

# Integrating server-generated pages in hybrid applications

- Download MobileFirst project (<https://github.com/MobileFirst-Platform-Developer-Center/IncludeExternalPages>)

This tutorial covers the following topics:

- Overview
- Java implementation
- JavaScript implementation
- Sample application

## Overview

Many enterprises today decide to develop their own customer or employee-facing mobile applications. Some of those companies already have mobile-facing websites (mobile web).

Such companies must make an important decision:

- Should all the mobile web features be implemented from scratch in the mobile application, which is great from a user experience perspective, but very time- and money-consuming?
- Should the mobile application contain only new features with old ones still accessible by a mobile browser, which is easier to implement but not great in terms of user experience?

The **WebViewOverlay** approach allows the reuse and integration of existing mobile websites within a mobile application.

Navigation is smooth and seamless between components that are internal in the mobile application and the external content on the external mobile website.

## Web resources that are bundled inside the application



([http://developer.ibm.com/mobilefirstplatform/wp-content/uploads/sites/32/2014/07/10\\_07\\_bundled\\_resources.png](http://developer.ibm.com/mobilefirstplatform/wp-content/uploads/sites/32/2014/07/10_07_bundled_resources.png))

## External web content



([http://developer.ibm.com/mobilefirstplatform/wp-content/uploads/sites/32/2014/07/10\\_07\\_external\\_content.png](http://developer.ibm.com/mobilefirstplatform/wp-content/uploads/sites/32/2014/07/10_07_external_content.png))

This tutorial demonstrates an application implementation for the Android environment. The application contains three tab items. The first two tabs contain internal content. The third tab shows an external IBM mobile website.



First and second tabs  
contain internal web  
resources



Third tab looks like  
another application  
page



But technically, it  
contains an extra  
WebView component  
on top of it

([http://developer.ibm.com/mobilefirstplatform/wp-content/uploads/sites/32/2014/07/10\\_07\\_3d-phones.png](http://developer.ibm.com/mobilefirstplatform/wp-content/uploads/sites/32/2014/07/10_07_3d-phones.png))

**WebViewOverlay** is implemented through Apache Cordova plug-ins. Developers can easily create their own protocol between internal web components and the **WebViewOverlay** control. Use the provided MobileFirst project to understand the concepts of **WebViewOverlay**.

## Java implementation

### Implementing the webViewOverlay

In Java, the sample implements the page integration as follows:

1. In the application main class, a `webViewOverlay` object is declared to display the external content. Static references are used for simplicity.

```
[code lang="java"]
```

```
public class IncludeExternalPages extends CordovaActivity implements
WLInitWebFrameworkListener {
private static WebView webViewOverlay;
public static Activity thisapp;
[/code]
```

2. The object is created, its layout properties are set, and it is added as a view to the root element. It is invisible initially. The `setMargins` method positions the `webViewOverlay` component in the screen.
- Note:** Android 4.4 introduces a new version of `WebView` that is based on Chromium and affects the `WebView` margins. For more information about this issue, see [Migrating to WebView in Android 4.4](http://developer.android.com/guide/webapps/migrating.html) (<http://developer.android.com/guide/webapps/migrating.html>).

```
[code lang="java" highlight="13,14,15,16,17,18,19,20,21,22"]
public void onInitWebFrameworkComplete(WLInitWebFrameworkResult result){
    if (result.getStatusCode() == WLInitWebFrameworkResult.SUCCESS) {
        super.loadUrl(WL.getInstance().getMainHtmlFilePath());

        thisapp = this;
        WebViewClient webViewClient = new WebViewClient() {
            @Override
            public boolean shouldOverrideUrlLoading(WebView view, String url) {
                view.loadUrl(url);
                return true;
            }
        };

        webViewOverlay = new WebView(this);
        webViewOverlay.setVisibility(View.INVISIBLE);
        webViewOverlay.setWebViewClient(webViewClient);
        RelativeLayout.LayoutParams webViewOverlayLayoutParams = new
        RelativeLayout.LayoutParams(
            RelativeLayout.LayoutParams.MATCH_PARENT,
            RelativeLayout.LayoutParams.MATCH_PARENT);
        webViewOverlayLayoutParams.setMargins(0, 120, 0, 196);
        webViewOverlay.setLayoutParams(webViewOverlayLayoutParams);
        webViewOverlay.getSettings().setJavaScriptEnabled(true);
        ...
        ...
    }
}[/code]
```

3. A `RelativeLayout` object is created.
- The `RelativeLayout` object works as a root layout.
  - The current root view is removed from its original parent. Instead, the `root` and `webViewOverlay` objects are added to the `rootRelativeLayout` object.
  - The content view is set to `rootRelativeLayout`.

```
[code lang="java" highlight="5,6,7,8,9,10"]
public void onInitWebFrameworkComplete(WLInitWebFrameworkResult result){
    ...

    webViewOverlay.getSettings().setJavaScriptEnabled(true);

    RelativeLayout rootRelativeLayout = new RelativeLayout(this);

    ((FrameLayout)root.getParent()).removeAllViews();
    rootRelativeLayout.addView(root);
}
```

```

rootRelativeLayout.addView(webViewOverlay);
setContentView(rootRelativeLayout);
...
[/code]

```

## Implementing the Java code of the Cordova plug-in

1. In a new class, `WebViewOverlayPlugin.java`, the actions that the plug-in supports are declared.

```

[code lang="java"]
public class WebViewOverlayPlugin extends CordovaPlugin {
    private final String ACTION_OPEN_URL = "open";
    private final String ACTION_CLOSE_WEBVIEWOVERLAY = "close";
    ...
[/code]

```

2. If an `open` request is received from the web part of the application, the external content is loaded and makes the `webViewOverlay` visible.

```

[code lang="java"]
public class WebViewOverlayPlugin extends CordovaPlugin {
    ...
    @Override
    public boolean execute(String action, JSONArray args, CallbackContext callbackContext) {
        if (action.equals(ACTION_OPEN_URL)) {
            IncludeExternalPages.thisapp.runOnUiThread(new Runnable() {
                public void run() {
                    IncludeExternalPages.clearWebViewOverlayHistory();
                    IncludeExternalPages.loadWebViewOverlay("http://m.ibm.com/");
                    IncludeExternalPages.setWebViewOverlayVisibility(View.VISIBLE);
                    IncludeExternalPages.requestWebViewOverlayFocus();
                    IncludeExternalPages.clearWebViewOverlayHistory();
                }
            });
            return true;
        }
    }
[/code]

```

3. If a `close` request is received from the web part of the application, the `webViewOverlay` is cleaned up and hidden.

UI-related actions occur on a dedicated UI thread.

```

[code lang="java"]
public class WebViewOverlayPlugin extends CordovaPlugin {
    ...
    ...
    } else if (action.equals(ACTION_CLOSE_WEBVIEWOVERLAY)) {
        IncludeExternalPages.thisapp.runOnUiThread(new Runnable() {
            public void run() {
                IncludeExternalPages.loadWebViewOverlayContent("");
            }
        });
    }
}

```

```

IncludeExternalPages.setWebViewOverlayVisibility(View.INVISIBLE);
IncludeExternalPages.clearWebViewOverlayHistory();
}
});
return true;
} else
return false;
}
}
[/code]

```

## JavaScript implementation

In JavaScript, the sample implements the page integration as follows.

1. A `WebViewOverlayPlugin` object is created and populated with the required methods.

```

[code lang="javascript"]
function WebViewOverlayPlugin() {};
WebViewOverlayPlugin.prototype.open = function() {
cordova.exec(null, null, 'WebViewOverlayPlugin', 'open', []);
};
WebViewOverlayPlugin.prototype.close = function() {
cordova.exec(null, null, 'WebViewOverlayPlugin', 'close', []);
};
window.webViewOverlay = new WebViewOverlayPlugin();
[/code]

```

2. The clicked tab ID is analyzed and either shows or hides the `webViewOverlay` accordingly. Loading external content can take time, so adding a Busy Indicator to improve the user experience should be considered.

```

[code lang="javascript"]
function tabClicked(id){
WL.Logger.debug("tabClicked >> id :: " + id);
$(".tab").addClass('hidden');
if (id=="3"){
openWebViewOverlay();
} else {
$("#tab" + id).removeClass('hidden');
closeWebViewOverlay();
}
}

function openWebViewOverlay(){
WL.Logger.debug("openWebViewOverlay");
window.webViewOverlay.open();
}

```

```
function closeWebViewOverlay(){
WL.Logger.debug("closeWebViewOverlay");
window.webViewOverlay.close();
}
[/code]
```

## Sample application

Click to download (<https://github.com/MobileFirst-Platform-Developer-Center/IncludeExternalPages>) the MobileFirst project.



([http://developer.ibm.com/mobilefirstplatform/wp-content/uploads/sites/32/2014/07/10\\_07\\_end\\_result.png](http://developer.ibm.com/mobilefirstplatform/wp-content/uploads/sites/32/2014/07/10_07_end_result.png))