FREE eBook

LEARNING swagger

Free unaffiliated eBook created from
Stack Overflow contributors.

#swagger

Table of Contents

About

You can share this PDF with anyone you feel could benefit from it, downloaded the latest version from: swagger

It is an unofficial and free swagger ebook created for educational purposes. All the content is extracted from Stack Overflow Documentation, which is written by many hardworking individuals at Stack Overflow. It is neither affiliated with Stack Overflow nor official swagger.

Use the content presented in this book at your own risk; it is not guaranteed to be correct nor accurate, please send your feedback and corrections to info@zzzprojects.com

Chapter 1: Getting started with swagger

Remarks

This section provides an overview of what swagger is, and why a developer might want to use it.

It should also mention any large subjects within swagger, and link out to the related topics. Since the Documentation for swagger is new, you may need to create initial versions of those related topics.

Examples

Introduction - Installation - Setup (Developing in Node.js)

Introduction:

Swagger is a set of rules/specifications for a format describing REST APIs. It provides a powerful and actively developed ecosystem of tools around this formal specification like code generators and editors. The best part of Swagger is that the documentation of methods, parameters, and models are tightly integrated into the server code, allowing APIs to always stay in sync. Here's a link giving a brief overview of what is swagger: getting-started.

Writing specifications:

The specifications can be written in either JSON or YAML. And so we make the swagger.json or swagger.yaml file accordingly. The online editor can be used for creating the file. Here's a link describing the syntax for specifications: http://swagger.io/specification/

Ways to use swagger:

1. *API-first approach (Top down approach):* Use swagger editor → Write swagger definitions → Use swagger-codegen and swagger-ui to generate APIs
2. *Service first approach (Bottom up approach):* Develop JAX-RS resource classes using swagger annotations → Use swagger-core to automatically generate the swagger definitions → Using swagger-codegen and swagger-ui to generate client APIs and documentations. The above can be done during maven build during swagger maven plugin.

Installation and Setup

In this section, we will install swagger, setup the swagger UI and generate server side and client SDK using it. For installing swagger using Node package manager execute the following command:

```
npm install -g swagger
```

Use of '-g' flag will ensure the module is installed globally. Next, we will create a project using the

following command:

```
swagger project create <project-name>
```

This will ask the user to select a framework for developing the REST APIs. Express can be selected for the same. This will create the project directory with following items and a README.md file in each of them:

- api/
  - controllers/
  - helpers/
  - mocks/
  - swagger/
- config/
- test/
  - api/
    - controllers/
    - helpers
- app.js
- package.json

The server is basically ready now and can be started using this command to be executed in project root:

```
swagger project start
```

If the host server is set as `localhost` and port number is not modified in `app.js` file, then the server is started at: `http://localhost:10010` Now the swagger UI can be used to further develop our REST APIs. This can be started in a new terminal using:

```
swagger project edit
```

This will open up the swagger editor in a browser tab on a randomly generated port. A sample hello GET request can be seen already present in the swagger.yaml file. Any further change to this file will cause the server to restart on its own.

In the paths section, the value used for `x-swagger-router-controller` should be the javascript file name in controllers folder. As a sample, hello_world.js should be present in the controllers directory. Also, the value for `operationId` parameter represents the function name in the above javascript file. This is where business logic should be written. Thus, our swagger setup is complete and can be used to further develop our API.

Read Getting started with swagger online: https://riptutorial.com/swagger/topic/5361/getting-started-with-swagger

Chapter 2: springfox

Examples

Override default response messages

Springfox defines a set default response messages that are applied to all API controllers by default. This includes e.g. `201 - Created` and `204 - No Content`, as well as several `40x` responses. There might be cases, in which the default response messages don't apply for your API. You have to build-in possibilities to deal with this:

- You can turn of the default response message and define your own using the `@ApiResponses` annotation.
- You can define your own response messages globally

Turn of default response messages

```
docket.useDefaultResponseMessages(false);
```

You can now set your individual response messages on a per-controller level. E.g.

```
 @ApiResponses(value = {
        @ApiResponse(code=400, message = "This is a bad request, please stick to the API
description", response = RestApiExceptionModel.class),
        @ApiResponse(code=401, message = "Your request cannot be authorized.", response =
RestApiExceptionModel.class)
 })
```

Set your own default response messages

```
ModelRef errorModel = new ModelRef("RestApiExceptionModel");
List<ResponseMessage> responseMessages = Arrays.asList(
        new
ResponseMessageBuilder().code(401).message("Unauthorized").responseModel(errorModel).build(),
        new
ResponseMessageBuilder().code(403).message("Forbidden").responseModel(errorModel).build(),
        new
ResponseMessageBuilder().code(404).message("NotFound").responseModel(errorModel).build());

docket.globalResponseMessage(RequestMethod.POST, responseMessages)
        .globalResponseMessage(RequestMethod.PUT, responseMessages)
        .globalResponseMessage(RequestMethod.GET, responseMessages)
        .globalResponseMessage(RequestMethod.DELETE, responseMessages);
```

Setup springfox using swagger-ui in spring-boot

1. Get springfox into your application by using Maven or Gradle

2. Create a new Docket bean in your application and configure it
3. Document your API according to your needs
4. Launch your application and see your achieved results

#1 Getting springfox with Maven

Add the dependencies for swagger2 and swagger-ui in your pom.xml

```
<dependency>
    <groupId>io.springfox</groupId>
    <artifactId>springfox-swagger2</artifactId>
    <version>2.6.0</version>
</dependency>
<dependency>
    <groupId>io.springfox</groupId>
    <artifactId>springfox-swagger-ui</artifactId>
    <version>2.6.0</version>
</dependency>
```

#2 Configure your application to use swagger

Add the annotation `@EnableSwagger2` to your `@SpringBootApplication` annotated main class and create a swagger Docket bean within this (or any other) configuration class.

```
@Bean
public Docket api() {
    return new Docket(DocumentationType.SWAGGER_2)
      .select()
      .apis(RequestHandlerSelectors.any())
      .paths(PathSelectors.any())
      .build();
}
```

This configuration will generate an API documentation over all spring controllers within your application. If you need to limit the API documentation generation to certain controllers you can choose between various RequestHandlerSelectors. E.g. you can generate your API documentation based on your package structure using `RequestHandlerSelectors.basePackage("your.package.structure")` or based specific classes that you've annotated using `RequestHandlerSelectors.withClassAnnotation(Api.class)`.

#3 Document your API

Use the annotations as described in the documentation, to enhance your controller classes and methods with additional information. To describe the general information of your api, like general title, description or the version, make use of the ApiInfoBuilder() within your Docket bean.

Example for the metadata definition using ApiInfoBuilder:

```
// Within your configuration class
```

```
public static ApiInfo metadata(){
    return new ApiInfoBuilder()
            .title("Your Title")
            .description("Your Description")
            .version("1.x")
            .build();
}

// Within your method that definies the Docket bean...
docket.apiInfo(metadata());
```

Read springfox online: https://riptutorial.com/swagger/topic/7637/springfox

Chapter 3: swagger-ui

Remarks

It's nice if you have fair amount of idea on following components :

REST WS Concepts (JAX-RS) Use of annotations Web application REST API standards Maven and its dependency

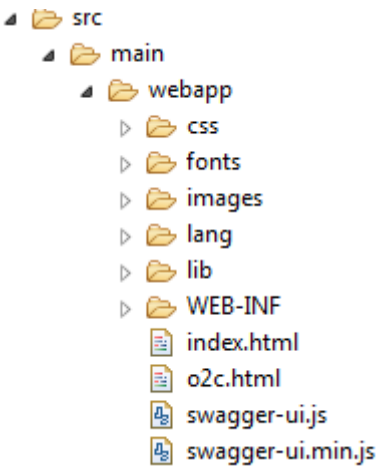
Examples

swagger-ui with jersey REST WS

As the official website of Swagger says :

Swagger is to define a standard, language-agnostic interface to REST APIs which allows both humans and computers to discover and understand the capabilities of the service without access to source code, documentation, or through network traffic inspection. When properly defined via Swagger, a consumer can understand and interact with the remote service with a minimal amount of implementation logic. Similar to what interfaces have done for lower-level programming, Swagger removes the guesswork in calling the service.

Assuming you use Maven and jersey, you will require following dependency to be added : Maven Swagger Dependency along with dependencies of JAX-RS. Now you have to create "maven webapp" and under the webapp you need to paste contents present on this URL. The folder structure of webapp should look like following after you paste those contents in your project :



After that follow this steps :

1. Create a java file with any name (in our case its "`ApiOriginFilter.java`") similar to below :

```
import javax.servlet.FilterChain;
import javax.servlet.FilterConfig;
import javax.servlet.ServletException;
```

```
import javax.servlet.ServletRequest;
import javax.servlet.ServletResponse;
import javax.servlet.http.HttpServletResponse;
import java.io.IOException;

public class ApiOriginFilter implements javax.servlet.Filter {
    /**
     * doFilter
     */
    @Override
    public void doFilter(ServletRequest request, ServletResponse response, FilterChain chain)
            throws IOException, ServletException {
        HttpServletResponse res = (HttpServletResponse) response;
        res.addHeader("Access-Control-Allow-Origin", "*");
        res.addHeader("Access-Control-Allow-Methods", "GET, POST, DELETE, PUT");
        res.addHeader("Access-Control-Allow-Headers", "Content-Type, api_key, Authorization");
        chain.doFilter(request, response);
    }

    /**
     * destroy
     */
    @Override
    public void destroy() {
    }

    /**
     * init
     */
    @Override
    public void init(FilterConfig filterConfig) throws ServletException {
    }
}
```

This file will ensure to filter the incoming requests as provided in the class.

2. Create a java file of any name suppose in our case its name is "`SwaggerJaxrsConfig.java`" as follows :

```
import org.eclipse.persistence.jaxb.MarshallerProperties;
import org.eclipse.persistence.jaxb.BeanValidationMode;
import org.glassfish.jersey.moxy.json.MoxyJsonConfig;
import org.glassfish.jersey.moxy.json.MoxyJsonFeature;
import org.glassfish.jersey.moxy.xml.MoxyXmlFeature;
import org.glassfish.jersey.server.ResourceConfig;

import org.glassfish.jersey.server.ServerProperties;
import org.glassfish.jersey.server.filter.RolesAllowedDynamicFeature;
import io.swagger.jaxrs.config.BeanConfig;

public class SwaggerJaxrsConfig extends ResourceConfig {

public SwaggerJaxrsConfig() {
    BeanConfig beanConfig = new BeanConfig();
    beanConfig.setTitle("Swagger API Title");
    beanConfig.setVersion("1.0.0");
    beanConfig.setSchemes(new String[] { "http" });
    beanConfig.setHost("localhost:8080/swagger-ui");
```

```
    beanConfig.setBasePath("/rest");
    beanConfig.setResourcePackage(
            "your.restws.package");
    beanConfig.setScan(true);
    property(ServerProperties.BV_SEND_ERROR_IN_RESPONSE, Boolean.TRUE);
    packages("your.restws.package");
    packages("io.swagger.jaxrs.listing");
    register(MoxyJsonFeature.class);
    // register(BadRequestExceptionMapper.class);
    register(new MoxyJsonConfig().setFormattedOutput(true)
    // Turn off BV otherwise the entities on server would be validated by MOXy as well.
    .property(MarshallerProperties.BEAN_VALIDATION_MODE, BeanValidationMode.NONE).resolver());

    register(MoxyXmlFeature.class);
    register(RolesAllowedDynamicFeature.class);
}
}
```

As you can see, in above class we have provided all the details required to use swagger UI like Host on which this swagger project will be hosted along with facility to set base path of your choice and all the http protocols supported like "`http`" or "`https`" and even more details as per your requirement.There is also provision to let Swagger know all of your REST WS's location which can be set using `setResourcePackage` along with packages This class enables us to use Swagger UI with our customization.

Now make entry of above 2 files in web.xml so as to use them after deploying our application on server like follow :

```
<servlet>
    <servlet-name>jersey-servlet</servlet-name>
    <servlet-class>org.glassfish.jersey.servlet.ServletContainer</servlet-class>
    <init-param>
        <param-name>javax.ws.rs.Application</param-name>
        <param-value>your.package.SwaggerJaxrsConfig</param-value>
    </init-param>
    <load-on-startup>1</load-on-startup>
</servlet>
<servlet-mapping>
    <servlet-name>jersey-servlet</servlet-name>
    <url-pattern>/rest/*</url-pattern>
</servlet-mapping>

<filter>
    <filter-name>ApiOriginFilter</filter-name>
    <filter-class>your.package.ApiOriginFilter</filter-class>
</filter>
<filter-mapping>
    <filter-name>ApiOriginFilter</filter-name>
    <url-pattern>/rest/*</url-pattern>
</filter-mapping>
```

Now, we will move to actual code where we will use Swagger provided Annotations :

Create a bean Employee.java as below :

```
import io.swagger.annotations.ApiModel;
```

```
import io.swagger.annotations.ApiModelProperty;

@ApiModel("Employee bean")
public class Employee {

    private String name;
    private String id;
    private String dept;

    @ApiModelProperty(value = "Name of employee", example = "Test Employee")
    public String getName() {
        return name;
    }

    public void setName(String name) {
        this.name = name;
    }

    @ApiModelProperty(value = "Id of employee", example = "123456")
    public String getId() {
        return id;
    }

    public void setId(String id) {
        this.id = id;
    }

    @ApiModelProperty(value = "Department of employee", example = "IT Division",
allowableValues = "IT, Sales, Admin")
    public String getDept() {
        return dept;
    }

    public void setDept(String dept) {
        this.dept = dept;
    }
}
```

The components of Swagger we used here are :

1. `@ApiModel("Employee bean")` - This will decide name of the Bean class that needs to be displayed on Swagger UI.
2. `@ApiModelProperty(value ="ABC", example="DeptName")` - This will provide information of each field used in the bean. value provides description of the field and example provides sample value of that field.

Now we will create a REST Controller as follows to create a GET webservice as follows :

```
import javax.ws.rs.GET;
import javax.ws.rs.Path;
import javax.ws.rs.Produces;
import javax.ws.rs.core.GenericEntity;
import javax.ws.rs.core.MediaType;
import javax.ws.rs.core.Response;

import org.slf4j.Logger;
import org.slf4j.LoggerFactory;
import org.swagger.ws.bean.Employee;
```

```
import org.swagger.ws.service.EmployeeService;

import io.swagger.annotations.Api;
import io.swagger.annotations.ApiOperation;
import io.swagger.annotations.ApiResponse;
import io.swagger.annotations.ApiResponses;

@Path("/employee")
@Api(tags = {"Employee"})
public class EmployeeController {
    private static final Logger LOGGER = LoggerFactory.getLogger(EmployeeController.class);

@GET
@Produces(MediaType.APPLICATION_JSON + ";charset=utf-8")
@ApiOperation(produces="application/json", value = "Fetch employee details", httpMethod="GET",
notes = "<br>This service fetches Employee details", response = Employee.class)
@ApiResponses(value = { @ApiResponse(code = 200,response = Employee.class, message =
"Successful operation"),@ApiResponse(code = 400, message = "Bad Request", response =
Error.class), @ApiResponse(code = 422, message = "Invalid data", response = Error.class),
@ApiResponse(code = 500, message = "Internal Server Error", response = Error.class) })
public Response getEmployee()  {
        EmployeeService employeeService = new EmployeeService();
        Employee empDetails = employeeService.getEmployee();
        Response response;
        LOGGER.debug("Fetching employee");
        GenericEntity<Employee> entity = new GenericEntity<Employee>(empDetails){};
        response = Response.status(200).entity(entity).build();
        return response;
    }
}
```

The components of Swagger we used here are :

1. `@Api(tags = {"Employee"})` - This annotation will tell Swagger what should be the title of the web service. In this case the title is "`Employee`". Please note that few standards while writing REST WS is also applicable while writing Swagger Documentation like title should not be like "`GetEmployee`" or "`DeleteEmployee`",etc.
2. `@ApiOperation(produces="application/json", value = "Fetch employee details", httpMethod="GET", notes = "<br>This service fetches Employee details", response = Employee.class)` - This annotation provides brief idea about your webservice.
    - `produces` describes format of response,
    - `value` describes brief idea about the webservice
    - `notes` describes detailed information about this webservice in case of any.
3. `@ApiResponses(value = { @ApiResponse(code = 200,response = Employee.class, message = "Successful operation"),@ApiResponse(code = 400, message = "Bad Request", response = Error.class), @ApiResponse(code = 422, message = "Invalid data", response = Error.class), @ApiResponse(code = 500, message = "Internal Server Error", response = Error.class) })` - This annotations provides us a way to handle different types of `HTTP` Status codes that can be received as a response as while consuming this webservice. It allows us to set the error code, custom message against it and even allows us to catch that error in separate error class, if required.

Finally, we have to create actual Service class which will fetch the details of employees when the webservice is consumed by client. You can implement it as required. Following is the sample service for the Demo purpose :

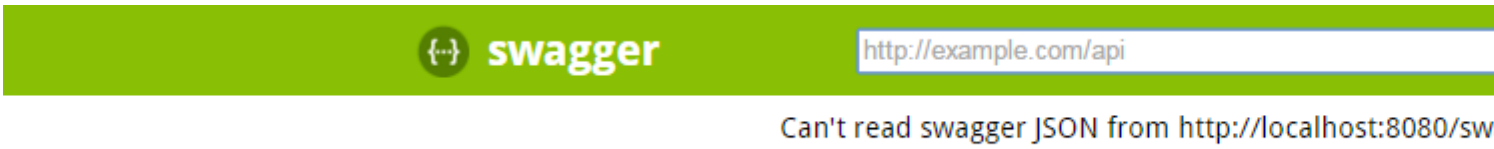
```
public class EmployeeService {

public Employee getEmployee() {
    Employee employee = new Employee();
    employee.setId("1");
    employee.setName("Test");
    employee.setDept("IT");
    return employee;
    }
}
```

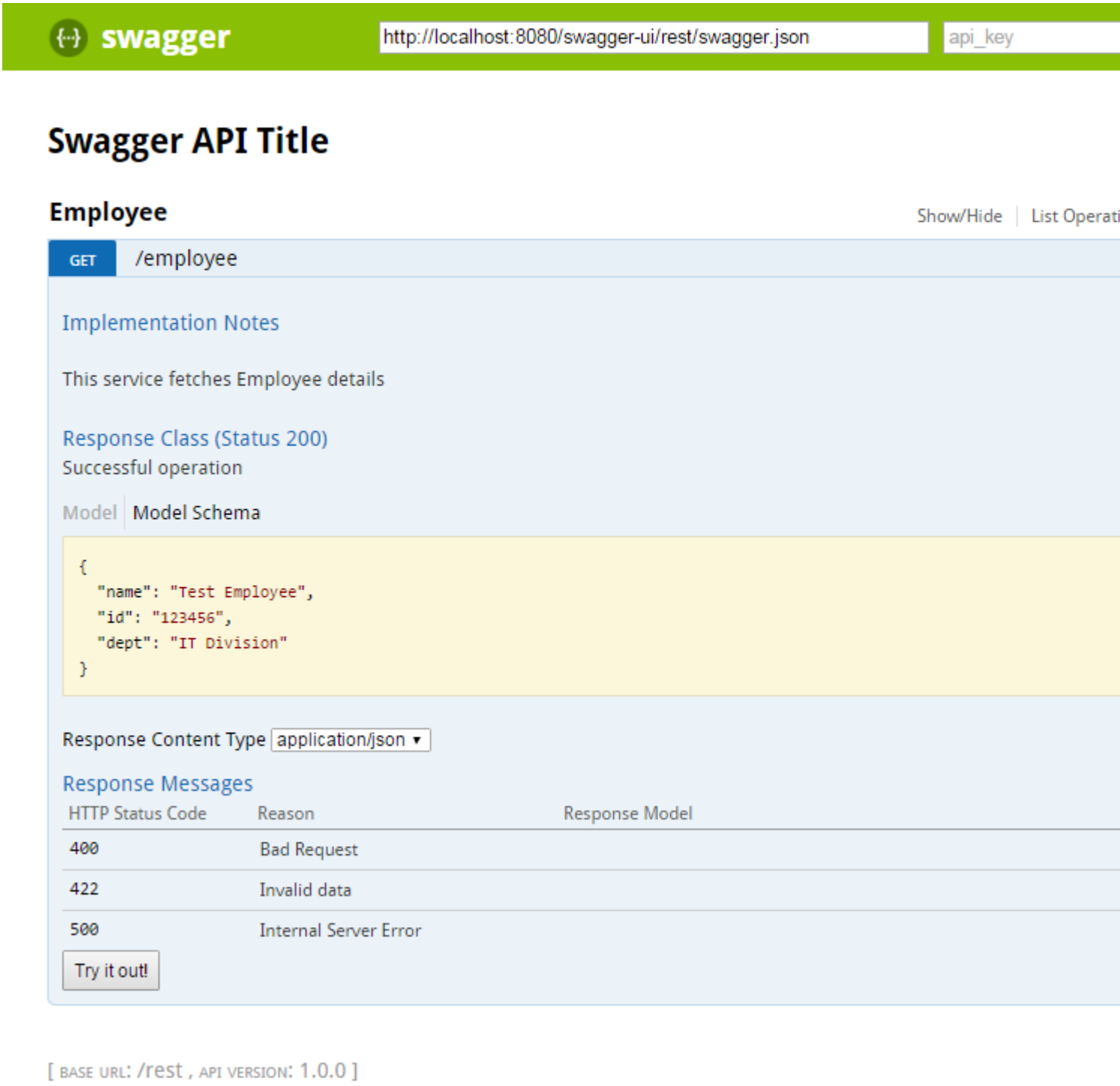
Now you are ready to see your documentation on Swagger UI. Deploy your Swagger project and start the server. Now go to browser and hit the URL of your project. In this case its

http://localhost:8080/swagger-ui/

If swagger is properly configured then you should be able to see following screen :

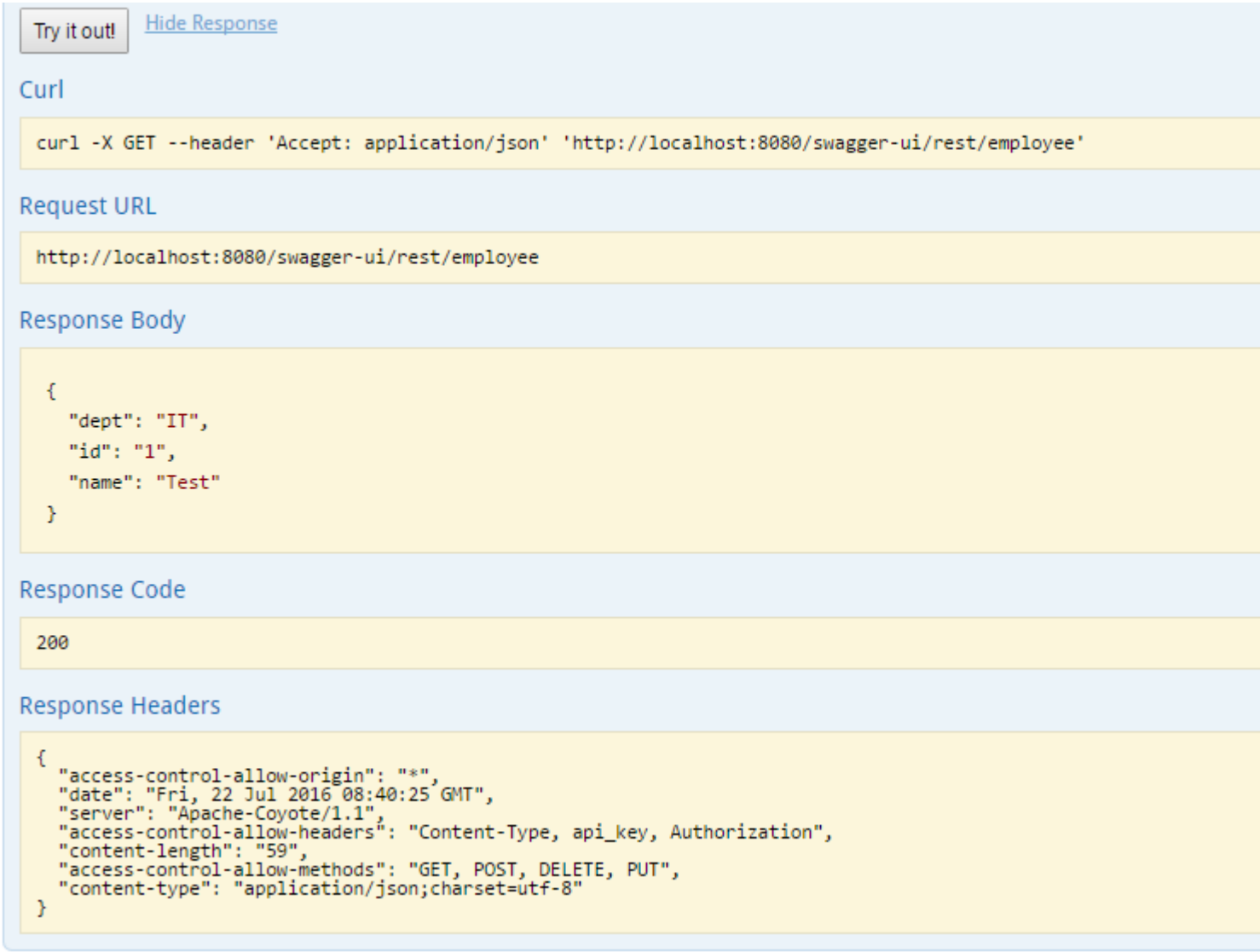


Now, to see your webservice documentation provide your project's "base_url/rest/swagger.json" in the textbox (http://exampl.com/api) you can see in above image. After providing that URL in textbox, you can see following screen providing documentation of your REST webservice :



The text box where "`api key`" is written in above image, you can provide specific header or key value if your project demands it like authentication based on user id,etc. For that you will also need to make changes in index.html under the tag starting with `<input placeholder="api_key" ......`

Another additional benefit of Swagger-UI is, it provides a button "`Try it out!`". This button lets you enable to see what could be the response of this webservice. For this case, if we click on that button, it will give following response on the screen :



So this is the sample demo for Swagger UI. There are many options you can still discover while writing REST controller which will help you at documentation level by using more Annotations and their attributes.

Read swagger-ui online: https://riptutorial.com/swagger/topic/6686/swagger-ui

Credits

S. No	Chapters	Contributors
1	Getting started with swagger	Community, Daniel Käfer, gonephishing
2	springfox	mika
3	swagger-ui	Suyash