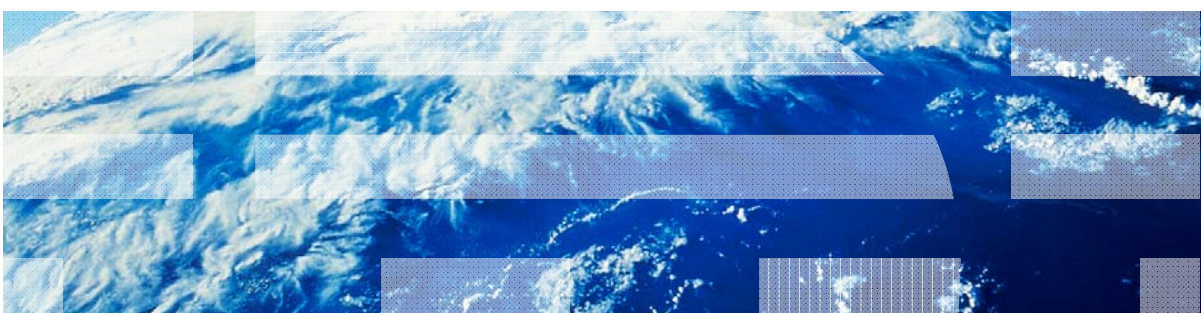
# *IBM Worklight V6.0.0*
# *Getting Started*

## iOS – Adding native functionality to hybrid application with Apache Cordova plug-in



27 August 2013

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# *Agenda*

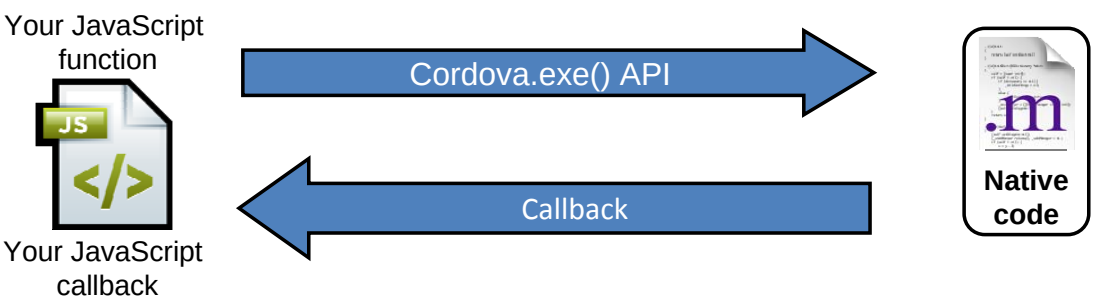
- Apache Cordova plug-in overview
- Plug-in declaration
- Implementing cordova.exec() in JavaScript
- Implementing an Objective-C code plug-in

# *Apache Cordova plug-in overview (1 of 2)*

- In some cases, developers of an IBM Worklight® application might have to use a specific third-party native library or a device function that is not yet available in Apache Cordova.
- With Apache Cordova, developers can *creating an Apache Cordova plug-in*, that is, create custom native code blocks and have them called in their applications by using JavaScript™.
- This module demonstrates how to create a simple Apache Cordova plug-in and how to 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 (2 of 2)*

- To creating and use an iOS Apache Cordova plug-in:
  - Declare the plug-in in the **config.xml** file.
  - Use **cordova.exec()** API in the JavaScript code.
  - Create the plug-in class that will be run natively in iOS.
- The plug-in performs the required action and calls a JavaScript callback method that is specified during **cordova.exec()** invocation.



# *Agenda*

- Apache Cordova plug-in overview
- Plug-in declaration
- Implementing cordova.exec() in JavaScript
- Implementing an Objective-C code of a plug-in

# Plug-in Declaration

- For Cordova to know about the plug-in that will be created in the next slides, you must also declare that plug-in in the project.
  - Add your plug-in reference to the **config.xml** file, which is in the **`native`** folder of the iOS environment.
  - Make sure to place the plug-in reference below the **<!—User—>** section.

```
  <plugin name="SignificantLocationChangeWatchPlugin" value="Significant
  <plugin name="AnalyticsConfigurator" value="AnalyticsConfigurator"/>
  <!--User-->
  <plugin name="HelloWorldPlugin" value="HelloWorldPlugin"/>
</plugins>
```

**The name that the JavaScript code uses to reference the plug-in**

**The name of the implementation class**

# *Agenda*

- Apache Cordova plug-in overview
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# *Implementing cordova.exec() in JavaScript (1 of 3)*

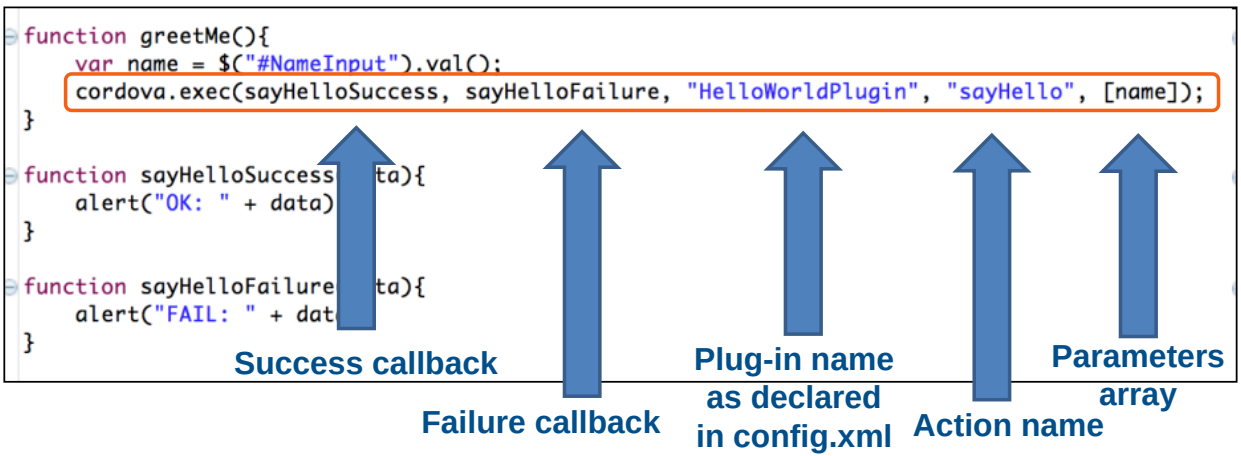
- From the JavaScript code of the application, use **cordova.exec()** to call the Cordova plug-in.

```
function greetMe(){
    var name = $("#NameInput").val();
    cordova.exec(sayHelloSuccess, sayHelloFailure, "HelloWorldPlugin", "sayHello", [name]);
}

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

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

Use **cordova.exec()** to call the plug-in.

# *Implementing cordova.exec() in JavaScript (2 of 3)*

- From the JavaScript code of the application, use **cordova.exec()** to call the Cordova plug-in.



# *Implementing cordova.exec() in JavaScript (3 of 3)*

- From the JavaScript code of the application, use **cordova.exec()** to call the Cordova plug-in.

```
function greetMe(){
    var name = $("#NameInput").val();
    cordova.exec(sayHelloSuccess, sayHelloFailure, "HelloWorldPlugin", "sayHello", [name]);
}

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

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

Success and failure callbacks will be called by the plug-in.

# *Agenda*

- Apache Cordova plug-in overview
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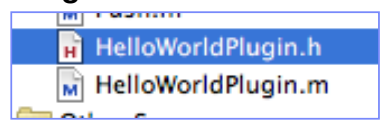
# *Implementing an Objective-C Code plug-in (1 of 6)*

- Now that the plug-in is declared, and the JavaScript implementation is ready, you can also implement the Cordova plug-in.
- For this purpose, ensure that the project is built in Eclipse and opened in the Xcode IDE.

# *Implementing an Objective-C Code plug-in (2 of 6)*

- In the Xcode IDE, open the generated Xcode project that you previously built in Eclipse.
- Add an Objective-C class. Call it **HelloWorldPlugin**.
- Import the **Cordova/CDV.h** and inherit the **CDVPlugin** class.
- Declare the method signature.




```
#import <Foundation/Foundation.h>
#import <Cordova/CDV.h>

@interface HelloWorldPlugin : CDVPlugin

- (void)sayHello:(CDVInvokedUrlCommand*)command;

@end
```

# *Implementing an Objective-C Code plug-in (3 of 6)*

- Implement the method:

```
#import "HelloWorldPlugin.h"

@implementation HelloWorldPlugin

- (void)sayHello:(CDVInvokedUrlCommand*)command{

    NSString *responseString =
        [NSString stringWithFormat:@"Hello World, %@", [command.arguments objectAtIndex:0]];

    CDVPluginResult *pluginResult
        [CDVPluginResult resultWith tus:CDVCommandStatus_OK messageAsString:responseString];

    [self.commandDelegate sendPluginR t:pluginResult callbackId:command.callbackId];
}

@end
```

The **command** argument contains references to the parameters that are sent from JavaScript and callbacks.

# *Implementing an Objective-C Code plug-in (4 of 6)*

- Implement the method:

```
#import "HelloWorldPlugin.h"

@implementation HelloWorldPlugin

- (void)sayHello:(CDVInvokedUrlCommand*)command{

    NSString *responseString =
        [NSString stringWithFormat:@"Hello World, %@", [command.arguments objectAtIndex:0]];

    CDVPluginResult *pluginResult =
        [CDVPluginResult resultWithStatus:CDVCommandStatus_OK messageAsString:responseString];

    [self.commandDelegate sendPluginResult:pluginResult callbackId:command.callbackId];
}

@end
```

Use it to retrieve the parameters that are sent from JavaScript.

# *Implementing an Objective-C Code plug-in (5 of 6)*

- Implement the method:

```
#import "HelloWorldPlugin.h"

@implementation HelloWorldPlugin

- (void)sayHello:(CDVInvokedUrlCommand*)command{

    NSString *responseString =
        [NSString stringWithFormat:@"Hello World, %@", [command.arguments objectAtIndex:0]];

    CDVPluginResult *pluginResult =
        [CDVPluginResult resultWithStatus:CDVCommandStatus_OK messageAsString:responseString];

    [self.commandDele sendPluginResult:pluginResult callbackId:command.callbackId];
}

@end
```

The **pluginResult** object is created with data retrieved from JavaScript. The **CDVCommandStatus** parameter defines whether the plug-in call was successful or not.

# *Implementing an Objective-C Code plug-in (6 of 6)*

- Implement the method:

The **sendPluginResult** method is used to return a response back to JavaScript (invoke callback).

```
#import "HelloWorldPlugin.h"

@implementation HelloWorldPlugin

- (void)sayHello:(CDVInvokedUrlCommand*)comma

    NSString *responseString =
        [NSString stringWithFormat:@"Hello, %@", [command.arguments objectAtIndex:0]];

    CDVPluginResult *pluginResult =
        [CDVPluginResult resultWithStatus:CDVCommandStatus_OK messageAsString:responseString];

    [self.commandDelegate sendPluginResult:pluginResult callbackId:command.callbackId];
}

@end
```

# End Result

- The sample for this training module can be found in the Getting Started page of the IBM Worklight documentation website at: http://www.ibm.com/mobile-docs

## *Important*

- If you add existing Cordova plug-ins, instead of creating your own plug-ins, make sure to place their “`.m`” and “`.h`” files in the `Classes` folder in the Xcode project.
- Placing these “`.m`” and “`.h`” files in the `iphone\native\classes` folder in Eclipse is not enough to have them referenced in the Xcode project.

# Check yourself questions

- For a plug-in to be recognized in a JavaScript application, you should add it to:
  - config.xml file
  - Worklight.plist file
  - Plugins.plist file
  - Plug-in will be automatically recognized by JavaScript without adding it to any of previous files.
- When should a Cordova plug-in be used?
  - When you want to implement an application in the native code because you are not familiar with JavaScript.
  - When you want your application to look more like a native application.
  - When you want to gain access to OS APIs that you cannot access within the web container.
  - When you need to retrieve data from a remote server.
- What are the mandatory components of a Cordova plug-in?
  - A native class that implements the required functionality. After it is declared in **config.xml** file, it can be called from the application JavaScript code.
  - A native class that implements the required functionality and a JavaScript wrapper for it. The wrapper functions can be called from JavaScript.
  - A native class that implements the required functionality, a JavaScript wrapper for it, and a declaration in the application-descriptor.xml file.
  - A JavaScript wrapper only. Native classes are already provided by IBM Worklight.

# Check yourself questions

- For a plug-in to be recognized in a JavaScript application, you should add it to:
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