Testing and Debugging Adapters

fork and edit tutorial (https://github.ibm.com/MFPSamples/DevCenter/tree/master/tutorials/en/foundation/8.0/adapters/testing-and-debugging-adapters/index.md) | report issue (https://github.ibm.com/MFPSamples/DevCenter/issues/new)

Overview

You can test Java and JavaScript adapters as well as debug Java code implemented for use in Java or JavaScript adapters via IDEs such as Eclipse, IntelliJ and alike.

This tutorial demonstrates how to test adapters using the MobileFirst Developer CLI and using Postman and also how to debug a Java adapter using the Eclipse IDE.

Jump to:

- Testing Adapters
  - Using Postman
  - Using Swagger
- Debugging Adapters
  - JavaScript adapters
  - Java adapters

Testing Adapters

MobileFirst adapters are available via a REST interface. This means that if you know the URL of a resource, you can use HTTP tools such as Postman to test requests and pass `URL` parameters, `path` parameters, `body` parameters or `headers` as you see fit.

The structure of the URL used to access the adapter resource is:

- In JavaScript adapters - `http://hostname-or-ip-address:port-number/mfp/api/adapters/{adapter-name}/{procedure-name}`
- In Java adapters - `http://hostname-or-ip-address:port-number/mfp/api/adapters/{adapter-name}/{path}`

Passing parameters

- When using Java adapters, parameters can be passed in the URL, body, form, etc, depending on how you configured your adapter.
- When using JavaScript adapters, parameters are passed as `params=["param1", "param2"]`. In other words, a JavaScript procedure receives only one parameter called `params` which needs to be an array of ordered, unnamed values. This parameter can either be in the URL (`GET`) or in the body (`POST`) using `Content-Type: application/x-www-form-urlencoded`.

Handling security

If your resource is protected by a scope, the request prompts you to provide a valid authorization header. Note that by default, MobileFirst uses a simple security scope even if you did not specify any. So unless you specifically disabled security, the endpoint is always protected.

To disable security in Java adapters you should attach the `OAuthSecurity` annotation to the method/class:

```
@OAuthSecurity(enabled=false)
```

To disable security in JavaScript adapters you should add the `secured` attribute to the procedure:

```
<procedure name="adapter-procedure-name" secured="false"/>
```

Alternatively, the development version of the MobileFirst Server includes a test token endpoint to bypass the security challenges.

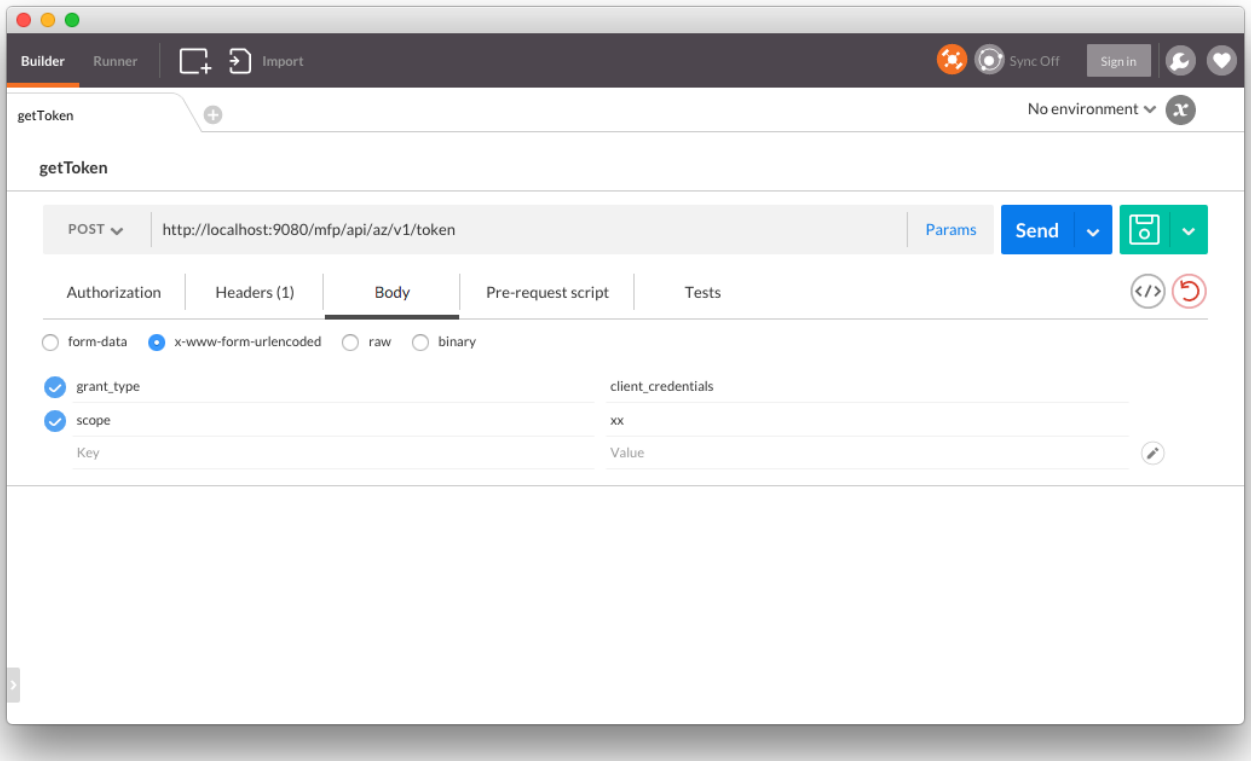
Using Postman

Test Token

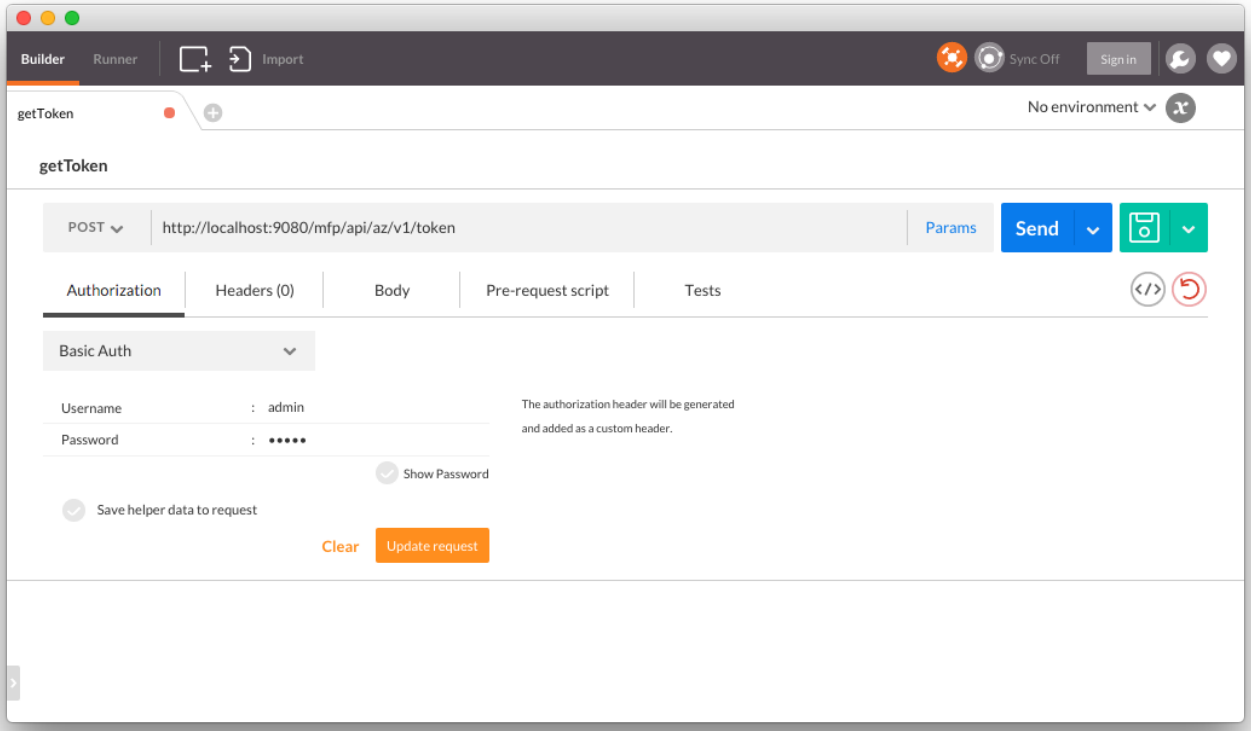
To receive a Test Token you should:

1. Use your HTTP client (Postman) to make an HTTP `POST` request to `http://<IP>:<PORT>/mfp/api/az/v1/token` with the following parameters using `Content-Type: application/x-www-form-urlencoded`:

   ```
   grant_type : client_credentials
   scope : **
   ```



2. Add an `authorization header` using `Basic authentication` with username "admin" and password "admin".

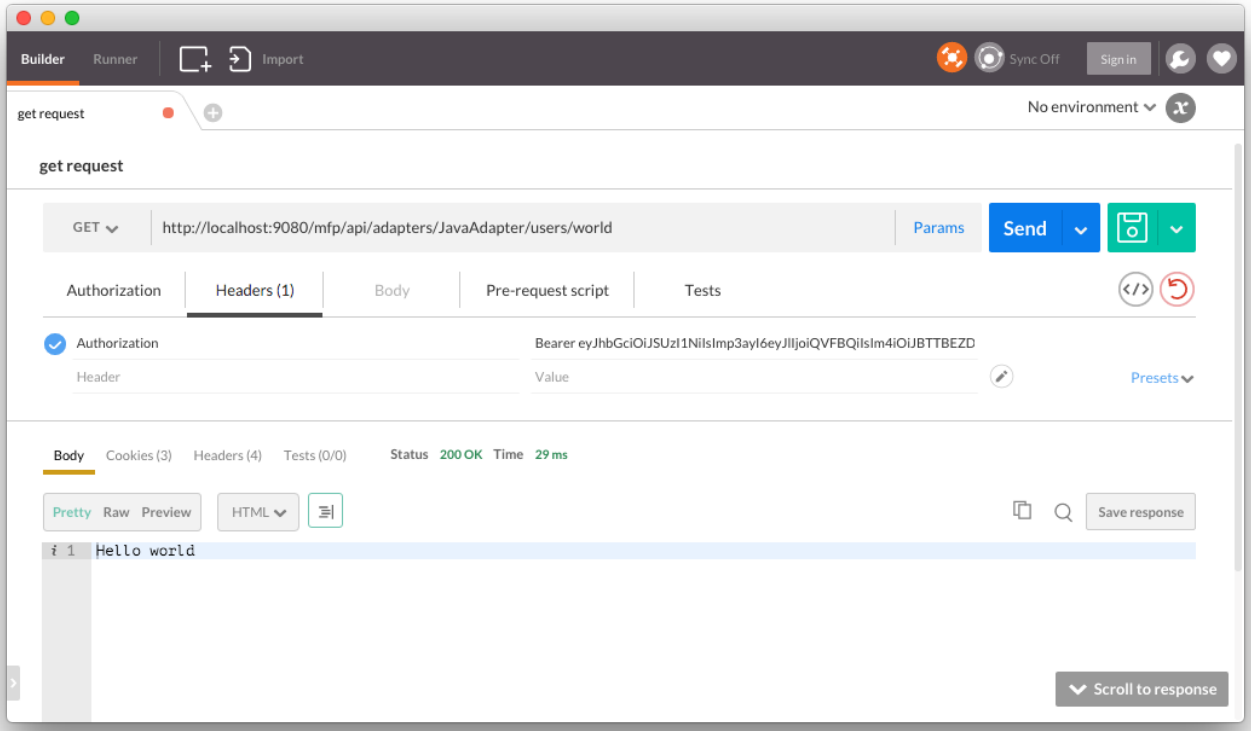


The result will be a JSON object with a temporary valid access token:


```
{
  "access_token": "eyJhbGciOiJSUzI1NiIsImp3ayI6eyJlIjoiQVFBQiIsIm4iOiJBTTBEZDd4QWR2NkgteWdM
N3I4cUNMZEUtM0kya2s0NXpnWnREZF9xczhmdm5ZZmRpcVRTVjRfMnQ2T0dHOENWNUNlNDFQTXBJd
21MNDEwWDlJWm52aHhvWWlGY01TYU9lSXFvZS1ySkEwdVp1dzJySGhYWjNXVkNlS2V6UlZjQ09Zc1FO
LW1RSzBtZno1XzNvLWV2MFVZd1hrU093QkJsMUVocUl3VkR3T2llZzJKTUdsMEVYc1BaZmtOWkktSFU0
b01paS1Uck5MelJXa01tTHZtMDloTDV6b3NVTkExNXZlQ0twaDJXcG1TbTJTNjFuRGhIN2dMRW95bURuV
EVqUFk1QW9oMmluSS0zNlJHWVZNVViTzQ2Q3JOVVI1SW9iT2lYbEx6QklodUlDcGZWZHhUX3g3c3RL
WDVDOUJmTVRCNEdrT0hQNWNVdjdOejFkRGhJUHU4Iiwia3R5IjoiUlNBIiwia2lkIjoidGVzdCJ9fQ.eyJpc3Mi
OiJjb20uaWJtLm1mcCIsInN1YiI6InRlc3QiLCJhdWQiOiJjb20uaWJtLm1mcCIsImV4cCI6MTQ1MjUxNjczODA
wNSwic2NvcGUiOiJ4eCJ9.vhjSkv5GShCpcDSu1XCp1FlgSpMHZa-fcJd3iB4JR-xr_3HOK54c36ed_U5s3rvX
Viao5E4HQUZ7PIEOl23bR0RGT2bMGJHiU7c0lyrMV5YE9FdMxqZ5MKHvRnSOeWlt2Vc2izh0pMMTZd-oL-
0w1T8e-F968vycyXeMs4UAbp5Dr2C3DcXCzG_h9jujsNNxgXL5mKJem8EpZPolQ9Rgy2bqt45D06QTW7J9
Q9GXKt1XrkZ9bGpL-HgE2ihYeHBygFll80M8O56By5KHwfSvGDJ8BMdasHFfGDRZUtC_yz64mH1lVxz5o0v
WqPwEuyfslTNCN-M8c3W9-6fQRjO4bw",
  "token_type": "Bearer",
  "expires_in": 3599,
  "scope": "**"
}
```


Sending request

Now with any future request to adapter endpoints, add an HTTP header with the name `Authorization` and the value you received previously (starting with Bearer). The security framework will skip any security challenges protecting your resource.

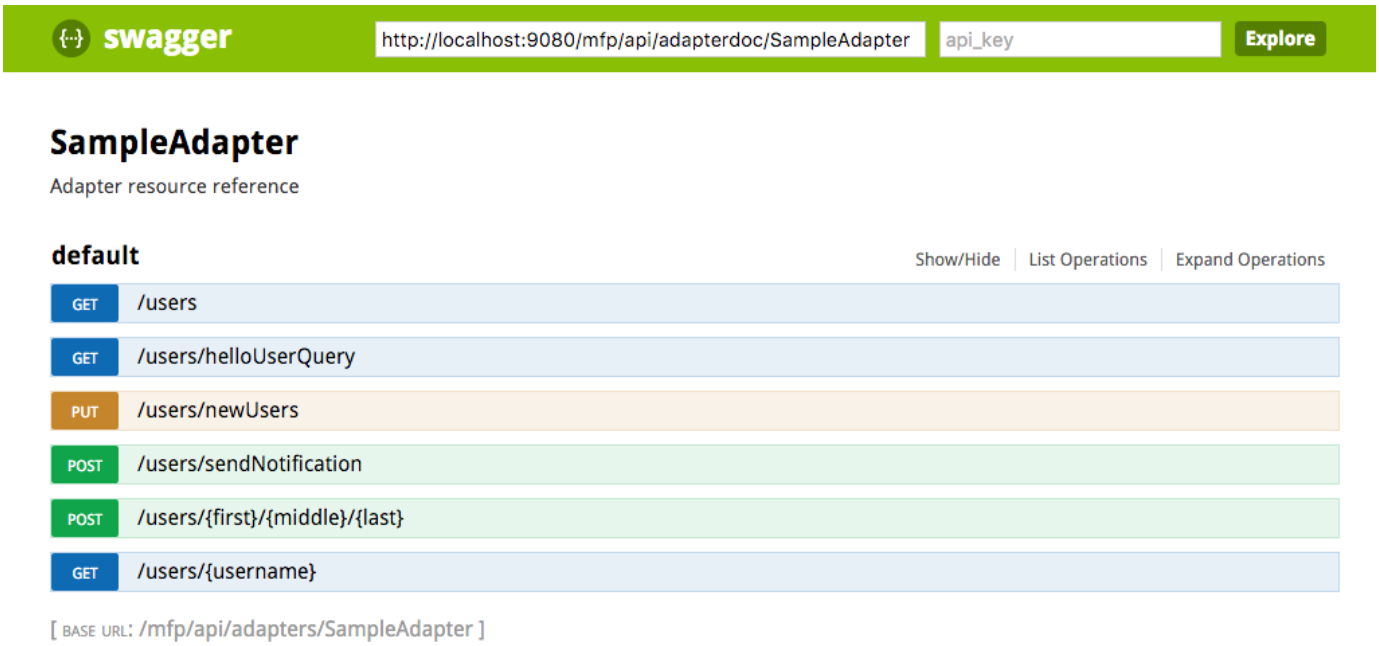


Using Swagger

The Swagger docs UI is a visual representation of an adapter's REST endpoints.
Using Swagger, a developer can test the adapter endpoints before they are consumed by a client application.

To access Swagger:

1. Open the MobileFirst Operations Console and select an adapter from the adapters list.
2. Click on the **Resources** tab.
3. Click on the **View swagger Docs** button.
4. Click on the **Show/Hide** button.



Test Token

To add a Test Token to the request, so the security framework will skip any security challenges protecting your resource, click the **on/off switch** button on the right corner of an endpoint's operation.

You will be asked to select which scopes you want to grant to the Swagger UI (for testing purposes you can select all). If you are using the Swagger UI for the first time you may be required to log in with the MobileFirst Operations Console username and password.

Sending request

Expand the endpoint's operation, enter the required parameters (if needed) and click on the **Try it out!** button.

POST /users/{first}/{middle}/{last}

ON

Response Class (Status 200)

Response Content Type */*

Parameters

Parameter	Value	Description	Parameter Type	Data Type
first	John		path	string
middle	M		path	string
last	Smith		path	string
age	42		query	integer
height	175		formData	string
Date	1974-05-05		header	string

Try it out! Hide Response

Curl

```
curl -X POST --header "Content-Type: application/x-www-form-urlencoded" --header "Accept: */*" --header "Date: 1974-05-
```

Request URL

```
http://localhost:9080/mfp/api/adapters/SampleAdapter/users/John/M/Smith?age=42
```

Response Body

```
John M Smith
Age: 42
Height: 175
Date: null
```

Response Code

```
200
```

Response Headers

```
{
  "date": "Wed, 03 Feb 2016 07:58:31 GMT",
  "x-powered-by": "Servlet/3.1",
  "content-length": "43",
  "content-type": "application/octet-stream"
}
```

Debugging Adapters

JavaScript adapters

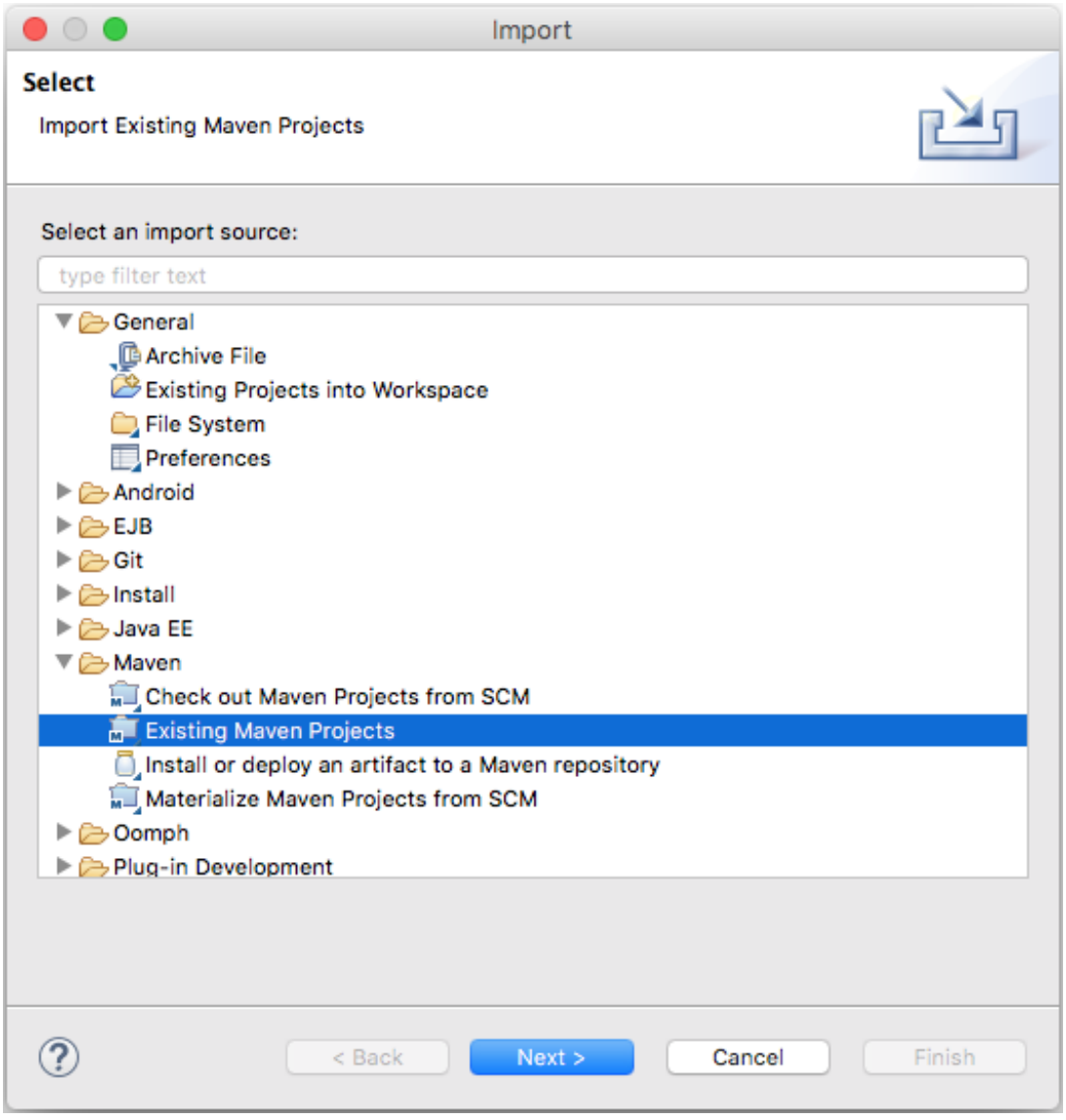
You can debug JavaScript code in JavaScrit adapters by using the `WL.Logger` API.
Available logging levels, from least to most verbose, are: `WL.Logger.error`, `WL.Logger.warn`, WL.Logger.info `and` WL.Logger.debug`.

The logs are then printed to the log file of the application server.
Be sure to set the server verbosity level accordingly, otherwise you will not see the logging in the log file.

Java adapters

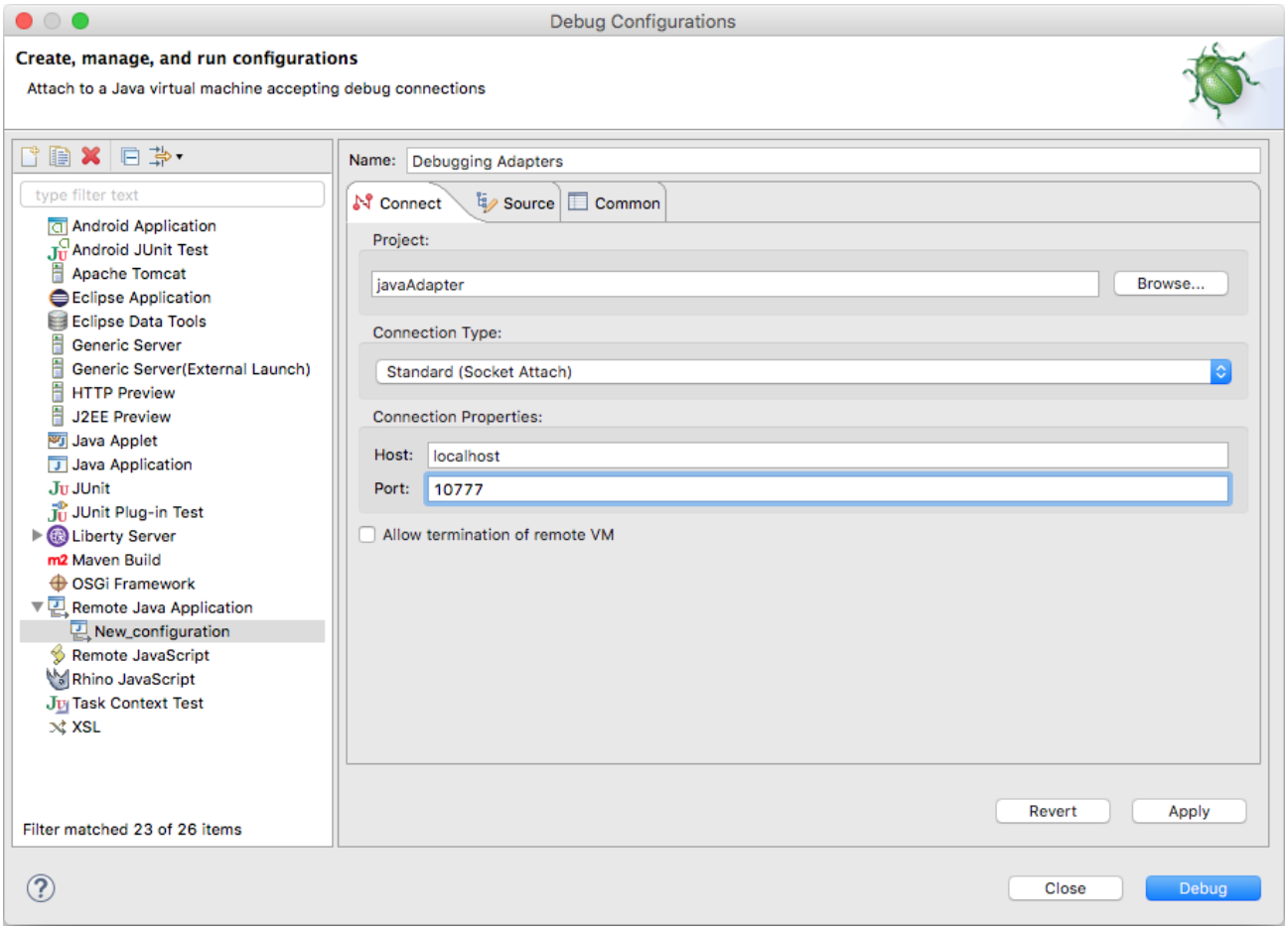
Before an adapter's Java code can be debugged, Eclipse needs to be configured as follows:

1. **Maven integration** - Starting Eclipse Kepler (v4.3), Maven support is built-in in Eclipse.
   If your Eclipse instance does not support Maven, follow the m2e instructions
   (http://www.eclipse.org/m2e/) to add Maven support.
2. Once Maven is available in Eclipse, import the adapter Maven project:

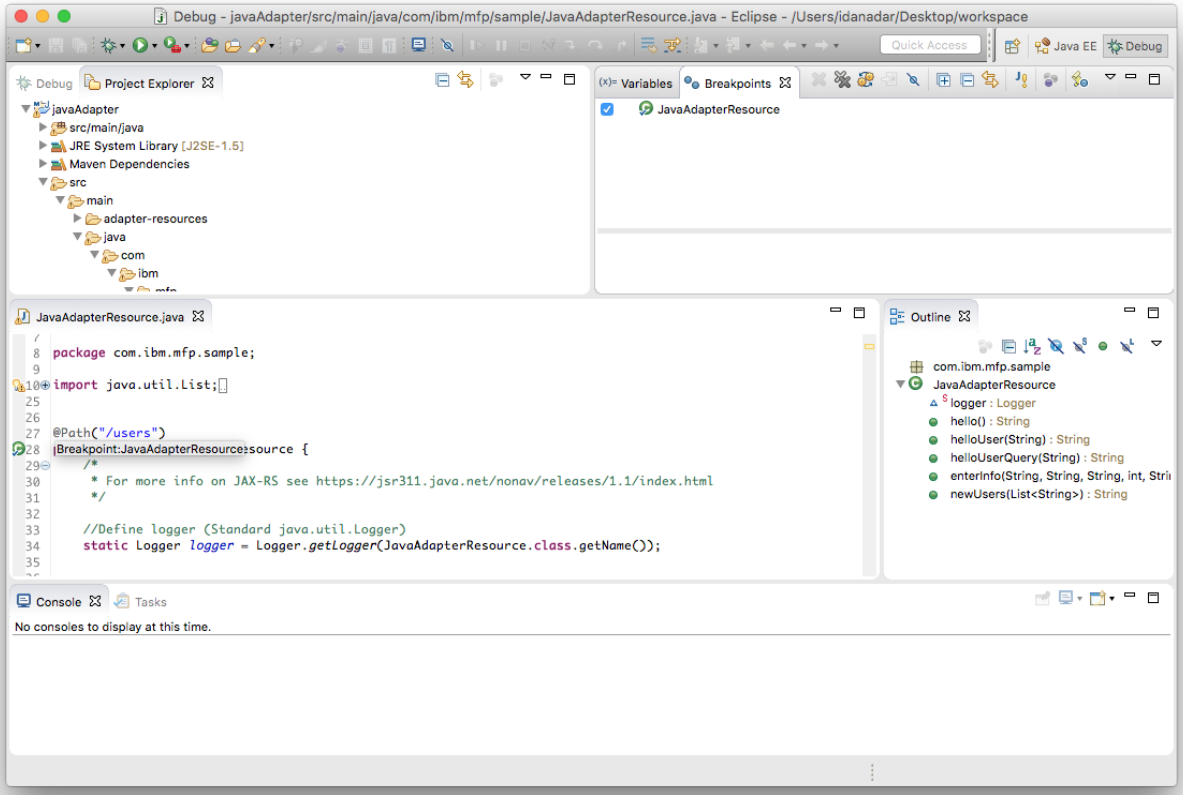


3. Provide debugging parameters:

- Click **Run → Debug Configurations**.
- Double-click on **Remote Java application**.
- Provide a **Name** for this configuration.
- Set the **Port** value to "10777".
- Click **Browse** and select the Maven project.
- Click **Debug**.



4. Click on **Window → Show View → Debug** to enter *debug mode*. You can now debug the Java code normally as you would do a standard Java application. You need to issue a request to the adapter to make its code run and hit any set breakpoints. This can be accomplished by following the instructions on how to call an adapter resource in the Testing adapters section (../creating-adapters/#testing-adapters).


Debug - javaAdapter/src/main/java/com/ibm/mfp/sample/JavaAdapterResource.java - Eclipse - /Users/idanadar/Desktop/workspace
Quick Access
Java EE
Debug
Debug
Project Explorer
javaAdapter
src/main/java
JRE System Library [J2SE-1.5]
Maven Dependencies
src
main
adapter-resources
java
com
ibm
Variables
Breakpoints
JavaAdapterResource
JavaAdapterResource.java
8 package com.ibm.mfp.sample;
10 import java.util.List;
27 @Path("/users")
28 Breakpoint:JavaAdapterResource source {
29 /*
30 * For more info on JAX-RS see https://jsr311.java.net/nonav/releases/1.1/index.html
31 */
33 //Define logger (Standard java.util.Logger)
34 static Logger logger = Logger.getLogger(JavaAdapterResource.class.getName());
Outline
com.ibm.mfp.sample
JavaAdapterResource
logger : Logger
hello() : String
helloUser(String) : String
helloUserQuery(String) : String
enterInfo(String, String, String, int, Stri
newUsers(List<String>) : String
Console
Tasks
No consoles to display at this time.