BlackBerry Browser

Version: 6.0

Feature and Technical Overview

BlackBerry

Published: 2010-08-04
SWD-1214041-0804090240-001

Contents

Overview

1

The BlackBerry® Browser is a full-featured web browser that is designed to render and support most existing web content on a mobile device. In BlackBerry 6, the BlackBerry Browser has undergone a number of dramatic improvements in order to provide a better web experience for BlackBerry device users.

Key to these improvements has been the adoption of WebKit as the engine for the BlackBerry Browser. An open-source browser engine, WebKit is used by several major desktop browsers, as well as an increasing number of mobile browsers. WebKit provides the BlackBerry Browser with a major improvement in both performance and standards support. This makes more of the web accessible to the BlackBerry Browser, as well as providing web developers with a broader set of features that they can use to design and develop compelling web experiences for BlackBerry device users.

In addition, in BlackBerry 6, the browser introduces a number of significant design improvements, such as support for tabbed browsing, which lets users have several pages open at a time, and automatic network transport selection, which ensures that the browser is transferring data using the fastest and least expensive network connection available.

The WebKit browser engine

In BlackBerry 6, the BlackBerry® Browser is built upon the WebKit browser engine. The browser engine is the underlying processing layer of the BlackBerry Browser, BlackBerry® Widget applications, and BlackBerry Java® Applications that use an embedded browser object. The browser engine is responsible for parsing the web content, calculating style values, executing JavaScript® code, and laying out the content.

WebKit is an open-source browser engine developed by contributors from several different organizations, whose primary focus is on implementing key W3C® and ECMA standards. Non-standard technologies, such as images, media, or BlackBerry specific functionality, must be managed by plug-ins or BlackBerry extensions to WebKit.

There are two components to the WebKit browser engine:

- WebCore: The WebCore component manages the presentational code, and is responsible for arranging and rendering the content in the viewport, computing style values, and managing the DOM.
- JavaScriptCore: The JavaScriptCore component manages the behavioral code, and is responsible for processing JavaScript code.

How the WebKit browser engine impacts web developers

For web developers who are developing content or applications for the BlackBerry web platform, the WebKit browser engine provides several advantages.

Advantage	Description
Improved performance	With WebKit, the browser can render webpages and process JavaScript code faster than earlier versions of the browser. Perceived wait times are reduced, which translates into a better experience for the user.
Improved support of web standards	With WebKit, the browser offers more support for web standards than was available in earlier versions. With improved support for major web standards, including HTML 5, CSS 3, SVG, and other XML-based standards such as XPath and XSLT, web developers now have a much richer set of features to use when developing web content or applications.
Improved conformity with other browsers	The BlackBerry Browser implements the full version of WebKit, rather than a mobile-specific version. As a result, the browser engine used by the BlackBerry Browser in BlackBerry 6 is essentially the same browser engine used by WebKit based desktop browsers. This means that, for web standards support, the BlackBerry Browser now offers greater conformity with other major desktop browsers.
Larger browser engine development community	Because WebKit is an open-source project with many contributors, web developers can benefit from the collective efforts of a much larger team of developers, working together to expand the standards support and improve the performance of the WebKit browser engine.

The change to WebKit has also resulted in the loss of some non-standard functionality that was available in the BlackBerry Browser prior to BlackBerry 6, including offline form queues, automatic pattern matching of telephone numbers and email addresses, and keyboard shortcuts.

Key features of the BlackBerry Browser in BlackBerry 6

2

Supported web standards and technologies

HTML and WML standards

Standard	Status	Specification
HTML 5		
Parsing	Partially supported	www.w3.org/TR/html5/syntax.html#parsing
Canvas and Canvas 2D API	Supported	www.w3.org/TR/html5/the-canvas-element.html
Semantic structure	Supported	www.w3.org/TR/html5/sections.html#the-section-element
Forms	Partially supported	www.w3.org/TR/html5/forms.html
Embedded media	Partially supported	www.w3.org/TR/html5/audio.html
Offline web applications	Supported	www.w3.org/TR/offline-webapps/
Geolocation API	Supported	www.w3.org/TR/geolocation-API/
SQL Database API	Supported (when a microSD card is mounted on the device)	www.w3.org/TR/webdatabase/
Web storage	Supported (when a microSD card is mounted on the device)	www.w3.org/TR/webstorage/
Web Workers API	Supported	www.w3.org/TR/workers/
Timers API	Supported	www.w3.org/TR/html5/webappapis.html#timers
HTML 4.01		
HTML 4.01	Supported	www.w3.org/TR/html401/
XHTML		
XHTML 1.1	Supported	www.w3.org/TR/xhtml11/
XHTML Basic 1.1	Supported	www.w3.org/TR/xhtml-basic/
XHTML Mobile Profile	Supported	www.openmobilealliance.org/
WML		

Standard	Status	Specification
WML1.3	Supported	www.openmobilealliance.org/

CSS standards

Standard	Status	Specification
CSS 3		
CSS 3	Partially supported	www.w3.org/Style/CSS/current-work
CSS 2.1		
CSS 2.1	Supported	http://www.w3.org/TR/CSS2/
CSS Mobile Profile		
CSS Mobile Profile 2.0	Supported	www.w3.org/TR/css-mobile/

Scripting standards

Standard	Status	Specification
ECMAScript™		
ECMAScript 3	Supported	www.ecma-international.org/
JavaScript®		
JavaScript 1.8	Partially supported	developer.mozilla.org/
JavaScript 1.6	Supported	developer.mozilla.org/
JavaScript 1.5	Supported	developer.mozilla.org/
JavaScript 1.4	Supported	developer.mozilla.org/
JavaScript 1.3	Supported	developer.mozilla.org/
DOM		
DOM Level 3 Events	Partially supported	www.w3.org/TR/DOM-Level-3-Events/
DOM Level 2 Core	Supported	www.w3.org/TR/DOM-Level-2-Core/
DOM Level 2 Events	Supported	www.w3.org/TR/DOM-Level-2-Events/
DOM Level 2 HTML	Supported	www.w3.org/TR/DOM-Level-2-HTML/
DOM Level 2 Style	Supported	www.w3.org/TR/DOM-Level-2-Style/

Standard	Status	Specification
DOM Level 2 Traversal and Range	Supported	www.w3.org/TR/DOM-Level-2-Traversal-Range/
AJAX		
XMLHttpRequest	Supported	www.w3.org/TR/XMLHttpRequest/

XML-based standards

Standard	Status	Specification
XML		
XML 1.0/1.1	Supported	www.w3.org/TR/xml11/
XSLT 1.0	Supported	www.w3.org/TR/xslt
XPath 1.0	Supported	www.w3.org/TR/xpath/
SVG		
SVG 1.1	Partially supported	www.w3.org/TR/SVG/
SVG Tiny™ 1.2	Partially supported	www.w3.org/TR/SVGTiny12/
SVG Tiny 1.1	Partially supported	www.w3.org/TR/SVGMobile/
Web syndication		
RSS 2.0	Partially supported	www.rssboard.org/rss-specification
RSS 0.9	Partially supported	www.rssboard.org/rss-0-9-0
Atom™	Partially supported	tools.ietf.org/html/rfc4287

Supported browser extensions

Standard	Status	Description
BlackBerry® extensions		
`window.blackberry`	Supported	Provides information about the network on which the BlackBerry device is running.
`blackberry.launch`	Supported	Provides methods that let you access core and add-on BlackBerry applications through JavaScript®.

Content types supported by the BlackBerry Browser

Supported image formats

File extension	MIME type	Description
.bmp	image/bmp	A bitmap image.
.gif	image/gif	A GIF or animated GIF image.
.jpg, .jpeg	image/jpeg	A JPEG image file.
.png	image/png	A Portable Network Graphics image file.
.svg	image/svg+xml	A Scalable Vector Graphic file.

Supported audio formats

The BlackBerry® Browser uses the Media application on the BlackBerry device for all audio playback. The Media application supports the following audio formats. For optimal playback, the recommended format is an .mp4 file using AAC-LC compression.

File extension	MIME type	Description
.3g2	audio/3gpp2	A multimedia container format designed for use on CDMA-based mobile phones. This format can contain audio data encoded using EVRC or QCELP.
.3gp	audio/3gpp	A multimedia container format designed for use on GSM-based mobile phones. This format can contain audio data encoded using AAC or AMR.
.aac	audio/aac, audio/x-aac	A container format for audio data encoded using AAC.
.amr	audio/amr	A container format for audio data encoded using AMR.
.flac	audio/flac	A container format for audio data encoded using the FLAC non-proprietary lossless format.
.m4a	audio/m4a, audio/mp4	An audio-only MPEG-4 file.
.mid, .midi	audio/midi, audio/mid, audio/x-midi, audio/x-mid, audio/sp-midi	A container for audio data encoded using MIDI.
.mp3	audio/mpeg, audio/mp3, audio/x-mpeg	A container for audio data encoded using MPEG 1 Layer 3.

File extension	MIME type	Description
.mp4	audio/mp4	A multimedia container for audio or video data encoded using MPEG-4. MPEG-4-encoded files that contain only audio data commonly use the .m4a extension.
.ogg	audio/ogg	A container most commonly used for audio data encoded using Vorbis, a non proprietary lossy audio compression format. Ogg files may also contain audio encoded using FLAC.
.wav	audio/wav, audio/x-wav	A container for audio data encoded using the waveform audio format, file format standard for storing an audio bit stream on computers
.wma	audio/x-ms-wma	A container for audio data encoded using Windows Media® Audio audio data compression technology developed by Microsoft®.

Supported video formats

The BlackBerry® Browser uses the Media application on the BlackBerry device for all video playback. The Media application supports the following video formats. For optimal playback, the recommended format is an .mp4 file using MPEG4 Advance Simple Profile video compression with AAC-LC audio compression.

File extension	MIME type	Description
.3g2	video/3gpp2	A multimedia container format designed for use on CDMA-based mobile phones. This format can contain video data encoded using H.263, MPEG-4 Part 2, or H.264.
.3gp	video/3gpp	A multimedia container format designed for use on GSM-based mobile phones. This format can contain video data encoded using H.263, MPEG-4 Part 2, or H.264.
.asf	video/x-ms-asf	A proprietary multimedia container developed by Microsoft® that can be used for streaming video data encoded using WMV9 Simple or WMV Main.
.avi	video/x-msvideo	A container format for video data encoded using MPEG-4.
.m4v	video/mp4	A container format for video data encoded using H.263, MPEG-4 Part 2, or H.264.
.mov	video/quicktime	A proprietary multimedia container for developed by Apple for video data encoded using MIDI.

File extension	MIME type	Description
.mp4	video/mp4	A multimedia container for audio or video data encoded using H.263, MPEG-4 Part 2, or H.264.
.wmv	video/x-ms-wmv	A container for video data encoded using Windows Media Video video data compression technology developed by Microsoft®.

Supported file formats

File extension	MIME type	Description
.bbaw	application/x-bb-appworld	A text file that contains the application ID for an application found in the BlackBerry App World™ storefront.
.doc	application/msword	A Microsoft® Word document.
.jad	text/vnd.sun.j2me.app-descriptor	A BlackBerry® Java® Application descriptor file.
.kml	application/vnd.google-earth.kml+xml	A Keyhole Markup Language file, an XML-based file format that defines geographic information for a particular location or set of locations.
.kmz	application/vnd.google-earth.kmz	A compressed KML file.
.pdf	application/pdf	An Adobe® Acrobat® document.
.ppt	application/vnd.ms-powerpoint	A Microsoft® PowerPoint® document.
.vcf	text/x-vcard	A vCard file, a standard file format for electronic business cards.
.xloc	text/vnd.rim.location.xloc	A BlackBerry Maps location document.
.xls	application/vnd.ms-excel	A Microsoft® Excel® spreadsheet.

Key URI link schemes supported by the BlackBerry Browser

The BlackBerry® Browser supports the following URI link schemes.

URI scheme	Description	Example
http:	Specifies a link to an HTTP resource.	View this resource.

URI scheme	Description	Example
`https:`	Specifies a secure link to an HTTP resource.	`<a href="https://www.example.com/a_secure_resource.html">View this secure resource.</a>`
`mailto:`	Specifies a link using an SMTP email address.	`<a href="mailto:jane.doe@blackberry.com">Email Jane</a>`
`pin:`	Specifies a PIN link, which sends a PIN message to a BlackBerry device user using the BlackBerry device PIN.	`<a href="PIN:1234a567">Send PIN message to Jane</a>`
`rtsp:`	Specifies a link to a media resource that can be streamed.	`<a href="rtsp://www.example.com/a_streamable_resource.mp4">Stream this resource.</a>`
`sms:`	Specifies a text message link. You can specify multiple phone numbers as a comma-separated list.	`<a href="sms:+15195896475,+15194048540">Two Recipients</a>`
`tel:`	Specifies a phone link, as defined by the RFC 3699 specification.	`<a href="tel:14165551212">Call office</a>`

Key HTTP headers included with browser requests

The BlackBerry® Browser includesa number of HTTP headers with each request. You can use the following headers to ensure that you send the optimal content or resources for the BlackBerry device, the network, and the user.

Header	Description
`User-Agent`	The `User-Agent` header is sent by all browsers with every content request. The value of this header is a string that identifies the browser making the request. With the adoption of WebKit in BlackBerry 6, the format and content of the `User-Agent` string for the BlackBerry Browser has changed so that it resembles other WebKit based browsers. In BlackBerry 6, the `User-Agent` string uses the following form:

Header	Description
	`Mozilla/5.0 (BlackBerry; U; BlackBerry <model>; en-US) AppleWebKit/<webkit_version> (KHTML, like Gecko) Version/<version> Mobile Safari/<webkit_version>` where • *<model>* is the model number of the BlackBerry device that makes the request • *<version>* is the version of the BlackBerry® Device Software the BlackBerry device runs • *<webkit_version>* is the version of the WebKit engine that the browser uses
`Accept`	The `Accept` header is sent by all browsers with every content request. The value of this header provides information about the content types that the requesting browser accepts. This header does not reflect the browser settings specified by the BlackBerry device user. For example, this header always indicates that the browser accepts JavaScript®, even if the user disables JavaScript in the browser. The `Accept` header uses the following form: `text/html,application/xhtml+xml, application/xml, application/x-javascript, */*;q=0.5`
`Accept-Language`	The `Accept-Language` header is sent by all browsers with every content request. The value of this header provides information about the language preferences of the user. The BlackBerry Browser populates the value for this header by using the display language that the user specifies in the Options application. The user can not set the language within the browser itself. This header is commonly used as a simple way to infer the locale of the user. For example, if the value of the `Accept-Language` header is `de-at` (Austrian German), you can reasonably assume that the user is located in Austria.
`x-wap-profile`	The `x-wap-profile` header is unique to mobile devices. This header provides information about the device that requests the content. The value of this header is a URL of the RDF file for the BlackBerry device making the request. The RDF file is an XML-based document that provides hardware information and supported features of the BlackBerry device. You can use this information to, for example, determine the device input method, the device screen size, and other device-specific information.

Header	Description
	The URL string also includes information about the network the browser is using, allowing you to determine whether the request is made over a wireless network or a Wi-Fi® connection. The `x-wap-profile` URL string uses the following form: `"http://www.blackberry.net/go/mobile/profiles/uaprof/`*`<BlackBerry-model>`*`_`*`<network-bearer>`*`/ `*`<software-version>`*`.rdf"`. where: • *`<BlackBerry-model>`* is the model number of the BlackBerry device • *`<network-bearer>`* is the network over which the BlackBerry Browser is currently communicating • *`<software-version>`* is the version of the BlackBerry Device Software

BlackBerry Browser architecture

3

Available network gateways

The BlackBerry® Browser can communicate via several different network gateways or proxies. Each network gateway requires the browser to communicate using a different network transport.

The ability of the browser to communicate through each of these network gateways depends on which network transports have been provisioned on the device. Newer BlackBerry devices typically have at least Wi-Fi® and WAP network transports available.

In BlackBerry 6, the browser chooses which network transport it will use, based on availability, cost, and performance.

Network gateway or proxy	Description
Wi-Fi hotspot	A Wi-Fi hotspot provides Wi-Fi-enabled BlackBerry devices with access to the Internet over a wireless LAN. A Wi-Fi connection is the fastest and least expensive data routing option. It provides greater bandwidth than the wireless network, and circumvents the data charges that are associated with transferring browser content over a wireless connection. When a Wi-Fi connection is available, this gateway is the preferred option.
BlackBerry® Internet Service Browsing	The BlackBerry Internet Service Browsing network gateway acts as a proxy for the BlackBerry Browser. This gateway compresses the content in the response to enhance wireless network efficiency. Over a wireless network, the BlackBerry Internet Service Browsing gateway, when available, is the preferred option. It provides the fastest and most efficient browsing for BlackBerry devices among wireless network gateways.
BlackBerry® MDS Connection Service	The BlackBerry MDS Connection Service network gateway is designed to provide users with secure access to their organization's intranets. The BlackBerry MDS Connection Service is a component of the BlackBerry® Enterprise Server that exists on the organization's network, behind a firewall. This gateway can also provide access to the Internet, but is not optimized for use with the BlackBerry Browser included with BlackBerry 6. If the BlackBerry Enterprise Server permits it, it is possible for the BlackBerry Browser to connect to the BlackBerry MDS Connection Service over a Wi-Fi connection, allowing users to access intranet resources over a faster and cheaper connection. Because all

Network gateway or proxy	Description
	communication between the BlackBerry device and the BlackBerry Enterprise Server is Triple-DES encrypted, accessing the BlackBerry MDS Connection Service over Wi-Fi is secure.
WAP gateway	WAP network gateways are hosted by wireless service providers. WAP gateways typically use the WAP 2.0 protocol, to deliver content to mobile devices. The features and behavior of each WAP gateway is determined by the wireless service provider. These gateways typically do not provide the same level of compression and optimization that is available with the BlackBerry Internet Service Browsing gateway. Wireless service providers can configure the browser to use their WAP gateway as the default gateway.

Automated transport selection

In earlier versions of the BlackBerry® Device Software, users were required to manually change which network transport they wanted the browser to communicate over by selecting a specific configuration of the browser. In BlackBerry 6, the BlackBerry® Browser automatically selects which network transport it will use. The browser chooses which transport to use based on which available transport offers results in the least cost and the highest performance among the available transports.

By default, the browser prioritizes the available transports in the following order:

1. If the user has a Wi-Fi® connection available, the browser uses the Wi-Fi transport
2. If the user has a Wi-Fi connection available and is attempting to retrieve an intranet resource, the browser uses the Wi-Fi transport to connect directly to the BlackBerry® MDS Connection Service and access the intranet resource. The BlackBerry® Enterprise Server must be configured to permit the BlackBerry Browser to connect to the BlackBerry MDS Connection Service via a Wi-Fi connection.
3. If the user does not have a Wi-Fi connection available, the browser uses the BlackBerry® Internet Service Browsing transport to connect to the BlackBerry Internet Service Browsing proxy.
4. If the user does not have a Wi-Fi connection available and is attempting to retrieve an intranet resource, the browser uses the BlackBerry MDS Connection Service transport to connect to the BlackBerry MDS Connection Service.
5. If none of the above conditions apply, the browser uses the WAP transport to connect to the wireless service provider proxy.

Web development tools

4

There are a number of free development tools you can download and use to help you create and test your web content or application for use on a BlackBerry device.

To download any of the BlackBerry web development tools, visit http://na.blackberry.com/eng/developers/resources/devtools.jsp.

BlackBerry Smartphone Simulator

The BlackBerry® Smartphone Simulator includes the BlackBerry Browser and other BlackBerry device applications that are typically available on BlackBerry devices. You can use the BlackBerry Smartphone Simulator to test your web pages in the BlackBerry Browser.

You can download the BlackBerry Smartphone Simulator for multiple BlackBerry devices so that you can test functionality and layout across different devices.

BlackBerry Web Plug-in for Eclipse

The BlackBerry® Web Plug-in for Eclipse® is an extension for a your existing Eclipse development environment that provides you with the tools for creating BlackBerry Web and Widget applications, and for profiling, debugging, and testing code that is designed for the BlackBerry within the Eclipse development environment.

You can use the profiling tools to track project resources and produce efficient web pages that you design for the BlackBerry Browser.

From within Eclipse, you can set break points, debug, and step through linked-in or inline JavaScript® code in HTML documents. The BlackBerry Browser updates the web page in the BlackBerry Smartphone Simulator as you step through your code.

BlackBerry Web Plug-in for Microsoft Visual Studio

The BlackBerry® Web Plug-in for Microsoft® Visual Studio® provides you with the tools for creating BlackBerry Web and Widget applications, and for profiling, debugging, and testing code that is designed for the BlackBerry Browser from within the Microsoft Visual Studio development environment.

With the BlackBerry Web Plug-in, you can use familiar tools for web development while you use features provided with the BlackBerry Web Plug-in to develop code and test it in the BlackBerry Browser. You can also design and develop standalone widget applications.

From within Microsoft Visual Studio, you can set break points, debug, and step through linked-in and inline JavaScript code in ASP.NET projects.

BlackBerry Browser push solutions

5

Push technology lets you send content or notifications to specific BlackBerry® devices without user intervention. For mobile devices that communicate over wireless networks, which are both slower and costlier than Wi-Fi® or LAN networks, push solutions help to reduce network usage by eliminating the need for users to make unnecessary requests for content.

A complete push solution has three principle components: On the server is the push initiator, which makes push requests when new content is available. On the BlackBerry device is the push-enabled application, which receives the content or notifications. In between is the Push Proxy Gateway, or PPG, which receives push requests from the push initiator and attempts to deliver the associated content or notification to the push-enabled application.

On BlackBerry devices, the push-enabled application is perhaps most commonly associated with BlackBerry® Java® Applications or BlackBerry® Widget applications. The BlackBerry® Browser is a built-in push-enabled application that, unlike Java applications or widgets, requires no additional client-side development.

To create a complete push solution, you must develop the push initiator to construct push requests that are appropriate for the PPG.

Supported push technologies

The BlackBerry Browser supports several different push technologies, each associated with a particular network gateway. The network gateway functions as the PPG, which receives your push requests and then attempts to deliver content or notifications to the BlackBerry devices specified. The level of push support depends on which network gateway functions as the PPG:

- The BlackBerry® MDS Connection Service network gateway only provides enterprise-level support for push technology, but it offers the most comprehensive push capabilities of the available PPGs. This gateway can be used to push web content directly to BlackBerry devices associated with your organization's BlackBerry® Enterprise Server. Once delivered, the content is on the device; the user can view it in the browser at any time, whether or not they have a network connection.
- The BlackBerry® Internet Service Browsing network gateway can be used to push notifications called web signals to users who have subscribed to the service. Web signals are added directly to the Home screen on a BlackBerry device. When new content is available, you can notify users by pushing a web signal update. On the device, the web signal icon changes to a notification icon. The user can click the icon to open the browser and display the content at the associated URL. The content is not retrieved by the browser until the user clicks the web signal to view it.
- WAP network gateways can be used to push notifications in a variety of WAP-compliant formats. If a WAP connection is available, and a service loading request containing a URL is pushed to the device, the browser automatically attempts to retrieve the URL. If no WAP connection is available, content is delivered via SMS or UDP messages.

Push support through the BlackBerry MDS Connection Service network gateway

The BlackBerry® MDS Connection Service is designed to provide extensive support for pushing content to BlackBerry devices that are associated with a BlackBerry® Enterprise Server. To push content to the BlackBerry device, you can develop a push initiator application that makes HTTP POST requests to the BlackBerry MDS Connection Service. Requests include a list of the destination BlackBerry devices that are targeted to receive the pushed content.

The BlackBerry MDS Connection Service sends the content to the appropriate BlackBerry devices using the users' email addresses or device PINs. The BlackBerry MDS Connection Service manages the connection to the wireless network and verifies that content is delivered as soon as a user is in a wireless coverage area.

Pushed content is stored in a separate cache. By default, pushed content is cleared from the cache after 12 hours. However, by including an `Expires` header in your push request, you can increase or decrease the time content is stored in cache memory.

On the BlackBerry device, a separate browser listener thread listens on port 7874 for incoming messages and processes incoming messages.

For more information, see the *BlackBerry Enterprise Server Push Solutions Development Guide*.

Supported push methods

Using the BlackBerry® MDS Connection Service, you can push content to the BlackBerry device using any of the following push methods:

- Pushing content to a browser channel: This method delivers content to the browser cache and adds an icon on the Home screen as an entry point to the content. Clicking the icon opens the pushed content in the browser. You can push a channel delete request to remove the channel at any time.
- Pushing content to the message list: This method delivers content to the message list, where it appears as an item in the list. Clicking the item in the message list displays the pushed content in the browser. Note that using this method, pushed content is not added to the pushed content cache.
- Pushing content to the browser cache: This method delivers content to the cache, but provides no notification to the user. The next time the user accesses the content, the browser retrieves the updated content from the cache.

Push support through the BlackBerry Internet Service Browsing network gateway

You can push notifications to BlackBerry® device users through the BlackBerry Internet Service Browsing network gateway using web signals. A web signal is a service hosted by Research In Motion that lets content providers access BlackBerry push technology available within BlackBerry® Infrastructure. Essentially, a web signal allows you to install an icon on the Home screen of a subscribed user that is associated with a specific URL.

To update a web signal, you submit an HTTP POST request to the BlackBerry® Infrastructure that includes:

- the delivery parameters (for example, the list of subscribed users to whom the notification should be sent, the length of time for which the push request is valid, and so on)

- the absolute URLs of two icons (the standard icon, displayed when no new content is available, and the notification icon, displayed when new content is available)
- the absolute URL of the content that you want the user to view

When the BlackBerry Infrastructure receives the request, it queues request, then delivers the URLs of the icons and the URL of the content to the BlackBerry devices.

The BlackBerry Browser receives the icons without user intervention, and replaces the standard icon with the notification icon on the Home screen. When the user clicks the notification icon, the BlackBerry Browser opens and retrieves the content from the URL specified in the push request. After the user clicks the notification icon, the BlackBerry Browser replaces the notification icon with the standard icon on the Home screen.

To use the web signals service, you must be a member of the BlackBerry Alliance Program. Each web signal you create must be registered with Research In Motion. You must create and host a subscription web page at which a user can subscribe to receive your web signal on their BlackBerry device.

For more information about signing up to use this service, go to http://na.blackberry.com/eng/developers/browserdev/websignals.jsp.

Push support through WAP network gateways

Push support through WAP gateways may vary based on the wireless service provider. To push content through a WAP gateway to a BlackBerry® device, a WAP Push service record must be provisioned on the device. WAP Push service records are typically sent during registration. The WAP Push service record specifies how the device receives WAP pushes, on which ports the WAP Push Processor listens for incoming WAP Push messages, and how the device manages the incoming messages.

Server applications can push content to the BlackBerry device using one of the following methods:

- Existing WAP connections: This method is available only when a WAP connection is open between the BlackBerry device and the WAP gateway.
- SMS messages: If an existing WAP connection is not available, the service record provisioned for the GPRS and CDMA networks typically uses SMS.

  Wireless service providers can restrict incoming SMS messages to specific source addresses. The source address restrictions are specified as parameters in the WAP Push service record.

Push message types	Description
service indicator	These messages are self-contained with some text to inform the user about an event or notification. The entire text of the message is included in the service indicator that is pushed to the BlackBerry device.

Push message types	Description
service loading	These messages include a URL at which the new content is located. The service loading message is pushed to the BlackBerry device first, and then the browser automatically downloads content from the URL location.

When a pushed message is successfully or unsuccessfully processed by the BlackBerry® Browser, a push completion notification is sent to the push initiator.

By default, the browser handles service indicator and service loading messages automatically. Users can change how incoming pushed messages are handled, or turn off WAP Push support in the browser configuration properties.

BlackBerry Browser extensibility

6

You can develop web content that can be used in contexts outside the BlackBerry® Browser. You can create stand-alone applications built upon the WebKit layout engine, using the same web-based technologies supported by the browser.

The BlackBerry web platform can be used as a foundation for the following types of applications:

- BlackBerry® Java® Applications: You can embed a browser object into a BlackBerry® Java® Application and design much of your application's UI using web components such as HTML, XHTML, CSS, JavaScript®.
- Widget applications: Widgets are standalone applications that are built using standard web components and can include other internal or external resources just like any web page.

These applications offer several benefits that are unavailable with standard browser-based web applications:

- The main components reside on the BlackBerry device, and network connections are only opened when necessary.
- They are installed to the user's Home screen.
- They can provide greater access to PIM data and deeper integration with other applications on the device.
- They can be made available to users through the BlackBerry App World™ storefront.

Embedded browser objects within a BlackBerry Java Application

BlackBerry® Java® Applications can be designed to make use of web components, allowing you to create a hybrid application that combines the simplicity of an HTML-based user interface with the power of the native BlackBerry Java APIs.

You can use the BrowserField2 API to create an embedded browser object within your Java application. This browser object uses the same WebKit layout engine and provides the same functionality as the BlackBerry® Browser, but because it is embedded within a BlackBerry Java Application, you have access to a much richer set of functionality and deeper integration with the BlackBerry device's suite of core and add-on applications than you would within the browser alone.

For example, using an embedded browser object within a BlackBerry Java Application, you can:

- create and send email or instant messenger messages
- access the native file system
- access a wide range of PIM data, such as email messages, contacts, or calendar information

BlackBerry Widget applications

BlackBerry® Widget applications are standalone BlackBerry device applications that consist of standard web components, including HTML, XHTML, style sheets, JavaScript® code, image files, and other resources. Widget applications follow the same security rules, configuration, and deployment model as other BlackBerry® Java® Applications.

You can extend the capabilities of widget applications by using the widget APIs, JavaScript extensions which provide deeper integration with BlackBerry device applications and data than is available through standard JavaScript in the BlackBerry Browser. For example, using the widget APIs, you can access PIM data from a number of different sources:

- email messages
- contacts
- calendar
- tasks
- call logs

When properly configured to do so, a BlackBerry Widget can read the information, update the information and create new entries.

Glossary

7

AJAX
Asynchronous JavaScript® and XML

API
application programming interface

CSS
cascading style sheet

DES
Data Encryption Standard

DOM
Document Object Model

HTML
Hypertext Markup Language

HTTP
Hypertext Transfer Protocol

HTTPS
Hypertext Transfer Protocol over Secure Sockets Layer

IP
Internet Protocol

IPPP
Internet Protocol Proxy Protocol

JSON
JavaScript® Object Notation

KML
Keyhole Markup Language

LAN
local area network

MIME
Multipurpose Internet Mail Extensions

MPEG
Moving Picture Experts Group

NTLM
NT LAN Manager

PAP
Push Access Protocol

SSL
Secure Sockets Layer

SVG
Scalable Vector Graphics

Triple DES
Triple Data Encryption Standard

TCP
Transmission Control Protocol

TLS
Transport Layer Security

URI
Uniform Resource Identifier

WAP
Wireless Application Protocol

WLAN
wireless local area network

WML
Wireless Markup Language

WTLS
Wireless Transport Layer Security

WTP
WAP Transaction Protocol

XHTML
Extensible Hypertext Markup Language

XML
Extensible Markup Language

Provide feedback

8

To provide feedback on this deliverable, visit www.blackberry.com/docsfeedback.

Legal notice

9

HEREIN INCLUDING WITHOUT LIMITATION ANY OF THE FOLLOWING DAMAGES: DIRECT, CONSEQUENTIAL, EXEMPLARY, INCIDENTAL, INDIRECT, SPECIAL, PUNITIVE, OR AGGRAVATED DAMAGES, DAMAGES FOR LOSS OF PROFITS OR REVENUES, FAILURE TO REALIZE ANY EXPECTED SAVINGS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, LOSS OF BUSINESS OPPORTUNITY, OR CORRUPTION OR LOSS OF DATA, FAILURES TO TRANSMIT OR RECEIVE ANY DATA, PROBLEMS ASSOCIATED WITH ANY APPLICATIONS USED IN CONJUNCTION WITH RIM PRODUCTS OR SERVICES, DOWNTIME COSTS, LOSS OF THE USE OF RIM PRODUCTS OR SERVICES OR ANY PORTION THEREOF OR OF ANY AIRTIME SERVICES, COST OF SUBSTITUTE GOODS, COSTS OF COVER, FACILITIES OR SERVICES, COST OF CAPITAL, OR OTHER SIMILAR PECUNIARY LOSSES, WHETHER OR NOT SUCH DAMAGES WERE FORESEEN OR UNFORESEEN, AND EVEN IF RIM HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW IN YOUR JURISDICTION, RIM SHALL HAVE NO OTHER OBLIGATION, DUTY, OR LIABILITY WHATSOEVER IN CONTRACT, TORT, OR OTHERWISE TO YOU INCLUDING ANY LIABILITY FOR NEGLIGENCE OR STRICT LIABILITY.

THE LIMITATIONS, EXCLUSIONS, AND DISCLAIMERS HEREIN SHALL APPLY: (A) IRRESPECTIVE OF THE NATURE OF THE CAUSE OF ACTION, DEMAND, OR ACTION BY YOU INCLUDING BUT NOT LIMITED TO BREACH OF CONTRACT, NEGLIGENCE, TORT, STRICT LIABILITY OR ANY OTHER LEGAL THEORY AND SHALL SURVIVE A FUNDAMENTAL BREACH OR BREACHES OR THE FAILURE OF THE ESSENTIAL PURPOSE OF THIS AGREEMENT OR OF ANY REMEDY CONTAINED HEREIN; AND (B) TO RIM AND ITS AFFILIATED COMPANIES, THEIR SUCCESSORS, ASSIGNS, AGENTS, SUPPLIERS (INCLUDING AIRTIME SERVICE PROVIDERS), AUTHORIZED RIM DISTRIBUTORS (ALSO INCLUDING AIRTIME SERVICE PROVIDERS) AND THEIR RESPECTIVE DIRECTORS, EMPLOYEES, AND INDEPENDENT CONTRACTORS.

IN ADDITION TO THE LIMITATIONS AND EXCLUSIONS SET OUT ABOVE, IN NO EVENT SHALL ANY DIRECTOR, EMPLOYEE, AGENT, DISTRIBUTOR, SUPPLIER, INDEPENDENT CONTRACTOR OF RIM OR ANY AFFILIATES OF RIM HAVE ANY LIABILITY ARISING FROM OR RELATED TO THE DOCUMENTATION.

Prior to subscribing for, installing, or using any Third Party Products and Services, it is your responsibility to ensure that your airtime service provider has agreed to support all of their features. Some airtime service providers might not offer Internet browsing functionality with a subscription to the BlackBerry® Internet Service. Check with your service provider for availability, roaming arrangements, service plans and features. Installation or use of Third Party Products and Services with RIM's products and services may require one or more patent, trademark, copyright, or other licenses in order to avoid infringement or violation of third party rights. You are solely responsible for determining whether to use Third Party Products and Services and if any third party licenses are required to do so. If required you are responsible for acquiring them. You should not install or use Third Party Products and Services until all necessary licenses have been acquired. Any Third Party Products and Services that are provided with RIM's products and services are provided as a convenience to you and are provided "AS IS" with no express or implied conditions, endorsements, guarantees, representations, or warranties of any kind by RIM and RIM assumes no liability whatsoever, in relation thereto. Your use of Third Party Products and Services shall be governed by and subject to you agreeing to the terms of separate licenses and other agreements applicable thereto with third parties, except to the extent expressly covered by a license or other agreement with RIM.

Certain features outlined in this documentation require a minimum version of BlackBerry® Enterprise Server, BlackBerry® Desktop Software, and/or BlackBerry® Device Software.

Research In Motion Limited
295 Phillip Street
Waterloo, ON N2L 3W8
Canada

Research In Motion UK Limited
Centrum House
36 Station Road
Egham, Surrey TW20 9LF
United Kingdom

Published in Canada