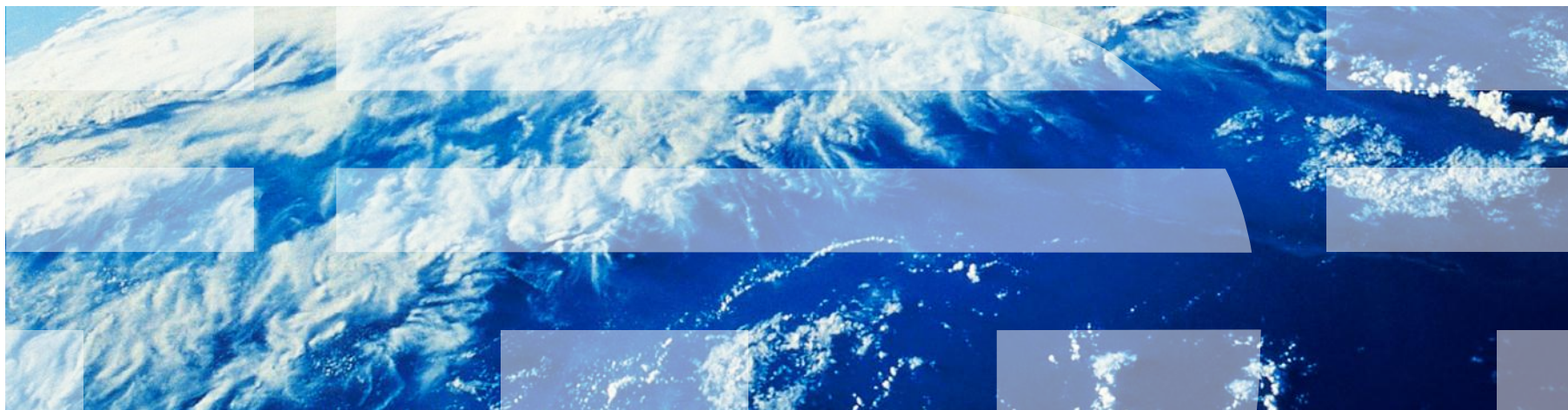


IBM Worklight Foundation V6.2.0 Getting Started

Adapter framework overview



Trademarks

- IBM, the IBM logo, ibm.com, Worklight, and Cast Iron are trademarks or registered trademarks of International Business Machines Corporation, registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at “[Copyright and trademark information](#)” at www.ibm.com/legal/copytrade.shtml.
- Java and all Java-based trademarks and logos are trademarks or registered trademarks of Oracle and/or its affiliates.
- Other company products or service names may be trademarks or service marks of others.
- This document may not be reproduced in whole or in part without the prior written permission of IBM.

About IBM®

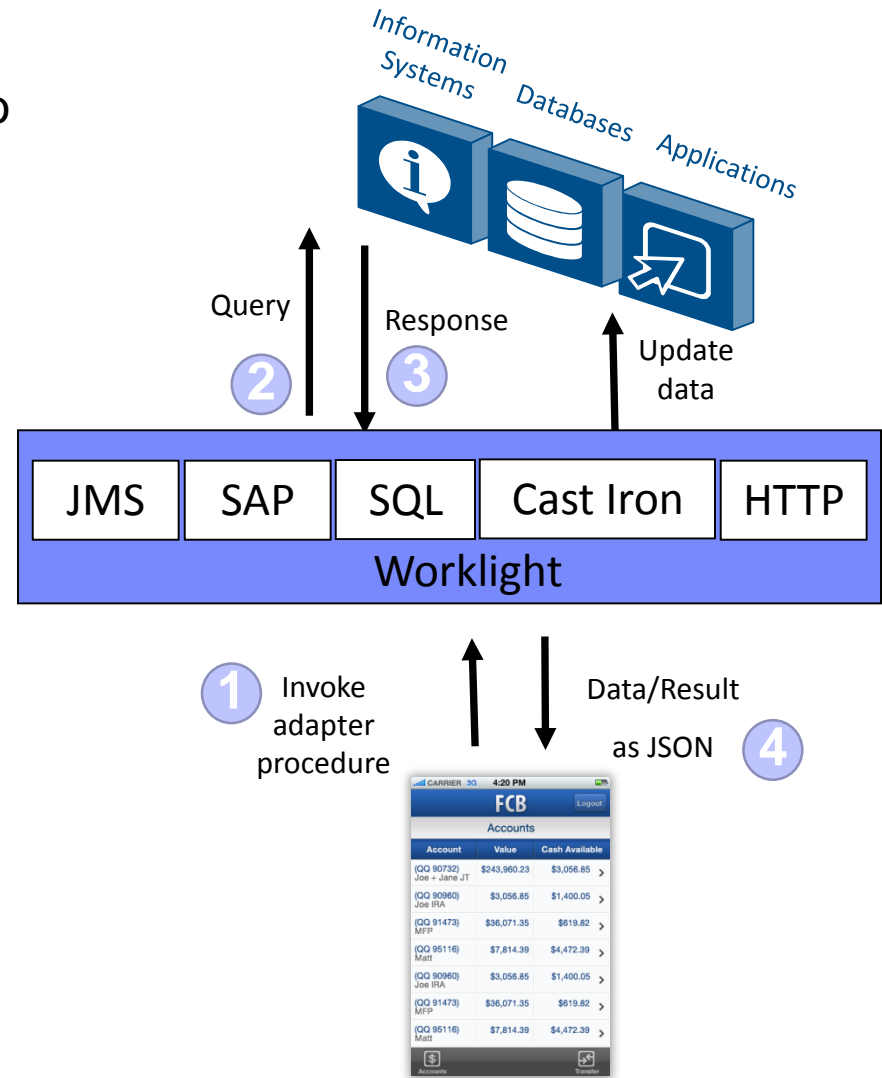
- See <http://www.ibm.com/ibm/us/en/>

Agenda

- **Adapters overview**
 - Benefits
 - Anatomy
- Adapter creation
- Adapter deployment
 - Testing adapter procedures
- Adapter structure
 - XML
 - JavaScript

Adapters overview

- An adapter is a transport layer that is used by IBM Worklight® Foundation to connect to various backend systems.
- Adapters are used to:
 - Retrieve information
 - Perform actions
- Adapters that are provided with the product:
 - SQL adapter
 - HTTP adapter (supports both REST and SOAP)
 - Cast Iron® adapter
 - JMS adapter
 - SAP Netweaver Gateway adapter



Adapters overview - Benefits

- **Universality**
 - Supports multiple integration technologies and backend information systems
- **Read-only and transactional capabilities**
 - Adapters support read-only and transactional access modes to backend systems
- **Fast development**
 - Use simple XML syntax and easily configured with JavaScript™ API
- **Security**
 - Use of flexible authentication facilities to create connections with backend systems
 - Adapters offer control over the identity of the connected user
- **Scalability**
 - Adapters reduce the number of transactions on backend systems by using cache to store retrieved backend data
- **Transparency**
 - Data that is retrieved from backend applications is exposed in a uniform manner regardless of the adapter type

Adapters overview - Anatomy

- Each Worklight adapter consists of:
 - An XML file, describing the connectivity options and listing the procedures that are exposed to the application or other adapters.
 - A JavaScript file, containing the implementation of procedures that are declared in the XML file.
 - Zero or more XSL files, containing a transformation scheme for retrieved raw XML data.
- Data that is retrieved by an adapter can be returned raw or preprocessed by the adapter itself. In both cases, it is presented to the application as a **JSON object**.

Adapters overview – Anatomy - procedures

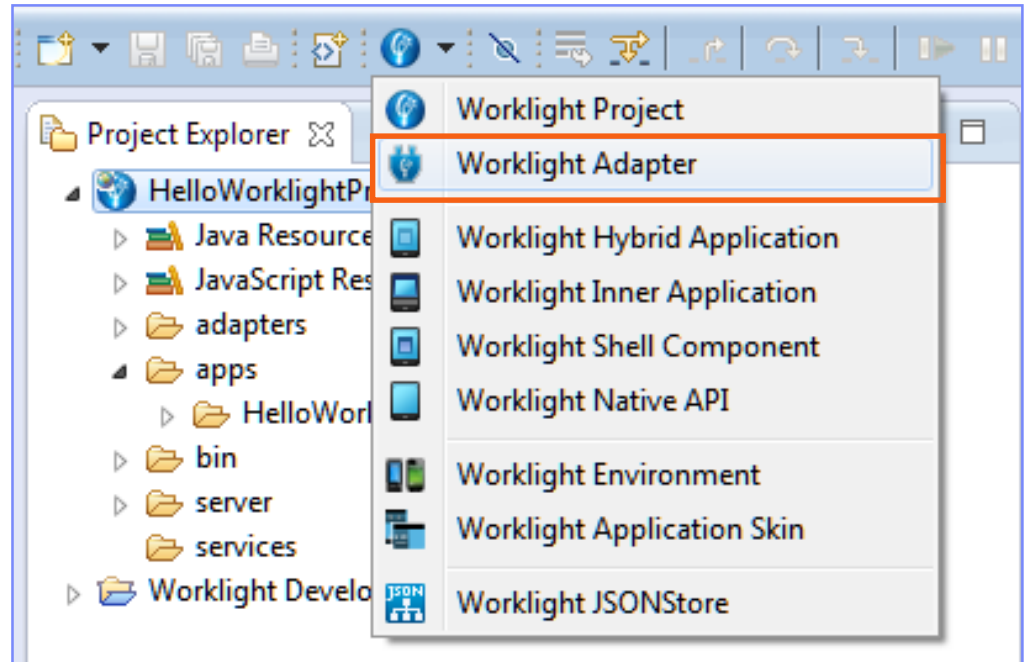
- Procedures provide adapter functions to the application.
- Procedures call backend services to retrieve data or to perform actions.
- Procedures are declared in XML and are implemented with server-side JavaScript.
- Using server-side JavaScript, a procedure can process the data before or after it calls the service.
- More filtering can be applied to retrieved data with simple XSLT.
- Usually, adapter procedures are implemented in JavaScript, but since an adapter is a server-side entity, it is possible to use Java snippets in the adapter code.

Agenda

- Adapters overview
 - Benefits
 - Anatomy
- Adapter creation
- Adapter deployment
 - Testing adapter procedures
- Adapter structure
 - XML
 - JavaScript

Adapter creation

- In Eclipse, click the Worklight icon that is located in the toolbar
- Select **Worklight Adapter**



Adapter creation – continued

- Select a Worklight project.
- Select an Adapter type.

New Worklight Adapter

Worklight Adapter
Create a new adapter.

Project name: HelloWorklightProject

Adapter type:

Adapter name:

- SQL Adapter
- HTTP Adapter
- Cast Iron Adapter
- SAP Netweaver Gateway Adapter
- JMS Adapter

Create procedures for offline

Retrieve JSON data with:

Add JSON data with:

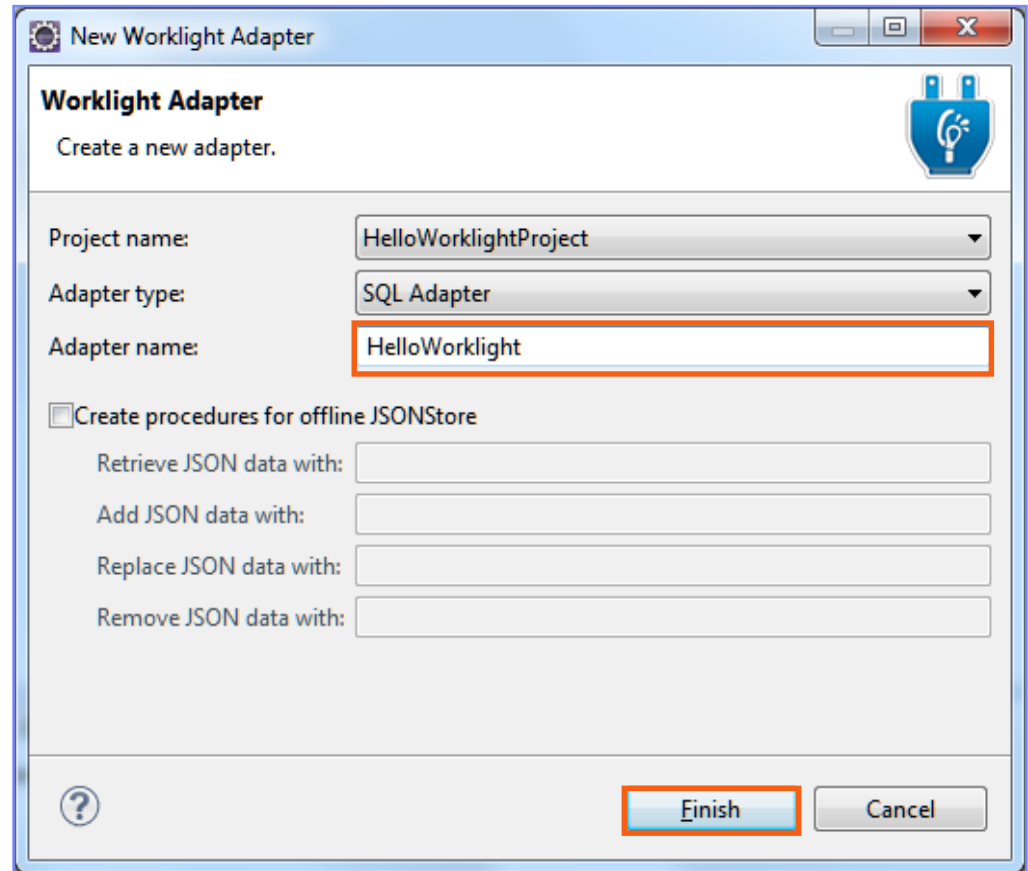
Replace JSON data with:

Remove JSON data with:

Finish Cancel

Adapter creation – continued

- Select an Adapter type.
- Type an Adapter name.
 - Applications access the adapter with this name.
- Click **Finish**.



New Worklight Adapter

Worklight Adapter
Create a new adapter.

Project name: HelloWorklightProject

Adapter type: SQL Adapter

Adapter name: HelloWorklight

Create procedures for offline JSONStore

Retrieve JSON data with:

Add JSON data with:

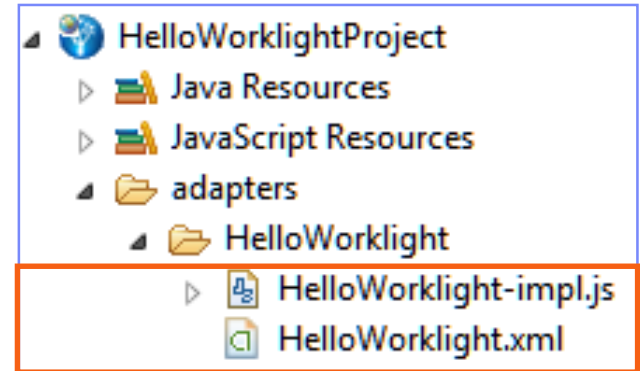
Replace JSON data with:

Remove JSON data with:

Adapter creation – continued

The result:

- XML files, which declare procedures and connection properties.
- A JavaScript file, which defines procedures and the adapter logic.

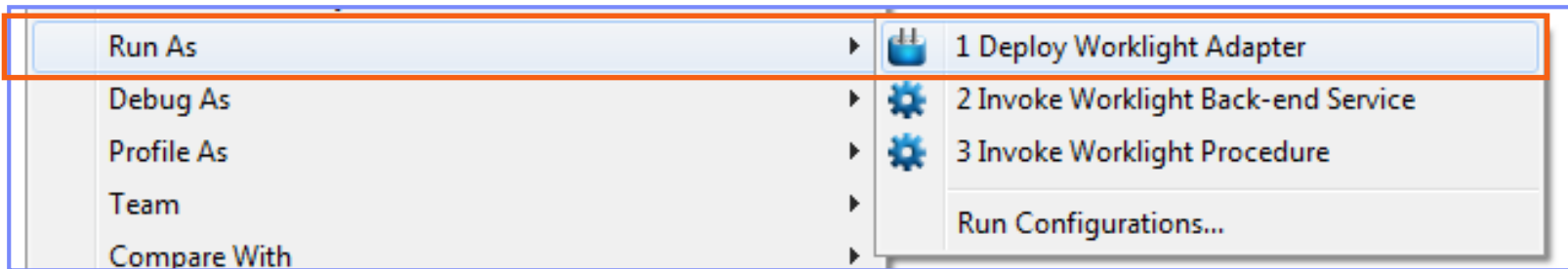


Agenda

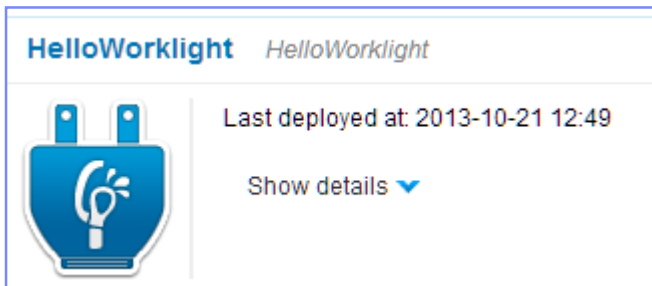
- Adapters overview
 - Benefits
 - Anatomy
- Adapter creation
- Adapter deployment
 - Testing adapter procedures
- Adapter structure
 - XML
 - JavaScript

Adapter deployment

- Select an adapter to deploy.
- Right-click the adapter and select **Run As > Deploy Worklight Adapter**.

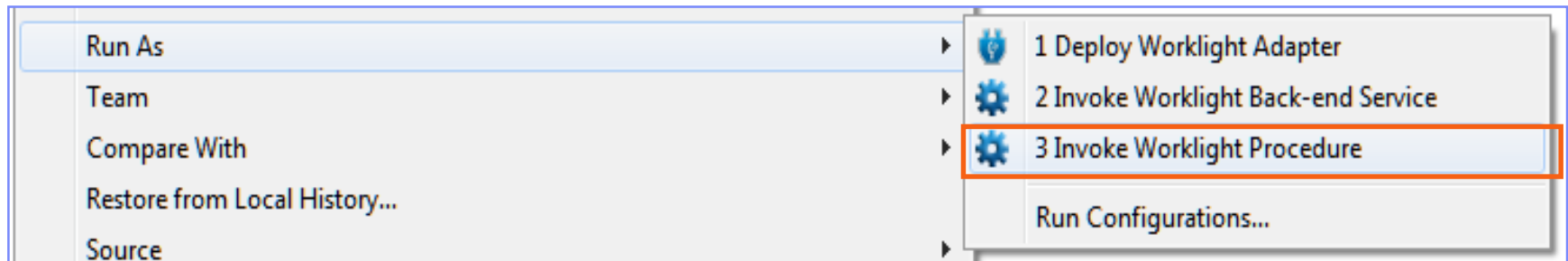


- Worklight Studio archives the adapter code and deploys it to the Worklight Server.
- You can see the deployed adapter in Worklight Console:



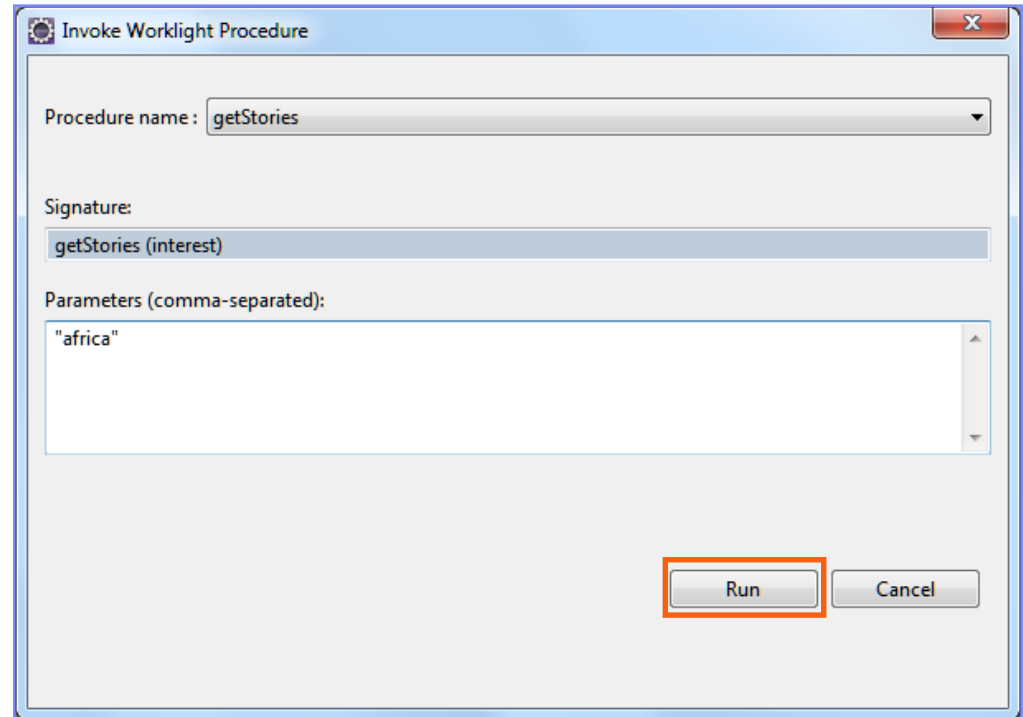
Adapter deployment – testing adapter procedures

- Use Worklight Studio to test the adapter procedures.
- To run a procedure test, choose **Invoke Worklight Procedure** from the **Run As** menu.



Adapter deployment – testing adapter procedures - continued

- Select the procedure that you want to test.
- Enter comma-separated procedure parameters.
- Click **Run**.



Agenda

- Adapters overview
 - Benefits
 - Anatomy
- Adapter creation
- Adapter deployment
 - Testing adapter procedures
- Adapter structure
 - XML
 - JavaScript

Adapter structure - XML

```
<wl:adapter name="HelloWorklight">
  <displayName />
  <description />
  <connectivity>
    <connectionPolicy>
    <loadConstraints>
  </connectivity>
  <procedure />
  <procedure />
  ...
</wl:adapter>
```

The adapter name is a required attribute.

Adapter structure – XML - continued

```
<wl:adapter name="HelloWorklight">  
  <displayName />  
  <description />  
  <connectivity>  
    <connectionPolicy>  
    <loadConstraints>  
  </connectivity>  
  <procedure />  
  <procedure />  
  ...  
</wl:adapter>
```

Optional: The name that is displayed in Worklight Console

Adapter structure – XML - continued

```
<wl:adapter name="HelloWorklight">
  <displayName />
  <description />
  <connectivity>
    <connectionPolicy>
    <loadConstraints>
  </connectivity>
  <procedure />
  <procedure />
  .....
</wl:adapter>
```

Optional: Additional information that is displayed in Worklight Console

Adapter structure – XML - continued

```

<wl:adapter name="HelloWorklight">
  <displayName />
  <description />
  <connectivity>
    <connectionPolicy>
    <loadConstraints>
  </connectivity>
  <procedure />
  <procedure />
  ...
</wl:adapter>

```

Connectivity

- Defines the connection properties and load constraints of the back-end system
- When the back-end system requires user authentication, this element defines how user credentials are obtained

Adapter structure – XML - continued

```
<wl:adapter name="HelloWorklight">  
  <displayName />  
  <description />  
  <connectivity>  
    <connectionPolicy>  
    <loadConstraints>  
  </connectivity>  
  <procedure />  
  <procedure />  
  ...  
</wl:adapter>
```

Procedures

Declare a service for accessing a back-end application. One entry for each adapter procedure.

Adapter structure – JavaScript

- Each procedure declared in the adapter XML file must have a corresponding function in the JavaScript file.
- WL.Server API defines a procedure logic in JavaScript.

```
<procedure name="procedure1"/>
<procedure name="procedure2"/>
```

XML File



```
var procedure1Statement = WL.Server.createStatement("select COLUMN1,
COLUMN2 from TABLE1 where COLUMN3 = ?");
```

```
function procedure1(param) {
    return WL.Server.invokeSQLStatement({
        preparedStatement : procedure1Statement,
        parameters : [param]
    });
}
```

JavaScript File

Quiz

Test your knowledge. Answers are in the following slide.

- A Worklight adapter is used to:
 - Adapt the application to various environments such as iOS or Android.
 - Connect to various back-end systems.
 - Make sure that client application works directly with a corporate back-end system.
 - Make sure that client application is not running on a jail-broken or rooted device.
- What type of adapter is not provided by Worklight?
 - SQL adapter to connect to SQL-based servers.
 - HTTP adapter to communicate with web-based services.
 - Cast Iron adapter.
 - SIP adapter for VoIP communications.
- Each Worklight adapter consists of:
 - Single XML file with adapter settings, single JS file with adapter implementation.
 - Single XML file with adapter settings, multiple JS files with adapter implementation.
 - Multiple XML files with adapter settings, multiple JS files with adapter implementation.
 - Multiple XML files with adapter settings, single JS file with adapter implementation.

Quiz - answers

- A Worklight adapter is used to:
 - Adapt the application to various environments such as iOS or Android.
 - Connect to various back-end systems.
 - Make sure that client application works directly with a corporate back-end system.
 - Make sure that client application is not running on a jail-broken or rooted device.
- What type of adapter is not provided by Worklight?
 - SQL adapter to connect to SQL-based servers.
 - HTTP adapter to communicate with web-based services.
 - Cast Iron adapter.
 - SIP adapter for VoIP communications.
- Each Worklight adapter consists of:
 - Single XML file with adapter settings, single JS file with adapter implementation.
 - Single XML file with adapter settings, multiple JS files with adapter implementation.
 - Multiple XML files with adapter settings, multiple JS files with adapter implementation.
 - Multiple XML files with adapter settings, single JS file with adapter implementation.

Notices

- Permission for the use of these publications is granted subject to these terms and conditions.
- This information was developed for products and services offered in the U.S.A.
- IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.
- IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:
 - IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.
- For license inquiries regarding double-byte character set (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:
 - Intellectual Property Licensing
Legal and Intellectual Property Law
IBM Japan Ltd.
1623-14, Shimotsuruma, Yamato-shi
Kanagawa 242-8502 Japan
- **The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law:** INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.
- This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.
- Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.
- IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.
- Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:
 - IBM Corporation
Dept F6, Bldg 1
294 Route 100
Somers NY 10589-3216
USA

- Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.
- The licensed program described in this document and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement or any equivalent agreement between us.
- Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

COPYRIGHT LICENSE:

- This information contains sample application programs in source language, which illustrate programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs.
- Each copy or any portion of these sample programs or any derivative work, must include a copyright notice as follows:
 - © (your company name) (year). Portions of this code are derived from IBM Corp. Sample Programs.
© Copyright IBM Corp. _enter the year or years_. All rights reserved.

Privacy Policy Considerations

- IBM Software products, including software as a service solutions, ("Software Offerings") may use cookies or other technologies to collect product usage information, to help improve the end user experience, to tailor interactions with the end user or for other purposes. In many cases no personally identifiable information is collected by the Software Offerings. Some of our Software Offerings can help enable you to collect personally identifiable information. If this Software Offering uses cookies to collect personally identifiable information, specific information about this offering's use of cookies is set forth below.
- Depending upon the configurations deployed, this Software Offering may use session cookies that collect session information (generated by the application server). These cookies contain no personally identifiable information and are required for session management. Additionally, persistent cookies may be randomly generated to recognize and manage anonymous users. These cookies also contain no personally identifiable information and are required.
- If the configurations deployed for this Software Offering provide you as customer the ability to collect personally identifiable information from end users via cookies and other technologies, you should seek your own legal advice about any laws applicable to such data collection, including any requirements for notice and consent. For more information about the use of various technologies, including cookies, for these purposes, see IBM's Privacy Policy at <http://www.ibm.com/privacy> and IBM's Online Privacy Statement at <http://www.ibm.com/privacy/details> the sections entitled "Cookies, Web Beacons and Other Technologies" and the "IBM Software Products and Software-as-a-Service Privacy Statement" at <http://www.ibm.com/software/info/product-privacy>.

Support and comments

- For the entire IBM Worklight documentation set, training material and online forums where you can post questions, see the IBM website at:
 - <http://www.ibm.com/mobile-docs>
- **Support**
 - Software Subscription and Support (also referred to as Software Maintenance) is included with licenses purchased through Passport Advantage and Passport Advantage Express. For additional information about the International Passport Advantage Agreement and the IBM International Passport Advantage Express Agreement, visit the Passport Advantage website at:
 - <http://www.ibm.com/software/passportadvantage>
 - If you have a Software Subscription and Support in effect, IBM provides you assistance for your routine, short duration installation and usage (how-to) questions, and code-related questions. For additional details, consult your IBM Software Support Handbook at:
 - <http://www.ibm.com/support/handbook>
- **Comments**
 - We appreciate your comments about this publication. Please comment on specific errors or omissions, accuracy, organization, subject matter, or completeness of this document. The comments you send should pertain to only the information in this manual or product and the way in which the information is presented.
 - For technical questions and information about products and prices, please contact your IBM branch office, your IBM business partner, or your authorized remarketer.
 - When you send comments to IBM, you grant IBM a nonexclusive right to use or distribute your comments in any way it believes appropriate without incurring any obligation to you. IBM or any other organizations will only use the personal information that you supply to contact you about the issues that you state.
 - Thank you for your support.
 - Submit your comments in the IBM Worklight Developer Edition support community at:
 - <https://www.ibm.com/developerworks/mobile/worklight/connect.html>
 - If you would like a response from IBM, please provide the following information:
 - Name
 - Address
 - Company or Organization
 - Phone No.
 - Email address

Thank You

