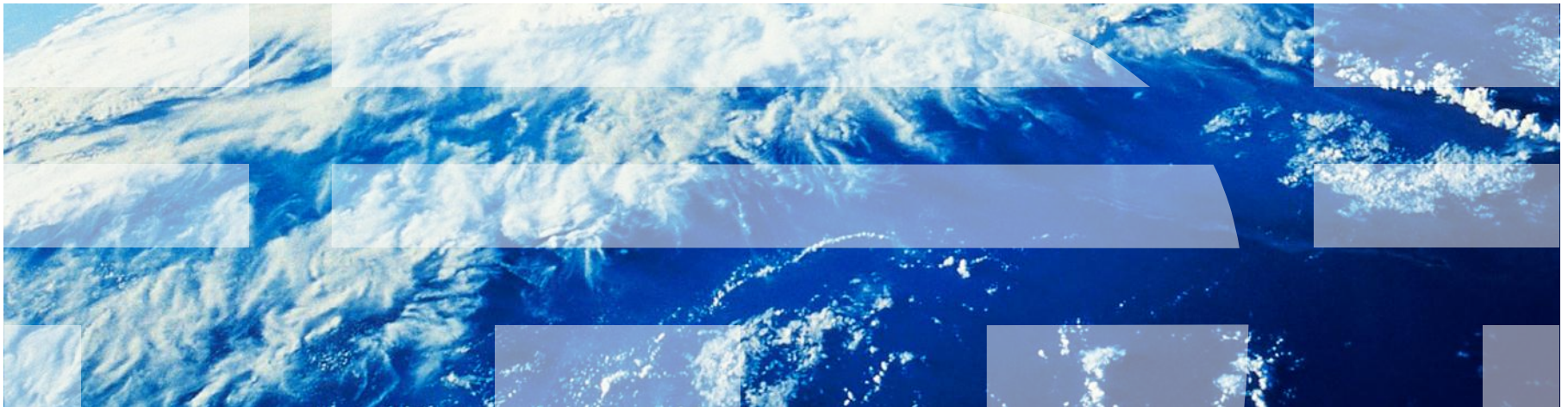


# ***IBM Worklight Foundation V6.2.0 Getting Started***

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



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# Agenda

- Apache Cordova plug-in overview
- Declaring a plug-in
- Implementing `cordova.exec()` in JavaScript
- Implementing an Objective-C code plug-in

## ***Apache Cordova plug-in overview***

- 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 create an Apache Cordova plug-in, which means that they create custom native code blocks, and call these code blocks in their applications by using JavaScript™.
- In this module, you learn how to create a simple Apache Cordova plug-in, and how to use it in your code.

## *Apache Cordova plug-in overview*

- **Note:** Unlike with Cordova-based applications where developers are required to check for the `deviceready` event before using the Cordova API set, in a Worklight application this check is done internally.
- Instead of implementing this check, you can place your implementation code in the `wlCommonInit()` function in `common\js\main.js`.

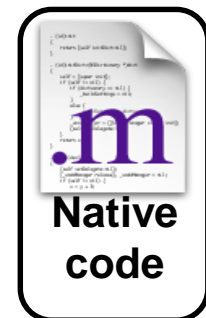
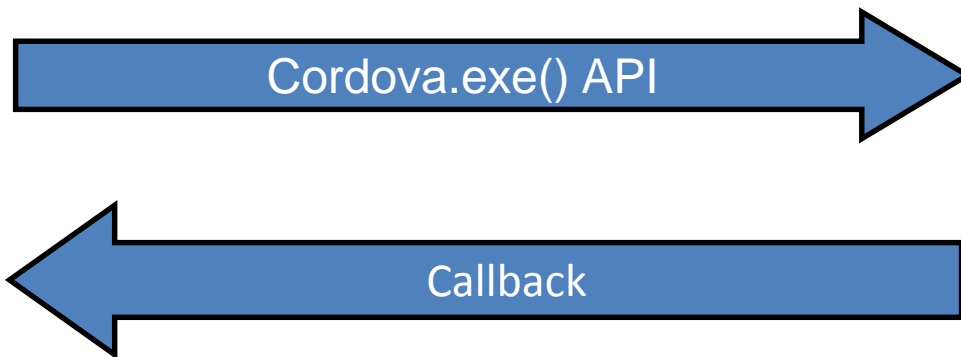
## Apache Cordova plug-in overview – continued

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

Your JavaScript  
function



Your JavaScript  
callback



# Agenda

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

## Declaring a plug-in

- You must first declare the new plug-in in the project, so that Cordova knows about it. The creation process of the plug-in is covered in the following slides.
  - Add your plug-in reference to the `config.xml` file, which is located in the **native** folder of the iOS environment.
  - Add your custom plug-in at the end of the list.

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

```
<feature name="HelloNative">  
  <param name="ios-package" value="HelloNative" />  
</feature>
```

The name of the implementation class



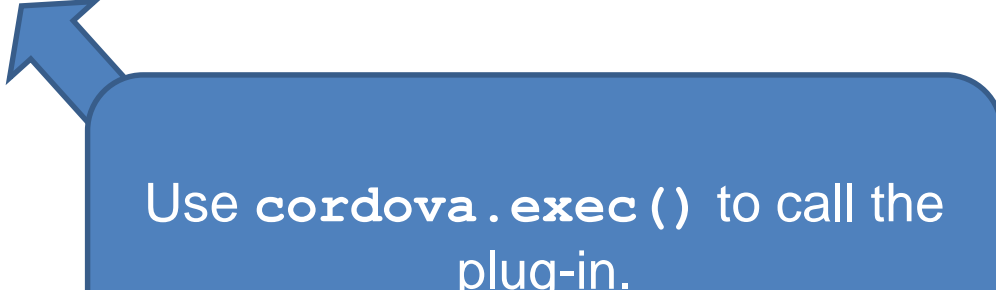
# Agenda

- Apache Cordova plug-in overview
- Declaring a plu-gin
- **Implementing `cordova.exec()` in JavaScript**
- Implementing an Objective-C code of a plug-in

## Implementing `cordova.exec()` in JavaScript

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

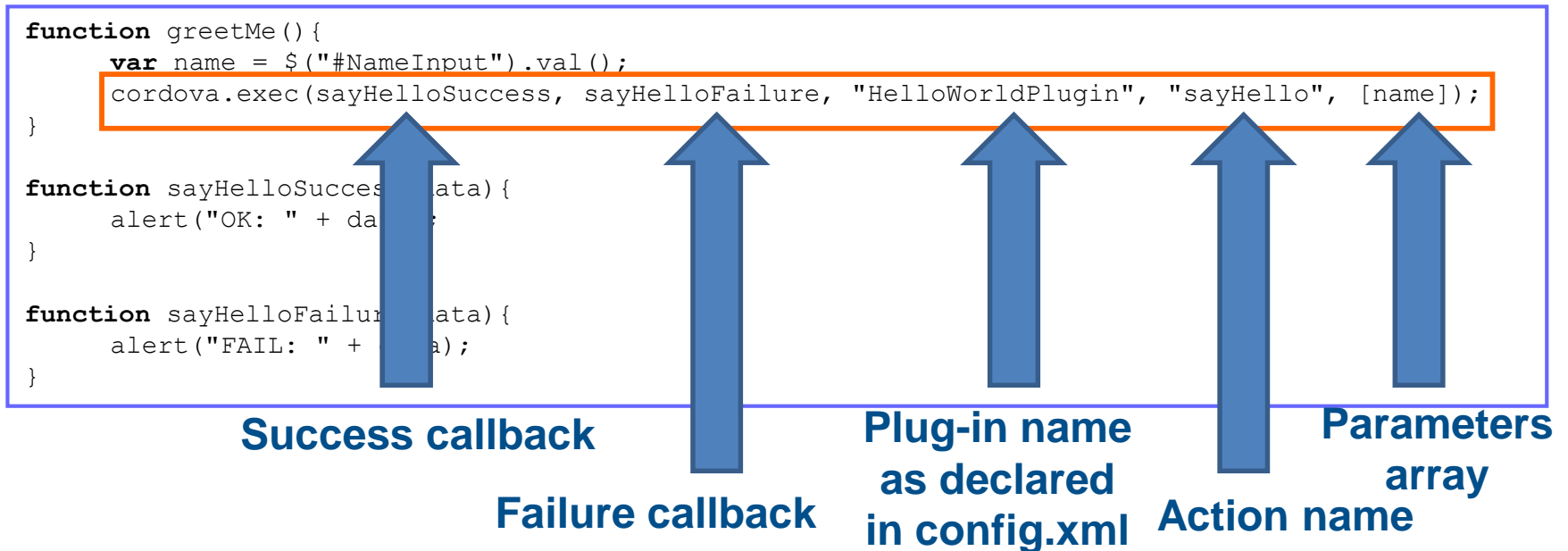
```
function greetMe(){  
    var name = $("#NameInput").val();  
    cordova.exec(sayHelloSuccess, sayHelloFailure, "HelloWorldPlugin", "sayHello", [name]);  
}  
  
function sayHelloSuccess(data){  
    alert("OK: " + data);  
}  
  
function sayHelloFailure(data){  
    alert("FAIL: " + data);  
}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



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

## Implementing `cordova.exec()` in JavaScript – continued

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



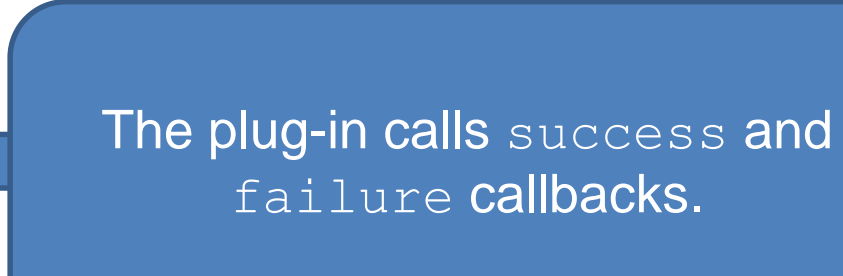
## Implementing `cordova.exec()` in JavaScript – continued

- 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);
}
```



# Agenda

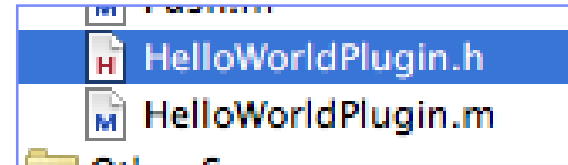
- Apache Cordova plug-in overview
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## ***Implementing an Objective-C Code plug-in***

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

## Implementing an Objective-C Code plug-in – continued

- 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 `HelloWorldPlugin` signature.



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


@interface HelloWorldPlugin : CDVPlugin
- (void) sayHello: (CDVInvokedUrlCommand*) command;
@end
```

## Implementing an Objective-C Code plug-in – continued

- Implement the method:

```
#import "HelloWorldPlugin.h"

@implementation HelloWorldPlugin
- (void)sayHello:(CDVInvokedUrlCommand*)command{
    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
```



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



## Implementing an Objective-C Code plug-in – continued

- Implement the method:

```
#import "HelloWorldPlugin.h"

@implementation HelloWorldPlugin
- (void)sayHello:(CDVInvokedUrlCommand*)command{
    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
```



This statement retrieves the parameters that are sent from JavaScript.

## Implementing an Objective-C Code plug-in – continued

- Implement the method:

```
#import "HelloWorldPlugin.h"

@implementation HelloWorldPlugin
- (void)sayHello:(CDVInvokedUrlCommand*)command{
    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
```

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 – continued

- Implement the method:

```
#import "HelloWorldPlugin.h"

@implementation HelloWorldPlugin
- (void)sayHello:(CDVInvokedUrlCommand*)command
    NSString *responseString =
        [NSString stringWithFormat:@"Hello %@",
        CDVPluginResult *pluginResult =
            [CDVPluginResult resultWithStatus:CDVCommandStatus_OK messageAsString:responseString];
            [self.commandDelegate sendPluginResult:pluginResult callbackId:command.callbackId];
}
@end
```

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

## End Result

- The sample for this training module can be found on 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 of the Xcode project.
- If you place these `.m` and `.h` files only in the **iphone\native\classes** folder in Eclipse, they will not be referenced in the Xcode project.

# Quiz

*Test your knowledge of the material in this module. Answers are in the following slide.*

- For a plug-in to be recognized in a JavaScript application:
  - You must add it to the `config.xml` file.
  - You must add it to the `Worklight.plist` file.
  - You must add it to the `Plugins.plist` file.
  - The plug-in is automatically recognized by JavaScript, and does not need to be added to any file.
- When must you use a Cordova plug-in?
  - 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 the `config.xml` file, it can be called from the JavaScript code of the application.
  - 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.

## Quiz - answers

- For a plug-in to be recognized in a JavaScript application:
  - You must add it to the `config.xml` file.
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  - You must add it to the `Plugins.plist` file.
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- When must you use a Cordova plug-in?
  - When you want to implement an application in the native code because you are not familiar with JavaScript.
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