbian S60 also have a few choices for which mobile web browser you can use

Browser	Key Feature	Layout Engine	Operating System
Android browser	Multiple Tabs, Zoom-in	WebKit	Window mobile, symbian
Opera Mobile	Multiple tabs, Zoom-in	Presto	Windows Mobile, Symbian
Opera Mini	Compressed downloads for fast browsing, Zoom-in	Presto	Java
Skyfire	Display rich websites with Flash or widgets like YouTube, customizable zoom feature	WebKit	Android, iPhone, Symbian, Windows Mobile
Safari	Display rich websites like YouTube, zoom feature, excellent touch-based user interface	WebKit	iPhone
Google Android	Display rich websites, zoom feature, touch screen interface	WebKit	Google Android
Microsoft IE for Mobile	Standard browser features	Trident	Windows Mobile
Firefox Mobile	Multiple tabs, Awesome bar, password manager, Add-on support, PC-syncing	Gecko	Nokia Maemo, Windows Mobile 6.0 (alpha)
Bolt	Split screen mode, Widgets	WebKit	Java MIDP 2.0

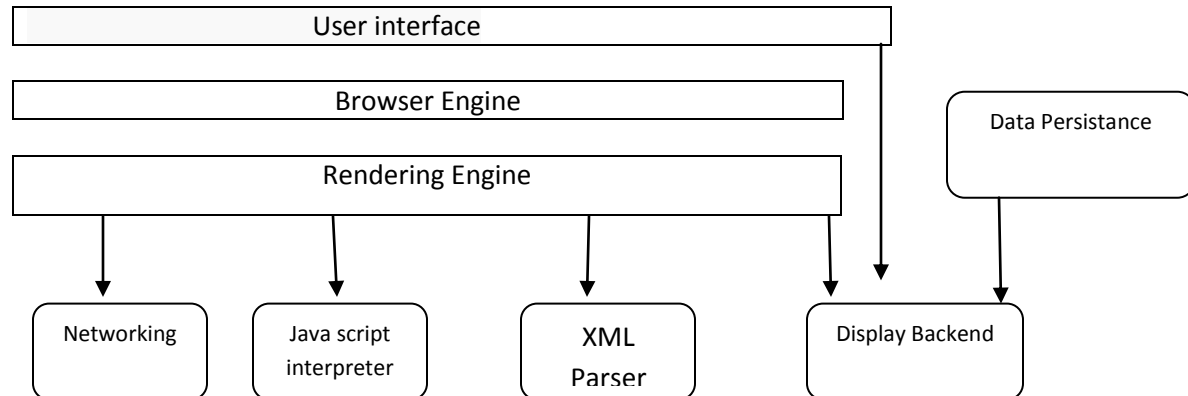
Default browsers used by major mobile phone and PDA vendors

Google is leading search engine. Google share for mobile sharing is more than 97% if compared to its web sibling.

- Chrome by Google
- Blazer by palm
- Net Front by Net Front
- PlayStation Portable web browser by Net Front
- Series 60 web browser by Web Kit
- Opera by opera software ASA
- Pocket internet Explorer by Microsoft Inc

Mobile web browser Architecture:

The Architecture of different browser are different, but they are similar in some respect. Therefore a generic architecture is



The generic architecture consists of 8 subsystem:

User Interface:

- The user interface subsystem is the layer b/w user and browser engine.

Browser Engine:

- It is a embeddable component that provide a high level interface to the rendering engine
- It load a given URL and support primitive browsing action such as forward , back and reload.

Rendering Engine

- The rendering engine subsystem produce a visual representation for a given URL
- It is capable of displaying HTML, and Extensible Markup Language documents, optionally styled with CSS as well as embedded content such as images

Networking Subsystem:

- The Networking Subsystem implement file transfer protocol such as HTTP and FTP

Java Script Interpreter

- The Java Script Interpreter Evaluate Java Script Code, which may be embedded into web page.

XML Parser:

- The XML Parser subsystem parse XML document into a Document Object Model Tree. This is one of most reusable subsystem in the architecture.

Display Backend Subsystem:

- The Display Backend Subsystem provides drawing and window primitive, asset of user interface widgets, and a set of fonts. It may tightly closed with operating system.

Data Persistence Subsystem

- The Data Persistence Subsystem store various data associated with the browsing session on disk. This may be high level data such as bookmark or it may be low level data such as cookies, security certificates, or cache.

Various Layout Engine:

WebKit is a layout engine software component designed to allow web browsers to render web pages. It powers Apple's Safari web browser and Google's Chrome web browser versions up to 27 applications. WebKit's C++ API provides a set of classes to display web content in windows, and implements browser features such as following links when clicked by the user, managing a back-forward list, and managing a history of pages recently visited.

WebKit2

WebKit2's goal is to abstract the components that provide web rendering cleanly from their surrounding interface or application shell, creating a situation where, "web content (JavaScript, HTML, layout, etc) lives in a separate process from the application UI". This abstraction is intended to make WebKit2's reuse a more straightforward process than WebKit's.

Usage

WebKit is used as the rendering engine within Safari and was formerly used by Google's Chrome web browser on Windows.

Net Front

Net Front Browser is a mobile browser for embedded devices, developed by Access Co. Ltd. of Japan, and was designed to function as an embedded browser. Mainly deployed on mobile phones, NetFront Browser is available for multiple platforms (see right info box) and has been deployed in multifunction printers (MFP), digital TVs, set-top boxes (STB), PDAs, web phones, game consoles, e-mail terminals and other device types.

The browser converts tables in a Web page into a vertical display, eliminating the need to scroll horizontally. This allows the user to zoom in and out on Web pages from 25% to 100%, and can select or scroll anywhere on a page with the stylus on Pocket PC devices.

Presto

Presto was the layout engine of the Opera web browser for a decade. It was released on 28 January 2003 in Opera 7, for Windows, after several public betas and technical previews. In Opera 15, the browser's developer Opera Software ASA began using the WebKit layout engine and V8 JavaScript engine combined with a modified Chromium browser.

Presto is a dynamic engine. WebPages could be re-rendered completely or partially in response to DOM events. Its releases saw a number of bug fixes and optimizations to improve the speed of the ECMAScript (JavaScript) engine. It is proprietary software only available as a part of the Opera browsers.

Gecko

Gecko is a free and open source layout engine used in many applications developed by Mozilla Foundation and the Mozilla Corporation (notably the Firefox web browser), as well as in many other open source software projects.

It is designed to support open Internet standards, and is used by different applications to display web pages and, in some cases, an application's user itself

Gecko offers a rich programming API that makes it suitable for a wide variety of roles in Internet-enabled applications, such as web browsers, content presentation, and client/server.

Gecko is written in C++ and is cross-platform, and runs on various operating systems including BSDs, Linux, OS X, Solaris, OS/2, AIX, OpenVMS, and Microsoft Windows.

Trident

Trident (also known as **MSHTML**) is the name of the layout engine for the Microsoft Windows version of Internet Explorer. It was first introduced with the release of Internet Explorer version 4.0 in October 1997; it has been steadily upgraded and remains in use today. For versions 7 and 8 of Internet Explorer, Microsoft made significant changes to the Trident layout engine to improve compliance with web standards and add support for new technologies. With version 9 of Internet Explorer, Microsoft intends to comply with many modern web standards, and also intends to significantly update the layout engine to be more competitive and modern compared to other current layout engines.

CONCLUSION

Internet web browsing has reached a critical tipping point. Increasingly, users rely more on mobile web browsers to access the Internet than desktop browsers. Meanwhile, WebPages over the past decade have grown in complexity by more than tenfold. The fast penetration of mobile browsing and ever richer WebPages implies a growing need for high-performance mobile devices in the future to ensure continued end-user browsing experience. There are many search engine for mobile browser but out of

them the most used is Webkit with almost every web browser. To improve the efficiency of mobile web browsing , one should improve its feature to an optimum level with new technology.

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