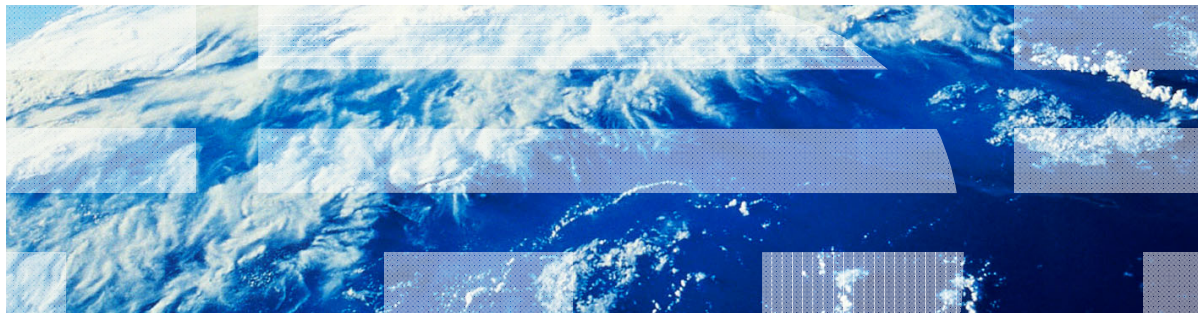


# ***IBM Worklight V5.0.5 Getting Started***

## **Module 6.1 – Advanced Adapter Usage and Mashup**



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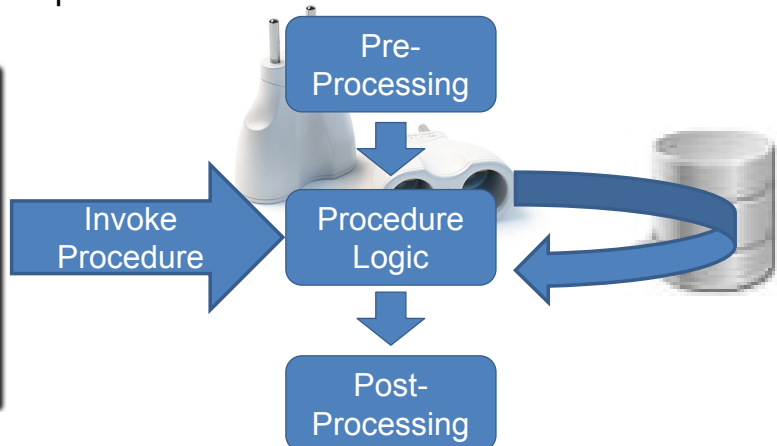
- Server-side scripting:
  - Why?
- The Worklight® server-side API
  - Invoking procedures
  - Getting server configuration
  - Logging
- Data mashup example
  - Augmenting DB data with Yahoo! Weather RSS data
- Exercise

## Server-side Scripting: why?

- Enhancing adapter capabilities
  - Pre- & post-processing logic
  - All processing can be done with only one call to the server and in one transaction
  - Enables data mashups from different sources

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## Server-side API

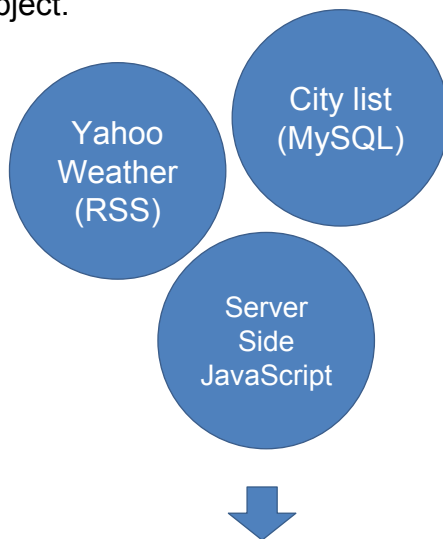
- **WL.Server.InvokeProcedure (invocationData)**
  - Procedure invocation from the current or another adapter
  - Same syntax as a client-side WL.Client.invokeProcedure
- **WL.Logger.debug (msg)**
  - Outputs messages to the console
  - Used for debugging
- **WL.Server.configuration object**
  - A map containing all the server properties defined in the `worklight.properties` file
    - Syntax
      - `WL.Server.configuration["property-name"]`
      - `WL.Server.configuration.property-name`
    - Example
      - `var addr = WL.Server.configuration["local.IPAddress"];`

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## Data Mashup Example

- The following example shows how to mash up data from two different data sources and to return the data stream to the application as a single ***invocationResult*** object.





## *Data Mashup example*

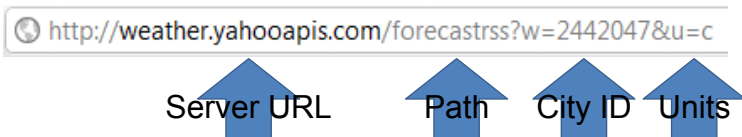
- Data mashup can be implemented in the same way for any number of data sources and across different adapter types.
- As an example, mash up data from the following sources:
  - **SQL:**
    - Extract a list of cities from the weather table
    - The result will contain the list of several cities around the world, their Yahoo! Weather identifier, and some description
  - **HTTP:**
    - Connect to the Yahoo! Weather Service
    - Extract an updated weather forecast for each of the cities retrieved with SQL
- Afterward, the mashed-up data will be returned to the application for display

## Data Mashup Example: SQL Adapter

- Create an SQL adapter and name it **SQLAdapter**
  - This adapter will contain three procedures:
    - **getCitiesWeather** – a public procedure, declared in the adapter XML file. It will be called from the application and return the mashed-up data
    - **getCitiesList** – an internal (private) function, not declared in the adapter XML file. It will be called from the adapter using a server API to get the cities list from the SQL server
    - **getCityWeather** – an internal (private) function, not declared in the adapter XML file. It will call the **getYahooWeather** procedure from a different adapter (HTTP) with the Yahoo! Weather ID as a parameter
    - Functions will be implemented with server-side JavaScript

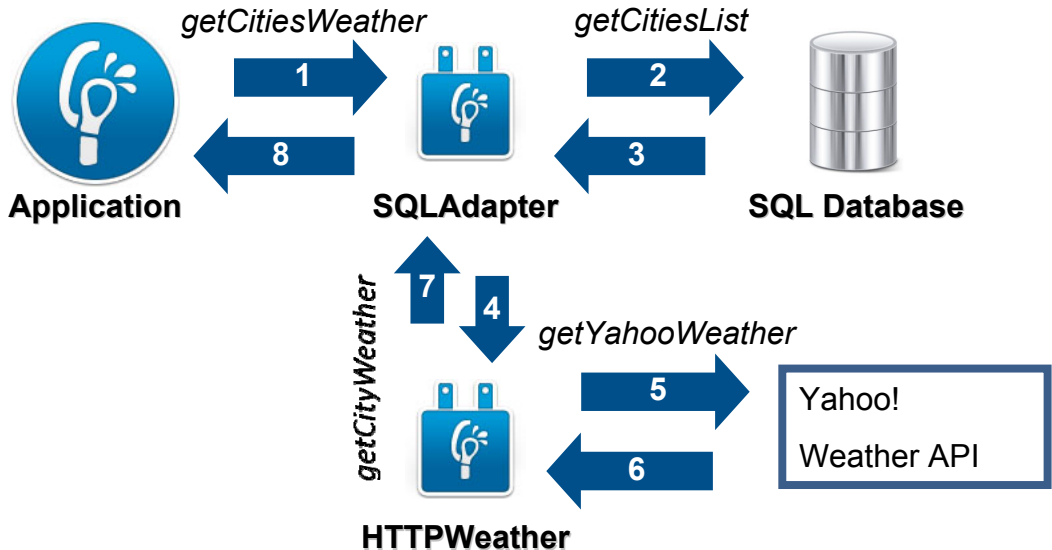
## Data Mashup Example: HTTP Adapter

- Create an HTTP adapter and name it **HTTPWeather**
- This adapter will connect to Yahoo! Weather RSS feed at <http://weather.yahooapis.com/forecastrss>
- The adapter will have a single procedure called **getYahooWeather**
- The HTTP request will have the two following parameters:
  - *w* – **Where in the world ID**, a city ID used by Yahoo!
  - *u* – units. Can be “c” for Celsius or “f” for Fahrenheit
- Full request URL example:



- City ID parameter is to be provided by procedure invoker
- Units parameter is hardcoded

# Data Mashup Example: Mashup Schema



## Data Mashup Example: Mashup Schema

Application calls the `getCitiesWeather` procedure from **SQLAdapter**

**SQLAdapter** retrieves the list of cities from SQL database

**SQLAdapter** calls `getYahooWeather` from **HTTPWeather** adapter with city ID as a parameter

**HTTPWeather** adapter retrieves weather data from Yahoo! Weather API and returns it to **SQLAdapter**

**SQLAdapter** returns mashed-up data to the application

Repeated  
for each city

## Data Mashup Example: Server-side JS

- Declare the getCitiesWeather procedure in the SQLAdapter XML file. Its function is to get data from two different adapters and mashup the result into one data object
- Create getCitiesList function in the SQLAdapter .js file and use it to retrieve and return the cities list from the SQL database

```
var getCitiesListStatement =
    WL.Server.createStatement("select city, identifier, summary from weather;");
function getCitiesList() {
    return WL.Server.invokeSQLStatement({
        preparedStatement : getCitiesListStatement,
        parameters : []
    });
}
```

- Retrieved data will contain a list of cities with the following fields:
  - **city** - a city name
  - **identifier** – city ID for Yahoo! Weather API
  - **summary** – a brief description of the city

## Data Mashup Example: Server-side JS

- Create a `getCityWeather` function in the `SQLAdapter.js` file and use it to retrieve and return weather data from the `HTTPWeather` adapter.

```
function getCityWeather(woeid){  
    return WL.Server.invokeProcedure({  
        adapter : 'HTTPWeather',  
        procedure : 'getYahooWeather',  
        parameters : [woeid]  
    });  
}
```

## Data Mashup Example: Server-side JS

- Declare the getYahooWeather procedure in the HTTPWeather XML file
- Its task is to retrieve weather data by using the supplied city ID as a parameter
- Create the getYahooWeather function in the HTTPWeather .js file and use it to retrieve and return weather data by using the Yahoo! Weather API

```
function getYahooWeather(woeid) {  
  
    var input = {  
        method : 'get',  
        returnedContentType : 'xml',  
        path : 'forecastrss',  
        parameters : {  
            'w' : woeid,  
            'u' : 'c' //celcius  
        }  
    };  
  
    return WL.Server.invokeHttp(input);  
}
```



## Data Mashup Example: Server-side JS

- In SQLAdapter, extract a city identifier from city list retrieved earlier and use it to call the getYahooWeather procedure of the HTTPWeather adapter
- Repeat for each city, attaching the received data to city object

```
function getCitiesWeather(){  
    var cityList = getCitiesList();  
    for (var i = 0; i < cityList.resultSet.length; i++) {  
        var yahooWeatherData = getCityWeather(cityList.resultSet[i].identifier);  
        cityList.resultSet[i].weather = yahooWeatherData;  
    }  
    return cityList;  
}
```

- Return mashed-up data to application

## Data Mashup Example: Examine the Result

Invocation Result from the WorkLight Server:

```
{
  "isSuccessful": true,
  "resultSet": [
    {
      "city": "New York",
      "identifier": "2459115",
      "summary": "New York City, which is geographically the largest city in the state history as a gateway for immigration to the United States and its status as a financial According to the U.S. Department of Commerce, it is also a destination of choice for ma 17th century Duke of York, James Stewart, future James II and VII of England and Scotlan",
      "weather": {
        "errors": [],
        "info": [],
        "isSuccessful": true,
        "rss": {
          "channel": {
            "astronomy": {
              "sunrise": "7:18 am",
              "sunset": "4:32 pm"
            },
            "atmosphere": {
              "humidity": "83",
              "pressure": "982.05",
              "rising": "0",
              "visibility": "2.41"
            },
            "description": "Yahoo! Weather for New York, NY",
            "image": {
              "height": "18",
              "link": "http://weather.yahoo.com",
              "title": "Yahoo! Weather",
              "url": "http://l.yimg.com/a/i/brand/purplelogo//uh/us/news-wea.gif",
              "width": "142"
            }
          }
        }
      }
    }
  ]
}
```


SQL Data

Yahoo! Weather



CityWeather

Select city:  ▼



**Current Conditions:**  
Cloudy, -5 C

**Forecast:**  
Mon - Blizzard. High: -3 Low: -6  
Tue - Mostly Sunny. High: 2 Low: -4

[Full Forecast at Yahoo! Weather](#)

(provided by [The Weather Channel](#))

New York City, which is geographically the largest city in the state and most populous in the United States, is known for its history as a gateway for immigration to the United States and its status a...

## Agenda

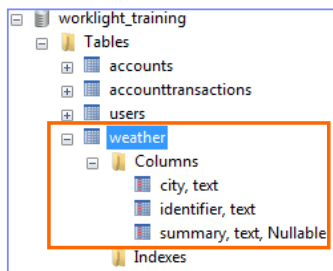
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## Exercise: Preparation

### CityWeather Application

- Create a database
  - Execute the `worklightTraining.sql` file, found under the `\server` folder on your local mySQL server, to create a training database

```
/*!40101 SET NAMES utf8 */;
/*!40101 SET SQL_MODE='';
CREATE DATABASE IF NOT EXISTS `WorkLight Training`;
USE `WorkLight Training`;
/*!40014 SET @OLD_FOREIGN_KEY_CHECKS=@@FOREIGN_KEY_CHECKS,
/*!40101 SET @OLD_SQL_MODE=@@SQL_MODE, SQL_MODE='NO_AUTO_V
/*!Table structure for table `accounts` */
DROP TABLE IF EXISTS `accounts`;
CREATE TABLE `accounts` (
  `accountId` VARCHAR(15) NOT NULL,
  `userId` VARCHAR(100) NOT NULL DEFAULT '',
  `accountType` VARCHAR(50) NOT NULL
```



## Exercise

- Create the CityWeather application and implement the example shown in this module
- Two adapters (SQL and HTTP) should be implemented
- SQLAdapter requires a JDBC connector driver
  - Must be downloaded separately by the developer and added to the lib\ folder of the Worklight project
  - JDBC connector driver can be downloaded at MySQL/Oracle/DB2 website
  - For this exercise, download MySQL version
- In the connectivity section of the SQLAdapter XML file, supply the connection details for the database as follows:

```
<connectivity>
  <connectionPolicy xsi:type="sql:SQLConnectionPolicy">
    <dataSourceDefinition>
      <driverClass>com.mysql.jdbc.Driver</driverClass>
      <url>jdbc:mysql://127.0.0.1:3306/worklight_training</url>
      <user>worklight</user>
      <password>worklight</password>
    </dataSourceDefinition>
  </connectionPolicy>
  <loadConstraints maxConcurrentConnectionsPerNode="5" />
</connectivity>
```

- When the application starts, it connects to the SQL database with the SQL adapter and retrieves the cities list from the weather table
- After receiving the cities list, the SQL adapter uses the HTTP adapter to connect to the Yahoo! Weather API to retrieve weather data for each of the cities on the list
- The application receives the mashed-up data and displays it
- Note: the application should make only one call to the adapter. All the mashup logic should be implemented by the server-side API

## Exercise: Solution

- 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>.

The diagram illustrates the solution flow for the CityWeather application. It starts with a project structure on the left, moves to a server invocation result in the middle, and ends with the rendered mobile application interface on the right.

**Project Structure (Left):**

- CityWeatherProj
  - JavaScript Resources
  - adapters
    - HTTPWeather
      - filtered.xsl
      - HTTPWeather.xml
      - HTTPWeather-impl.js
    - SQLAdapter
      - SQLAdapter.xml
      - SQLAdapter-impl.js
  - apps
    - CityWeather
      - common
        - css
        - images
        - js
          - auth.js
          - CityWeather.js
          - messages.js
          - CityWeather.html
        - legal
        - application-descriptor.xml
      - lib

**Invocation Result from the WorkLight Server (Middle):**

```

{
  "isSuccessful": true,
  "resultSet": [
    {
      "city": "New York",
      "identifier": "2459115",
      "summary": "New York City, which
      history as a gateway for immigration to
      According to the U.S. Department of Cos
      17th century Duke of York, James Stuart
      "weather": {
        "errors": [],
        "info": [],
        "isSuccessful": true,
        "rss": {
          "channel": {
            "astronomy": {
              "sunrise": "7:18 am",
              "sunset": "4:32 pm"
            },
            "atmosphere": {
              "humidity": "83",
              "pressure": "982.05",
              "rising": "0",
              "visibility": "2.41"
            }
          }
        }
      }
    }
  ]
}
  
```

**CityWeather Application Interface (Right):**

Select city:

**Current Conditions:**  
Cloudy, -5 C

**Forecast:**  
Mon - Blizzard. High: -3 Low: -6  
Tue - Mostly Sunny. High: 2 Low: -4

[Full Forecast at Yahoo! Weather](#)  
(provided by [The Weather Channel](#))

New York City, which is geographically the largest city in the state and most populous in the United States, is known for its history as a gateway for immigration to the United States and its status a...

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