

Creating REST Clients

Oxford University
Software Engineering Programme
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Just do it?!



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A good answer if you already know

- HTTP Client code
- XML
- JSON
- etc



First try it out

- Chrome Advanced REST Client is a good start
- SOAPUI also provides test capabilities
- curl should be your friend too!



Advanced Rest Client Application

Offline Mail | Inbox (124,820) | WSO2 | WSO2, Inc. - Calendar | bitmark | Shorten with bit.ly | Gmail - Inbox (720)

Advanced Rest Client

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http://localhost:8080/OrderService-1.0-SNAPSHOT/hello/echo/blah

GET POST PUT PATCH DELETE HEAD OPTIONS Other

Raw Form Headers

Add new header

Authorization Bearer MtQqjITzrJ0pSSTpOsoFIS0NO3Ya x

Clear Send

Status **200 OK** Loading time: 309 ms

Request headers

Authorization: Bearer MtQqjITzrJ0pSSTpOsoFIS0NO3Ya
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_8_2) AppleWebKit/537.11 (KHTML, like Gecko) Chrome/23.0.1271.95 Safari/537.11
Accept: */*
Accept-Encoding: gzip, deflate, sdch
Accept-Language: en-US, en; q=0.8
Accept-Charset: ISO-8859-1, utf-8; q=0.7, *; q=0.3

Response headers

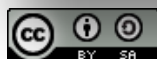
Server: Apache-Coyote/1.1
Date: Wed, 05 Dec 2012 11:15:10 GMT
Content-Type: text/plain
Content-Length: 4

Raw Parsed Response

Open output in new window Copy to clipboard Save as file

blah

Code highlighting thanks to [Code Mirror](#)



curl

```
curl -v http://localhost:8080/OrderService-1.0-SNAPSHOT/hello/echo/blah
* About to connect() to localhost port 8080 (#0)
*   Trying ::1...
* connected
* Connected to localhost (::1) port 8080 (#0)
> GET /OrderService-1.0-SNAPSHOT/hello/echo/blah HTTP/1.1
> User-Agent: curl/7.24.0 (x86_64-apple-darwin12.0) libcurl/7.24.0 OpenSSL/
0.9.8r zlib/1.2.5
> Host: localhost:8080
> Accept: */*
>
< HTTP/1.1 200 OK
< Server: Apache-Coyote/1.1
< Date: Wed, 05 Dec 2012 11:20:17 GMT
< Content-Type: text/plain
< Content-Length: 4
<
* Connection #0 to host localhost left intact
blah* closing connection #0
```



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Next choose your favourite HTTP library

- JS: XMLHttpRequest
- .NET: System.Net.Http.HttpClient
- Java: Many!
 - Built-in: java.net.URLConnection
 - CXF: org.apache.cxf.jaxrs.client.WebClient
 - Apache: org.apache.http.client.HttpClient
 - Google HTTP Client, etc, etc
- Ruby
 - https://www.ruby-toolbox.com/categories/http_clients (too many to list)



JAX-RS 2.0

- Includes support for clients
- Available since CXF 3.0.0



JAX-RS 2.0 Features

- Client API
- Client-side and Server-side Asynchronous
- Filters and Interceptors
- Improved Connection Negotiation
- Validation
- Hypermedia
- Alignment with JSR 330
- Model-View-Controller



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JAXRS 2.0 Client API

- Similar to CXF client
- Aiming to be much higher level than standard HTTP clients
- Not a bad idea, but don't give up on “loose coupling”
 - The client and the service are independent
 - Technology choice of one shouldn't influence the technology choice of the other



Example JAX-RS Client Code

```
Client client =  
ClientBuilder.newBuilder().newClient();  
WebTarget target = client.target("http://  
localhost:8080/rs");  
target =  
target.path("service").queryParams("a",  
"avalue");
```

```
Invocation.Builder builder =  
target.request();  
Response response = builder.get();  
Book book = builder.get(Book.class);
```



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Example HttpClient code

```
HttpClient client = new DefaultHttpClient();
{
    HttpGet request = new HttpGet(url);
    HttpResponse response = client.execute(request);
    System.out.println("Response status:" + response.getStatusLine());
    System.out.println("Response data:");
    HttpEntity entity = response.getEntity();
    if (entity != null) {

        BufferedReader br = new BufferedReader(new
            InputStreamReader(
                (entity.getContent())));
        String output;
        while ((output = br.readLine()) != null) {
            System.out.println(output);
        }
    }
}
```



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Example Python Code

```
h = http-lib2.Http();
    resp, content = h.request("http://
api.openweathermap.org/data/2.5/weather?q="+city)

try:
    response=json.loads(content)

    main = response['main']
    temp = round(main['temp'] - 273.15,2)
    humidity = main['humidity']
    pressure = main['pressure']
    wind = response['wind']
    windspeed = wind['speed']
    winddirection = wind['deg']
    country = response['sys']['country']
    city = response['name']
```



Example CXF Client code

```
webClient client = WebClient.create(url);  
Response r =  
client.accept(MediaType.APPLICATION_JSON).get();  
int status = r.getStatus();  
String jsonString = IOUtils.toString((InputStream)  
r.getEntity());
```



Questions?



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