

Research In Motion (RIM)

BlackBerry MDS Runtime Transition Toolkit

Contents

Overview	4
Java Platform.....	5
Application Logic.....	5
Communication.....	5
Web Service and Database Connections	6
WS Notification / XML Push	6
User Interface	7
Layout (Grid Control/Table Control/Repeater Control).....	8
Adding styles to controls.....	8
Defining Actions for Focusable Items	9
Defining Actions for Clickable Items	10
Menu Items	10
Data Binding.....	10
Offline Access.....	10
Device Integration.....	11
GPS	11
PIM	12
Messaging	12
Application Invocation	12
Add Menu Item to Native Built-in Application.....	13
Security	13
Development Tools	14
Deployment	14
Web Platform.....	17

Application Logic.....	17
Communication.....	17
SOAP Web Service and Database Connections.....	18
WS Notification / XML Push.....	18
User Interface	18
Grid Control.....	18
Table Control.....	18
Repeater Control.....	19
Adding styles to controls.....	19
Defining Actions for Focusable and Clickable Items	20
Menu Items.....	20
Data Binding.....	20
Offline Access.....	20
Device Integration.....	20
GPS.....	21
PIM.....	21
Messaging	21
Application Invocation	21
Add Menu Item to Native Built-in Application.....	21
Security	21
Development Tools.....	21
Deployment	22
Other Migration Paths	22

Overview

BlackBerry® MDS Studio allows developers to rapidly create custom applications for BlackBerry smartphones connected to web services or databases via the BlackBerry® Enterprise Server. Research In Motion (RIM) has provided notice that BlackBerry MDS Studio and the BlackBerry® Plug-in for Microsoft® Visual Studio versions prior to v1.2 that enabled BlackBerry MDS Runtime development will no longer be available for download as of December 31, 2009. The BlackBerry Plug-in for Microsoft Visual Studio will continue to be supported for versions 1.2 and up for web and widget development. Support for these products will end on June 30, 2010. For more information on the end of life of these products, please [click here](#).

This document provides information and links to sample code to help BlackBerry MDS Runtime developers transition their code to either a BlackBerry Java or Web application. As well, a list of third party solutions, which provide comparable functionality to BlackBerry MDS development tools, is provided at the end of this document.

BlackBerry® Developer Zone

<http://www.blackberry.com/developers/>

BlackBerry Java Development

<http://na.blackberry.com/eng/developers/javaappdev/>

BlackBerry Web Development

<http://na.blackberry.com/eng/developers/browserdev/>

BlackBerry® Widgets

<http://www.blackberry.com/developers/widget>

Java Platform

The BlackBerry Java Platform provides many rich features that allow developers to create applications with compelling user interfaces that can communicate with both corporate and consumer backend systems or even as standalone applications.

The following resources provide introductory documentation for development on the BlackBerry Java platform.

BlackBerry Java Application Fundamentals Guide 5.0

http://docs.blackberry.com/en/developers/deliverables/9091/JDE_5.0_FundamentalsGuide_Beta.pdf

BlackBerry Java Application - Core - Development Guide

<http://docs.blackberry.com/en/developers/deliverables/9137/>

Video - Introduction to BlackBerry Java Development

<http://www.blackberry.com/DevMediaLibrary/view.do?name=java>

Sample Code – BlackBerry Java Development Environment 5.0

<http://docs.blackberry.com/en/developers/subcategories/?userType=21&category=BlackBerry%20Java%20Application%20Development&subCategory=BlackBerry%20Java%20Development%20Environment%20Sample%20Applications>

Tutorials for Java and Web Development

<http://na.blackberry.com/eng/developers/resources/tutorials.jsp>

Application Logic

In order to develop native applications on BlackBerry smartphones some Java knowledge is necessary but, if desired, BrowserField components can be used to enable the developer to leverage their HTML, CSS and JavaScript® code within their Java Application. Although BrowserField components provide an HTML Parser and Layout Rendering and JavaScript Engines, pre-5.0, HTTP Connectivity, Caching, Cookies, Callbacks, Event handling had to be coded by the developer. BrowserField2, available in version 5.0 provides this functionality for free.

Video - How to Embed the Browser within Your Application

<http://www.blackberry.com/DevMediaLibrary/view.do?name=HowtoembedtheBrowser>

Communication

BlackBerry MDS Runtime applications rely on the integration of the BlackBerry MDS Runtime environment with back-end web services using SOAP. In the BlackBerry MDS Runtime environment, all stubs and XML parsing was done by the rapid application development tool. Moving to a Java

environment requires the developer to implement web services end points which can be created with the Sun Java Wireless Toolkit for CLDC or use an existing web service.

Web Service and Database Connections

Support for web services is available in BlackBerry® Device Software versions 4.3 and higher through JSR 172 – Web Services API. In order to use JSR 172, developers must generate stub from a WSDL document and within the client application, create an instance of the generated stub and invoke methods on it. Stub methods correspond to the web service endpoint's wsdl:operation in the WSDL document. Sun's J2ME Wireless Toolkit, version 2.1 and higher, includes a stub generator for JSR 172 JAX-RPC.

Prior to BlackBerry Device Software version 4.3, developers can import the kSoap library for their web services implementations.

Web Services Architecture

<http://www.w3.org/TR/ws-arch/>

JSR 172 – Web Services APIs

<http://java.sun.com/products/wsa/>

Introduction to J2ME Web Services

<http://developers.sun.com/mobility/apis/articles/wsa/>

KB – How to Use the XML Parser

http://www.blackberry.com/knowledgecenterpublic/livelink.exe/fetch/2000/348583/800332/800599/How_To_-_Use_the_XML_Parser.html?nodeid=820554

Sun Java Wireless Toolkit for CLDC

<http://java.sun.com/products/sjwtoolkit/>

kSoap

<http://ksoap.objectweb.org/>

A best practice for accessing server-side databases via BlackBerry Java applications is to use a RESTful API – parsing messages with XML APIs.

WS Notification / XML Push

WS Notification and XML Push allowed BlackBerry MDS Runtime applications to push data from the backend application directly to a user's BlackBerry Runtime application. In the BlackBerry Java platform there are other facilities available to push content directly to users connected to a BlackBerry Enterprise Server. Additionally applications can push content to users not connected to the BlackBerry Enterprise Server using the BlackBerry® Internet Service Push APIs.

With BlackBerry® Java® Development Environment version 5.0, there are new client-side Push APIs to allow developers to easily create client-side BlackBerry Java applications that listen for push notifications.

BlackBerry Java Application - Core - Development Guide – Creating Applications for Pushed Content
http://docs.blackberry.com/en/developers/deliverables/9137/Creating_applications_for_pushed_content_509043_11.jsp

The HTTP push sample application demonstrates how to push content to a BlackBerry smartphone and how to listen for pushed content on a BlackBerry smartphone.

The sample application provides both a server-side application that you can use to send content to a BlackBerry® Smartphone Simulator or BlackBerry smartphone and a client-side application that listens for pushed content on a BlackBerry smartphone.

HTTP Push Sample

<http://docs.blackberry.com/en/developers/subcategories/?userType=21&category=BlackBerry+Java+Application+Development&subCategory=BlackBerry+Java+Development+Environment+Sample+Applications>

BlackBerry Push API

<http://na.blackberry.com/eng/developers/javaappdev/pushapi.jsp>

KB - What Is - Sample applications demonstrating BlackBerry push technology - Emergency Contact List
http://www.blackberry.com/knowledgecenterpublic/livelink.exe/What_Is_-_Sample_applications_demonstrating_BlackBerry_push_technology_-_Emergency_Contact_List.html?func=doc.Fetch&nodeId=1055822&docTitle=What+Is+%2D+Sample+applications+demonstrating+BlackBerry+push+technology+%2D+Emergency+Contact+List&vernum=14

Video - Introduction to the BlackBerry Push API

<http://www.blackberry.com/DevMediaLibrary/view.do?name=BISpush>

User Interface

BlackBerry Java application user interface APIs provide developers with a framework of easy-to-use UI components that can also be customized to provide more advanced user interface design.

BlackBerry Smartphones UI Guidelines

<http://docs.blackberry.com/en/developers/deliverables/6625/>

Javadoc – UI Overview

<http://www.blackberry.com/developers/docs/5.0.0api/UI-summary.html>

Tutorial – A11 User Interface

http://na.blackberry.com/developers/resources/A11_User_Interface_V3.pdf

KB – What Is - BlackBerry UI hierarchy

http://www.blackberry.com/knowledgecenterpublic/livelink.exe/What_Is_-_BlackBerry_UI_hierarchy.html?func=doc.Fetch&nodeId=800513&docTitle=What+Is+%2D+BlackBerry+UI+hierarchy

KB – How To - Manage UI interactions

http://www.blackberry.com/knowledgecenterpublic/livelink.exe/fetch/2000/348583/800332/800505/800608/How_to_-_Manage_UI_interactions.html?nodeId=800514&vernum=0

Layout (Grid Control/Table Control/Repeater Control)

A GridLayoutManager API is available in BlackBerry Device Software version 5.0 that provides Table layout functionality similar to Grid, Table and Repeater controls available in MDS Runtime. To access this functionality on pre-5.0 devices a post on the BlackBerry Developer Blog with full sample code is available .

Javadoc - BlackBerry Device Software v5.0

<http://www.blackberry.com/developers/docs/5.0.0api/index.html>

Blog - How to use Table View layout

<http://supportforums.blackberry.com/t5/BlackBerry-Developer-s-Blog/How-to-use-Table-View-layout/ba-p/356886>

KB – How to Create a Rich UI Layout with TableLayoutManager

http://www.blackberry.com/knowledgecenterpublic/livelink.exe/How_To_-_Create_a_rich_UI_layout_with_TableLayoutManager.html?func=doc.Fetch&nodeId=1906675&docTitle=How+To+--+Create+a+rich+UI+layout+with+TableLayoutManager&vernum=2

KB – How to - Use the User Interface API to create an editable table

http://www.blackberry.com/knowledgecenterpublic/livelink.exe/fetch/2000/348583/800332/800505/800508/How_to_-_Use_the_User_Interface_API_to_create_an_editable_table.html?nodeId=800261&vernum=0

Adding styles to controls

In Java development platform, BlackBerry MDS Runtime controls translate into fields. In device version 4.6 and higher, developers can use the Decor APIs to add backgrounds and borders to all fields. Prior to version 4.6, developers must override the Field class' layout method in order to add styles.

KB – How To - Create a custom layout manager for a screen

http://www.blackberry.com/knowledgecenterpublic/livelink.exe/How_To_-_Create_a_custom_layout_manager_for_a_screen.html?func=doc.Fetch&nodeId=800263&docTitle=How+To+%2D+Create+a+custom+layout+manager+for+a+screen

KB – How To - Create a screen with stationary headings

http://www.blackberry.com/knowledgecenterpublic/livelink.exe/How_To_-_Create_a_screen_with_stationary_headings.html?func=doc.Fetch&nodeId=1207952&docTitle=How+To+%2D+Create+a+screen+with+stationary+headings

KB – How To - Create custom fields

http://www.blackberry.com/knowledgecenterpublic/livelink.exe/fetch/2000/348583/800332/800505/800345/How_To_-_Create_custom_fields.html?nodeid=800618&vernum=0

KB – How To - Create a Custom Dialog

http://www.blackberry.com/knowledgecenterpublic/livelink.exe/fetch/2000/348583/800332/800505/800256/How_To_-_Create_a_custom_Dialog.html?nodeid=800507&vernum=0

KB – How to - Change the background color of a screen

http://www.blackberry.com/knowledgecenterpublic/livelink.exe/How_to_-_Change_the_background_color_of_a_screen.html?func=doc.Fetch&nodeId=800335&docTitle=How+to+%2D+Change+the+background+color+of+a+screen

Video - How to Extend Manager

<http://www.blackberry.com/DevMediaLibrary/view.do?name=HowToExtendManager>

Sample Code - Custom Buttons

<http://docs.blackberry.com/en/developers/deliverables/7721/index.jsp?name=BlackBerry+Java+Development+Environment+-+Custom+Buttons+Sample+Application+-+Sample+Application+Overview5.0+Beta&language=English&userType=21&category=BlackBerry+Java+Application+Development&subCategory=BlackBerry+Java+Development+Environment+Sample+Applications>

Sample Code – Decor Sample Application

<http://docs.blackberry.com/en/developers/deliverables/9076/index.jsp?name=BlackBerry+Java+Development+Environment+-+Decor+Sample+Application+-+Sample+Application+Overview5.0+Beta&language=English&userType=21&category=BlackBerry+Java+Application+Development&subCategory=BlackBerry+Java+Development+Environment+Sample+Applications>

Defining Actions for Focusable Items

To receive the focus for a particular field, the developer must override the Field class's `isFocusable` method to return true. The framework invokes `onFocus` when the field gains focus, and `onUnfocus` when the field loses focus. Developers can override these methods to define specific behaviors for these events. To handle focus movements within a field, the framework invokes `moveFocus`. For more information see the detailed Javadoc overview for the Field class.

Javadoc – Field

<http://www.blackberry.com/developers/docs/5.0.0api/net/rim/device/api/ui/Field.html>

Defining Actions for Clickable Items

Developers can specify listeners for changes to specific fields. Each field can have only one change listener object although groups of fields can use the same field listener.

Javadoc – Field

<http://www.blackberry.com/developers/docs/5.0.0api/net/rim/device/api/ui/Field.html>

Javadoc – FieldChangeListener

<http://www.blackberry.com/developers/docs/5.0.0api/net/rim/device/api/ui/FieldChangeListener.html>

Menu Items

Developers can easily add menu items in their own Java application and in 5.0 developers can also change the appearance of the menu items.

BlackBerry Java Application - Core - Development Guide – Creating Menus and Submenus

http://docs.blackberry.com/en/developers/deliverables/9094/Create_a_menu_836422_11.jsp

BlackBerry Java Application - Integration - Development Guide – Menu Items

http://docs.blackberry.com/en/developers/deliverables/8540/Menu_items_565588_11.jsp

Data Binding

In order to achieve similar functionality to BlackBerry MDS Studio's provided data binding a design pattern like Model View Controller could be used.

Model View Controller Design Pattern

<http://java.sun.com/blueprints/patterns/MVC.html>

Offline Access

BlackBerry Java applications have access to many of different persistence models including the PersistentStore and RuntimeStore, JSR 75 – File API and, new in version 5.0, SQLite. Both JSR 75 and SQLite allowing reading and writing of data from the microSD™ card as well as embedded device memory on devices that have an embedded storage (such as the BlackBerry® Storm™ and BlackBerry® Bold™ smartphone).

BlackBerry Java Application - Core - Development Guide

http://docs.blackberry.com/en/developers/deliverables/9137/Storing_data_509304_11.jsp

BlackBerry Java Application Development Guide – Data Storage

http://docs.blackberry.com/en/developers/deliverables/9091/JDE_5.0_FundamentalsGuide_Beta.pdf

Tutorial – A13 Storing Persistent Data

http://na.blackberry.com/developers/resources/A13_Storing_Persistent_Data_V2.pdf

KB – How to - Store persistent data on the BlackBerry smartphone

http://www.blackberry.com/knowledgecenterpublic/livelink.exe/How_To_-_Store_persistent_data_on_the_BlackBerry_smartphone.html?func=doc.Fetch&nodeId=800530&docTitle=How+To+%2D+Store+persistent+data+on+the+BlackBerry+smartphone&vernum=6

KB – How To - Programmatically determine if a MmicroSD card has been inserted

http://www.blackberry.com/knowledgecenterpublic/livelink.exe/How_To_-_Programmatically_determine_if_a_microSD_card_has_been_inserted.html?func=doc.Fetch&nodeId=1295868&docTitle=How+To+%2D+Programmatically+determine+if+a+microSD+card+has+been+inserted

Video – Introduction to Persistence Models on BlackBerry Smartphones

http://www.blackberry.com/DevMediaLibrary/view.do?name=Persistence%20ModelsOverview_of_Persistence_on_BlackBerry

Sample Code - SQLite Database

<http://docs.blackberry.com/en/developers/deliverables/9089/index.jsp?name=BlackBerry+Java+Development+Environment+-+SQLite+Database+Sample+Application+-+Sample+Application+Overview5.0+Beta&language=English&userType=21&category=BlackBerry+Java+Application+Development&subCategory=BlackBerry+Java+Development+Environment+Sample+Applications>

Device Integration

BlackBerry Java development allows for greater device integration than was provided by the BlackBerry MDS Runtime Environment.

GPS

BlackBerry Java applications can access device location using JSR 179 – Location API. Version 5.0 has additional BlackBerry Location APIs including reverse geo-coding.

BlackBerry Java Application - Location-Based Services - Development Guide

<http://docs.blackberry.com/en/developers/deliverables/10718/index.jsp?name=BlackBerry+Java+Application+-+Location-Based+Services+-+Development+Guide5.0+Beta&language=English&userType=21&category=BlackBerry+Java+Application+Development&subCategory=BlackBerry+Java+Development+Environment>

Video - Introduction to GPS and BlackBerry Smartphones

<http://www.blackberry.com/DevMediaLibrary/view.do?name=GPSOverview>

Video - Advanced GPS Techniques

<http://www.blackberry.com/DevMediaLibrary/view.do?name=GPSAdvanced>

Sample Code – GPS

<http://docs.blackberry.com/en/developers/deliverables/7701/index.jsp?name=BlackBerry+Java+Development+Environment+-+GPS+Sample+Application+-+Sample+Application+Overview5.0+Beta&language=English&userType=21&category=BlackBerry+Java+A>

[pplication+Development&subCategory=BlackBerry+Java+Development+Environment+Sample+Applications](#)

PIM

BlackBerry Java applications can access device PIM data using JSR 75 – PIM APIs and additional BlackBerry specific APIs.

JSR 175

<http://java.sun.com/javame/technology/msa/jsr75.jsp>

BlackBerry Java Application - Integration - Development Guide

<http://docs.blackberry.com/en/developers/deliverables/8540/index.jsp?name=BlackBerry+Java+Application+-+Integration+-+Development+Guide5.0+Beta&language=English&userType=21&category=BlackBerry+Java+Application+-+Development&subCategory=BlackBerry+Java+Development+Environment>

Javadoc – PIM Overview

<http://www.blackberry.com/developers/docs/5.0.0api/PIM-summary.html>

Messaging

BlackBerry Java applications can integrate with the message list and the messaging capabilities of the BlackBerry smartphone including creating, sending and listening for email, PIN, SMS and MMS messages. JSR 120 Wireless Messaging API (WMA) is supported. Message list integration APIs are included in net.rim.blackberry.api.messageList.

Javadoc – Messaging Overview

<http://www.blackberry.com/developers/docs/5.0.0api/Messaging-summary.html>

BlackBerry Java Application - Core - Development Guide

http://docs.blackberry.com/en/developers/deliverables/9137/Using_custom_messages_folders_51138_1_11.jsp

Application Invocation

Developers can invoke third party Java applications using JSR 211 – CHAPI. RIM native Java applications can be invoked using either JSR 211 or the Invoke API. Applications can also register their own application to be invoked from a MenuItem in a native RIM Java application or embed RIM BlackBerry applications such as BlackBerry® Maps, the BlackBerry® Browser or the BlackBerry Media player within their own application.

JSR 211 - Java ME Content Handler API

<http://java.sun.com/products/chapi/>

BlackBerry Java Application - Integration - Development Guide

<http://docs.blackberry.com/en/developers/deliverables/8540/index.jsp?name=BlackBerry+Java+Application+-+Integration+->

[+Development+Guide5.0+Beta&language=English&userType=21&category=BlackBerry+Java+Application+Development&subCategory=BlackBerry+Java+Development+Environment](#)

Javadoc – Application Integration Overview

<http://www.blackberry.com/developers/docs/5.0.0api/App-Integration-summary.html>
<http://www.blackberry.com/developers/docs/5.0.0api/App-Integration-summary.html>

Add Menu Item to Native Built-in Application

BlackBerry Java applications can add menu applications to native RIM applications using the MenuItemRepository.

KB - How To - Add a custom menu item to an existing BlackBerry application

http://www.blackberry.com/knowledgecenterpublic/livelink.exe/How_To_-_Add_a_custom_menu_item_to_an_existing_BlackBerry_application.html?func=doc.Fetch&nodeId=800633&docTitle=How+To+%2D+Add+a+custom+menu+item+to+an+existing+BlackBerry+application&version=7

Security

BlackBerry Code Signing Keys are required to control usage of sensitive BlackBerry APIs. Controlled APIs are split into four areas:

- Runtime APIs
- BlackBerry Application APIs
- Cryptography APIs
- Certicom APIs

Developers leverage the SignatureTool to sign their applications with their unique BlackBerry Code Signing Keys. Please note that keys do not expire and can be re-used for all BlackBerry Java and Widget application signing.

BlackBerry Code Signing

<http://na.blackberry.com/eng/developers/javaappdev/codekeys.jsp>

Tutorial – A1 – A60 How and When to Sign

http://na.blackberry.com/developers/resources/A60_How_And_When_To_Sign_V2.pdf

Video – Deploying and Signing Applications in the BlackBerry JDE Plug-in for Eclipse

<http://www.blackberry.com/DevMediaLibrary/view.do?name=deploying>

Video – Deploying and Signing Applications in the BlackBerry JDE
<http://www.blackberry.com/DevMediaLibrary/view.do?name=deployingJDE>

Application Control permits user/BlackBerry Enterprise Server admin the ability to “trust” applications to use the sensitive apis on their device.

Blog – Explaining BlackBerry Security for Developers: IT Policy
<http://supportforums.blackberry.com/t5/BlackBerry-Developer-s-Blog/Explaining-BlackBerry-Security-for-Developers-IT-Policy/ba-p/338714>

Blog – Explaining BlackBerry Security for Developers: Application Control
<http://supportforums.blackberry.com/t5/BlackBerry-Developer-s-Blog/Explaining-BlackBerry-Security-for-Developers-Application/ba-p/343561>

Video – How to Handle Security Prompts
<http://www.blackberry.com/DevMediaLibrary/view.do?name=SecurityPrompts>

Development Tools

Developers can create BlackBerry Java applications using the BlackBerry Java Plug-in for Eclipse and BlackBerry Java SDK

All contain an BlackBerry MDS-CS simulator and an Email Simulator and a default device simulator although other device simulators can be also be downloaded and installed

Tutorial – A1 Setting up Necessary Tools
http://na.blackberry.com/developers/resources/A1_Setting_up_necessary_tools_v5.0.pdf

Blog – How-to Set up a Lightning Fast BlackBerry Smartphone Simulator
<http://supportforums.blackberry.com/t5/BlackBerry-Developer-s-Blog/How-to-Set-up-a-Lightning-Fast-BlackBerry-Smartphone-Simulator/ba-p/320637>

Video – BlackBerry JDE Plug-in for Eclipse Installation and Configuration
<http://www.blackberry.com/DevMediaLibrary/view.do?name=eclipseJDE>

Video – Introduction to BlackBerry Simulators
<http://www.blackberry.com/DevMediaLibrary/view.do?name=simsintro>

Deployment

Distribution Method	Short Description	Files Required
BlackBerry App World™ storefront	Installs the application or BlackBerry Widget through the BlackBerry App World storefront on a BlackBerry	.alx and .cod

smartphone.		
Wireless network using the BlackBerry Browser	Installs the application or BlackBerry Widget directly to a BlackBerry smartphone over the wireless network via download link accessed through the BlackBerry Browser.	.jad and .cod
BlackBerry Desktop Manager	Installs the application or BlackBerry Widget directly to a connected BlackBerry device using the BlackBerry® Desktop Manager.	.alx and .cod
BlackBerry Application Web Loader	Installs the application or BlackBerry Widget directly to a connected BlackBerry device using via Microsoft® ActiveX® control accessed through a desktop computer Browser	.jad and .cod
Wireless push from the BlackBerry Enterprise Server	Installs your application or BlackBerry Widget to BlackBerry smartphones wirelessly, using a push from the BlackBerry Enterprise Server to multiple devices on the network.	.alx and .cod

BlackBerry Java Application - Core - Development Guide

http://docs.blackberry.com/en/developers/deliverables/9137/Packaging_and_distributing_BB_Java_applications_512511_11.jsp

Deploying BlackBerry Applications

http://docs.blackberry.com/en/admin/deliverables/2733/Deploying_Java_Applications.pdf

Tutorial – A70 How to Deploy and Distribute Applications

http://na.blackberry.com/developers/resources/A70_How_to_Deploy_and_Distribute_Applications_V1.pdf

Video – How Do I Use Javaloader?

<http://www.blackberry.com/DevMediaLibrary/view.do?name=javafinal>

Video – Over-the-air Push via BlackBerry® Enterprise Server

<http://www.blackberry.com/DevMediaLibrary/view.do?name=overthairpush>

Video – BlackBerry Application Web Loader

<http://www.blackberry.com/DevMediaLibrary/view.do?name=loader>

Video – BlackBerry Smartphone Over-the-air Download By User
<http://www.blackberry.com/DevMediaLibrary/view.do?name=OTA>

Video – BlackBerry Desktop Manager
<http://www.blackberry.com/DevMediaLibrary/view.do?name=desktopmanager>

Web Platform

The BlackBerry Web Platform allows developers to use the standard web authoring tools they already know. In v5.0, BlackBerry Widgets are available. BlackBerry Widgets are standalone BlackBerry applications that consist of standard web components and other resources that run natively on the device.

BlackBerry Web Development

<http://na.blackberry.com/eng/developers/browserdev/>

BlackBerry Browser - Fundamentals Guide

<http://docs.blackberry.com/en/developers/deliverables/8857/index.jsp?name=BlackBerry+Browser+-+Fundamentals+Guide5.0+Beta&language=English&userType=21&category=BlackBerry+Browser&subCategory=>

BlackBerry Browser - HTML Reference

<http://docs.blackberry.com/en/developers/deliverables/8859/index.jsp?name=BlackBerry+Browser+-+HTML+Reference5.0+Beta&language=English&userType=21&category=BlackBerry+Browser&subCategory=>

BlackBerry Browser - JavaScript Reference

<http://docs.blackberry.com/en/developers/deliverables/8861/index.jsp?name=BlackBerry+Browser+-+JavaScript+Reference5.0+Beta&language=English&userType=21&category=BlackBerry+Browser&subCategory=>

BlackBerry Browser - CSS Reference

<http://docs.blackberry.com/en/developers/deliverables/8861/index.jsp?name=BlackBerry+Browser+-+JavaScript+Reference5.0+Beta&language=English&userType=21&category=BlackBerry+Browser&subCategory=>

BlackBerry Widgets

<http://www.blackberry.com/developers/widget>

Application Logic

Developers can leverage their HTML, CSS and JavaScript code with creating either BlackBerry Web applications or BlackBerry Widgets.

Communication

BlackBerry MDS Runtime applications relies on the integration of the BlackBerry smartphones runtime environment with back-end web services using SOAP.

SOAP Web Service and Database Connections

In the BlackBerry Web development environment, AJAX XMLHttpRequests are typically used to provide either synchronous or asynchronous communication. A best practice for accessing server-side databases via BlackBerry web applications and BlackBerry Widgets is to use a RESTful APIs – parsing messages with XML APIs. An example is provided here - <http://supportforums.blackberry.com/t5/Web-Development/WIDGET-gt-WEBSERVICE/td-p/353181>

WS Notification / XML Push

Corporations that have implemented a BlackBerry Enterprise Server can leverage message, content or cache push mechanisms. On the consumer side, BlackBerry Web Signals (currently only available to BlackBerry Alliance Members) is available to developers. Additionally, BlackBerry Widgets can access push requests to the device through the BlackBerry Widget Push APIs.

BlackBerry Enterprise Server Push

http://docs.blackberry.com/en/developers/deliverables/9137/Types_of_requests_to_push_content_509045_11.jsp

BlackBerry Web Signals

<http://na.blackberry.com/eng/developers/browserdev/websignals.jsp>

BlackBerry Widget APIs

<http://docs.blackberry.com/en/developers/deliverables/10619/index.html?name=BlackBerry+Widget+S+DK+-+API+Reference1.0&language=English&userType=21&category=BlackBerry+Widgets&subCategory=BlackBerry+Widget+Development+Guides>

User Interface

For both BlackBerry web applications and BlackBerry Widgets a combination of HTML, JavaScript and CSS can be used to reproduce much of the UI functionality found in BlackBerry MDS Runtime applications.

BlackBerry Smartphones UI Guidelines

<http://docs.blackberry.com/en/developers/deliverables/6625/>

Grid Control

W3C HTML 4 Tables

<http://www.w3.org/TR/html4/struct/tables.html>

Table Control

A scrollable <div> statement in combination with an HTML table would provide a similar experience

```
<div style="HEIGHT:100px; WIDTH:50%; OVERFLOW:auto">
  <table border=1 width=100%>
```

```
<tr><td>row 1 - A</td><td>row 1 - B</td></tr>

<!-- many more table rows -->

<tr><td>row x - A</td><td>row x - B</td></tr>
</table>
</div>
```

Repeater Control

Generate HTML table content via a JavaScript loop.

```
<html>
<head>
<title> Traversing an HTML Table with JavaScript and DOM Interfaces</title>
<script>
  function start() {
    // get the reference for the body
    var body = document.getElementsByTagName("body")[0];

    // creates a <table> element and a <tbody> element
    var tbl = document.createElement("table");
    var tblBody = document.createElement("tbody");

    // creating all cells
    for (var j = 0; j < 2; j++) {
      // creates a table row
      var row = document.createElement("tr");

      for (var i = 0; i < 2; i++) {
        // Create a <td> element and a text node, make the text
        // node the contents of the <td>, and put the <td> at
        // the end of the table row
        var cell = document.createElement("td");
        var cellText = document.createTextNode("cell: row "+j+", column "+i);
        cell.appendChild(cellText);
        row.appendChild(cell);
      }

      // add the row to the end of the table body
      tblBody.appendChild(row);
    }

    // put the <tbody> in the <table>
    tbl.appendChild(tblBody);
    // appends <table> into <body>
    body.appendChild(tbl);
    // sets the border attribute of tbl to 2;
    tbl.setAttribute("border", "2");
  }
</script>
</head>
<body onload="start()">
</body>
</html>
```

Adding styles to controls

The BlackBerry Browser and BlackBerry Widget rendering engine provides full CSS support for styling of controls and content. Version 5.0 also adds partial support for HTML5 Forms and partial CSS 3 support

Defining Actions for Focusable and Clickable Items

Developers should use JavaScript event handlers.

Menu Items

Developers can add menu items to BlackBerry Widgets using the BlackBerry Widget APIs

BlackBerry Widget APIs

<http://docs.blackberry.com/en/developers/deliverables/10619/index.html?name=BlackBerry+Widget+SDK+-+API+Reference1.0&language=English&userType=21&category=BlackBerry+Widgets&subCategory=BlackBerry+Widget+Development+Guides>

Data Binding

No UI to data binding model exists for either BlackBerry Web applications or BlackBerry Widgets.

Offline Access

In version 5.0, both web applications and BlackBerry Widgets can access SQLite databases on both device memory and SD Card. BlackBerry Widgets can also interact with the filesystem.

Gears Database APIs

http://code.google.com/apis/gears/api_database.html

BlackBerry Widget APIs

<http://docs.blackberry.com/en/developers/deliverables/10619/index.html?name=BlackBerry+Widget+SDK+-+API+Reference1.0&language=English&userType=21&category=BlackBerry+Widgets&subCategory=BlackBerry+Widget+Development+Guides>

Device Integration

Developers can leverage the BlackBerry Widgets APIs to add device integration functionality to their BlackBerry Widgets.

BlackBerry Widget APIs

<http://docs.blackberry.com/en/developers/deliverables/10619/index.html?name=BlackBerry+Widget+SDK+-+API+Reference1.0&language=English&userType=21&category=BlackBerry+Widgets&subCategory=BlackBerry+Widget+Development+Guides>

GPS

Pre-5.0, web applications can use BlackBerry JavaScript APIs to access device location data. 5.0 web applications can access this functionality with the Gears Geolocation APIs. BlackBerry Widgets can leverage location data with the BlackBerry Widget location API.

Gears Geolocation APIs

http://code.google.com/apis/gears/api_geolocation.html

PIM

BlackBerry Widgets can access device PIM data through the use of the BlackBerry Widget PIM APIs.

Messaging

BlackBerry Widgets can invoke the new message screen via the invoke API or interact directly with the message list storage itself through the use of the BlackBerry Widget Messaging APIs.

Application Invocation

Web applications can provide links within their application that will invoke the BlackBerry Media Player, New Message Screen, Phone Application and BlackBerry Maps. BlackBerry Widgets can invoke native BlackBerry applications using the BlackBerry Widget Invoke APIs. Note that the BlackBerry Widget APIs can be extended to invoke third party applications.

Add Menu Item to Native Built-in Application

Menu Items can be added to BlackBerry Widgets via the BlackBerry Widget Menu APIs.

Security

When deployed from a web server through the BlackBerry Browser, web applications that use Gears automatically display a prompt to the user for permission for the application. In the case of Web Icons, applications follow the same security model as Java applications. BlackBerry Widgets also follow the same security model as Java applications but also require whitelist settings to be added to the configuration file to provide access to external resources.

Tutorial – How to secure your BlackBerry Widget

[http://na.blackberry.com/eng/developers/devbetasoftware/WidgetTutorial %20How-to-secure-your-BlackBerry-Widget.pdf](http://na.blackberry.com/eng/developers/devbetasoftware/WidgetTutorial_%20How-to-secure-your-BlackBerry-Widget.pdf)

Development Tools

Free development tools for creating BlackBerry web applications and BlackBerry Widgets are available.

Tutorial – How to set up Eclipse for Mobile Development

http://na.blackberry.com/eng/developers/resources/How_to_set_up_Eclipse_for_Mobile_Development.pdf

Tutorial – How to set up Microsoft Visual Studio for Mobile Development

[http://na.blackberry.com/eng/developers/resources/How to set up Microsoft Visual Studio for Mobile Development.pdf](http://na.blackberry.com/eng/developers/resources/How_to_set_up_Microsoft_Visual_Studio_for_Mobile_Development.pdf)

Tutorial – How to install the BlackBerry Widget Packager

http://na.blackberry.com/eng/developers/devbetasoftware/WidgetTutorial_How-to-install-the-BlackBerry-Widget-Packager.pdf

Blog – How-to Set up a Lightning Fast BlackBerry Smartphone Simulator

<http://supportforums.blackberry.com/t5/BlackBerry-Developer-s-Blog/How-to-Set-up-a-Lightning-Fast-BlackBerry-Smartphone-Simulator/ba-p/320637>

Deployment

Web applications can be deployed either as a URL link to the web server or on the device as a web icon or a BlackBerry Widget. Web applications in 5.0 can also use the Gears Desktop API. Both Web icons and BlackBerry Widgets are packaged the same way as native BlackBerry Applications and can therefore be distributed via a web site, the desktop manager or App World, using the same security model as native BlackBerry applications.

Gears Desktop APIs

http://code.google.com/apis/gears/api_desktop.html

KB – How To - Create a web icon

[http://www.blackberry.com/knowledgecenterpublic/livelink.exe/fetch/2000/348583/800332/800440/How To - Create a web icon.html?nodeid=1487655&vernum=0](http://www.blackberry.com/knowledgecenterpublic/livelink.exe/fetch/2000/348583/800332/800440/How_To_-_Create_a_web_icon.html?nodeid=1487655&vernum=0)

BlackBerry Widget SDK - Development Guide - Making BlackBerry Widgets available to users

http://docs.blackberry.com/en/developers/deliverables/10609/Making_widgets_available_to_users_896746_11.jsp

Other Migration Paths

Below is a list of third party solutions which provide comparable functionality to BlackBerry MDS Runtime applications.

Antenna Software

<http://www.antennasoftware.com>

Apps go

<http://www.appsgo.com>

Canvas

<http://www.gocanvas.com>

Flowfinity

<http://www.flowfinity.com>

Kryos Velocity

<http://www.kryos.com>

Mirifex

<http://www.mirifex.com>

Pyxis Mobile

<http://www.pyxismobile.com>

Seregon

<http://seregon.com>

Soluteo

<http://www.soluteo.com>

Vaultus

<http://www.vaultus.com>

© 2009 Research In Motion Limited. All rights reserved. BlackBerry®, RIM®, Research In Motion®, SureType®, SurePress™ and related trademarks, names and logos are the property of Research In Motion Limited and are registered and/or used in the U.S. and countries around the world.