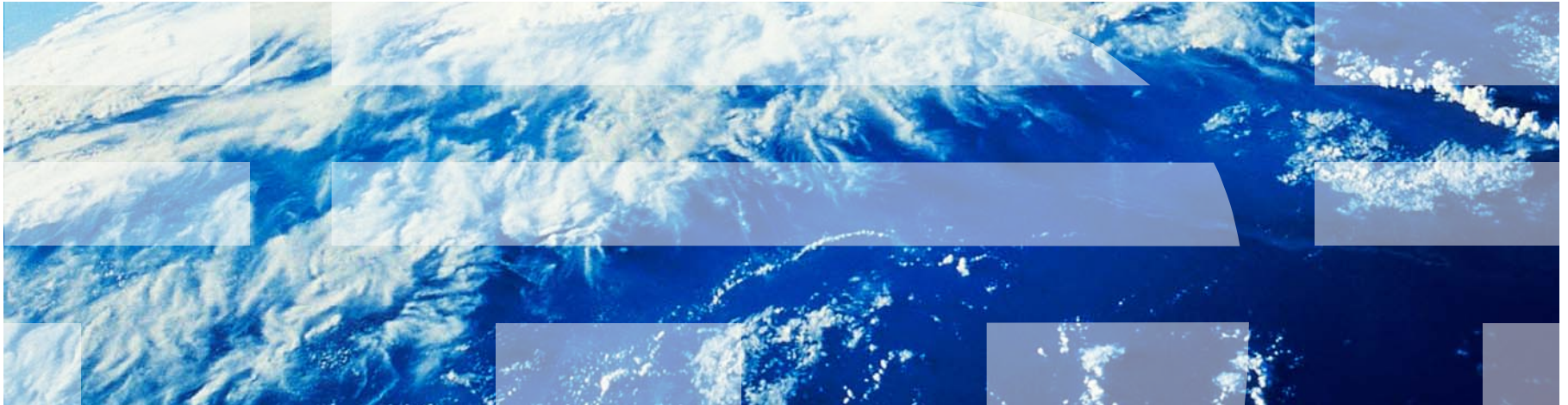


IBM Worklight V6.1.0 Getting Started

General information when developing for Android



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- Installation
- Android development
 - Developing for different resolutions
 - Environment-specific APIs
 - Environment-specific images
 - Apache Cordova
- Testing
 - Debugging the app
- Deployment

Installation

See ***Setting up your Android Development Environment*** training module for a detailed explanation.



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Android development

- An Android app that is developed by using IBM Worklight® comprises the following components:
 - A Java™ main class that is provided by IBM Worklight and that hosts an instance of the WebView component.
 - A set of Java and JavaScript™ libraries that provide access to various device features and capabilities.
 - Web application code that is provided by the developer, which is written in HTML, CSS, and JavaScript, and runs in one or more instances of the browser that is hosted within the Main class.
 - All application components, including the web code the developer provides, packaged into a single Android project.
- IBM Worklight supports Android devices that run Android OS version 2.3.3 and 4.x.
- If you use a source control management system (for example, Rational Team Concert™, Git, or Subversion), see the IBM Worklight user documentation at http://pic.dhe.ibm.com/infocenter/wrklight/v6r1m0/topic/com.ibm.worklight.dev.doc/dev_ref/r_integrating_with_source_contro.html for instructions on committing your source code.

Android development – continued

- It is useful to always consult the Google Design and Develop websites when you develop applications.
 - Design: <http://developer.android.com/design/index.html>
 - Develop: <http://developer.android.com/develop/index.html>

Developing for different resolutions

- Various Android devices have different screen resolutions:
 - HTC Hero – 320x480
 - Nexus One – 480x800
 - Samsung Galaxy S4 – 1080 x 1920
 - Google Nexus 4 – 1280 x 768
- When you are displaying graphical elements on wider screens, Android automatically scales images and fonts to the appropriate ratio.
- For example, on a 480-pixel wide screen, a 100-pixel wide image is scaled by $480/320 (= 1.5)$ to 150 pixels in width, and the text that is displayed with an 18-pixel font is displayed with a 24-pixel font.

Developing for different resolutions - continue

- By default, the `AndroidManifest.xml` file that is created by Worklight Studio defines that the application supports only normal screens:

```
<supports-screens
    android:smallScreens="false"
    android:normalScreens="true"
    android:largeScreens="false"
    android:resizeable="false"
    android:anyDensity="false"
/>
```

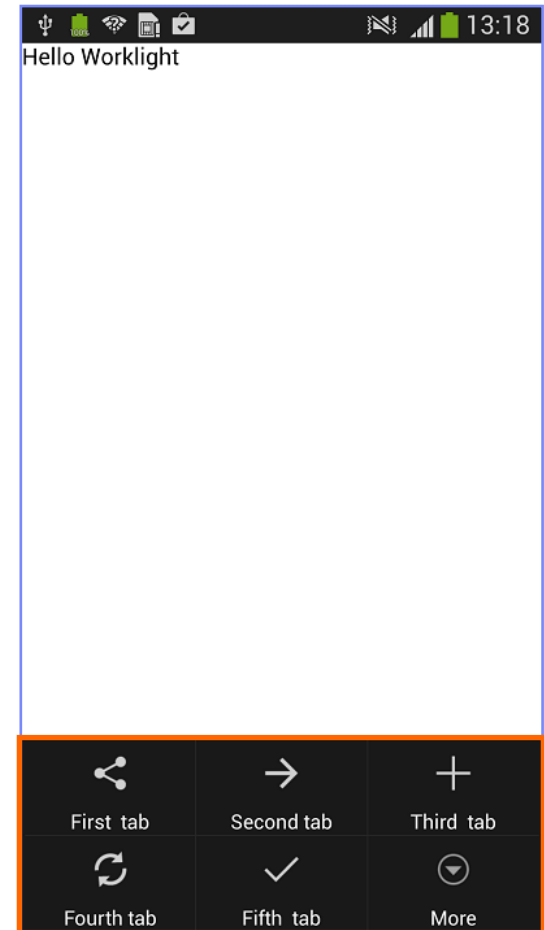
- To support tablets and newer Android devices, you must declare that the application supports other types of screens.
- Make sure to add appropriately sized resources (icons, images, styling) for those screen types and sizes.
- For more information about supporting multiple screens, see the *Supporting multiple form factors using Worklight skins* training module.
- For more information about supporting multiple screens, see <http://developer.android.com>.

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Environment-specific APIs options menu

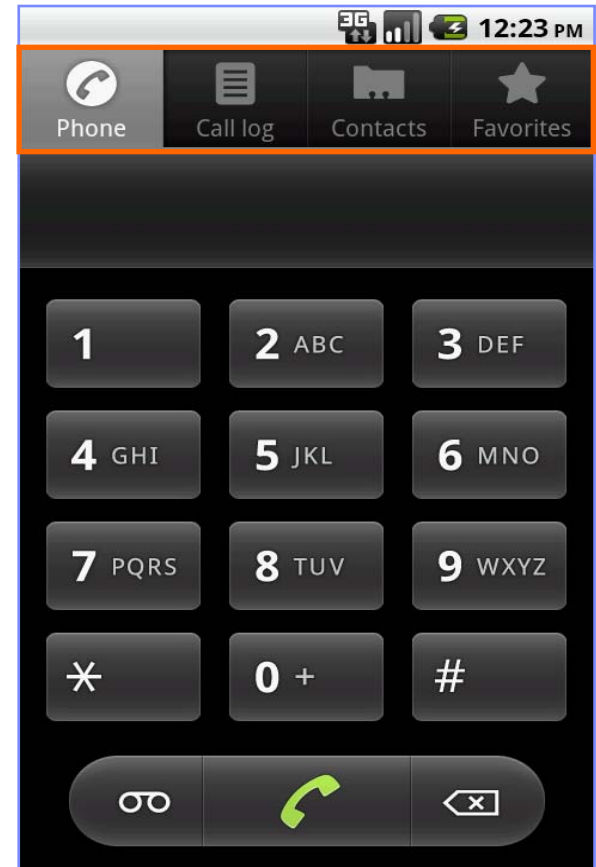
- Android devices have a dedicated button for displaying an app options menu.
- You access the options menu by pressing the device menu key.
- When displayed, the menu holds the first six menu items.
- If six or more items are added to the options menu, you can access extra items by pressing the **More** item in the options menu.
- For more information about options menu development, see the *Common UI Controls* training module.



Environment-specific APIs – continued

Tab bars

- The tab bar navigation is one of the basic and most common principles of contemporary user interfaces.
- The Android tab bar is emulated by using HTML, CSS, and JavaScript, which makes it flexible and easy to customize.
- Each tab can have its own icon and invoke JavaScript functions.
- The Android tab bar is generated by using the IBM Worklight JavaScript API.
- For more information about tab bar development, see the *Common UI Controls* training module.



Environment-specific APIs – continued

- **Note:** By altering the `targetSdkVersion` value in the `AndroidManifest.xml` file, it is possible to control the look and feel of the native UI elements that are displayed in the application interface (dialogs, buttons, spinners, display resolution, and so on).
- By default, an IBM Worklight application is generated with `MinSdkVersion="9"` (Android 2.3.3) and `targetSdkVersion=value`, where "value" is the latest version that is installed by the developer with the Android SDK Manager.
- This means that a device uses the UI elements that fit best to its installed Android OS version.
- For example, in Android 2.x and Android 4.x, the look and feel of the Options Menu feature differs.

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Environment-specific images

Android icon sizes

- According to the Android UI development guidelines, the following icon sizes must be used in the options menu and tab bar.

Icon Type	Standard Asset Sizes (in Pixels), for Generalized Screen Densities		
	Low density screen (<i>ldpi</i>)	Medium density screen (<i>mdpi</i>)	High density screen (<i>hdpi</i>)
Launcher	36 x 36 px	48 x 48 px	72 x 72 px
Menu	36 x 36 px	48 x 48 px	72 x 72 px
Status Bar	24 x 24 px	32 x 32 px	48 x 48 px
Tab	24 x 24 px	32 x 32 px	48 x 48 px
Dialog	24 x 24 px	32 x 32 px	48 x 48 px
List View	24 x 24 px	32 x 32 px	48 x 48 px

- For more information, see http://developer.android.com/guide/practices/screens_support.html

Environment-specific images – continued

Options Menu

- As seen in the previous slide, different Android devices come with different resolutions, so they require icons of different sizes.
- If you implement the Options Menu feature in an app, the various icons must be placed in the appropriate drawable folder, which is in `your-project-name\apps\your-app-name\android\nativeResources\res\drawable-*`
 - * Designates a screen density (LDPI, MDPI, HDPI, XDPI, XXDPI).
- IBM Worklight builder then copies these images to the generated project native folder.

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Apache Cordova

- You can use the Apache Cordova framework in Android applications to access the native elements of the device, such as contacts, geo-location services, media services, and accelerometer.
- For more information about Apache Cordova development, see the *Apache Cordova overview* training module.

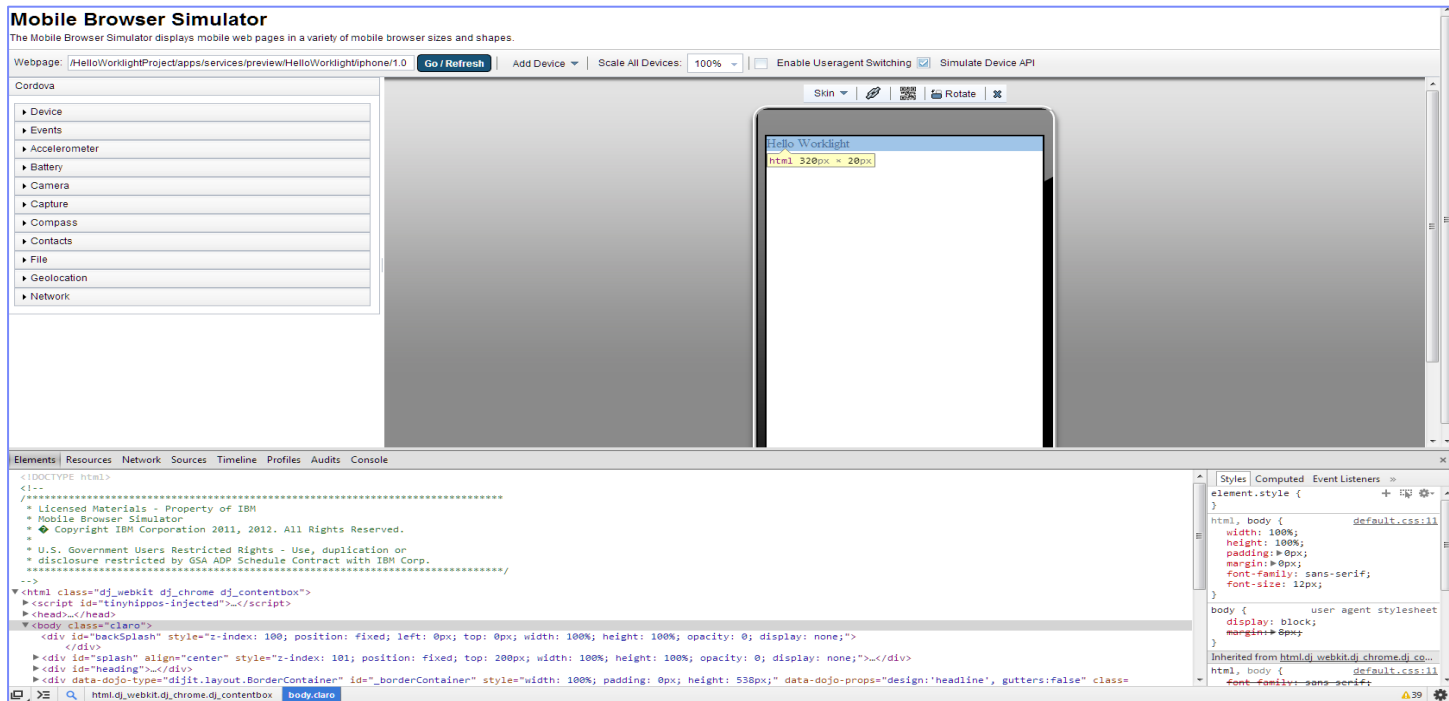
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Debugging the application

Phase 1: Testing in your browser

- Your Android app resources are previewed in the Mobile Browser Simulator, so you are able to debug it by using the facilities of the browser, such as Firebug or Developer toolbar.



Debugging the application - continued

Phase 2: Testing in the Android Emulator

- Preview your application on the Android Emulator.
- Experience a more native feel for the application.
- Use the Eclipse ADT LogCat view to debug your application by using the Android simulator.



Time	pid	tag	Message
01-03 15:26:43.285	D 2471	gps_BRCM	gps_inject_location: cal
01-03 15:26:47.464	D 2471	WifiService	releaseWifiLockLocked: W
01-03 15:26:52.507	D 3028	dalvikvm	GC_EXPLICIT freed 114 ob
01-03 15:26:57.535	D 2650	dalvikvm	GC_EXPLICIT freed 517 ob
01-03 15:27:03.484	I 2582	dhcpcd	renewing lease of 192.16
01-03 15:27:03.503	I 2582	dhcpcd	acknowledged 192.168.1.5
01-03 15:27:03.503	I 2582	dhcpcd	leased 192.168.1.58 for

Debugging the application - continued

Phase 3: Testing in an Android device

- If your Android mobile device is connected to your development workstation, you can deploy the app on an Android device directly from Eclipse.
- You can use LogCat to debug the application when you run it on the device.
- **Note:** the device must also be connected to the same WiFi network that the Worklight Server is connected to, to ensure communication between the application and server, if required.



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Deployment

- You deploy you Android application through Google Play:
 1. Prepare your app for submission.
 2. Upload your app to Google Play.
 3. Manage apps on Google Play.

<http://developer.android.com/guide/publishing/publishing.html>

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