Integrating server-generated pages in hybrid applications

Overview

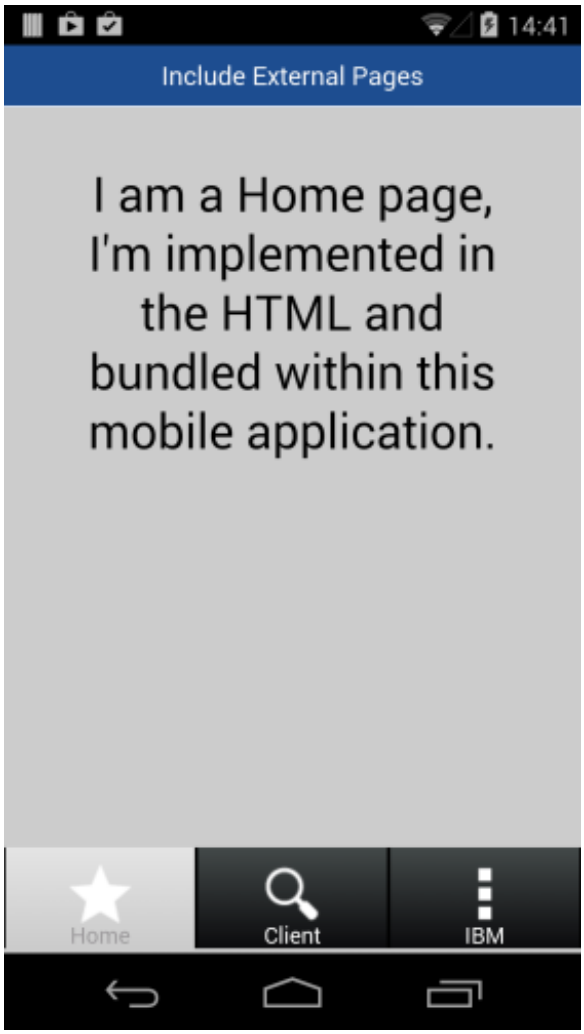
Many enterprises today decide to develop their own customer or employee-facing mobile applications. Some of those companies already have mobile-facing websites (mobile web).

Such companies must make an important decision:

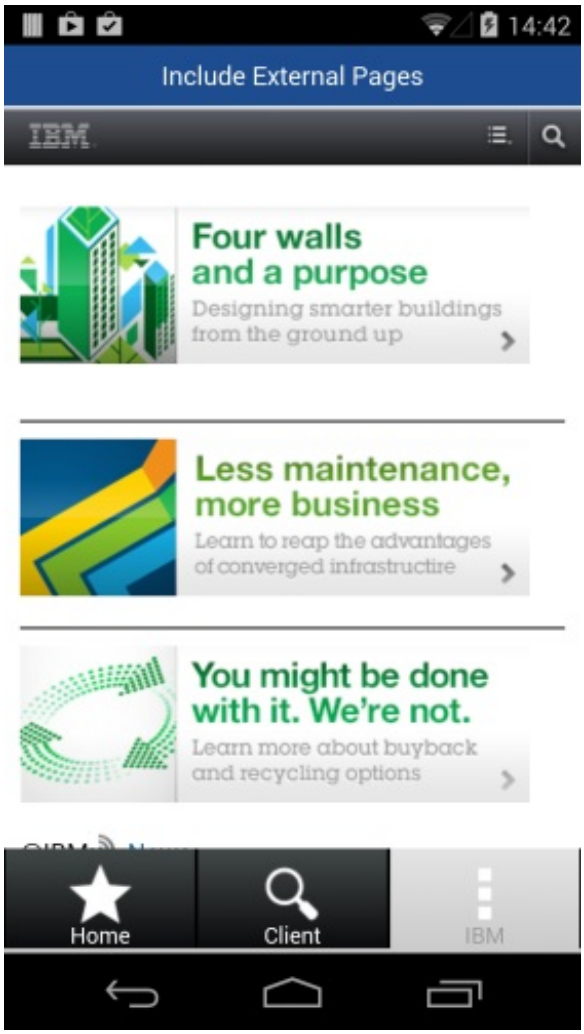
- Should all the mobile web features be implemented from scratch in the mobile application, which is great from a user experience perspective, but very time- and money-consuming?
- Should the mobile application contain only new features with old ones still accessible by a mobile browser, which is easier 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



External web content



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.

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**.

Prerequisite: Before you proceed, you must be proficient with implementing Cordova plug-ins (../../adding-native-functionality/).

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.

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

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).

```
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);
      …
      …
```

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`.

```
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);
    …
```

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.

```
public class WebViewOverlayPlugin extends CordovaPlugin {
   private final String ACTION_OPEN_URL = "open";
   private final String ACTION_CLOSE_WEBVIEWOVERLAY = "close"
;
   …
```

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

```
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;
```

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.

```
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;
    }
}
```

JavaScript implementation

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

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

```
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();
```

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.

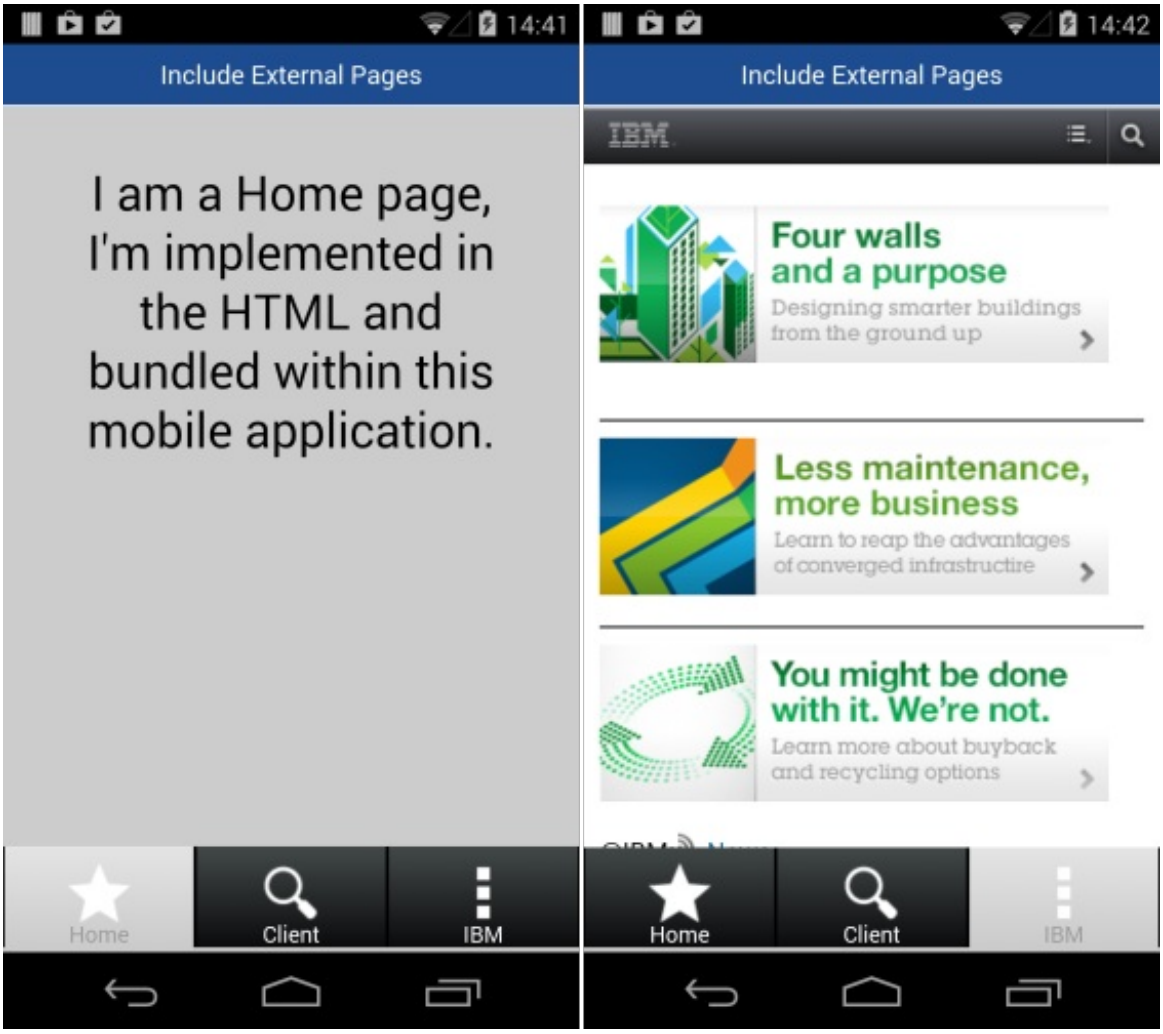
```
function tabClicked(id){
    WL.Logger.debug("tabClicked >> id :: " + id)
;
    $(".tab").addClass('hidden');
    if (id=="3"){
        openWebViewOverlay();
    } else {
        $("#tab" + id).removeClass('hidden');
        closeWebViewOverlay();
    }
}

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

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

Sample application

Click to download (https://github.com/MobileFirst-Platform-Developer-Center/IncludeExternalPages/tree/release71) the MobileFirst project.


14:41
Include External Pages
I am a Home page, I'm implemented in the HTML and bundled within this mobile application.
Home
Client
IBM
14:42
Include External Pages
IBM
Four walls and a purpose
Designing smarter buildings from the ground up
Less maintenance, more business
Learn to reap the advantages of converged infrastructire
You might be done with it. We're not.
Learn more about buyback and recycling options
Home
Client
IBM