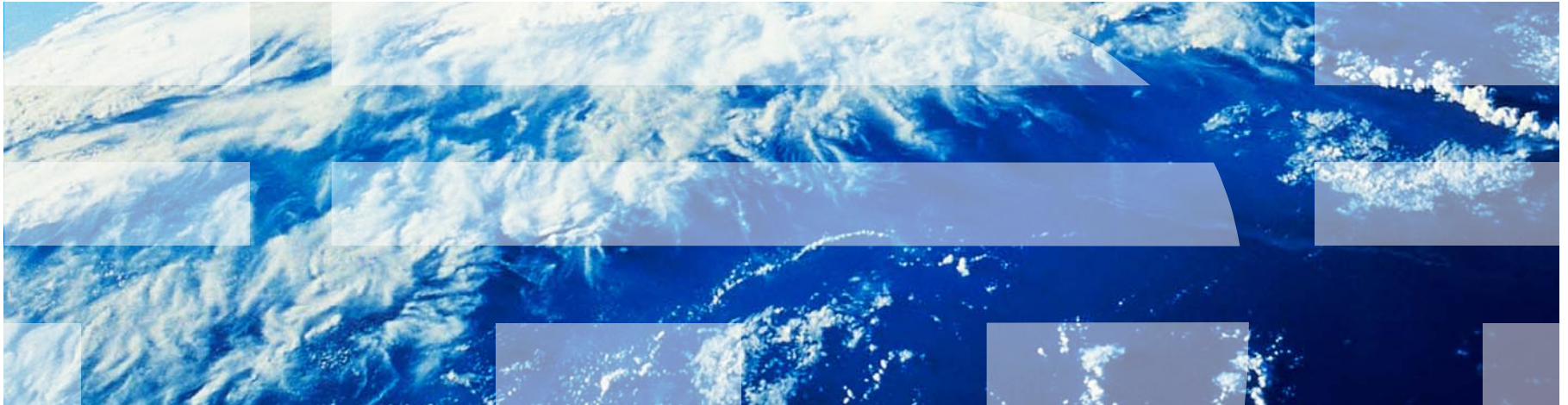IBM

IBM Worklight V6.1.0
Getting Started

Using Java in adapters

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Agenda

- Overview

- Adding custom Java classes to your project

- Invoking custom Java classes from adapter

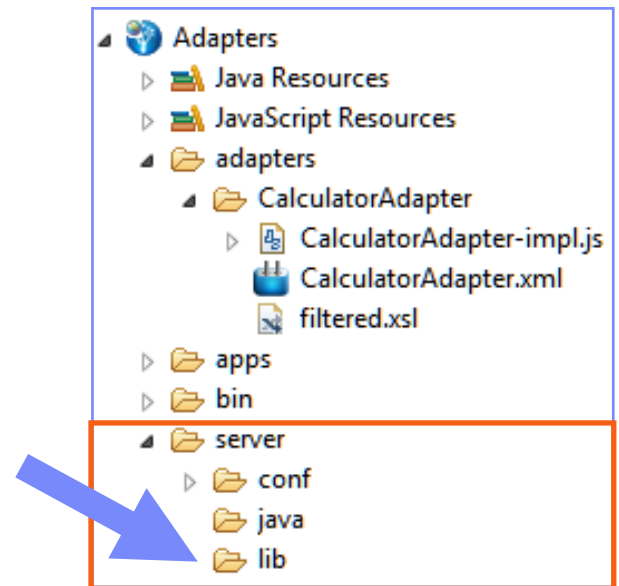- Invoking adapter procedures from Java code

- Exercise

Overview

- Adapter is a server-side entity.

- Adapters are implemented in JavaScript™.

- Use the adapter to perform some complex functions; for example, encrypting and decrypting data or generating and validating security tokens.

- Where JavaScript is not enough to implement these functions, or a Java™ class exists, it is possible to use Java code in your adapter.

- Important – The Java code is an extension of the adapter function and not a replacement.

Agenda

- Overview

- Adding custom Java classes to your project

- Invoking custom Java classes from adapter

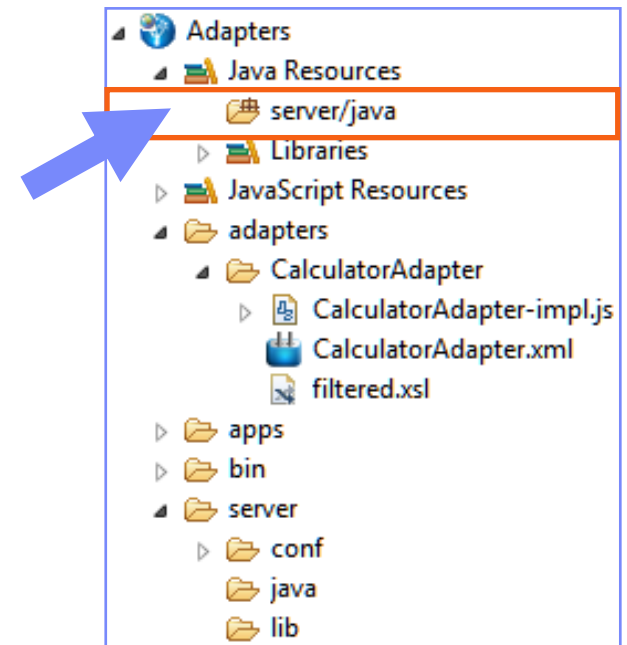- Invoking adapter procedures from Java code

- Exercise

Adding custom Java classes to your project

- To use an existing Java library, add the JAR file to the `server\lib` folder of your Worklight® project.

- After the Worklight adapter is built and deployed, this JAR file is automatically deployed to Worklight Server.

Adding custom Java classes to your project – continued

- To add custom Java code to your project, right-click the `server/java` folder in your Worklight project and add a Java class file. Name it **Calculator1.java**.

- **Important:** – package name must start with either **com**, **org** or **net**.

- Add this file to a package. In this sample, the `com.worklight.customcode` is used.

Adding custom Java classes to your project – continued

- Add two methods to your Calculator1.java class.

  - Static method; does not require a new instance of a class.

  - Instance method.

```java
package com.worklight.customcode;

public class Calculator1 {

    public static int addTwoIntegers(int first, int second){
        return first + second;
    }

    public int subtractTwoIntegers(int first, int second){
        return first - second;
    }

}
```

- If your Java code has additional dependencies, put the required JARs in the `server\lib` folder of your Worklight project.

Agenda

- Overview

- Adding custom Java classes to your project

- Invoking custom Java classes from adapter

- Invoking adapter procedures from Java code

- Exercise

Invoking custom Java classes from the adapter

- After your custom Java code is created and any required JAR files are added, you can reference it from your Worklight Adapter JavaScript as if it was written in Java.

```javascript
function addTwoIntegers(a,b){
    return {
        result: com.worklight.customcode.Calculator1.addTwoIntegers(a,b)
    };
}

function subtractTwoIntegers(a,b){
    var calcInstance = new com.worklight.customcode.Calculator1();

    return {
        result : calcInstance.subtractTwoIntegers(a,b)
    };
}
```

Invoke the static Java method as shown, and use the full class name to reference it directly

Invoking custom Java classes from the adapter – continued

- After your custom Java code is created and any required JAR files are added, you can reference it from your Worklight Adapter JavaScript as if it was written in Java.

```
function addTwoIntegers(a,b){
    return {
        result: com.workli
    };
}

function subtractTwoIntegers(a,b){
    var calcInstance = new com.worklight.customcode.Calculator1();

    return {
        result : calcInstance.subtractTwoIntegers(a,b)
    };
}
```

To use the instance method, create a class instance and invoke the instance method from it

Agenda

- Overview

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- Invoking custom Java classes from adapter

- Invoking adapter procedures from Java code

- Exercise

Invoking adapter procedures from Java code

- You can also invoke Worklight Adapter procedures from your Java code.

```java
public void callProcedure(){
    DataAccessService service = WorklightBundles.getInstance().getDataAccessService();
    String paramArray = "['param1','param2','param3']";
    ProcedureQName procedureQName = new ProcedureQName("adapterName", "procedureName");
    InvocationResult result = service.invokeProcedure(procedureQName, paramArray);
    JSONObject jsonObject = result.toJSON();
    String value = (String)jsonObject.get("key");
}
```

Invoking adapter procedures from Java code – continued

- You can also invoke Worklight Adapter procedures from your Java code.

```java
public void callProcedure(){
    DataAccessService service = WorklightBundles.getInstance().getDataAccessService();
    String paramArray = "['param1','param2','param3']";
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    InvocationResult result = service.invokeProcedure(procedureQName, paramArray);
    JSONObject jsonObject = result.toJSON();
    String value = (String)jsonObject.get("key");
}
```

Get a reference to a
DataAccessService instance

Invoking adapter procedures from Java code - continued

- You can also invoke Worklight Adapter procedures from your Java code.

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public void callProcedure(){
    DataAccessService service = WorklightBundles.getInstance().getDataAccessService();
    String paramArray = "['param1','param2','param3']";
    ProcedureQName procedureQName = new ProcedureQName("adapterName", "procedureName");
    InvocationResult result = service.invokeProcedure(procedureQName, paramArray);
    JSONObject jsonObject = result.toJSON();
    String value = (String)jsonObject.get("key");
}
```

Create a parameter array and a
ProcedureQName object

Invoking adapter procedures from Java code – continued

- You can also invoke Worklight Adapter procedures from your Java code.

```
public void callProcedure(){
    DataAccessService service = WorklightBundles.getInstance().getDataAccessService();
    String paramArray = "['param1','param2','param3']";
    ProcedureQName procedureQName = new ProcedureQName("adapterName", "procedureName");
    InvocationResult result = service.invokeProcedure(procedureQName, paramArray);
    JSONObject jsonObject = result.toJSON();
    String value = (String)jsonObject.get("key");
}
```

Invoke the procedure and use the InvocationResult returned

Agenda

- Overview

- Adding custom Java classes to your project

- Invoking custom Java classes from the adapter

- Invoking the adapter procedures from the Java code

- Exercise

Exercise

- Implement the addition and removal that is shown in this module as the custom Java code that is called by the adapter.

```
Invocation Result of procedure: 'addTwoIntegers' from the Worklight Server:

{
    "isSuccessful": true,
    "result": 7
}
```

- 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.

Check yourself questions

- Is it possible to use existing JAR functions in my Worklight adapter?
  - No, it is not possible.
  - Yes, it is possible: the JAR file is added to the server\lib folder.
  - Yes, it is possible: the JAR file is copied to the Eclipse workspace.
  - Yes, it is possible: the JAR file is added to the server\java folder.
- What types of Java methods can be called from the Worklight adapter?
  - Only static methods that do not require a class instance to be created.
  - Only instance methods that are called after the new class instance is created.
  - Both static and instance methods can be called from the adapter.
  - The adapter has a full access to supplied Java code: static, public, and private methods can be called.
- How can Java code replace a Worklight adapter?
  - Remove need for Worklight adapter by routing directly to Java code.
  - Set useJavaAdapters property to `true` in the adapter XML file.
  - Delete the adapter JS file and declare a Java class in the XML file.
  - The Java code is an extension of the adapter function and not a replacement.

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