

Research In Motion

A70 – How to Deploy and Distribute Applications

For BlackBerry SmartPhones

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09

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A70 – How to Deploy Applications

There are number of ways you can install the application on the device.

You can chose to have Over the Air solution, where a user goes to your web site and installs the application from it, use the Desktop Manager or Javaloader to install downloaded application from your PC via USB lead, use Application Web Loader which installs the application via USB from the web site or use BES administration to push the application to the device.

You can also distribute your application through the new BlackBerry App World. The last method I will cover is Virtual Preloads.

In this tutorial we will show you how to use all of these methods.

Introduction

Before you deploy your application if you are using any of the APIs which require signing, be sure you sign your application. For more information how and when to sign applications please read our A60 – How And When To Sign tutorial.

You will also need to consider Application Control Permissions, as the user or administrator can set up is your application trusted or not – the Trust Level. The user or the administrator can set up permissions to deny your application number of resources i.e. connection to Internet or Keystroke Injections and that might affect your application.

Also worth considering are IT Policies. They take precedence over Application Control Policies, so even if user allows a feature, but IT policy disables it, your application will not be able to use it.

Desktop Manager

The users can install the applications by themselves if they have a PC, the Desktop Manager software, and the USB lead.



Figure 1

To be able to use the Desktop Manager (Figure 1) to load your software user will need ALX and COD files.

In order to generate these files you will need to go to your project in Eclipse (or JDE) and build the project. Each time when you run or debug your application Eclipse will build new version of COD file. For more information how to build and sign your application please check our tutorials A10 and A60.

Generating ALX file is also quite easy: Right click on your project and select Generate ALX file from the menu (Figure 2).

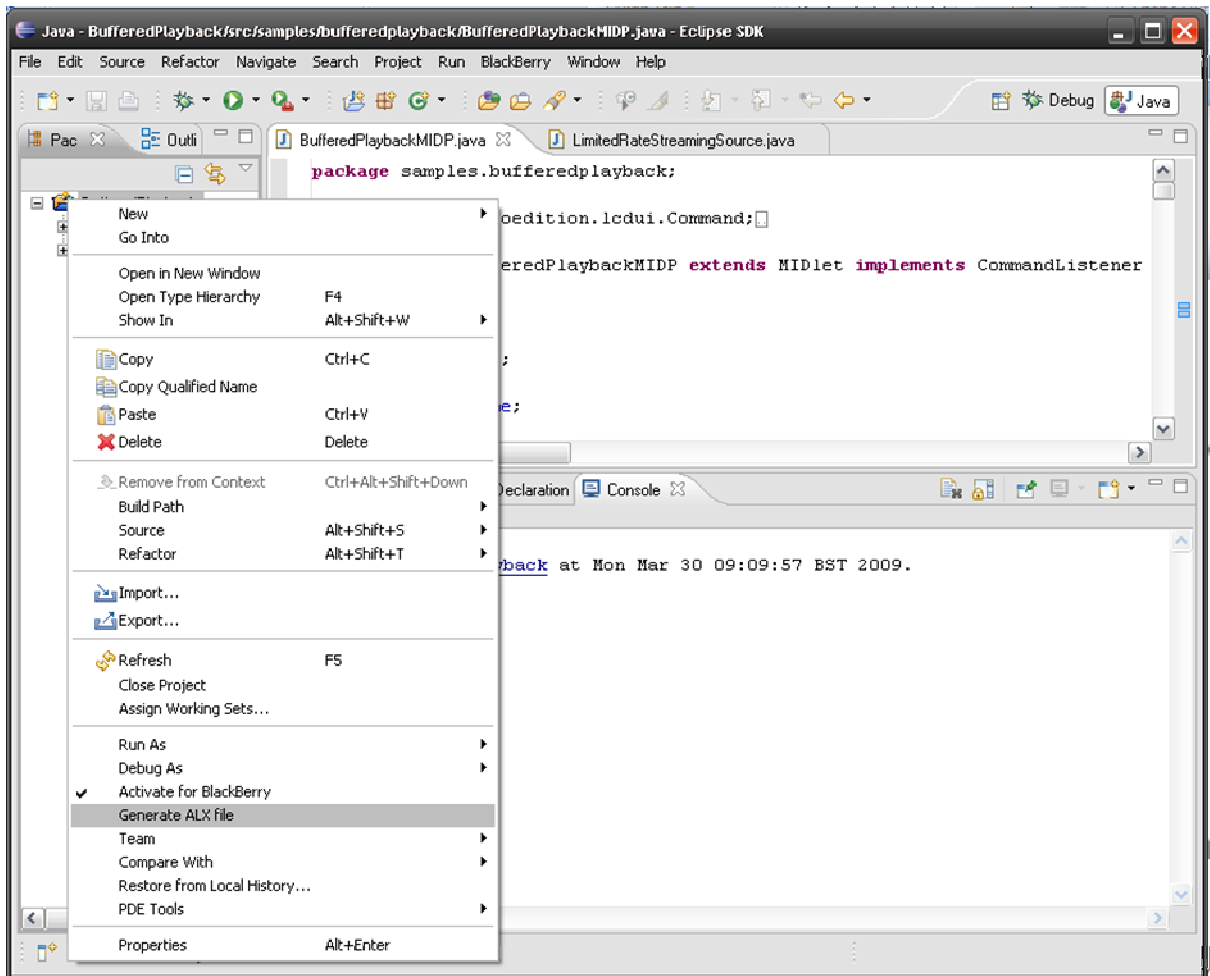


Figure 2

Both ALX and COD file will be in your Workspace folder (Figure 3).

You will also find here JAD and JAR files as well as DEBUG files which you might find useful.

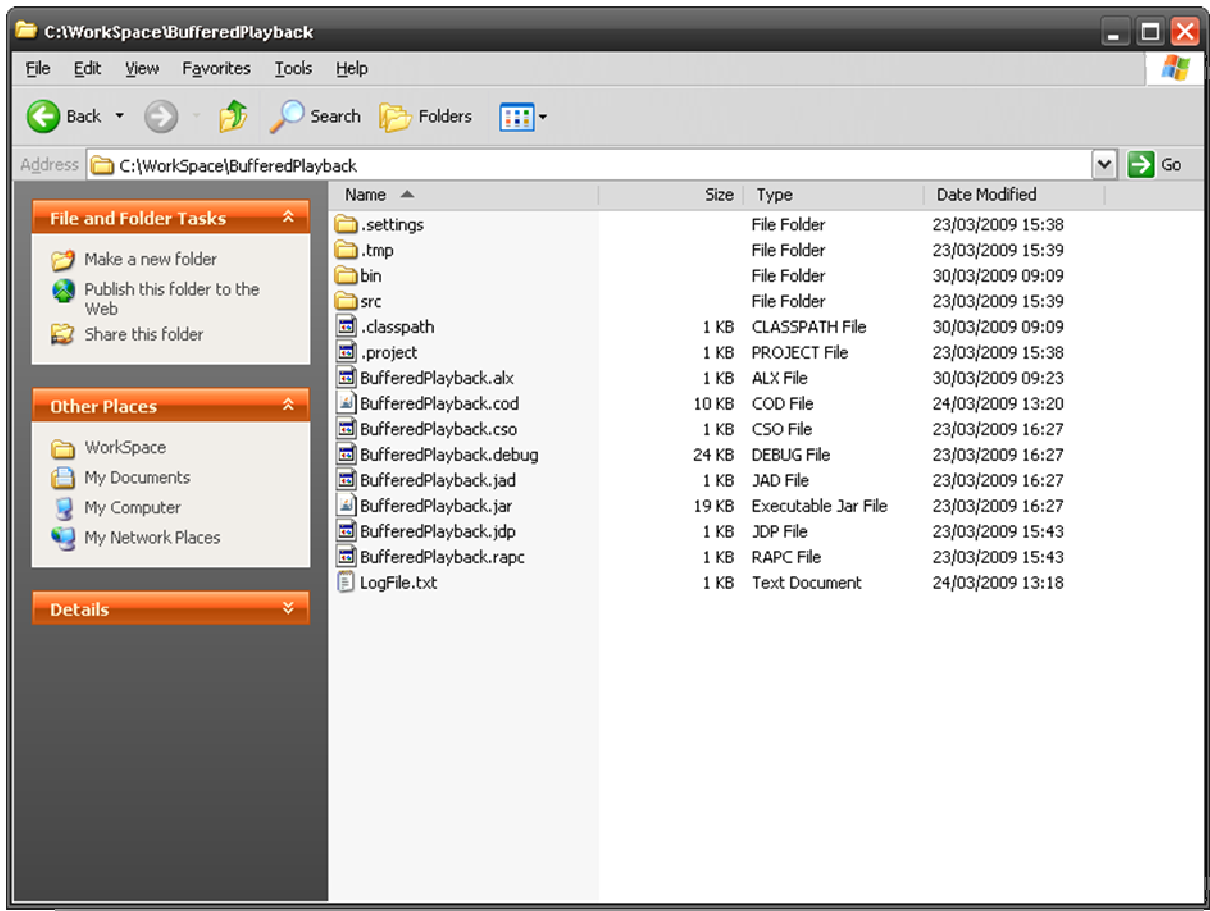


Figure 3

To load the application on the device, launch the Desktop Manager, click on Application Loader, then on the Start button under Add / Remove Applications

This will display all the installed applications on your device. Click on Browse button and go to your ALX file. Press Next and Finish and after a while the application will be loaded on your device (Figure 4).

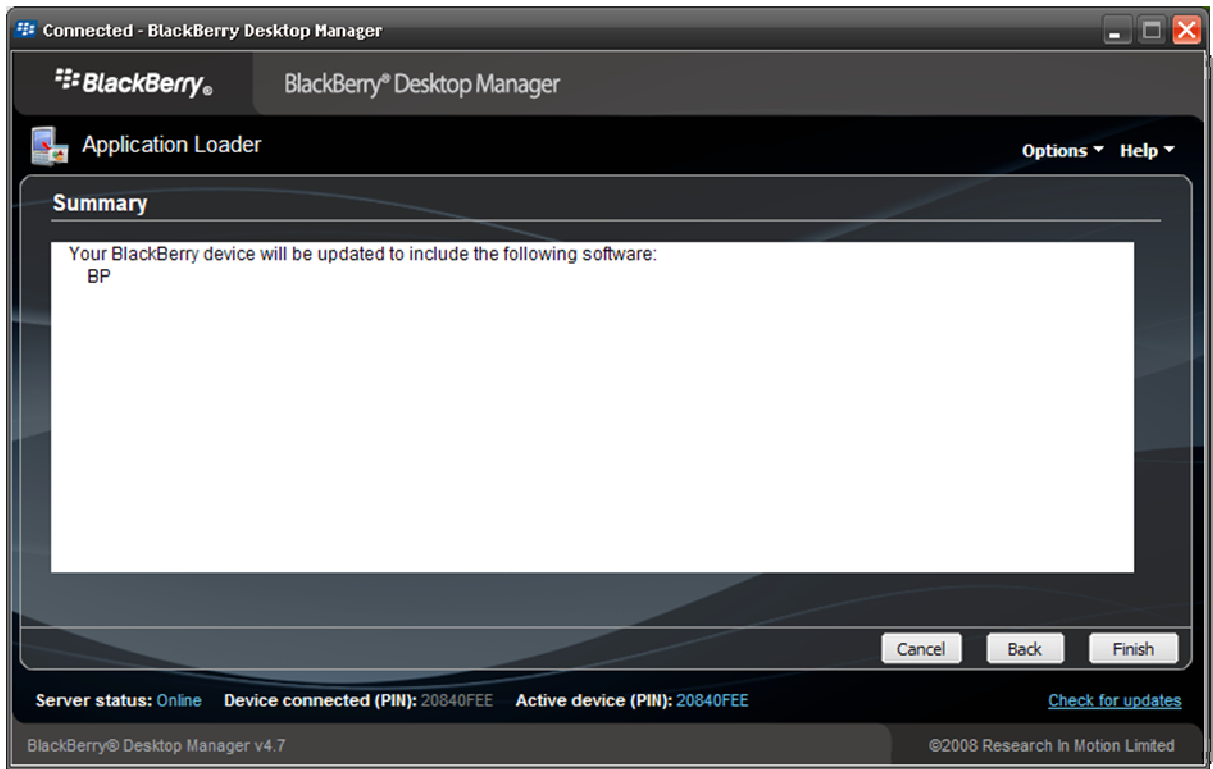
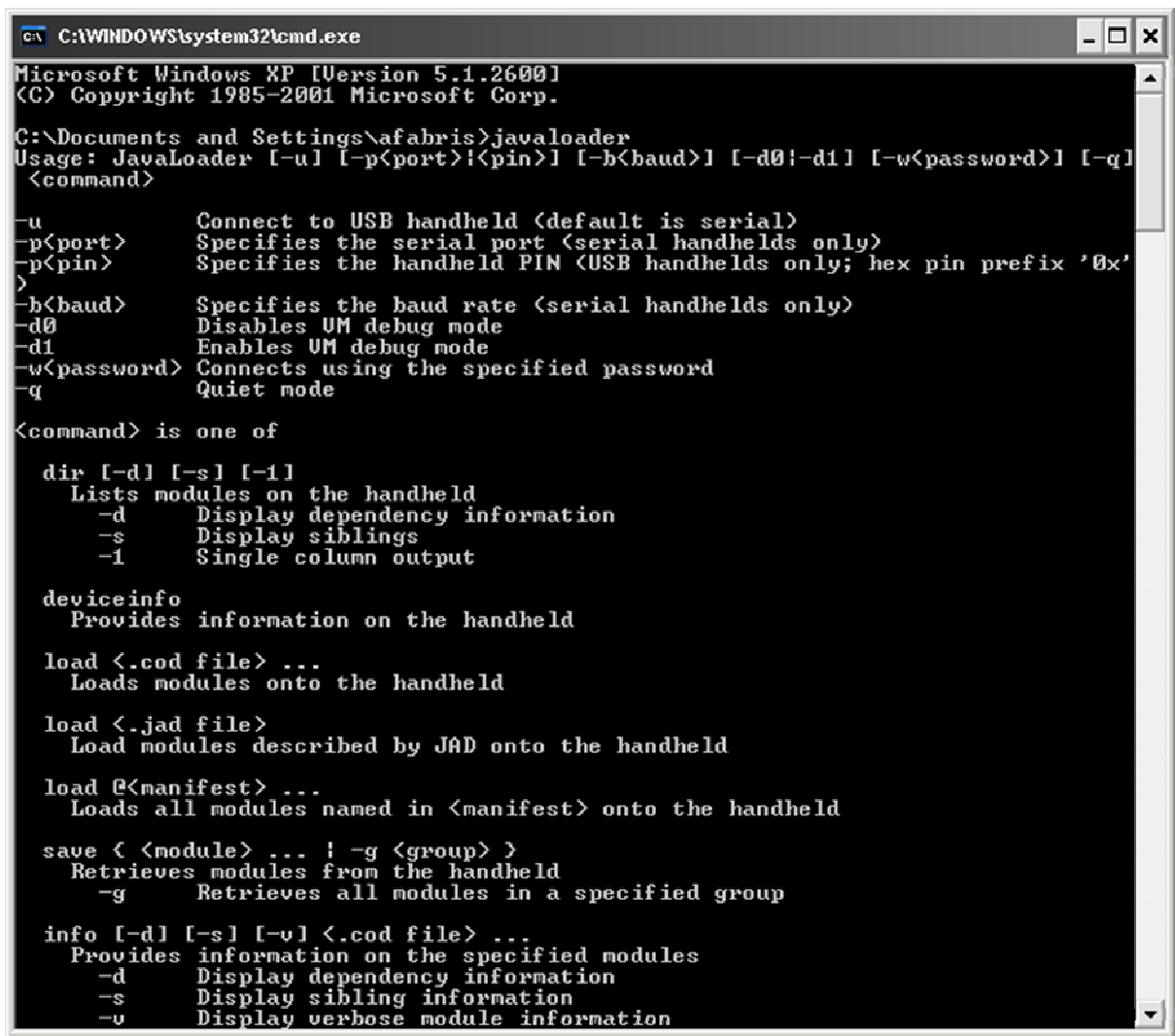


Figure 4

Javaloader

Javaloader is a developer only deployment method. It should not be used as a method to distribute applications. Inexperienced users will not be able to use this command prompt tool, and it might result in loss of data or stopping device from working. Javaloader is a small command prompt utility which gives you very powerful low level control over the device (Figure 5).



```

C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\afabris>javaloader
Usage: JavaLoader [-u] [-p<port>|<pin>] [-b<baud>] [-d0|-d1] [-w<password>] [-q]
<command>

-u          Connect to USB handheld (default is serial)
-p<port>    Specifies the serial port (serial handhelds only)
-p<pin>     Specifies the handheld PIN (USB handhelds only; hex pin prefix '0x'
)
-b<baud>    Specifies the baud rate (serial handhelds only)
-d0        Disables UM debug mode
-d1        Enables UM debug mode
-w<password> Connects using the specified password
-q         Quiet mode

<command> is one of

dir [-d] [-s] [-i]
  Lists modules on the handheld
  -d      Display dependency information
  -s      Display siblings
  -i      Single column output

deviceinfo
  Provides information on the handheld

load <.cod file> ...
  Loads modules onto the handheld

load <.jad file>
  Load modules described by JAD onto the handheld

load @<manifest> ...
  Loads all modules named in <manifest> onto the handheld

save < <module> ... [-g <group> ]
  Retrieves modules from the handheld
  -g      Retrieves all modules in a specified group

info [-d] [-s] [-v] <.cod file> ...
  Provides information on the specified modules
  -d      Display dependency information
  -s      Display sibling information
  -v      Display verbose module information

```

Figure 5

Javaloader is bundled with all JDE kits, and you can usually find it in Program Files / Research In Motion / BlackBerry JDE 4.x / bin folder.

To see the help file, click on your start button, and type cmd, which will give you the command prompt. Type javaloader and you will have a list of all the functions of this program listed on your

display. Make sure you added the path to the javaloader to your system path so you can access it from any folder.

The switch you should always use is `-u` to tell the software to use USB cable. After that you can type `dir` to get all the modules loaded on your device. Other useful commands are `eventlog`, which will help you debug your application, `screenshot`, which allows you to get screenshots, `erase` and `save`, which allow you to delete or copy files from the device to your PC.

```
javaloader -u dir
javaloader -u eventlog
javaloader -u screenshot filename.bmp
javaloader -u erase filename
```

To load your application you just need the COD file. Just type:

```
javaloader -u load yourfilename.cod
```

If the file already exists on the device, the device will reboot. The Device Manager might erase files loaded this way.

Application Web Loader

The easiest way for the user to load the application over the USB lead is to use Application Web Loader. The user does not have to have Desktop Manager installed or to use command line tools.

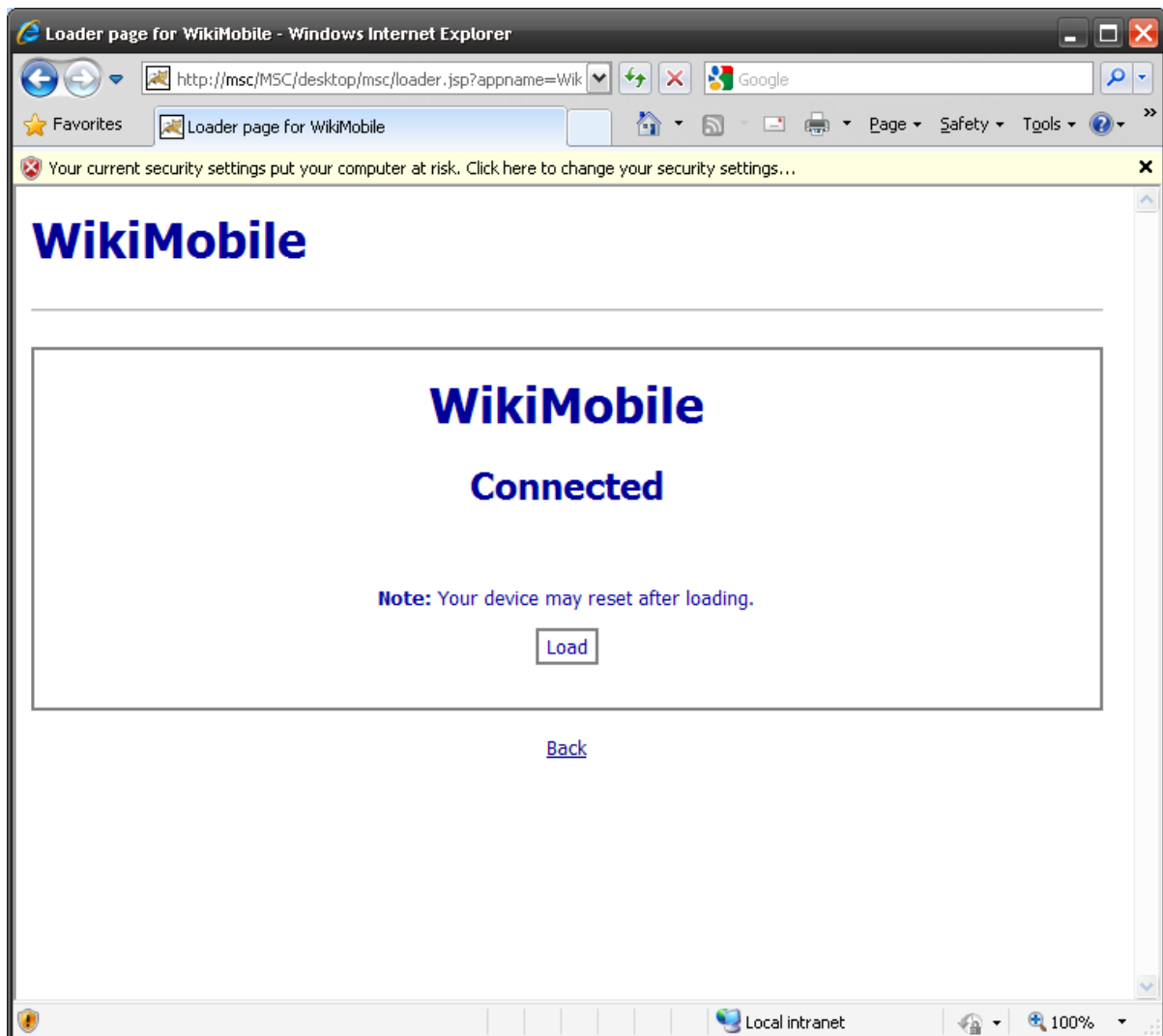


Figure 6

The user goes to the web site, connects his/her device, enters device password (if set) and clicks on Load button. The application will be loaded to the device (Figure 6).

The Application Web Loader requires ActiveX component and Internet Explorer 5.0+.

You will need to have JAD and COD file on your web server as well as your AxLoader.cab file. BlackBerry application loader needs to be downloaded and installed on your web server:

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

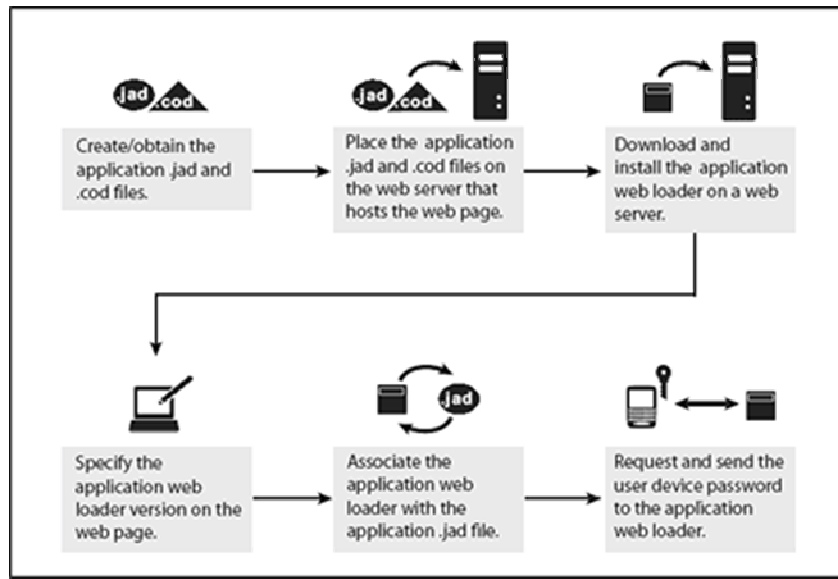


Figure 7

Once you have all the components on your web server you will just need to associate web loader with application .jad file (Figure 7).

The sample HTML code is shown below.

```

<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 3.2 Final//EN">

<HTML>

<HEAD>
<TITLE>Loader page for Hello World Application</TITLE>
</HEAD>

<body bgcolor="#FFFFFF" lang=EN-CA link=blue vlink=navy alink="#FF0000"
  onload="update();">

<p><h1>Hello World Application</h1></p>
<p>
A simple application that displays "Hello World!" on the screen.
</p>
<hr>
<center>

<div>
<style>
TABLE {margin-left:1.5em; font:x-small 'Tahoma'; margin-right:1.5em; align:center}
TD {vertical-align:center; align:center; font-weight:bold}
TR {padding:0}
BODY {font:x-small 'Tahoma'; margin-right:1.5em; color:#000099}
H2 {text-size:large; color:#000099}
.bd {border:2px solid gray;padding-left:5px;padding-right:5px;padding-
top:2px;padding-bottom:2px;cursor:hand}
</style>

<!-- Use this element to specify the required version of the BlackBerry Application
Web Loader -->
<OBJECT ID="AxLoader"
CLASSID="CLSID:DAF7E6E6-D53A-439a-B28D-12271406B8A9"
CODEBASE='../AxLoader.cab#version=1,0,0,16'>
</OBJECT>

<div align='center' style='border=2px solid gray'>
<br/>
<b><h1>Hello World Application</h1></b>
<h2 id='title'></h2>
<div id='message' align='center'>
<br/>
</div>
<br/>

<div id='sections'>
<div id='password' align='center' style="display:none">

<!-- Use this element to provide a user password to the BlackBerry Application Web
Loader. The web page does not handle the password directly. -->
<OBJECT ID="AxLoaderPassword" CLASSID="CLSID:DAF7E6E7-D53A-439a-B28D-
12271406B8A9"></OBJECT>
<br/><br/>
<a class='bd' onmousedown="providePassword()"
  onkeydown="if(window.event.keyCode==13){providePassword();}">Enter</a>
</div>

<div id='load' align='center' style="display:none">
<strong>Note:&nbsp;&nbsp;&nbsp;</strong>Your BlackBerry device may reset after loading.<br/>
<br/>
<a class='bd' onmousedown="loadFiles()"
  onkeydown="if(window.event.keyCode==13){loadFiles();}">Load</a>
</div>

<div id='progress' align='center' style="display:none">

```

```

<span id='progress_bar' style='background-color:#6897C6;width=0;height=10;font-
size=9px;color=white;text-align=center'>0%</span>
</div>

</div>

<br/>
<a class='bd' id='retry' style="display:none" onmousedown="releaseHold()"
onkeydown="if(window.event.keyCode==13){releaseHold();}">Again</a>
<br/>

</div>

<div style="display:block" id="debugInfo"/>

<script language=JScript>
function AxLoader::progressUpdate() {
    progress_bar.innerText = AxLoader.progress.toString() + "%";
    progress_bar.style.width = AxLoader.progress * 120 / 100;
}

function AxLoader::stateChanged() {
    update();
}

function AxLoaderPassword::onEnter() {
    providePassword();
}

function releaseHold() {
    AxLoader.reset();
}

function providePassword() {
    AxLoader.submitPassword(AxLoaderPassword);
}

function show(section, titletext, html) {
    var count = sections.children.length;
    for (i=0; i<count; i++) {
        element = sections.children(i);
        if (element.id == section) {
            element.style.display = 'block';
        } else {
            element.style.display = 'none';
        }
    }
    title.innerHTML = titletext;
    message.innerHTML = html;
}

function update() {
    debugInfo.innerText = AxLoader.debugInfo;
    var state = AxLoader.state;
    if ("" + state == "undefined") {
        show('message', 'Unable to create the loader Active X Control', "Please
review your security settings and user privileges on this machine.");
        return;
    }

    switch(AxLoader.state) {
        case 0: // The BlackBerry Application Web Loader cannot find the BlackBerry
USB driver.
            show('message', 'No Driver', "The BlackBerry USB driver is not
installed.");

```

```

        retry.style.display = 'none';
        break;
    case 1: // The BlackBerry Application Web Loader does not detect the
BlackBerry device.
        show('message', 'No BlackBerry Found', "To install the Hello World
Application, connect your BlackBerry to the USB port on this computer.");
        retry.style.display = 'none';
        break;
    case 2: // The BlackBerry Application Web Loader requires a user password.
        show('password', 'Connected', "Type the BlackBerry device password to
continue.<br/>(" + AxLoader.passwordRetries + ") attempts remaining.");
        retry.style.display = 'none';
        AxLoaderPassword.focus();
        break;
    case 3: // The BlackBerry Application Web Loader succesfully connected to
the BlackBerry device.
        <!-- The BlackBerry Application Web Loader determines if supported
BlackBerry device software versions exist. -->
        var version = AxLoader.version;
        if (version.indexOf("3.6") != 0 &&
            version.indexOf("3.7") != 0 &&
            version.indexOf("3.8") != 0 &&
            version.indexOf("4.0") != 0 &&
            version.indexOf("4.1") != 0 &&
            version.indexOf("4.2") != 0 &&
            version.indexOf("4.2.1") != 0) {
            show('load', 'Connected', "Click the link to install the Hello World
Application on your BlackBerry device.");
            break;
        }
        show('load', 'Connected', "Click the link to install the Hello World
Application on the BlackBerry device (Version " + version + ").");
        retry.style.display = 'none';
        break;
    case 4: // The BlackBerry Application Web Loader is installing an
application on a BlackBerry device.
        show('progress', 'Loading', "");
        retry.style.display = 'none';
        break;
    case 5: // An error occurred while connecting to or installing on a
BlackBerry device.
        var remedy = "An unspecified error has occurred.";
        switch(AxLoader.error) {
            case 1: // ERROR_UNABLE_TO_CONNECT
                remedy = "Unable to connect to device. Close any other
BlackBerry applications that are running, for example, the BlackBerry Desktop
Software. Try again.";
                break;
            case 2: // ERROR_DEVICE_IS_FULL
                remedy = "The device is full. Remove some data and try again.";
                break;
            case 3: // ERROR_UNABLE_TO_DOWNLOAD
                remedy = "Error downloading file. Check your Internet
connection and try again.";
                break;
            case 4: // ERROR_UNABLE_TO_CREATE_LOCAL_COPY
                remedy = "Unable to create a local copy of files. Verify that
space is available for temporary files on your computer.";
                break;
            case 5: // ERROR_INVALID_FILE
                remedy = "Attempt to load an invalid file. Try again.";
                break;
            case 6: // ERROR_LOAD_FAILED
                remedy = "Error loading file. Try again.";
                break;
            case 7: // ERROR_OUT_OF_MEMORY
                remedy = "Out of Memory. Close some applications and try
again.";

```

```
        break;
    }
    show('message', 'Error', remedy);
    retry.style.display = 'block';
    break;
    case 6: // The BlackBerry Application Web Loader successfully installed an
application on a BlackBerry device.
        show('message', 'Done', "Hello World Application has been loaded.");
        retry.style.display = 'block';
        break;
    }
}

function loadFiles() {
    <!-- Load the appropriate .jad file based on the hardware ID and version number
-->
    // loadJad accepts either a relative URL for the .jad file or the actual .jad
file contents as a string.
    // The BlackBerry Web Application Loader supports BlackBerry .jad files only.
Convert MIDlets to .cod files.
    var hwid = AxLoader.hwid;
    if ((hwid & 0x04000000) == 0x04000000) {
        AxLoader.loadJad("helloworld.jad");
    } else {
        AxLoader.load("helloworld_mono.jad");
    }
}

</script>
</div>

</body>
</HTML>
```


Over The Air

Over The Air distribution allows user to go to your web site, download and install the application wirelessly. This method can allow you to distribute your application anywhere in the world with very low cost.

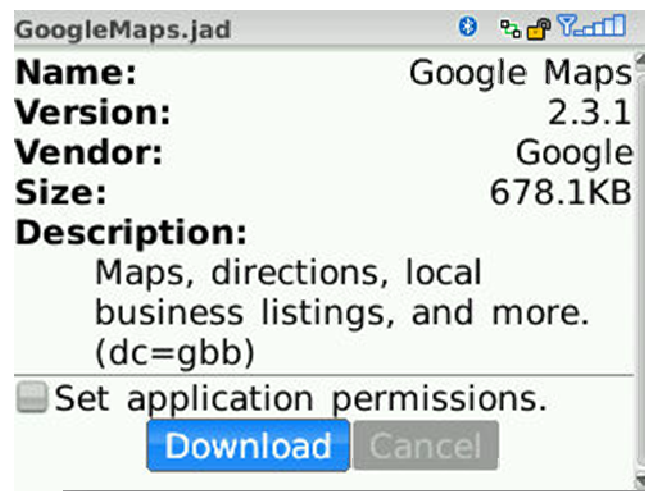


Figure 8

The BlackBerry browser will automatically show installation page and allow you to download and install the application (Figure 8).

The user can see the information about your applications, and is able to set application permissions.

To allow users to install the application over the air you will need to have a web server. On the web server you will need two files:

- Yourapplication.cod
- Yourapplication.jad

On your web server you will need to setup three MIME types:

- .jad files: text/vnd.sun.j2me.app-descriptor
- .cod files: application/vnd.rim.cod
- .jar files (optional): application/java-archive

On the Apache server for example you will need to edit mime.types file.

Some of the problems you might encounter are how to detect which device is connected and which version of your application want to allow to be downloaded. You can detect the device which is connected by checking HTTP user-agent or profile header.

```
User-Agent:
```

```
BlackBerry8320/4.2.2 Profile/MIDP-2.0 Configuration/CLDC-1.1
```

```
VendorID/100
```

```
Profile:
```

```
http://www.blackberry.net/go/mobile/profiles/uaprof/8320/4.2.2.rdf
```

Also you will need to consider do you want to limit the access to your application. One way is to secure your website with username and password, or implement a charging mechanism if you want to charge the users for your application.

BlackBerry Enterprise Server

The applications can be pushed by BlackBerry Enterprise Server to the devices connected to it. New BES 5.0 (Figure 9) has a web interface which allows administrators to log in from any computer in the world, and easily deploy applications to specific users or groups. It also allows easy control of the application permissions.

The current BES version 4.1 SP 6 also have the features to deploy applications and control permissions.

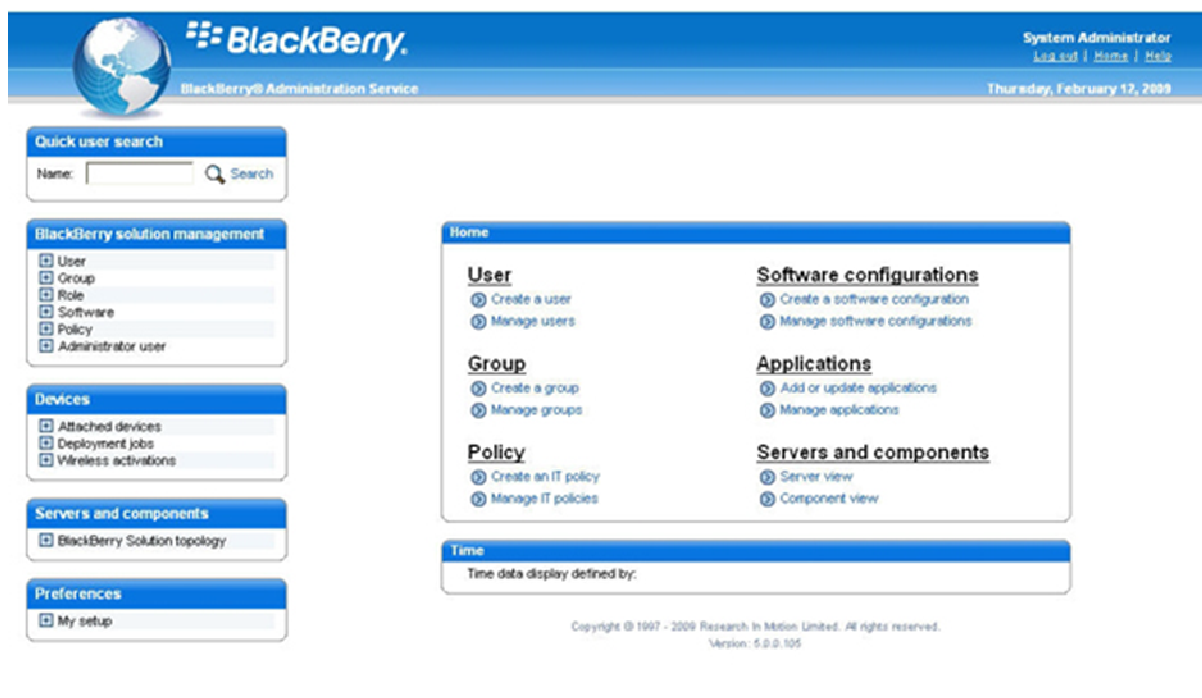


Figure 9

The managing and administration of the BES server is beyond the scope of this tutorial so for more information please visit the BlackBerry Enterprise Server web site.

<http://na.blackberry.com/eng/services/server/>

BlackBerry App World

BlackBerry App World offers you the exciting opportunity to showcase your applications to millions of BlackBerry smart phone users around the world.

Developers across the globe can submit their applications for consideration in the BlackBerry App World.

In order to have your application published in BlackBerry App World, you must create a vendor account.

You will need to agree to the Vendor Agreement, fill in your details, and have a PayPal account in order to get the payments. For more details please visit this site:

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

Applications submitted for BlackBerry App World will have to be approved by RIM before they can be published on BlackBerry App World.

BlackBerry App World supports devices running OS version 4.2.0 or higher. It means it is supported on the following devices:

- BlackBerry® Bold™ 9000 smart phone
- BlackBerry® Storm™ smart phone
- BlackBerry® Pearl™ Flip Series
- BlackBerry® Curve™ 8300 Series
- BlackBerry® Curve™ 8900 smart phone
- BlackBerry® 8800 Series
- BlackBerry® Pearl™ Series

Virtual Preloads, Instant Load & Application Centre

Another way of deploying your applications is to use the carriers to virtually preload applications on BlackBerry smart phones. The carrier sends icons to the user's BlackBerry device, so they appear on user's home screen when they register the device with the network. When the user clicks on the icon, the device launches browser and downloads the application. The carrier leverages service books to deliver the icons to the device. As each carrier is different I suggest to contact them directly to find out more about deploying your applications in this fashion.

Instant Load means that applications are transparently installed upon initial network activation. So instead of displaying the icon which launches the download web site, the application is installed automatically.

Application Centre (Figure 10) is available with handheld software version 4.7. User can use it to discover and download application built for BlackBerry smart phones. The user is also notified of new application available for download. The Application Centre is managed by the carrier, and therefore if you want to deploy your applications this way, I suggest to contact the specific carrier to get more information.



Figure 10

Links

BlackBerry Developers Web Site:

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

BlackBerry App World:

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

BlackBerry Enterprise Server:

<http://na.blackberry.com/eng/services/server/>

BlackBerry Web Loader:

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

Developer Video Library:

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

Documentation:

<http://na.blackberry.com/eng/support/docs/developers/?userType=21>

Knowledge Base Articles:

<http://www.blackberry.com/knowledgecenterpublic/livelink.exe/fetch/2000/348583/customview.html?func=ll&objId=348583>

Forums:

<http://supportforums.blackberry.com/rim/?category.id=BlackBerryDevelopment>