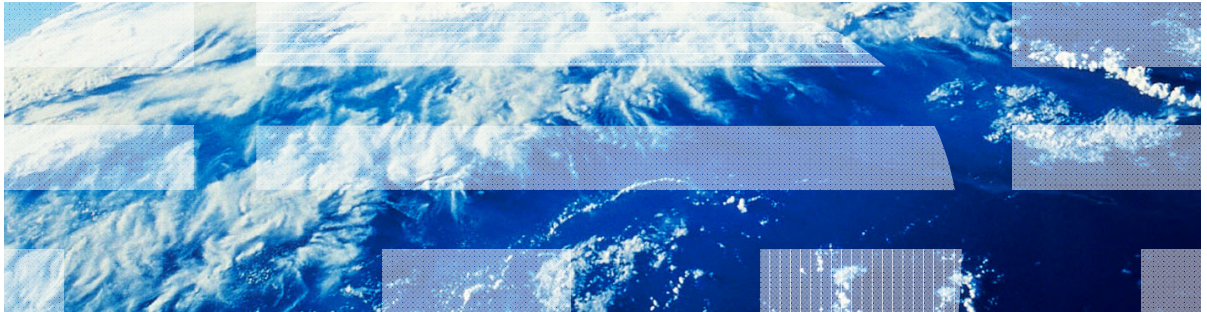IBM

IBM Worklight V5.0.5
Getting Started

Module 9.3 – Android Development Using the Apache Cordova Plug-in

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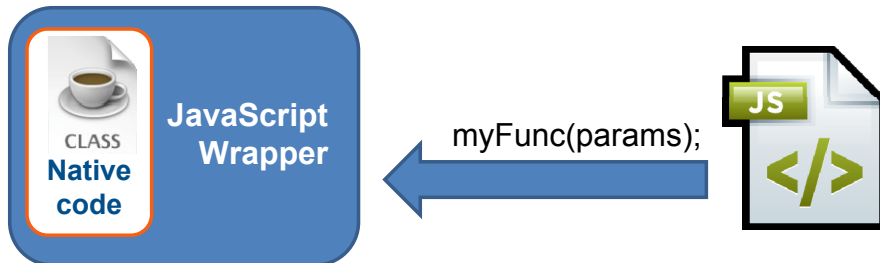
- See http://www.ibm.com/ibm/us/en/

Agenda

- Apache Cordova plug-in overview
- Implementing the plug-in using Java code
- Adding the plug-in to DOM
- Invoking the plug-in from JavaScript

Apache Cordova plug-in overview

- Occasionally within a Worklight® application, developers need to use a specific third-party native library or a device function not yet available in Apache Cordova.

- Apache Cordova allows developers to create custom native code blocks and to invoke them from JavaScript.

- This technique is called an Apache Cordova plug-in.

- In this module you will see how to create a simple Android Apache Cordova plug-in and use it in your code.

- More samples can be found in the Apache Cordova documentation at https://github.com/phonegap/phonegap-plugins.

Apache Cordova plug-in overview

- An Apache Cordova plug-in consists of two parts:
  - A Java™ code that runs natively within the Android OS
  - A JavaScript wrapper
- When both parts are implemented, developers are able to calla native code from JavaScript in a simple and familiar way.
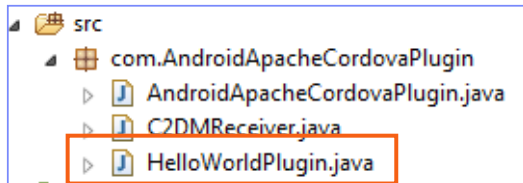

myFunc(params);

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- Apache Cordova plug-in overview
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Implementing the plug-in using Java code

- Start by creating a Java class for a plug-in. Call it **HelloWorldPlugin.java.**

- Add your plug-in entry to the `res\xml\config.xml` file.

- Extend the **org.apache.cordova.api.Plugin** class and add required imports.

```
public class HelloWorldPlugin extends Plugin {
```

Implementing the plug-in using Java code

- Implement an **execute** method.

```java
@Override
public PluginResult execute(String action, JSONArray arguments, String callbackId) {
    PluginResult result = null;

    if (action.equals("sayHello")){
        String responseText = "Hello world";
        try {
            responseText+= ", " + arguments.getString(0);
            result = new PluginResult(PluginResult.Status.OK, responseText);
        } catch (JSONException e) {
            result = new PluginResult(PluginResult.Status.JSON_EXCEPTION, e.getMessage());
        }
    }
    else
        result = new PluginResult(PluginResult.Status.INVALID_ACTION);

    return result;

}
```
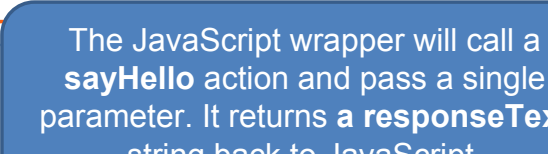
Implementing the plug-in using Java code

- Implement an **execute** method.

```java
@Override
public PluginResult execute(String action, JSONArray arguments, String callbackId) {
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        } catch (JSONException e) {
            result = new PluginResult(PluginResult.Status.JSON_EXCEPTION, e.ge    age());
        }
    }
    else
        result = new PluginResult(PluginResul

    return result;

}
```

> The JavaScript wrapper will call a **sayHello** action and pass a single parameter. It returns **a responseText** string back to JavaScript.

Implementing the plug-in using Java code

- Implement an **execute** method.

```
@Override
public PluginResult execute(String action,
    PluginResult result = null;

    if (action.equals("sayHello")){
        String responseText = "Hello world"
        try {
            responseText+= ", " + arguments.getString();
            result = new PluginResult(PluginResult.Status.OK, responseText);
        } catch (JSONException e) {
            result = new PluginResult(PluginResult.Status.JSON_EXCEPTION, e.getMessage());
        }
    }
    else
        result = new PluginResult(PluginResult.Status.INVALID_ACTION);

    return result;

}
```

If other actions are called, the ***INVALID_ACTION*** is returned.

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Adding the plug-in to DOM

- The second step of the plug-in implementation is to declare it in the DOM and then to create a wrapper for it.

```
function HelloWorldPlugin(){

}

HelloWorldPlugin.prototype.sayHello = function(onSayHelloSuccess, onSayHelloFailure, name){
    cordova.exec(onSayHelloSuccess, onSayHelloFailure, "HelloWorldPlugin", "sayHello", [name]);
};

cordova.addConstructor(function() {
    if (!window.plugins) window.plugins = {};
    window.plugins.helloWorldPlugin = new HelloWorldPlugin();
});
```

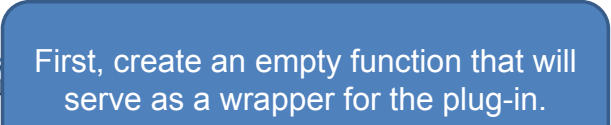## *Adding the plug-in to DOM*

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};

cordova.addConstructor(function() {
    if (!window.plugins) window.plugins = {};
    window.plugins.helloWorldPlugin = new Hel
});
```

First, create an empty function that will serve as a wrapper for the plug-in.

Adding the plug-in to DOM

- Second step of the plug-in implementation is to declare it in the DOM and then to create a wrapper for it.

```
function HelloWorldPlugin(){

}

HelloWorldPlugin.prototype.sayHello = function(onSayHelloSuccess, onSayHelloFailure, name){
    cordova.exec(onSayHelloSuccess, onSayHelloFailure, "HelloWorldPlugin", "sayHello", [name]);
};

cordova.addConstructor(function() {
    if (!window.plugins) window.plugins = {};
    window.plugins.helloWorldPlugin = new HelloWorldPlugin();
});
```

Create a **sayHello** function by using the **HelloWorldPlugin** prototype and the hardcoded plug-in class name and action. It will invoke the plug-in by using **cordova.exec()**.

Adding the plug-in to DOM

- The second step of the plug-in implementation is to declare it in the DOM and then to create a wrapper for it.

```
function HelloWorldPlugin(){

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cordova.addConstructor(function() {
    if (!window.plugins) window.plugins = {}
    window.plugins.helloWorldPlugin = new HelloWorldPlugin();
});
```

Success callback

Failure callback

Plug-in Java class name

Action name

Parameters array

Adding the plug-in to DOM

- The second step of the plug-in implementation is to declare it in the DOM and then to create a wrapper for it.

```javascript
function HelloWorldPlugin(){

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HelloWorldPlugin.prototype.sayHello = function(onSayHelloSuccess, onSayHelloFailure, name){
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};

cordova.addConstructor(function() {
    if (!window.plugins) window.plugins = {};
    window.plugins.helloWorldPlugin = new HelloWorldPlugin();
});
```

The final step is to add a helloWorldPlugin property to the DOM window.plugins object. You can now invoke your plug-in by using **window.plugins.helloWorldPlugin.sayHello().**

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Invoking plug-in from JavaScript

- Now you are ready to invoke your plug-in from JavaScript.

```javascript
function greetMe(){
    window.plugins.helloWorldPlugin.sayHello(sayHelloSuccess, sayHelloFailure, $("#NameInput").val());
}

function sayHelloSuccess(data){
    alert("OK : " + JSON.stringify(data));
}

function sayHelloFailure(data){
    alert("FAIL : " + JSON.stringify(data));
}
```

Success and failure callbacks

Invoking plug-in from JavaScript

- The sample for this training module can be found in the Getting Started page of the IBM Worklight documentation website at
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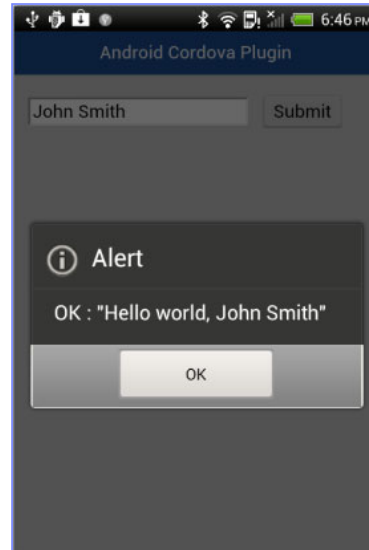
Check yourself questions

- In order for the plug-in to be recognized in an application JavaScript, it should be added to:
  - A Cordova.xml file.
  - A Worklight.xml file.
  - A Plugins.xml file.
  - The plug-in will be automatically recognized by JavaScript without adding it to any of previous files.

- When should Cordova plug-ins be used?
  - When developers want to implement their application in the native code because they are not familiar with JavaScript.
  - When developers want the application to look more like a native application.
  - When developers want to gain access to the OS APIs that are not accessible within the web container.
  - When developers need to retrieve data from a remote server.

- What are the components of a Cordova plug-in?
  - A native class implementing the required functionality. It can be called directly from an application JavaScript.
  - A native class implementing the required functionality and a JavaScript wrapper for it. The wrapper functions can be called from JavaScript.
  - A native class implementing the required functionality, a JavaScript wrapper for it and a declaration in the application-descriptor.xml file.
  - A JavaScript wrapper only. The native classes are already provided by Worklight.

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