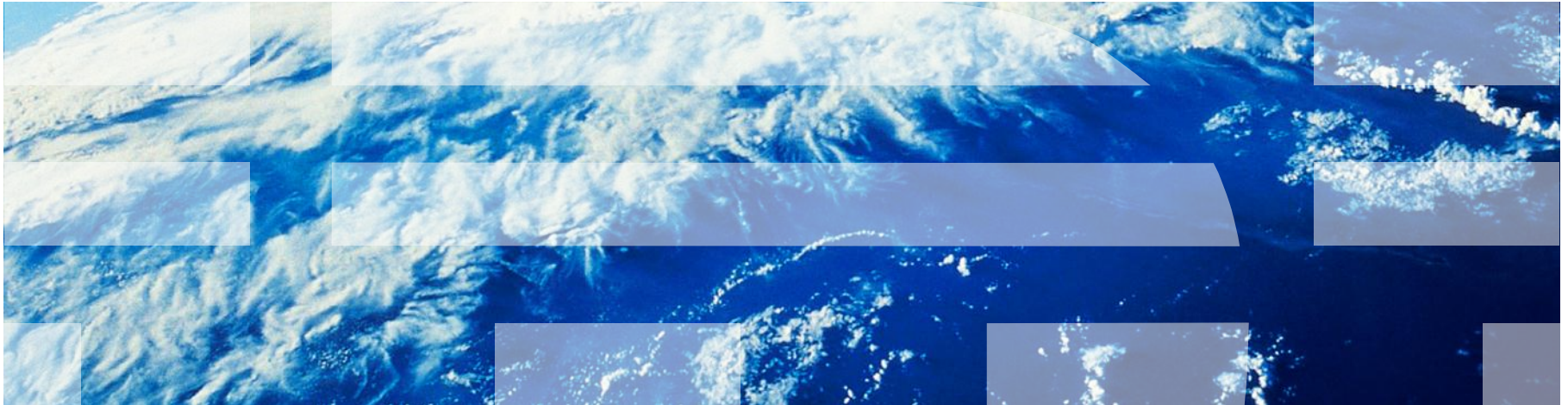


IBM Worklight Foundation V6.2.0 Getting Started

HTTP adapter – Communicating with HTTP back-end systems



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Agenda

- What is it?
- How does it work?
- Creating the adapter
- Using SOAP
 - Creating SOAP-based service request
 - Service request invocation
 - Service discovery
- Back-end service discovery
- Exercise

What is it?

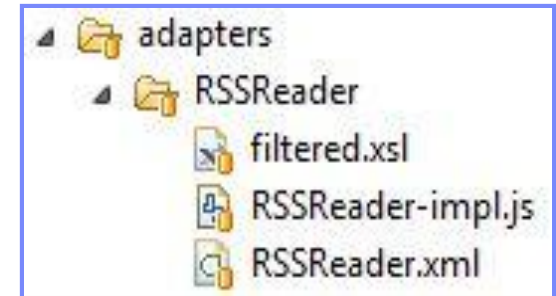
- A Worklight® HTTP adapter:
 - Works with RESTful and SOAP-based services.
 - Can read structured HTTP sources. For example, RSS feeds.
 - Allows sending a GET or POST HTTP request and retrieves data from the response headers and body.
 - Is easily customizable with simple server-side JavaScript™.
 - Enables optional server-side filtering.
 - Retrieved data can be in XML, HTML, JSON, or plain text formats.

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How does it work?

- The adapter is configured with XML.
- It uses XML to define the adapter properties and procedures.
- It uses JavaScript to create procedures.
- *Optional:* It uses XSL to filter received records and fields.

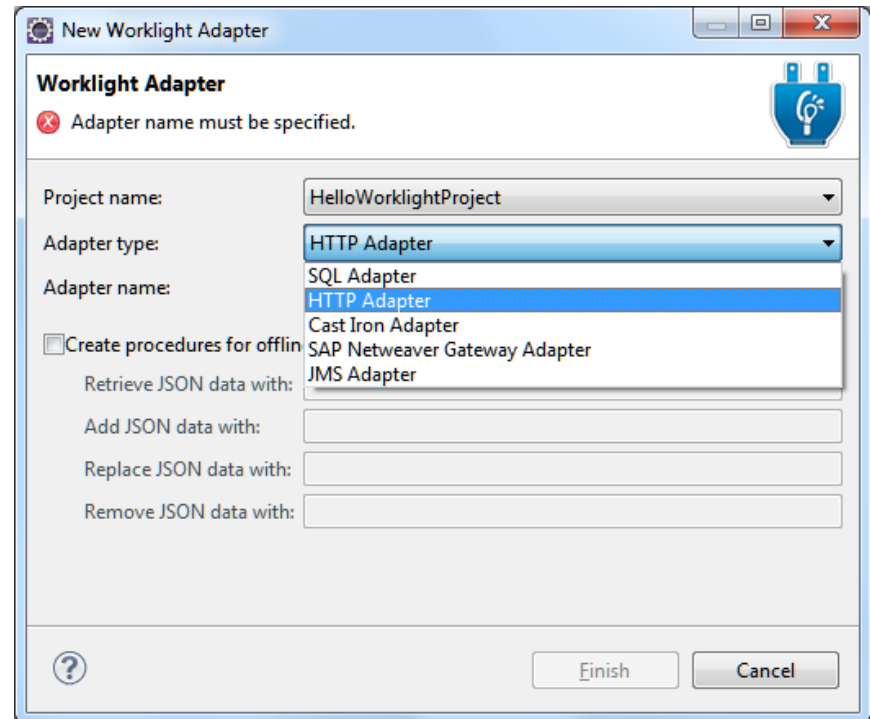
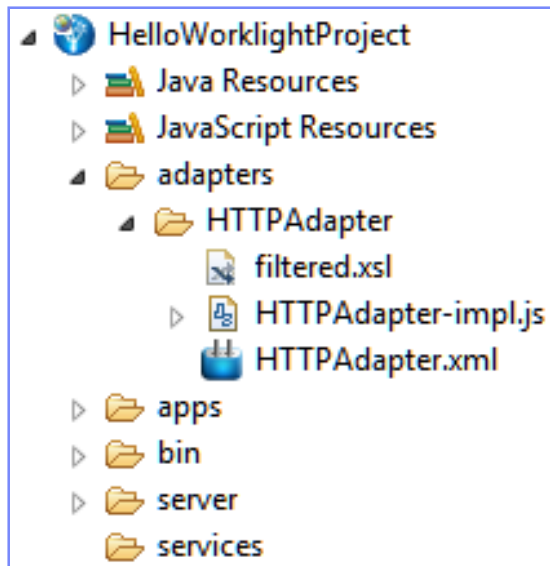


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Creating the adapter

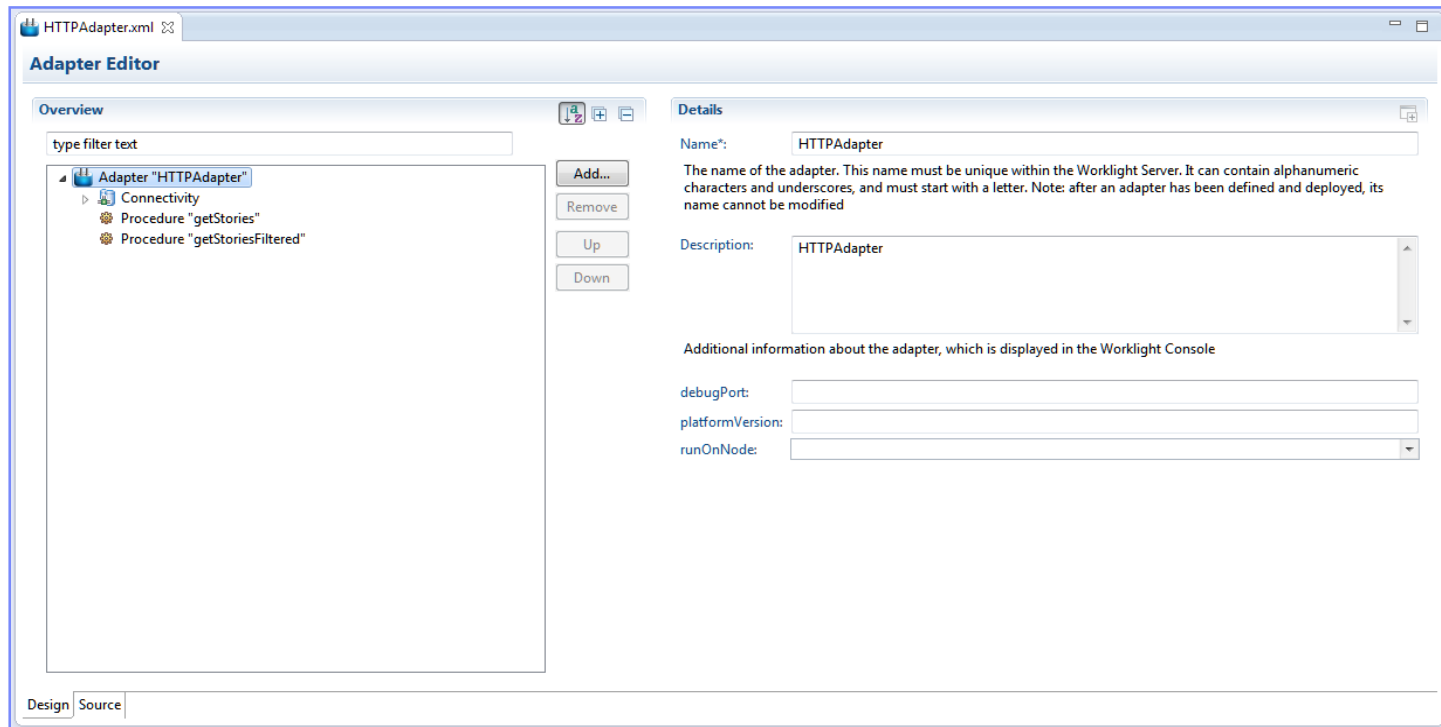
- In Worklight Studio, create a Worklight Adapter.
 - Choose the HTTP Adapter type.
 - A standard HTTP adapter structure is created:



Creating the adapter – continued

Adapter XML editor

- Settings and metadata are stored in the adapter XML file.
- You can use either the Design or Source editor to modify the adapter XML file.



Creating the adapter – continued

XML file: connectivity settings

- To edit the adapter XML file, you must:
 - Set the protocol to HTTP or HTTPS.
 - Set the HTTP domain to domain part of HTTP URL.
 - Set the TCP Port.

```
<connectivity>
  <connectionPolicy xsi:type="http:HTTPConnectionPolicyType">
    <protocol>http</protocol>
    <domain>rss.cnn.com</domain>
    <port>80</port>
    <!-- Following properties used by adapter's key manager for
    choosing specific certificate from key store
    <sslCertificateAlias></sslCertificateAlias>
    <sslCertificatePassword></sslCertificatePassword>
    -->
  </connectionPolicy>
  <loadConstraints maxConcurrentConnectionsPerNode="2" />
</connectivity>
```

Creating the adapter – continued

XML file: procedures declaration

- Edit the adapter XML file.
- Declare the required procedures below the connectivity element.

```
<connectivity>
```

```
...
```

```
...
```

```
...
```

```
</connectivity>
```

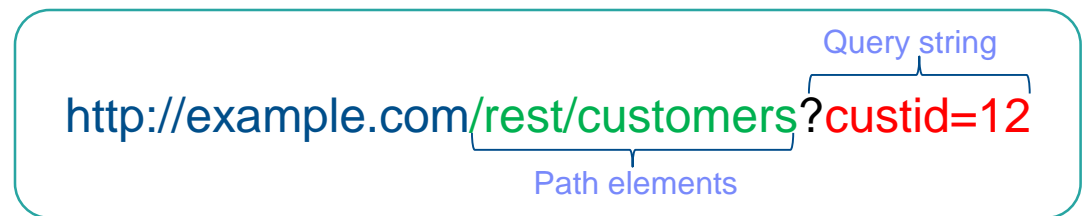
```
<procedure name="getStories"/>
```

```
<procedure name="getStoriesFiltered"/>
```

Creating the adapter – continued

JS file: procedures implementation

- Procedures are implemented in the adapter JavaScript file.
- The service URL is used for procedure invocation.
- Some parts of the URL are constant; for example, <http://example.com/>. They are declared in the XML file.
- Other parts of the URL can be parameterized; that is, substituted at run time by parameter values that are provided to the Worklight procedure.
- URL parts that can be parameterized are:
 - Path elements.
 - Query string parameters.
 - Fragments.
- See the Worklight user documentation for advanced options for adapters, such as cookies, headers, and encoding.



Creating the adapter – continued

JS file: procedures implementation

- The procedure name in the JavaScript file must be the same as in the XML file.
- The required invocation parameters are `method`, `path`, and `returnedContentType`.
- The procedure can be parameterized at run time.

```
<connectivity>
...
...
...
</connectivity>
<procedure name="getStories"/>
<procedure name="getStoriesFiltered"/>
```

The procedure XML file

```
function getStories(interest) {
    path = getPath(interest);
    var input = {
        method : 'get',
        returnedContentType : 'xml',
        path : path
    };
    return WL.Server.invokeHttp(input);
}
```

The procedure JavaScript file

Creating the adapter – continued

JS file: procedures implementation

- To invoke an HTTP request, use the `WL.Server.invokeHttp` method.
- Provide an input parameters object.
- You must specify:
 - The HTTP method: `GET` or `POST`.
 - The returned content type: `XML`, `JSON`, `HTML`, or `plain`.
 - The service path.
 - The query parameters (optional).
 - The request body (optional).
 - The transformation type (optional).
- For a complete list of invocation options, see the Worklight user documentation.

```
function getStories(interest) {  
    path = getPath(interest);  
  
    var input = {  
        method : 'get',  
        returnedContentType : 'xml',  
        path : path  
    };  
    return WL.Server.invokeHttp(input);  
}
```

Creating the adapter – continued

XSL transformation filtering

- XSL transformation can be applied to the received data.
- It can be used to filter received data.
- To apply, specify the transformation options in the procedure invocation input parameters.

```
function getStoriesFiltered(interest) {  
    path = getPath(interest);  
  
    var input = {  
        method : 'get',  
        returnedContentType : 'xml',  
        path : path,  
        transformation : {  
            type : 'xslFile',  
            xslFile : 'filtered.xsl'  
        }  
    };  
    return WL.Server.invokeHttp(input);  
}
```

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Creating a SOAP-based service request

- The `WL.Server.invokeHttp` method can be used to create a SOAP envelope, which can be sent directly.
 - To invoke a SOAP-based service in an HTTP adapter, you must encode the SOAP XML envelope within the request body.
 - Encoding XML within JavaScript is simple by using E4X, which is officially part of JavaScript 1.6.
 - This technology can be used to encode any type of XML document, not only SOAP envelopes.

- If you receive error messages for SOAP envelopes, disable the JavaScript validator.
 - Click **Project > Properties > Builders** and clear **JavaScript Validator**.

Creating a SOAP-based service request – continued

- Use JavaScript to create a SOAP Envelope.

```
var request =  
    <soap:Envelope  
        xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"  
        xmlns:xsd="http://www.w3.org/2001/XMLSchema"  
        xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">  
    <soap:Body>  
        <CelsiusToFahrenheit  
            xmlns="http://www.w3schools.com/webservices/">  
            <Celsius>{celsiusTemp}</Celsius>  
        </CelsiusToFahrenheit>  
    </soap:Body>  
</soap:Envelope>;
```

Creating a SOAP-based service request – continued

- It is possible to insert JavaScript code and variables into SOAP XML. It is evaluated at run time.

```
<soap:Envelope
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
  </soap:Body
    <messageHeader>
      <originatingIP>
        { WL.Server.configuration["local.IPAddress"]}
      </originatingIP>
      <requestTimestamp>
        { new Date().toLocaleString() }
      </requestTimestamp>
    </messageHeader>
  </soap:Body>
</soap:Envelope>;
```

Service request invocation

- The `WL.Server.invokeHttp(options)` method is used to invoke a request for a SOAP service.
- The Options object must include the following properties:
 - A method – usually `POST`
 - A `returnedContentType` – usually `XML`
 - A path – a service path
 - A body:
 - `content` – SOAP XML as a string
 - `contentType`

```
var input = {
  method: 'post',
  returnedContentType: 'xml',
  path: '/webservices/tempconvert.asmx',
  body: {
    content: request.toString(),
    contentType: 'text/xml; charset=utf-8',
  },
};
```

Service request invocation – continued

- Full SOAP-based service invocation procedure, as provided in the sample project:

```
function temperatureConvertor(celsiusTemp) {
    var request =
        <soap:Envelope
            xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
            xmlns:xsd="http://www.w3.org/2001/XMLSchema"
            xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">

            <soap:Body>
                <messageHeader>
                    <originatingIP>
                        { WL.Server.configuration["local.IPAddress"]}
                    </originatingIP>

                    <requestTimestamp>
                        { new Date().toLocaleString() }
                    </requestTimestamp>
                </messageHeader>

            </soap:Body>
        </soap:Envelope>;

    var input = {
        method: 'post',
        returnedContentType: 'xml',
        path: '/webservices/tempconvert.asmx',
        body: {
            content: request.toString(),
            contentType: 'text/xml; charset=utf-8',
        },
    };

    var result = WL.Server.invokeHttp(input);

    return result.Envelope.Body;
};
```

← SOAP envelope

← Options

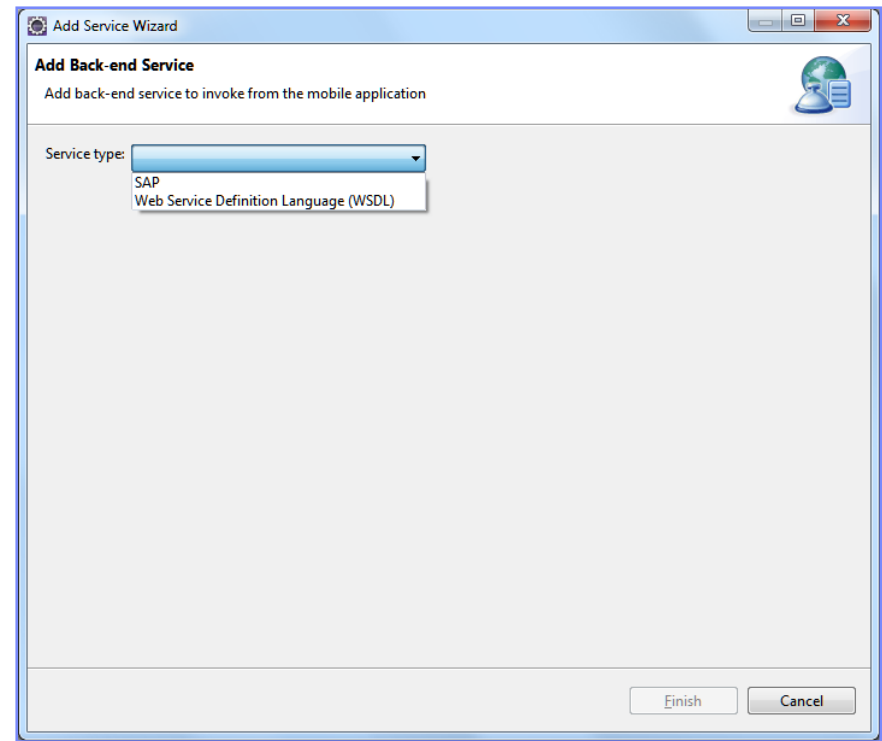
← Request invocation

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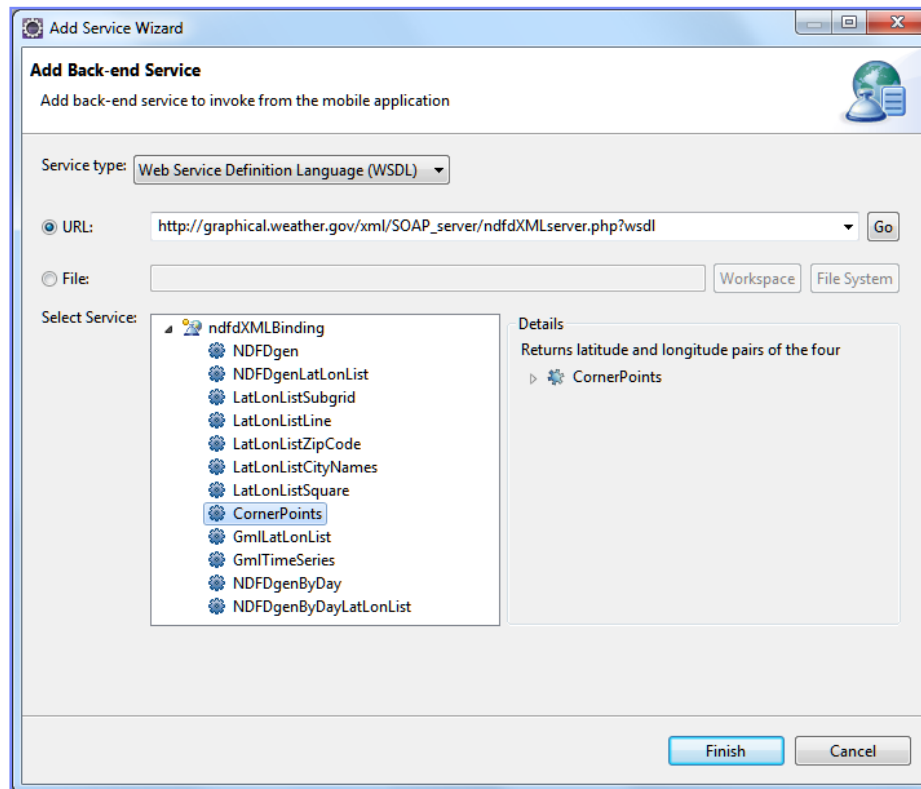
Back-end service discovery

- If you are developing HTTP adapters for SOAP (or SAP) services, you can reduce development time by using the Discover Back-end Services tool to auto-generate the adapter with procedures based on the provided WSDL.
- Right-click on the **services** folder in a Worklight project and choose **Discover back-end services**.
- Select the type of service, **SAP** or **SOAP**:



Back-end service discovery – continued

- Add the services location to use and select the service that you want to add to the adapter.
- Repeat for each service that you want to add; it will be added to the same adapter.



Back-end service discovery – continued

- The end result is an auto-generate adapter:

The screenshot shows an IDE window with a Project Explorer on the left and a code editor on the right. The Project Explorer shows a project named 'HelloWorklightProject' with a folder 'adapters' containing 'SoapAdapter2' and 'SoapAdapter2.xml'. The code editor displays the contents of 'SoapAdapter2-impl.js', which is auto-generated code for a SOAP adapter. The code includes comments explaining the adapter's purpose and structure, and defines several functions: 'ndfdXML_CornerPoints', 'ndfdXML_NDFDgenByDayLatLonList', 'buildBody', and 'getAttributes'.

```

//////////////////////////////////////
// Generated code - Do not edit
//
// This is a SOAP adapter that was auto-generated by Worklight for invocation of specific SOAP-based services.
// The adapter may invoke more than one service as long as they are all from the same endpoint (server host).
// Each adapter procedure matches a single operation for the same endpoint server and accepts:
//   - params - Serialized JSON representation of the XML-based SOAP body to be sent to the service
//   - headers - Custom HTTP headers to be specified when invoking the remote service. It is a JSON object with
//               the headers names and values. E.g. { 'name1' : 'value1', 'name2' : 'value2' }
//////////////////////////////////////

@function ndfdXML_CornerPoints(params, headers){
    var soapEnvNS;

    soapEnvNS = 'http://schemas.xmlsoap.org/soap/envelope/';
    var request = buildBody(params, 'xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/" xmlns:wsdl="http://schemas.xmlsoap.org/soap/envelope/"');
    return invokeWebService(request, headers);
}

@function ndfdXML_NDFDgenByDayLatLonList(params, headers){
    var soapEnvNS;

    soapEnvNS = 'http://schemas.xmlsoap.org/soap/envelope/';
    var request = buildBody(params, 'xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/" xmlns:wsdl="http://schemas.xmlsoap.org/soap/envelope/"');
    return invokeWebService(request, headers);
}

@function buildBody(params, namespaces, soapEnvNS){
    var body =
        '<soap:Envelope xmlns:soap="' + soapEnvNS + '">\n' +
        '<soap:Body>\n';

    body = jsonToXml(params, body, namespaces);

    body +=
        '</soap:Body>\n' +
        '</soap:Envelope>\n';
    return body;
}

@function getAttributes(jsonObj) {
    var attrStr = '';
    for(var attr in jsonObj) {
        var val = jsonObj[attr];
        if (attr.charAt(0) == '@') {
            attrStr += ' ' + attr.substring(1);
            attrStr += '=' + val + ' ';
        }
    }
    return attrStr;
}

```

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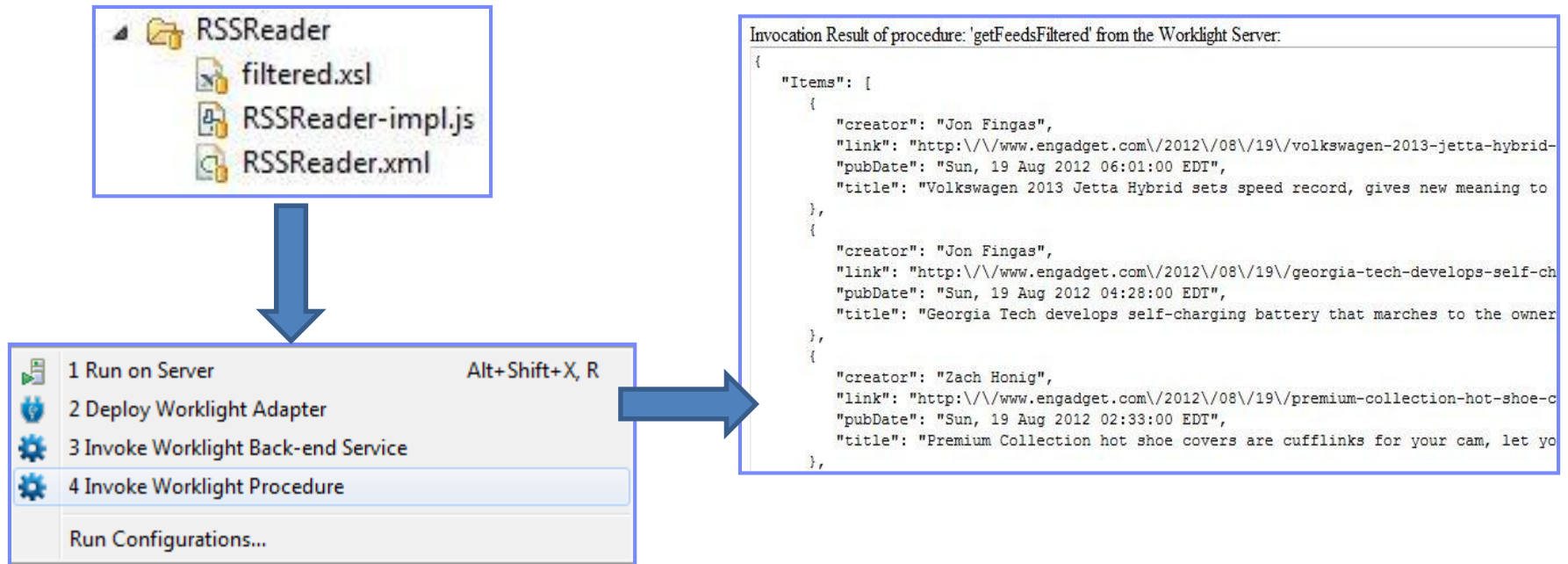
Exercise

Engadget RSS Reader

- Create a Worklight HTTP adapter called **RSSReader**.
- Connect to the Engadget RSS feed at <http://engadget.com/rss.xml>
- Declare and implement a `getFeeds` procedure, which retrieves the RSS feed.
- Declare and implement a `getFeedsFiltered` procedure, which does the same as `getFeeds`, but returns only the `title`, the `creator`, the `pubDate`, and the `link` fields.
- Deploy the adapter and use Worklight Studio to test your procedures as described in this module.

Exercise Solution

- The sample for this training module can be found on the Getting Started page of the Worklight documentation website at <http://www.ibm.com/mobile-docs>.



Quiz

Test your knowledge. Answers are in the following slide.

- HTTP adapters can be used to:
 - Work with RESTful services.
 - Work with SOAP services.
 - Issue GET and POST requests.
 - All of the above.
- What format of data can the HTTP adapter retrieve and automatically parse?
 - XML.
 - JSON.
 - Plain text.
 - All of the above.
- Can you use the HTTP adapter with non-standard HTTP ports?
 - You must use port 80 for HTTP and port 443 for HTTPS.
 - You can use any port for HTTP but only port 443 for HTTPS.
 - You must use port 80 for HTTP but can use any port for HTTPS.
 - It is possible to use any port for both HTTP and HTTPS.

Quiz - answers

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