Inhaltsverzeichnis

Version history

0.7.0 on 2023-01-19 by Jochen.

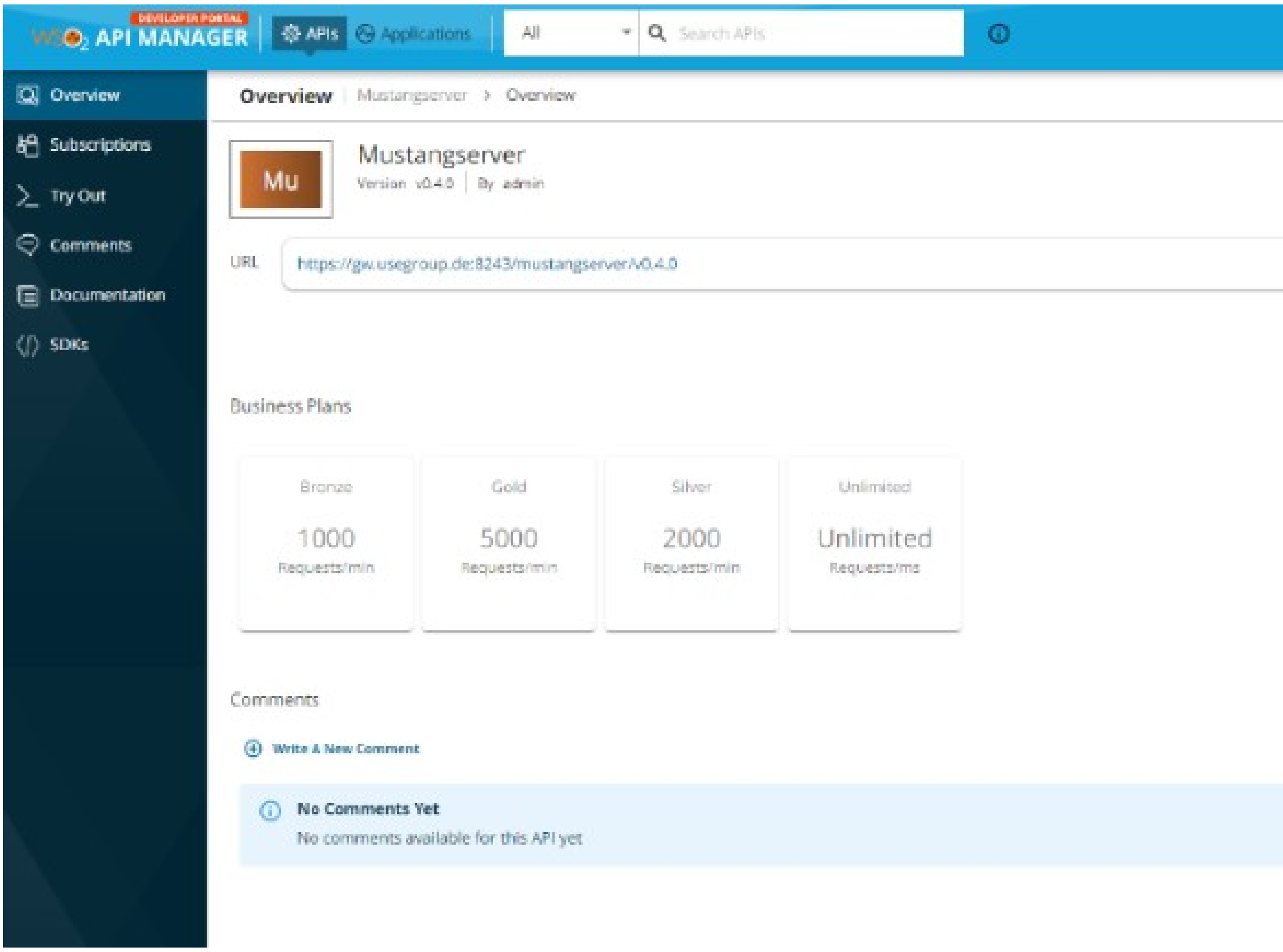
0.8.0 on 2023-02-25 by Jochen: Added Mustangserver 0.8.0 (=Order-X)

Server access

Access to the web interface is possible via https://api.usegroup.de/. Terms of service are listed in the chapter Terms of service on page 23.

To register please access https://api.usegroup.de:9443/devportal/services/configs
and click "Create Account" link on the bottom left. Select a username, "Proceed to self register", enter the rest of the data and have your email verified.
Afterwards you can login on https://api.usegroup.de .

If you select the desired Mustangserver version and click on the blue "try out" button (not the link in the navigation) on the next page you should be able to click a "get test key" button.



Overview | Mustangserver > Overview

Mu

Mustangserver

Version v0.4.0 | By admin

URL https://gw.usegroup.de:8243/mustangserver/v0.4.0

Business Plans

Bronze	Gold	Silver	Unlimited
1000	5000	2000	Unlimited
Requests/min	Requests/min	Requests/min	Requests/ms

Comments

No Comments Yet

No comments available for this API yet

e.g. when you open the "ping" operation and click "try it out" and "execute" you should get a "pong" response.

Operations

The available operations are

- ping: Just a test, always just returns „pong“. The only operation acessible via HTTP GET, the rest is POST.
- validate: Validate a Factur-X/ZUGFeRD or XRechnung CII or Order-X-CIO File using Mustang’s validator. Requires a file and returns a XML report. The format to be validated against will be read from it’s guideline ID.
- phive: Validate a CII or UBL file using https://github.com/phax/phive . Requires a VES ID and a file and returns JSON.

  Available VES IDs are

de.xrechnung:cii:1.2.0
de.xrechnung:cii:1.2.1
de.xrechnung:cii:1.2.2
de.xrechnung:cii:2.0.0
de.xrechnung:cii:2.0.1
de.xrechnung:cii:2.1.1
de.xrechnung:cii:2.2.0
de.xrechnung:ubl-creditnote:1.2.0
de.xrechnung:ubl-creditnote:1.2.1
de.xrechnung:ubl-creditnote:1.2.2
de.xrechnung:ubl-creditnote:2.0.0
de.xrechnung:ubl-creditnote:2.0.1
de.xrechnung:ubl-creditnote:2.1.1
de.xrechnung:ubl-creditnote:2.2.0
de.xrechnung:ubl-invoice:1.2.0
de.xrechnung:ubl-invoice:1.2.1
de.xrechnung:ubl-invoice:1.2.2
de.xrechnung:ubl-invoice:2.0.0
de.xrechnung:ubl-invoice:2.0.1
de.xrechnung:ubl-invoice:2.1.1
de.xrechnung:ubl-invoice:2.2.0
eu.cen.en16931:cii:1.0.0
eu.cen.en16931:cii:1.1.0
eu.cen.en16931:cii:1.2.0
eu.cen.en16931:cii:1.2.1
eu.cen.en16931:cii:1.2.3
eu.cen.en16931:cii:1.3.0
eu.cen.en16931:cii:1.3.1
eu.cen.en16931:cii:1.3.2
eu.cen.en16931:cii:1.3.3
eu.cen.en16931:cii:1.3.4
eu.cen.en16931:cii:1.3.5
eu.cen.en16931:cii:1.3.6
eu.cen.en16931:cii:1.3.6a
eu.cen.en16931:cii:1.3.7
eu.cen.en16931:cii:1.3.8
eu.cen.en16931:ubl-creditnote:1.0.0
eu.cen.en16931:ubl-creditnote:1.1.0
eu.cen.en16931:ubl-creditnote:1.2.0
eu.cen.en16931:ubl-creditnote:1.2.1
eu.cen.en16931:ubl-creditnote:1.2.3
eu.cen.en16931:ubl-creditnote:1.3.0
eu.cen.en16931:ubl-creditnote:1.3.1
eu.cen.en16931:ubl-creditnote:1.3.2
eu.cen.en16931:ubl-creditnote:1.3.3
eu.cen.en16931:ubl-creditnote:1.3.4
eu.cen.en16931:ubl-creditnote:1.3.5
eu.cen.en16931:ubl-creditnote:1.3.6
eu.cen.en16931:ubl-creditnote:1.3.6a
eu.cen.en16931:ubl-creditnote:1.3.7
eu.cen.en16931:ubl-creditnote:1.3.8
eu.cen.en16931:ubl:1.0.0
eu.cen.en16931:ubl:1.1.0
eu.cen.en16931:ubl:1.2.0
eu.cen.en16931:ubl:1.2.1
eu.cen.en16931:ubl:1.2.3
eu.cen.en16931:ubl:1.3.0
eu.cen.en16931:ubl:1.3.1
eu.cen.en16931:ubl:1.3.2
eu.cen.en16931:ubl:1.3.3
eu.cen.en16931:ubl:1.3.4
eu.cen.en16931:ubl:1.3.5
eu.cen.en16931:ubl:1.3.6
eu.cen.en16931:ubl:1.3.6a
eu.cen.en16931:ubl:1.3.7
eu.cen.en16931:ubl:1.3.8
eu.peppol.bis3.aunz.ubl:creditnote-self-billing:1.0.6
eu.peppol.bis3.aunz.ubl:creditnote-self-billing:1.0.7
eu.peppol.bis3.aunz.ubl:creditnote:1.0.6
eu.peppol.bis3.aunz.ubl:creditnote:1.0.7
eu.peppol.bis3.aunz.ubl:invoice-self-billing:1.0.6
eu.peppol.bis3.aunz.ubl:invoice-self-billing:1.0.7
eu.peppol.bis3.aunz.ubl:invoice:1.0.6
eu.peppol.bis3.aunz.ubl:invoice:1.0.7
eu.peppol.bis3.sg.ubl:creditnote:1.0.2
eu.peppol.bis3.sg.ubl:creditnote:1.0.3
eu.peppol.bis3.sg.ubl:invoice:1.0.2
eu.peppol.bis3.sg.ubl:invoice:1.0.3
eu.peppol.bis3:catalogue-response:3.13.0
eu.peppol.bis3:catalogue-response:3.14.0
eu.peppol.bis3:catalogue:3.13.0
eu.peppol.bis3:catalogue:3.14.0
eu.peppol.bis3:creditnote:3.13.0
eu.peppol.bis3:creditnote:3.14.0
eu.peppol.bis3:despatch-advice:3.13.0
eu.peppol.bis3:despatch-advice:3.14.0
eu.peppol.bis3:invoice-cii:3.14.0
eu.peppol.bis3:invoice-message-response:3.13.0
eu.peppol.bis3:invoice-message-response:3.14.0
eu.peppol.bis3:invoice:3.13.0
eu.peppol.bis3:invoice:3.14.0
eu.peppol.bis3:mlr:3.13.0
eu.peppol.bis3:mlr:3.14.0
eu.peppol.bis3:order-agreement:3.13.0
eu.peppol.bis3:order-agreement:3.14.0
eu.peppol.bis3:order-response:3.13.0
eu.peppol.bis3:order-response:3.14.0
eu.peppol.bis3:order:3.13.0
eu.peppol.bis3:order:3.14.0
eu.peppol.bis3:punch-out:3.13.0
eu.peppol.bis3:punch-out:3.14.0
eu.peppol.directory:businesscard:1.0.0
eu.peppol.directory:businesscard:2.0.0
eu.peppol.directory:businesscard:3.0.0

- pdf: Create a PDF/A file from any input PDF. Requires a PDF file (plain PDF, PDF A/1, PDF/A-3 or PDF/X). This operation will remove all non-PDF/A features as well as any embedded files, including potentially available Factur-X/ZUGFeRD files, and embed only available fonts.

- parse: Read a Factur-X/ZUGFeRD/XRechnung and create a JSON representation. Requires a Factur-X or Order-X file.
- Invoice2xml: Convert a Factur-X/ZUGFeRD/XRechnung JSON representation to XML. Requires a input JSON string, a standard (ZUGFeRD = zf, XRechnung = xr, Factur-X = fx or Order-X=ox), a version (usually 2 for ZUGFeRD and 1 for Factur-X) and a profile ("MINIMUM","BASICWL","BASIC","EN16931","EXTENDED" or "XRECHNUNG" for Factur-X, for ZUGFeRD 1 "BASIC","COMFORT" or "EXTENDED"). For XRechnung only "XRECHNUNG".
- extract: Extracts just the XML (not as JSON like parse) from a Factur-X/ZUGFeRD/Order-X file.
- combineXML: Combines CII XML and a PDF/A-1 document to a Factur-X/ZUGFeRD PDF/A-3 document. Requires a input PDF/A-1 file and a standard (ZUGFeRD = zf, Factur-X = fx or Order-X = ox), a version (usually 2 for ZUGFeRD and 1 for Factur-X) and a profile ("MINIMUM","BASICWL","BASIC","EN16931","EXTENDED" or "XRECHNUNG"
  for Factur-X, for ZUGFeRD 1 "BASIC","COMFORT" or "EXTENDED").
- cii2ubl: transforms XML from the UN/CEFACT Cross Industry Invoice (CII) XML format, the basis of factur-x/ZUGFeRD and the CII version of the XRechnung, to the Universal Business Language format, UBL. Requires a CII string.

Mediation, Transformation and Orchestration

The http://api.usegroup.de/ uses WSO² as API management which in turn uses Apache Synapse (https://synapse.apache.org/) for mediation/transformation/orchestration. This means that mediation and orchestration can be developed e.g. in WSO²'s Integration Studio (https://wso2.com/integration/integration-studio/) and uploaded as XML file. Apart from acting as a load balancer and central authentication this allow to

- override certain states in the process, e.g. implement a timeout after a certain number of seconds
- invoke a chain of operations in only one virtual endpoint, e.g. conversion from plain PDF, parallely converting invoice data to XML, merging PDF/A and XML and validation thereof and/or
- map any custom specific input- or output parameter to the values used by Mustangserver internally

Client development

For all clients outlined in this document Oauth's client credentials will be used. Before first use you will have to enable client credentials in the applications tab, https://api.usegroup.de:9443/devportal/applications Default Application, Oauth2 tokens. The procedure is described more detailled in the PHP Client chapter „Allowing Client Credentials" on page 7 but is generic to all examples and does not apply for PHP only.

Please note that most clients will use the Mustangserver version which had been *selected* in the backend when downloading the OpenAPI definition. New versions may be retired as soon as six month after release of the successor. It is possible to always use the latest (more precisely: recommended) version by removing the version from the endpoint:

```
-          "https://gw.usegroup.de:8243/mustang/v0.5.0/mustang/validate",
+          "https://gw.usegroup.de:8243/mustang/mustang/validate",
```

Example PHP Client

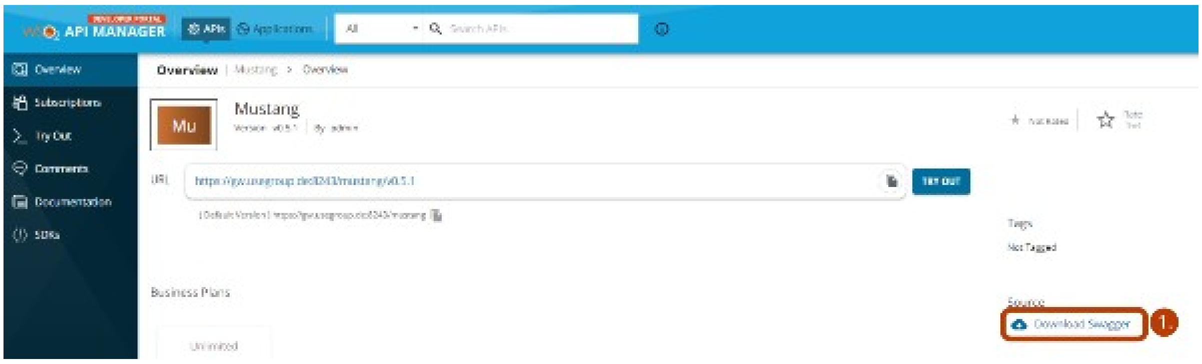
This example operates in a PHP context but https://editor.swagger.io/ also allows

C#, Dart, HTML, Go, Java, Javascript, Kotlin, Python, R, Ruby, Scala, Swift and Typescript.

Mustangserver Hello World

Preparations

Screenshot 1:

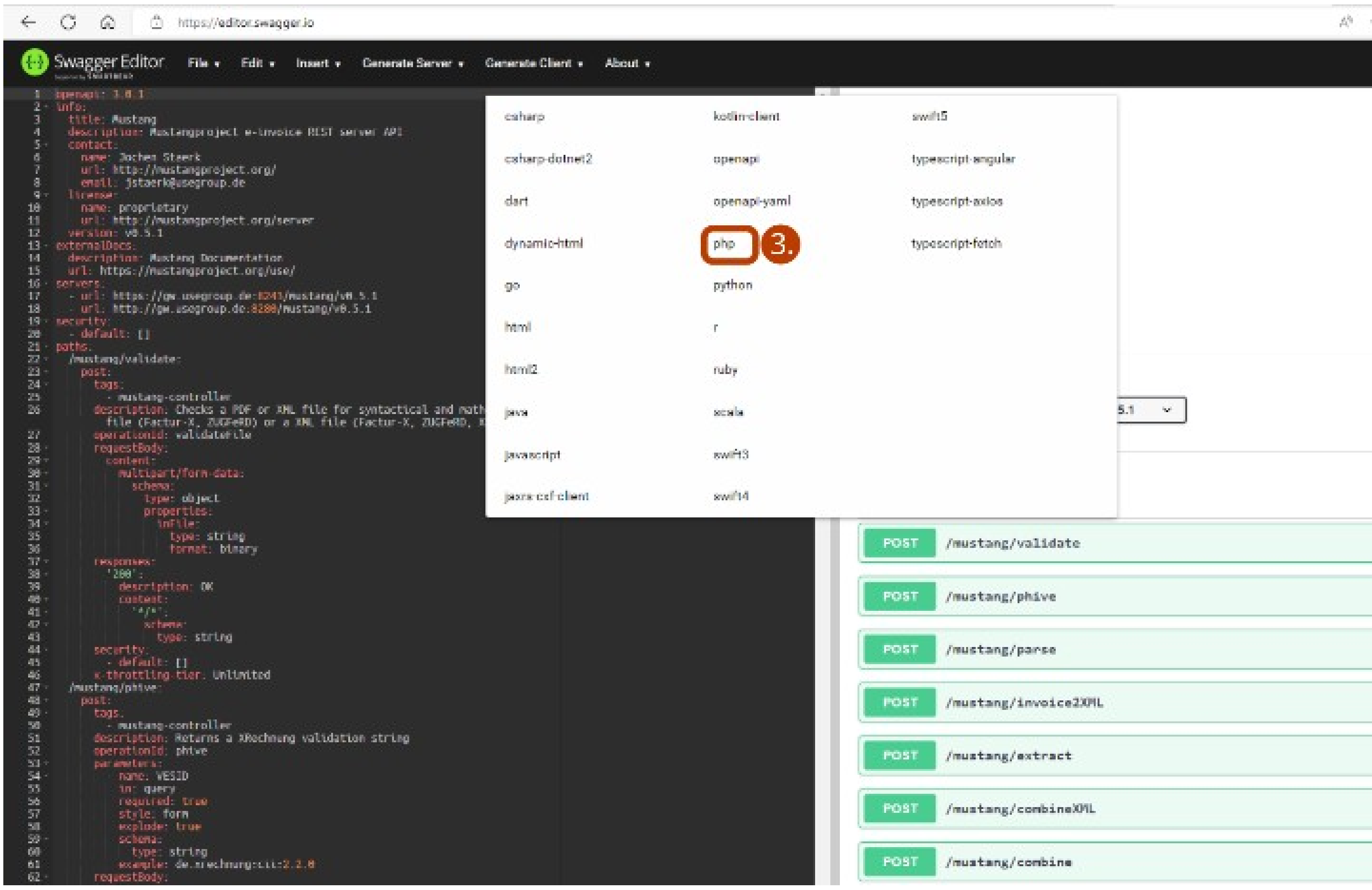


#1. Log in on https://api.usegroup.de/devportal/ , select the latest Mustangserver API and download the OpenAPI (=Swagger) definition of the API (->1.)
#2. Open the file in a text editor, select all and copy
#3. Go to editor.swagger.io, paste the definition and confirm conversion to yaml. Select Generate Client|PHP (3.). The API is public so usually there is no need to create code in a private matter. However, it is possible: Swagger editor is open source under the APL license (https://github.com/swagger-api/swagger-editor) and e.g. a Docker Image can bei obtained from https://registry.hub.docker.com/r/sebp/swagger-editor , i.e. using

```
sudo docker run --rm -p 8080:8080 sebp/swagger-editor
```

to run locally via port 8080.

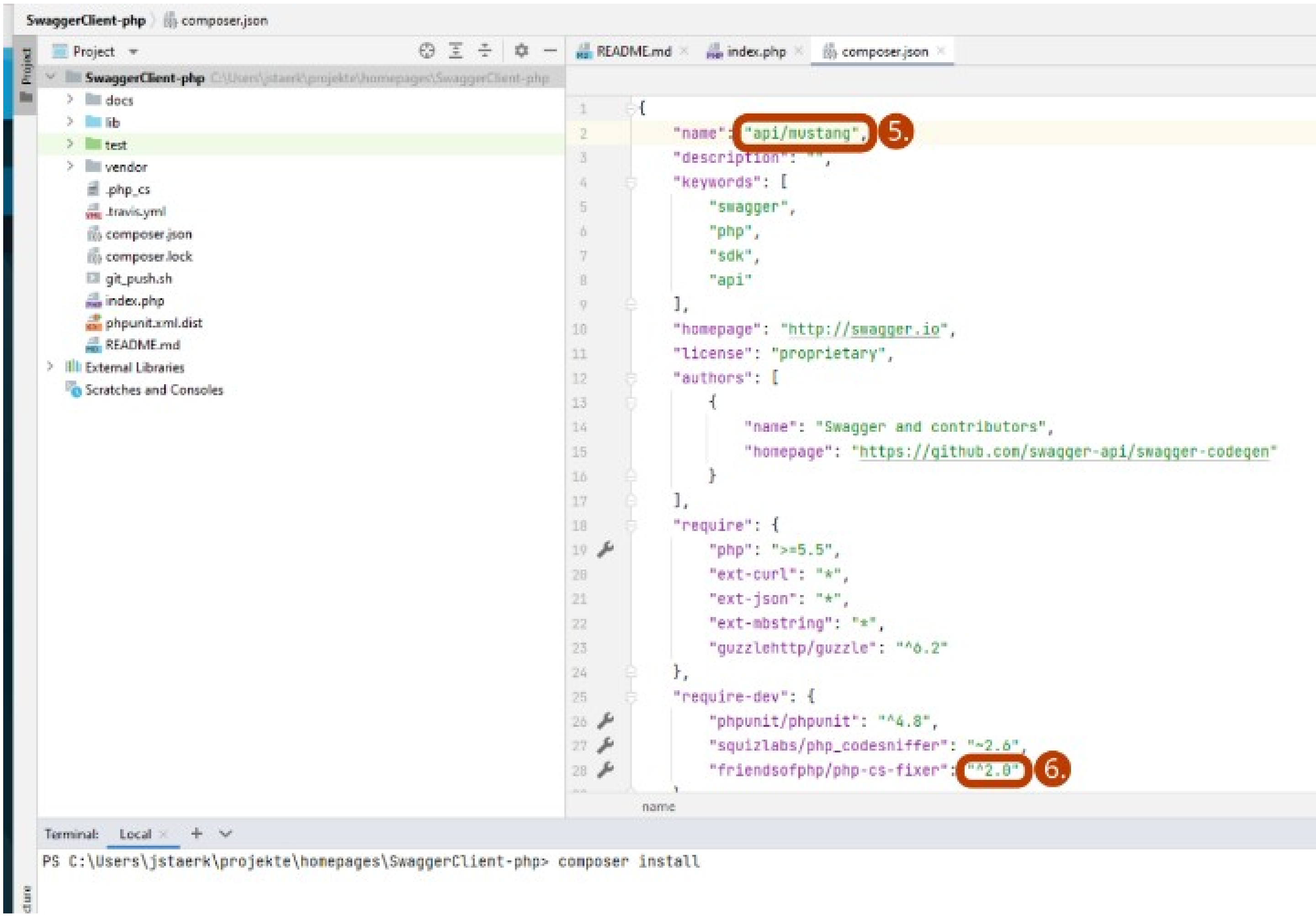
Screenshot 2:



```
openapi: 3.0.1
info:
  title: Mustang
  description: Mustangproject e-invoice REST server API
  contact:
    name: Jochen Staerk
    url: http://mustangproject.org/
    email: jstaerk@usegroup.de
  license:
    name: proprietary
    url: http://mustangproject.org/server
  version: v0.5.1
externalDocs:
  description: Mustang Documentation
  url: https://mustangproject.org/use/
servers:
  - url: https://gw.usegroup.de:8243/mustang/v0.5.1
  - url: http://gw.usegroup.de:8280/mustang/v0.5.1
security:
  - default: []
paths:
  /mustang/validate:
    post:
      tags:
        - mustang-controller
      description: Checks a PDF or XML file for syntactical and math
        file (Factur-X, ZUGFeRD) or a XML file (Factur-X, ZUGFeRD, X
      operationId: validateFile
      requestBody:
        content:
          multipart/form-data:
            schema:
              type: object
              properties:
                inFile:
                  type: string
                  format: binary
      responses:
        '200':
          description: OK
          content:
            '*/*':
              schema:
                type: string
      security:
        - default: []
      x-throttling-tier: Unlimited
  /mustang/phive:
    post:
      tags:
        - mustang-controller
      description: Returns a XRechnung validation string
      operationId: phive
      parameters:
        - name: VESID
          in: query
          required: true
          style: form
          explode: true
          schema:
            type: string
          example: de.xrechnung:cii:2.2.0
      requestBody:
```

#4. Extract the downloaded file, edit composer.json.
#5. change the name of the project in the composer.json file to lowercaps/lowercaps (5.)

Screenshot 3:



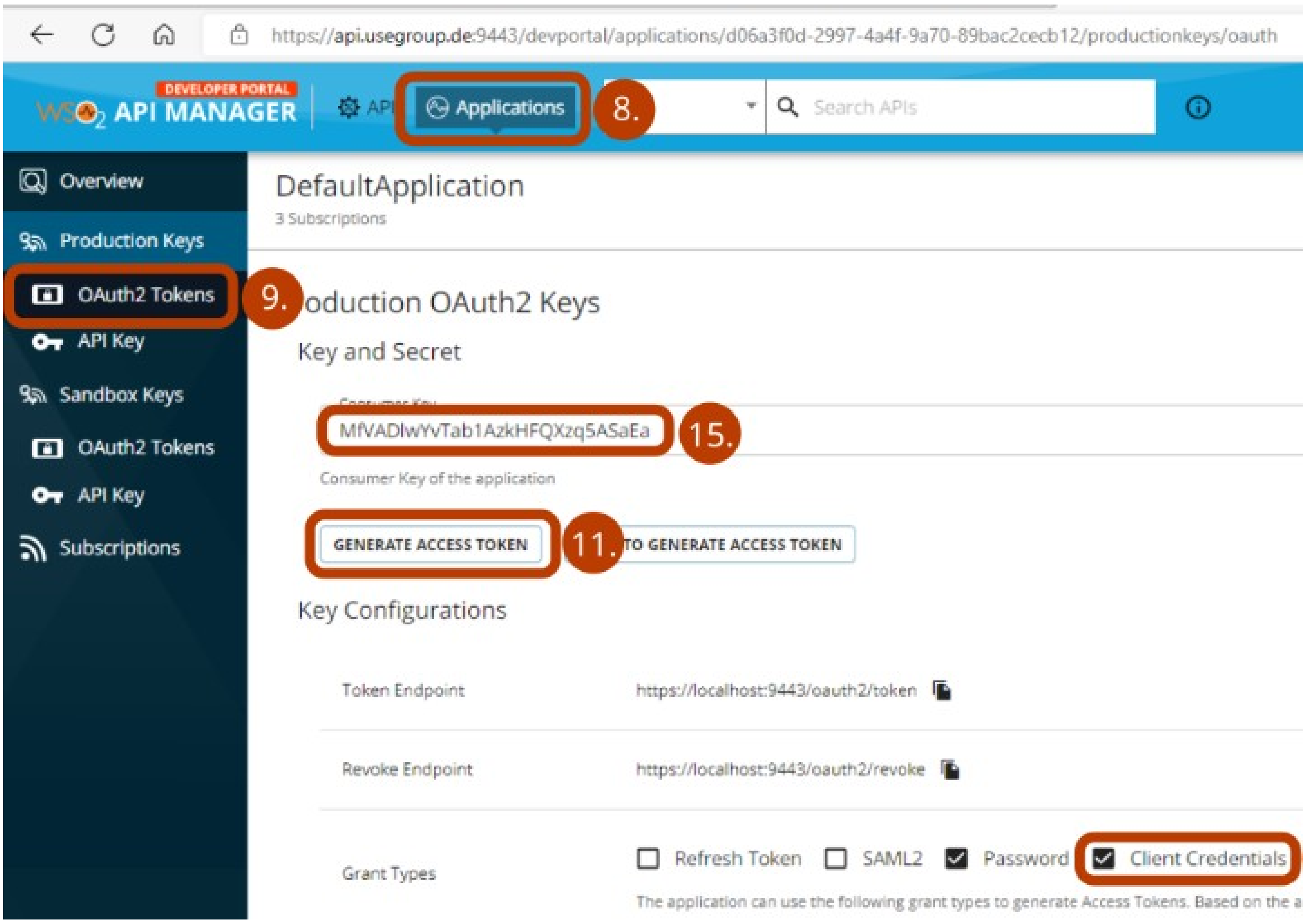
```json
{
    "name": "api/mustang",
    "description": "",
    "keywords": [
        "swagger",
        "php",
        "sdk",
        "api"
    ],
    "homepage": "http://swagger.io",
    "license": "proprietary",
    "authors": [
        {
            "name": "Swagger and contributors",
            "homepage": "https://github.com/swagger-api/swagger-codegen"
        }
    ],
    "require": {
        "php": ">=5.5",
        "ext-curl": "*",
        "ext-json": "*",
        "ext-mbstring": "*",
        "guzzlehttp/guzzle": "^6.2"
    },
    "require-dev": {
        "phpunit/phpunit": "^4.8",
        "squizlabs/php_codesniffer": "~2.6",
        "friendsofphp/php-cs-fixer": "^2.0"
```

```
PS C:\Users\jstaerk\projekte\homepages\SwaggerClient-php> composer install
```

#6. If you want to use PHP8+ upgrade the version number of php-cs-fixer to ^2.0. Then run "composer install" in that directory.
#7. Copy the example from the "Getting started" section of the readme.md to a new file, called index.php

Allowing Client Credentials

Screenshot 4:



https://api.usegroup.de:9443/devportal/applications/d06a3f0d-2997-4a4f-9a70-89bac2cecb12/productionkeys/oauth

DefaultApplication
3 Subscriptions

Production OAuth2 Keys

Key and Secret

Consumer Key: MfVADlwYvTab1AzkHFQXzq5ASaEa
Consumer Key of the application

Key Configurations

Token Endpoint: https://localhost:9443/oauth2/token

Revoke Endpoint: https://localhost:9443/oauth2/revoke

Grant Types: ☐ Refresh Token ☐ SAML2 ☑ Password ☑ Client Credentials

The application can use the following grant types to generate Access Tokens. Based on the a

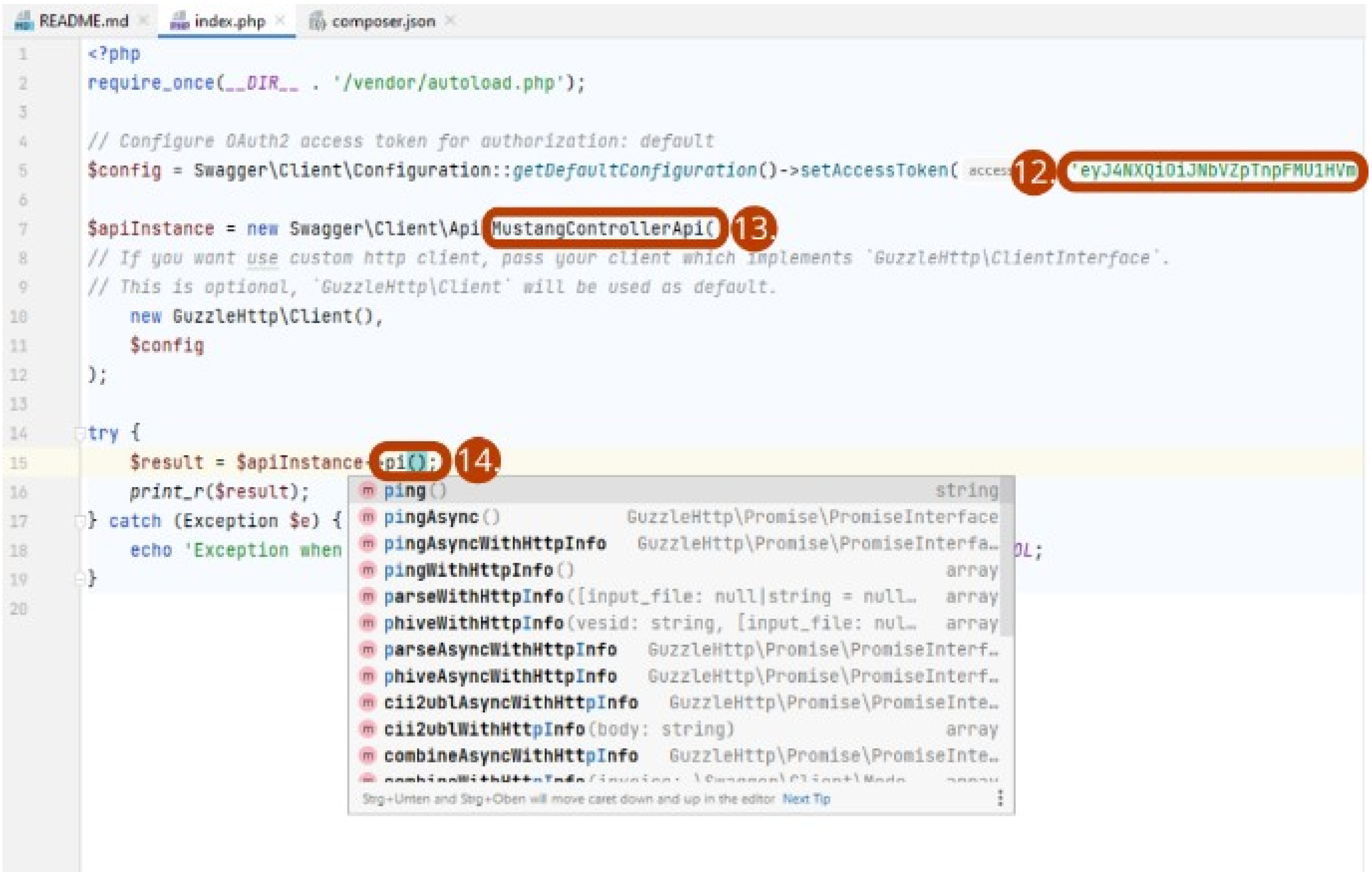
#8. Click on Applications (8.), Default Application,
#9. Production Keys/OAuth2 Token (9.).

#10. As preparation for Part B: Check Client Credentials and click the Update button on the bottom of the page.

Get access token

#11. For this part we will use a token which will expire shortly. Click Generate Access Token (11.), Generate and copy the resulting token. Paste it in

Screenshot 5:

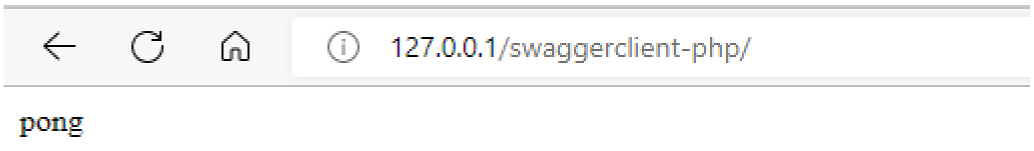


```
<?php
require_once(__DIR__ . '/vendor/autoload.php');

// Configure OAuth2 access token for authorization: default
$config = Swagger\Client\Configuration::getDefaultConfiguration()->setAccessToken( access 'eyJ4NXQiOiJNbVZpTnpFMU1HVm

$apiInstance = new Swagger\Client\Api\MustangControllerApi(
// If you want use custom http client, pass your client which implements `GuzzleHttp\ClientInterface`.
// This is optional, `GuzzleHttp\Client` will be used as default.
    new GuzzleHttp\Client(),
    $config
);

try {
    $result = $apiInstance->pi();
    print_r($result);
} catch (Exception $e) {
    echo 'Exception when                                                                   OL;
}
```

```
ping()                                                   string
pingAsync()                      GuzzleHttp\Promise\PromiseInterface
pingAsyncWithHttpInfo             GuzzleHttp\Promise\PromiseInterfa…
pingWithHttpInfo()                                        array
parseWithHttpInfo([input_file: null|string = null…        array
phiveWithHttpInfo(vesid: string, [input_file: nul…        array
parseAsyncWithHttpInfo            GuzzleHttp\Promise\PromiseInterf…
phiveAsyncWithHttpInfo            GuzzleHttp\Promise\PromiseInterf…
cii2ublAsyncWithHttpInfo            GuzzleHttp\Promise\PromiseInte…
cii2ublWithHttpInfo(body: string)                         array
combineAsyncWithHttpInfo            GuzzleHttp\Promise\PromiseInte…
Strg+Unten and Strg+Oben will move caret down and up in the editor  Next Tip
```

#12. index.php (12.), in the same file

#13. change ErrorController to Mustangcontroller (13.) and
#14. handle() to ping() (14.). Please note that usual PHP editors will give you code completion. Now you can open resulting index.php via your server and PHP processort in your browser, it should now look like Screenshot 6:



```
pong
```

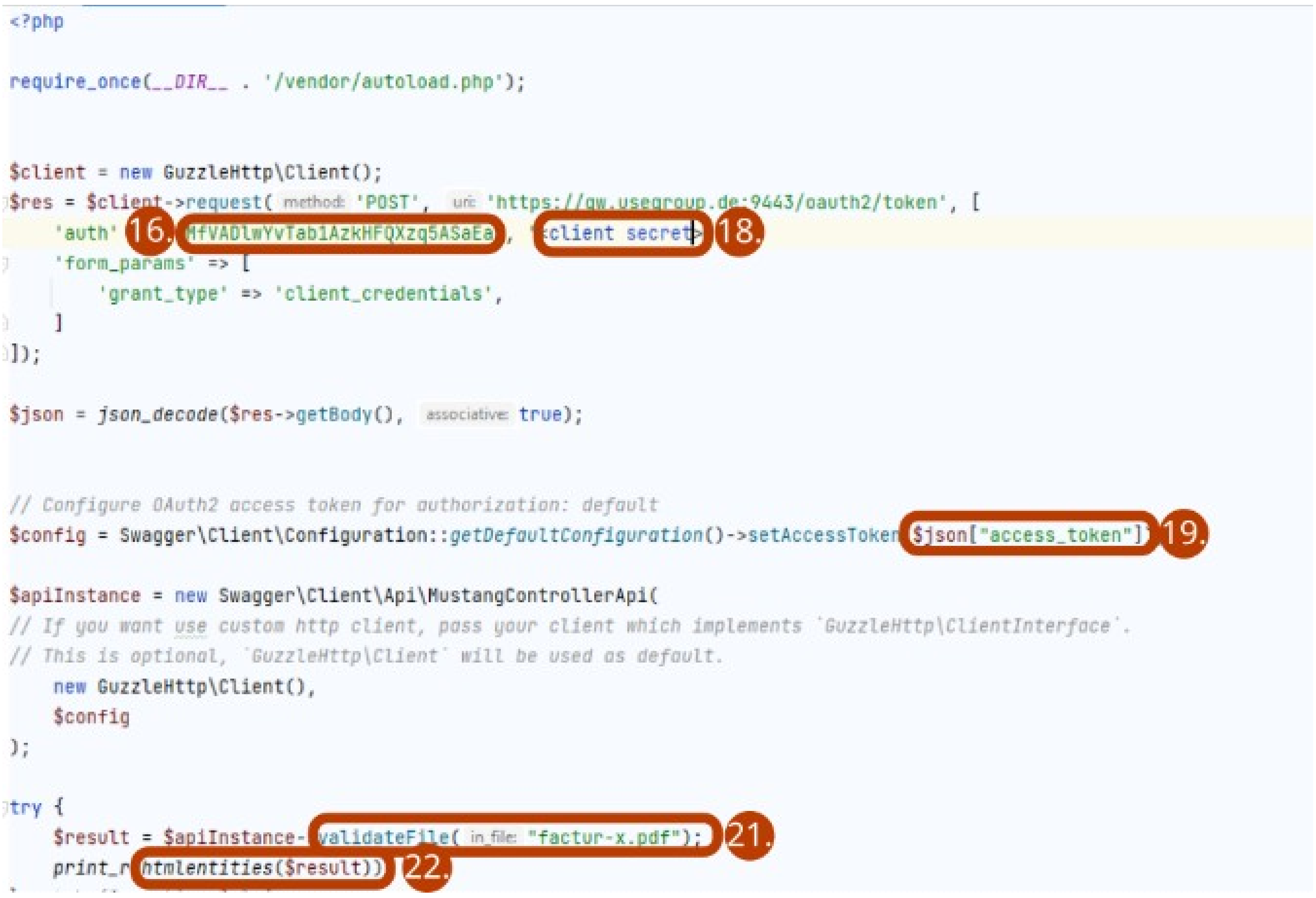
Part B: Sustainable OAuth2 Authentication and Validation of electronic invoices

Back to Screenshot 4:

In index.php paste the following code

```
$client = new GuzzleHttp\Client();
$res = $client->request('POST', 'https://gw.usegroup.de:9443/oauth2/token', [
    'auth' => ['<15.>', '<16.>'],
    'form_params' => [
        'grant_type' => 'client_credentials',
    ]
]);

$json = json_decode($res->getBody(), true);
```

Screenshot 7:



```
<?php

require_once(__DIR__ . '/vendor/autoload.php');


$client = new GuzzleHttp\Client();
$res = $client->request( method: 'POST',  uri: 'https://gw.usegroup.de:9443/oauth2/token', [
    'auth' 16. MfVADlwYvTab1AzkHFQXzq5ASaEa ,  client secret 18.
    'form_params' => [
        'grant_type' => 'client_credentials',
    ]
]);

$json = json_decode($res->getBody(),  associative: true);


// Configure OAuth2 access token for authorization: default
$config = Swagger\Client\Configuration::getDefaultConfiguration()->setAccessToken($json["access_token"]) 19.

$apiInstance = new Swagger\Client\Api\MustangControllerApi(
// If you want use custom http client, pass your client which implements `GuzzleHttp\ClientInterface`.
// This is optional, `GuzzleHttp\Client` will be used as default.
    new GuzzleHttp\Client(),
    $config
);

try {
    $result = $apiInstance->validateFile( in_file: "factur-x.pdf"); 21.
    print_r(htmlentities($result)) 22.
```

#15. copy Consumer Key (15., from screen 4) to the beginning of index.php (16.),

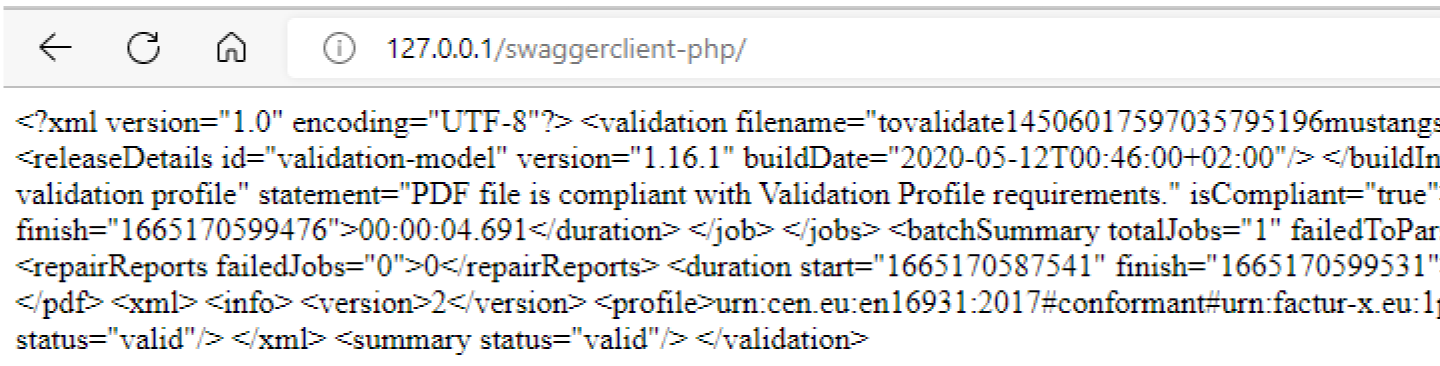
#17. reveal and copy Consumer Secret (18.).

#19 replace the static access token which will become invalid by $json["access_token"]

#20 Create or download a invoice to be validated, e.g. https://www.mustangproject.org/files/MustangGnuaccountingBeispielRE-20201121_508.pdf and save it as factur-x.pdf

#21 Change the method to validateFile and

#22 html escape the validation result, so that the result in the browser looks like screenshot 8:

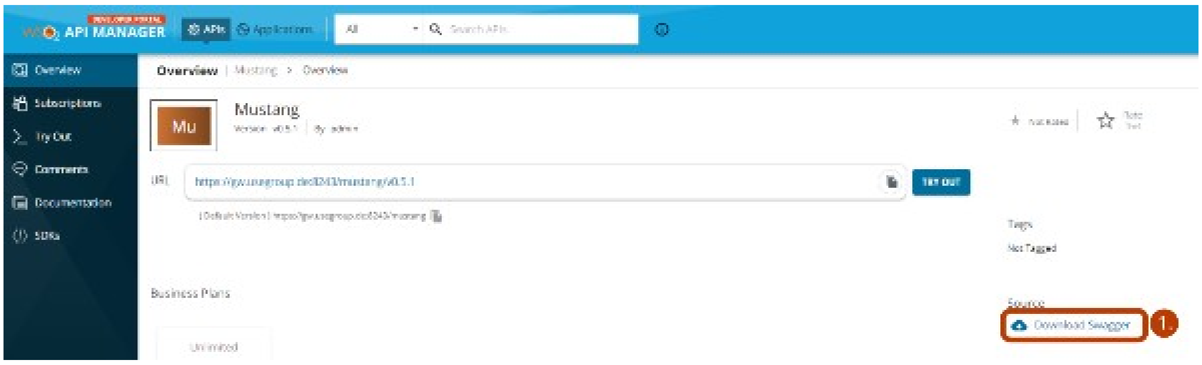


```
<?xml version="1.0" encoding="UTF-8"?> <validation filename="tovalidate14506017597035795196mustangs
<releaseDetails id="validation-model" version="1.16.1" buildDate="2020-05-12T00:46:00+02:00"/> </buildIn
validation profile" statement="PDF file is compliant with Validation Profile requirements." isCompliant="true"
finish="1665170599476">00:00:04.691</duration> </job> </jobs> <batchSummary totalJobs="1" failedToPar
<repairReports failedJobs="0">0</repairReports> <duration start="1665170587541" finish="1665170599531"
</pdf> <xml> <info> <version>2</version> <profile>urn:cen.eu:en16931:2017#conformant#urn:factur-x.eu:1
status="valid"/> </xml> <summary status="valid"/> </validation>
```

That's it. Instead of displaying the XML you can now parse it :-)

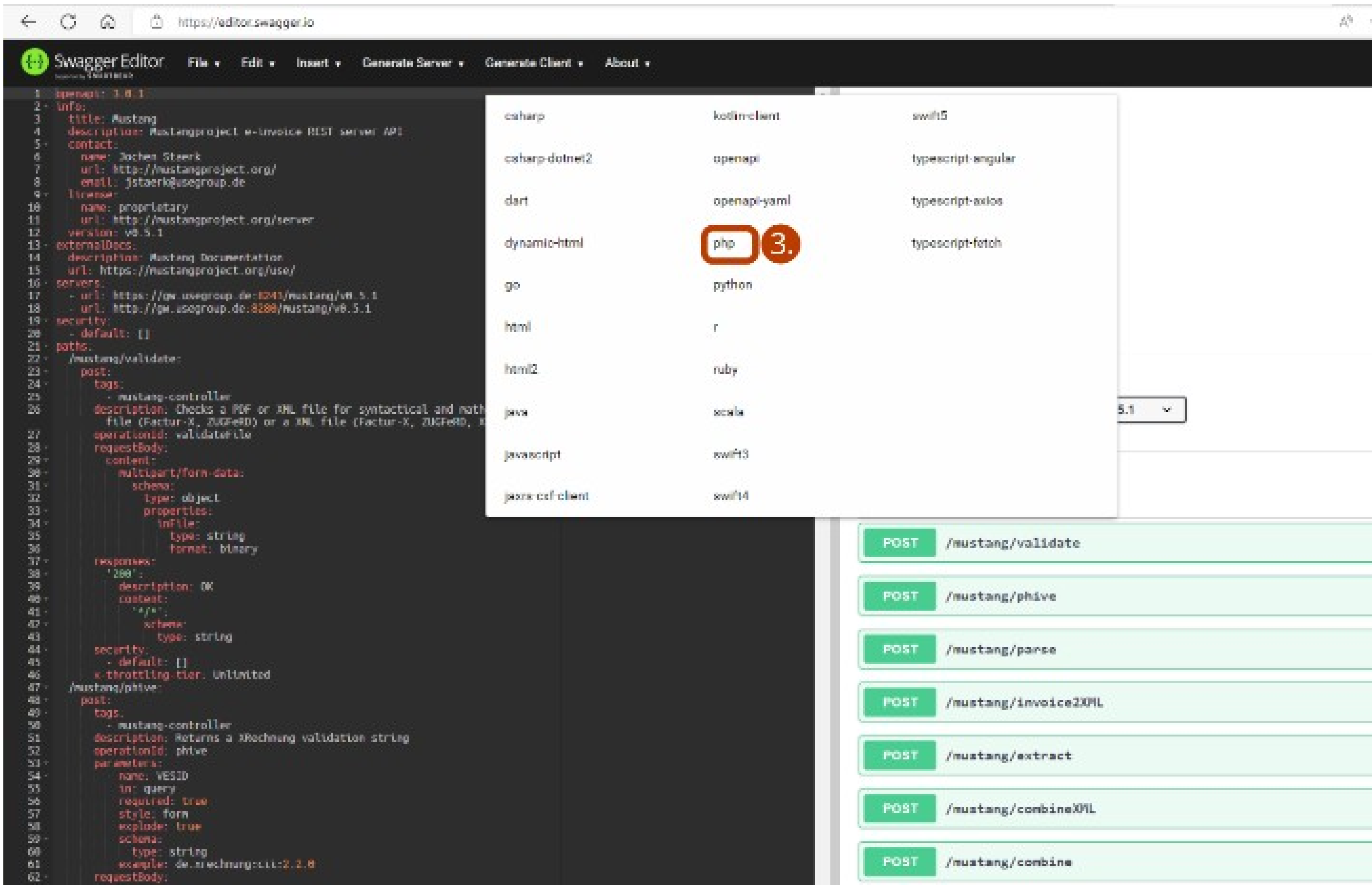
Feel free to also try the async functions.

Screenshot 1:



#1. Log in on https://api.usegroup.de/devportal/ , select the latest Mustangserver API and download the OpenAPI (=Swagger) definition of the API (->1.)
#2. Open the file in a text editor, select all and copy
#3. Go to editor.swagger.io, paste the definition and confirm conversion to yaml. Select Generate Client|PHP (3.)

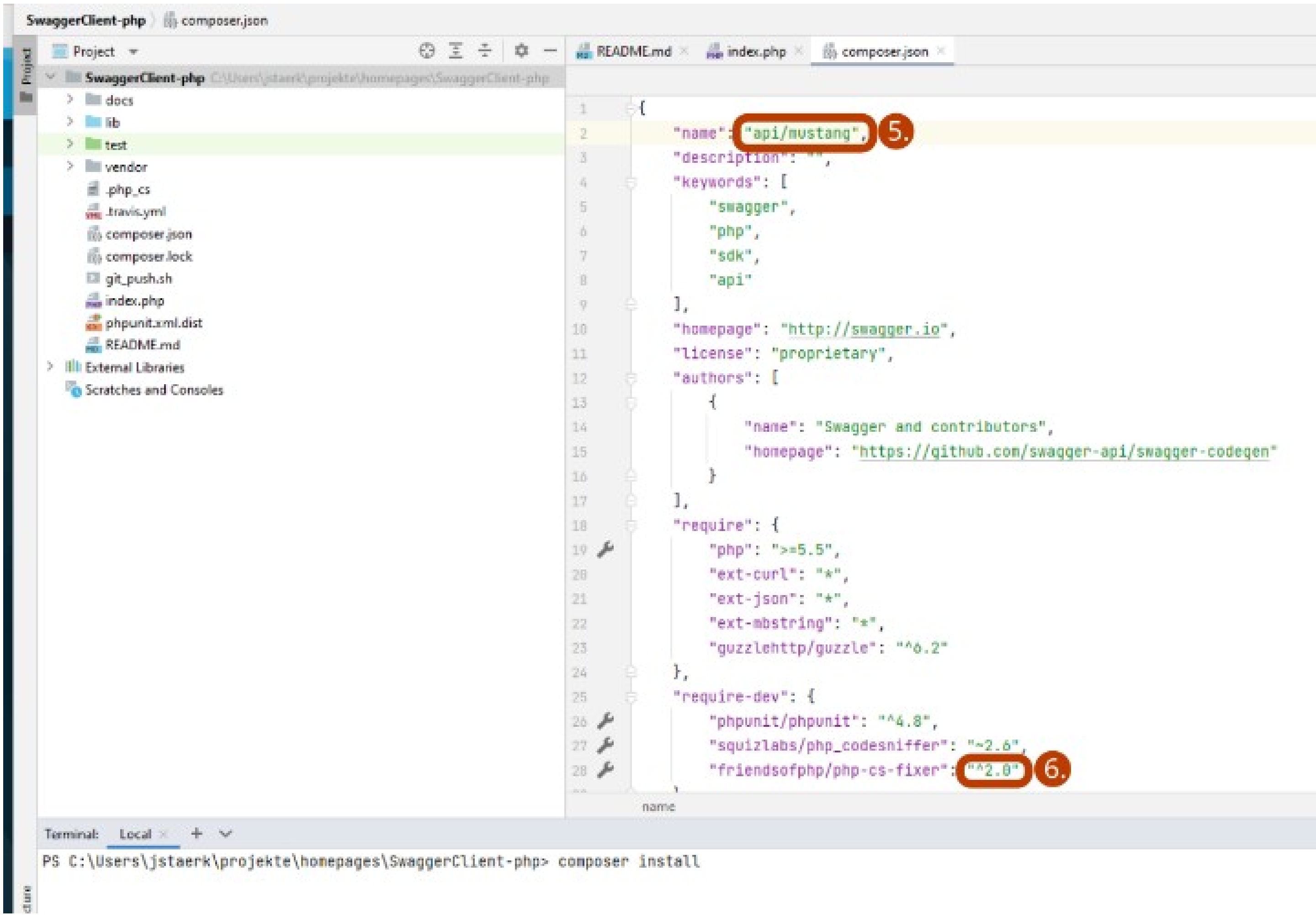
Screenshot 2:



```
openapi: 3.0.1
info:
  title: Mustang
  description: Mustangproject e-invoice REST server API
  contact:
    name: Jochen Staerk
    url: http://mustangproject.org/
    email: jstaerk@usegroup.de
  license:
    name: proprietary
    url: http://mustangproject.org/server
  version: v0.5.1
externalDocs:
  description: Mustang Documentation
  url: https://mustangproject.org/use/
servers:
  - url: https://gw.usegroup.de:8243/mustang/v0.5.1
  - url: http://gw.usegroup.de:8280/mustang/v0.5.1
security:
  - default: []
paths:
  /mustang/validate:
    post:
      tags:
        - mustang-controller
      description: Checks a PDF or XML file for syntactical and math
        file (Factur-X, ZUGFeRD) or a XML file (Factur-X, ZUGFeRD, X
      operationId: validateFile
      requestBody:
        content:
          multipart/form-data:
            schema:
              type: object
              properties:
                inFile:
                  type: string
                  format: binary
      responses:
        '200':
          description: OK
          content:
            '*/*':
              schema:
                type: string
      security:
        - default: []
      x-throttling-tier: Unlimited
  /mustang/phive:
    post:
      tags:
        - mustang-controller
      description: Returns a XRechnung validation string
      operationId: phive
      parameters:
          name: VESID
          in: query
          required: true
          style: form
          explode: true
          schema:
            type: string
          example: de.xrechnung:cii:2.2.0
      requestBody:
```

#4. Extract the downloaded file, edit composer.json.
#5. change the name of the project in the composer.json file to lowercaps/lowercaps (5.)

Screenshot 3:

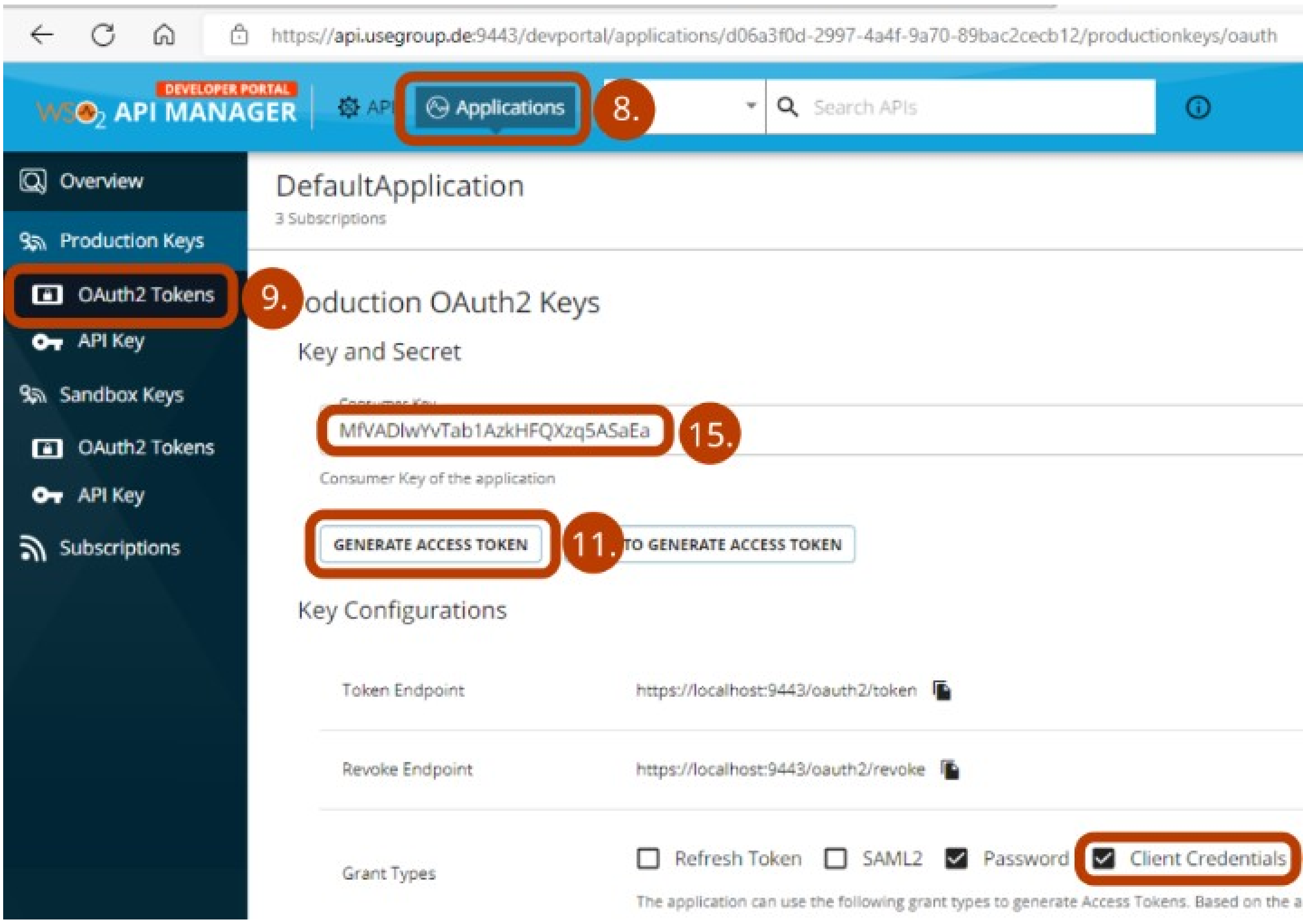


```
{
    "name": "api/mustang",
    "description": "",
    "keywords": [
        "swagger",
        "php",
        "sdk",
        "api"
    ],
    "homepage": "http://swagger.io",
    "license": "proprietary",
    "authors": [
        {
            "name": "Swagger and contributors",
            "homepage": "https://github.com/swagger-api/swagger-codegen"
        }
    ],
    "require": {
        "php": ">=5.5",
        "ext-curl": "*",
        "ext-json": "*",
        "ext-mbstring": "*",
        "guzzlehttp/guzzle": "^6.2"
    },
    "require-dev": {
        "phpunit/phpunit": "^4.8",
        "squizlabs/php_codesniffer": "~2.6",
        "friendsofphp/php-cs-fixer": "^2.0"
```

```
PS C:\Users\jstaerk\projekte\homepages\SwaggerClient-php> composer install
```

#6. If you want to use PHP8+ upgrade the version number of php-cs-fixer to ^2.0. Then run "composer install" in that directory.
#7. Copy the example from the "Getting started" section of the readme.md to a new file, called index.php

Screenshot 4:



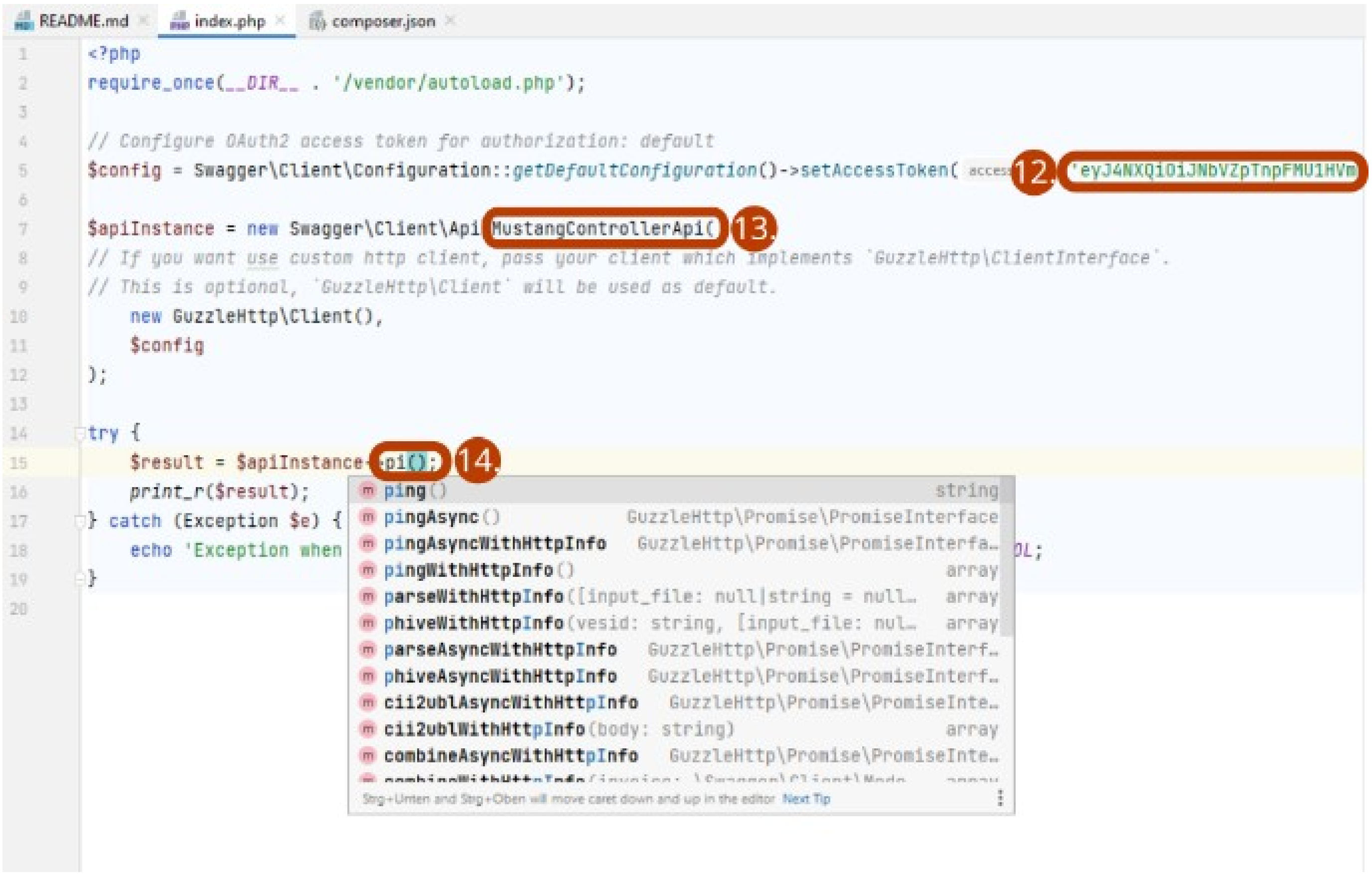
Token Endpoint	https://localhost:9443/oauth2/token
Revoke Endpoint	https://localhost:9443/oauth2/revoke
Grant Types	☐ Refresh Token ☐ SAML2 ☑ Password ☑ Client Credentials

The application can use the following grant types to generate Access Tokens. Based on the a

#8. Click on Applications (8.), Default Application,
#9. Production Keys/OAuth2 Token (9.).

#10. As preparation for Part B: Check Client Credentials and click the Update button on the bottom of the page.
#11. For this part we will use a token which will expire shortly. Click Generate Access Token (11.), Generate and copy the resulting token. Paste it in

Screenshot 5:

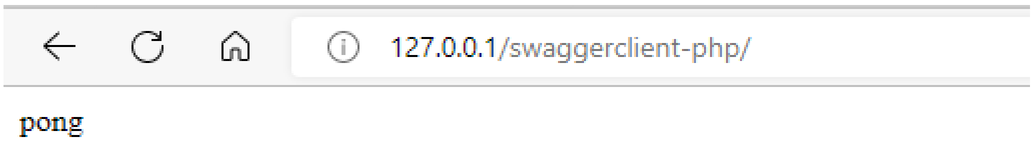

README.md
index.php
composer.json
12.
13.
14.
Strg+Unten and Strg+Oben will move caret down and up in the editor Next Tip

```
<?php
require_once(__DIR__ . '/vendor/autoload.php');

// Configure OAuth2 access token for authorization: default
$config = Swagger\Client\Configuration::getDefaultConfiguration()->setAccessToken( access 'eyJ4NXQiOiJNbVZpTnpFMU1HVm

$apiInstance = new Swagger\Client\Api MustangControllerApi(
// If you want use custom http client, pass your client which implements `GuzzleHttp\ClientInterface`.
// This is optional, `GuzzleHttp\Client` will be used as default.
    new GuzzleHttp\Client(),
    $config
);

try {
    $result = $apiInstance->pi();
    print_r($result);
} catch (Exception $e) {
    echo 'Exception when                                                                                   OL;
}
```

```
ping()                                                  string
pingAsync()                         GuzzleHttp\Promise\PromiseInterface
pingAsyncWithHttpInfo                GuzzleHttp\Promise\PromiseInterfa…
pingWithHttpInfo()                                       array
parseWithHttpInfo([input_file: null|string = null…       array
phiveWithHttpInfo(vesid: string, [input_file: nul…       array
parseAsyncWithHttpInfo               GuzzleHttp\Promise\PromiseInterf…
phiveAsyncWithHttpInfo               GuzzleHttp\Promise\PromiseInterf…
cii2ublAsyncWithHttpInfo              GuzzleHttp\Promise\PromiseInte…
cii2ublWithHttpInfo(body: string)                        array
combineAsyncWithHttpInfo              GuzzleHttp\Promise\PromiseInte…
```

#12. index.php (12.), in the same file

#13. change ErrorController to Mustangcontroller (13.) and
#14. handle() to ping() (14.). Please note that usual PHP editors will give you code completion.
Now you can open resulting index.php via your server and PHP processort in your browser, it should now look like Screenshot 6:



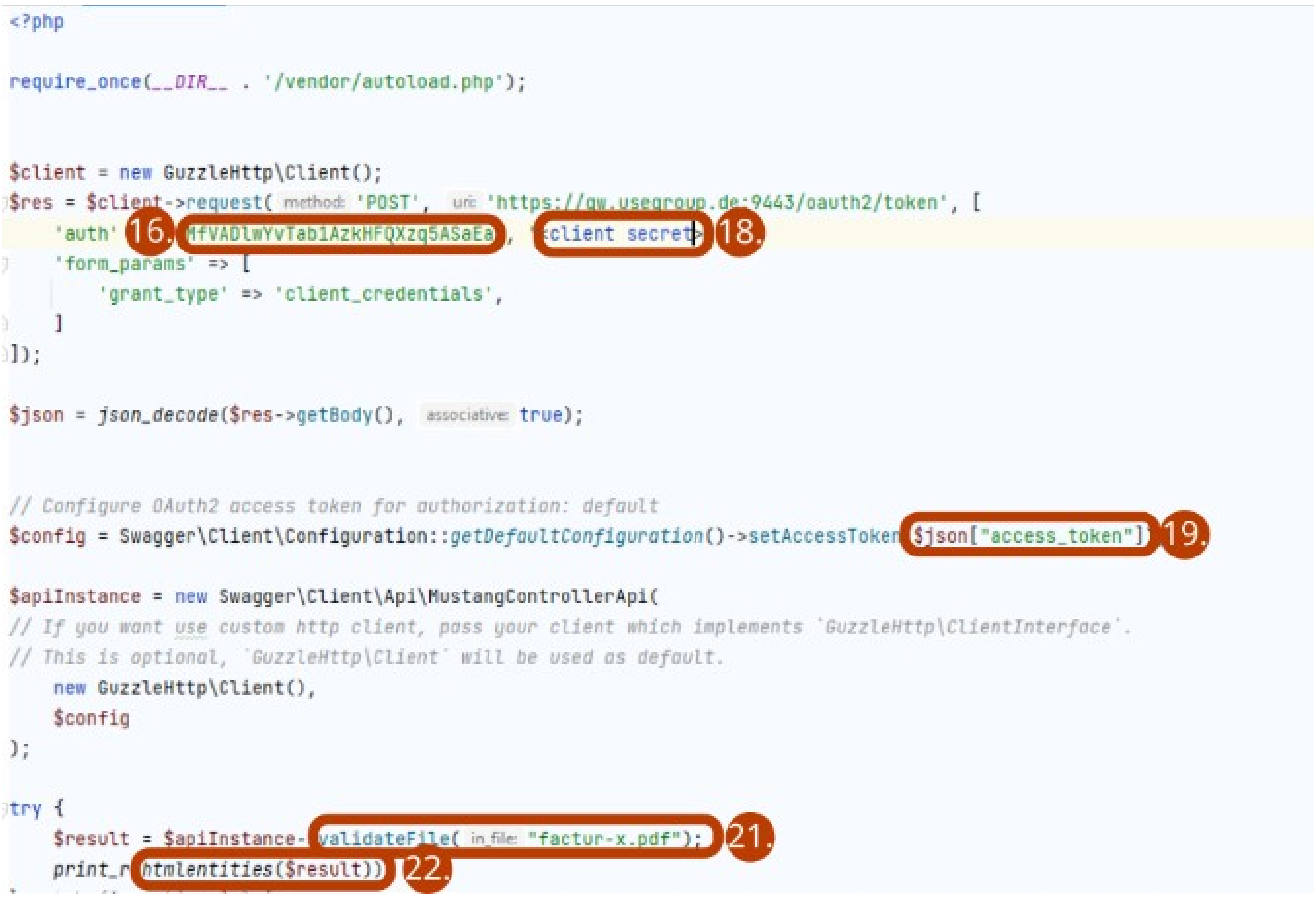
```
pong
```

OAuth2 Authentication and Validation of electronic invoices

Concerning Screenshot 4:
In index.php paste the following code

```
$client = new GuzzleHttp\Client();
$res = $client->request('POST', 'https://gw.usegroup.de:9443/oauth2/token', [
   'auth' => ['<15.>', '<16.>'],
   'form_params' => [
      'grant_type' => 'client_credentials',
   ]
]);

$json = json_decode($res->getBody(), true);
```

Screenshot 7:



```
<?php

require_once(__DIR__ . '/vendor/autoload.php');


$client = new GuzzleHttp\Client();
$res = $client->request( method: 'POST',  uri: 'https://gw.usegroup.de:9443/oauth2/token', [
    'auth' MfVADlwYvTab1AzkHFQXzq5ASaEa, '<client secret>
    'form_params' => [
        'grant_type' => 'client_credentials',
    ]
]);

$json = json_decode($res->getBody(),  associative: true);


// Configure OAuth2 access token for authorization: default
$config = Swagger\Client\Configuration::getDefaultConfiguration()->setAccessToken($json["access_token"]);

$apiInstance = new Swagger\Client\Api\MustangControllerApi(
// If you want use custom http client, pass your client which implements `GuzzleHttp\ClientInterface`.
// This is optional, `GuzzleHttp\Client` will be used as default.
    new GuzzleHttp\Client(),
    $config
);

try {
    $result = $apiInstance->validateFile( in_file: "factur-x.pdf");
    print_r(htmlentities($result));
```

#15. copy Consumer Key (15., from screen 4) to the beginning of index.php (16.),

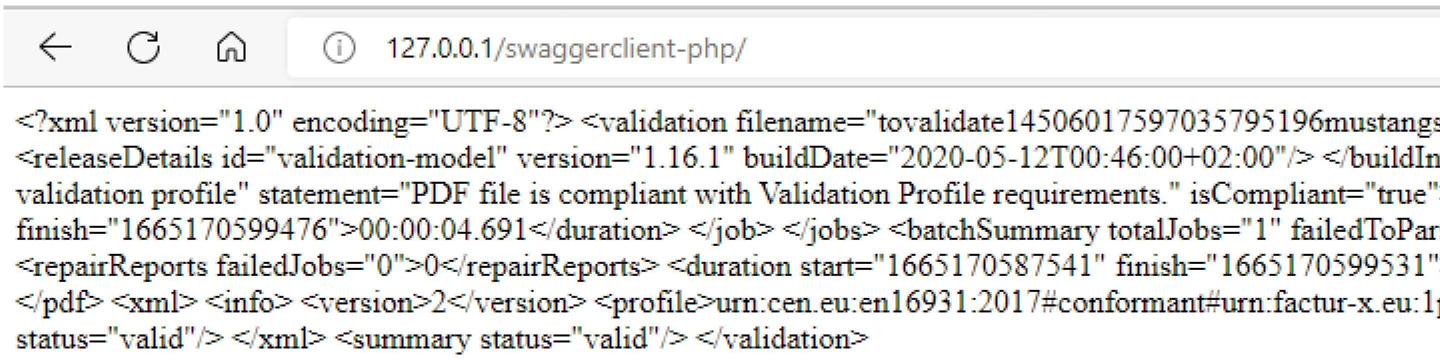
#17. reveal and copy Consumer Secret (18.).

#19 replace the static access token which will become invalid by $json["access_token"]

#20 Create or download a invoice to be validated, e.g. https://www.mustangproject.org/files/MustangGnuaccountingBeispielRE-20201121_508.pdf and save it as factur-x.pdf

#21 Change the method to validateFile and

#22 html escape the validation result, so that the result in the browser looks like screenshot 8:



127.0.0.1/swaggerclient-php/

```
<?xml version="1.0" encoding="UTF-8"?> <validation filename="tovalidate14506017597035795196mustangs
<releaseDetails id="validation-model" version="1.16.1" buildDate="2020-05-12T00:46:00+02:00"/> </buildIn
validation profile" statement="PDF file is compliant with Validation Profile requirements." isCompliant="true"
finish="1665170599476">00:00:04.691</duration> </job> </jobs> <batchSummary totalJobs="1" failedToPar
<repairReports failedJobs="0">0</repairReports> <duration start="1665170587541" finish="1665170599531"
</pdf> <xml> <info> <version>2</version> <profile>urn:cen.eu:en16931:2017#conformant#urn:factur-x.eu:1
status="valid"/> </xml> <summary status="valid"/> </validation>
```

That's it. Instead of displaying the XML you can now parse it.

Feel free to also try the async functions.

Postman

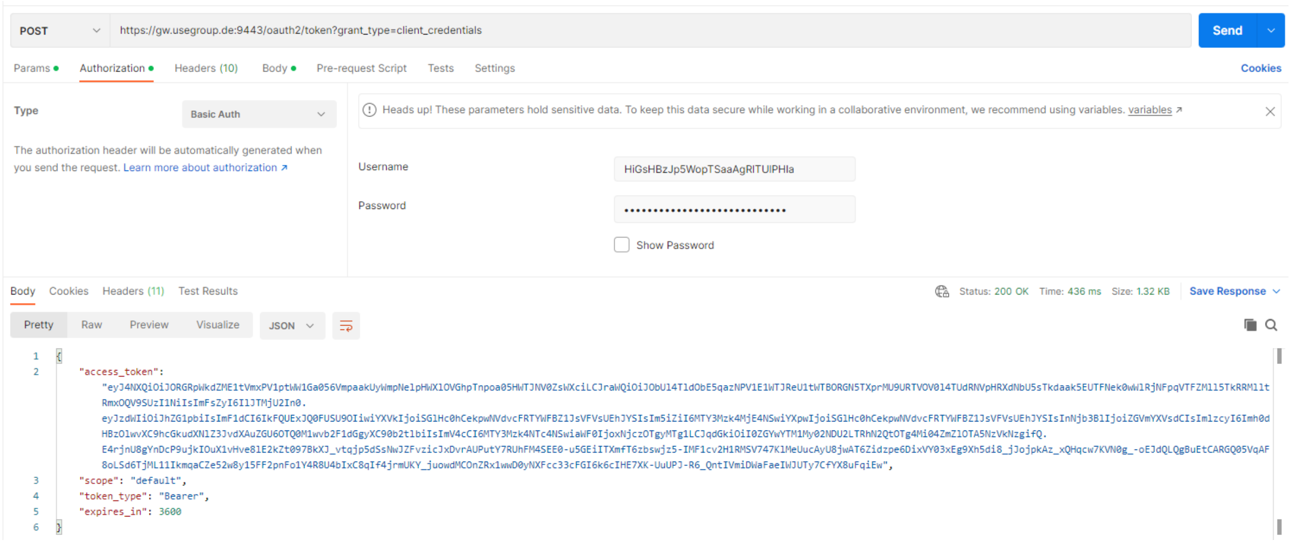
For this example, you will need enabled client credentials as described on page 7 in Allowing Client Credentials.

Use Import|File|Upload Files to upload you Openapi.yaml file into a Mustangserver collection.

Add a request to `https://gw.usegroup.de:9443/oauth2/token?grant_type=client_credentials` and call it Token Request. Postman will auto-detect the Parameter in the URL. Change the type to POST.

In Headers, add a new field Content-Type with application/json as its value.

The tab Authorization should be Basic auth with your client id and secret as username and password. Once you click Send, an according access token should be submitted:



```
POST https://gw.usegroup.de:9443/oauth2/token?grant_type=client_credentials
```

Type: Basic Auth

The authorization header will be automatically generated when you send the request. Learn more about authorization ↗

Heads up! These parameters hold sensitive data. To keep this data secure while working in a collaborative environment, we recommend using variables. variables ↗

Username: HiGsHBzJp5WopTSaaAgRlTUlPHla

Password: ••••••••••••••••••••••••••••••

Show Password

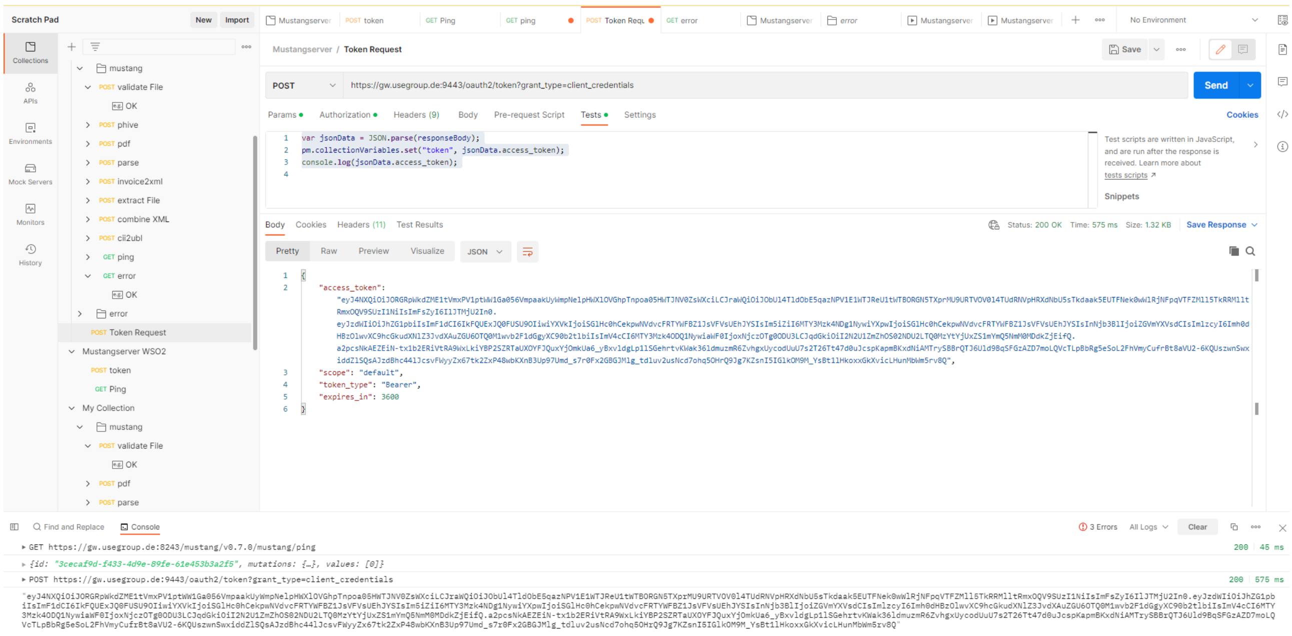
Status: 200 OK Time: 436 ms Size: 1.32 KB

```
{
    "access_token":
        "eyJ4NXQiOiJORGRpWkdZME1tVmxPV1ptWW1Ga056VmpaakUyWmpNelpHWXlOVGhpTnpoa05HWTJNV0ZsWXciLCJraWQiOiJObUl4TldObE5qazNPV1E1WTJReU1tWTBORGN5TXprMU9URTVOV0l4TUdRNVpHRXdNbU5sTkdaak5EUTFNek0wWlRjNFpqVTFZMll5TkRRMllt
        RmxOQV9SUzI1NiIsImFsZyI6IlJTMjU2In0.
        eyJzdWIiOiJhZG1pbiIsImF1dCI6IkFQUExJQ0FUSU9OIiwiYXVkIjoiSGlHc0hCekpwNVdvcFRTYWFBZ1JsVFVsUEhJYSIsIm5iZiI6MTY3Mzk4MjE4NSwiYXpwIjoiSGlHc0hCekpwNVdvcFRTYWFBZ1JsVFVsUEhJYSIsInNjb3BlIjoiZGVmYXVsdCIsImlzcyI6Imh0d
        HBzOlwvXC9hcGkudXNlZ3JvdXAuZGU6OTQ0M1wvb2F1dGgyXC90b2tlbiIsImV4cCI6MTY3Mzk4NTc4NSwiaWF0IjoxNjczOTgyMTg1LCJqdGkiOiI0ZGYwYTM1My02NDU2LTRhN2QtOTg4Mi04ZmZlOTA5NzVkNzgifQ.
        E4rjnU8gYnDcP9ujkIOuX1vHve81E2kZt097BkXJ_vtqjp5dSsNwJZFvzicJxDvrAUPutY7RUhFM4SEE0-u5GEiITXmfT6zbswjz5-IMF1cv2H1RMSV747K1MeUucAyU8jwAT6Zidzpe6DixVY03xEg9Xh5di8_jJojpkAz_xQHqcw7KVN0g_-oEJdQLQgBuEtCARGQ05VqAF
        8oLSd6TjML11IkmqaCZe52w8y15FF2pnFo1Y4R8U4bIxC8qIf4jrmUKY_juowdMCOnZRx1wwD0yNXFcc33cFGI6k6cIHE7XK-UuUPJ-R6_QntIVmiDWaFaeIWJUTy7CfYX8uFqiEw",
    "scope": "default",
    "token_type": "Bearer",
    "expires_in": 3600
}
```

Add

```
var jsonData = JSON.parse(responseBody);
pm.collectionVariables.set("token", jsonData.access_token);
console.log(jsonData.access_token);
```

In the „Tests“ tab and View|Show Postman Console (Alt+CTRL+C) . Once you click Send again you should be able to see the access token also in the Console:



Mustangserver / Token Request

```
POST https://gw.usegroup.de:9443/oauth2/token?grant_type=client_credentials
```

```
var jsonData = JSON.parse(responseBody);
pm.collectionVariables.set("token", jsonData.access_token);
console.log(jsonData.access_token);
```

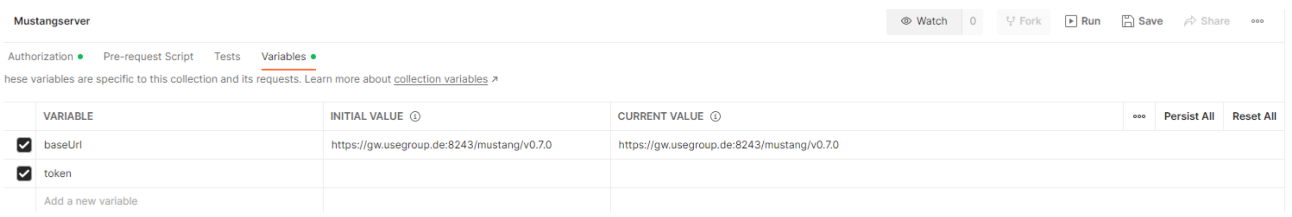
Test scripts are written in JavaScript, and are run after the response is received. Learn more about tests scripts ↗

Status: 200 OK Time: 575 ms Size: 1.32 KB

```
{
    "access_token":
        "eyJ4NXQiOiJORGRpWkdZME1tVmxPV1ptWW1Ga056VmpaakUyWmpNelpHWXlOVGhpTnpoa05HWTJNV0ZsWXciLCJraWQiOiJObUl4TldObE5qazNPV1E1WTJReU1tWTBORGN5TXprMU9URTVOV0l4TUdRNVpHRXdNbU5sTkdaak5EUTFNek0wWlRjNFpqVTFZMll5TkRRMllt
        RmxOQV9SUzI1NiIsImFsZyI6IlJTMjU2In0.
        eyJzdWIiOiJhZG1pbiIsImF1dCI6IkFQUExJQ0FUSU9OIiwiYXVkIjoiSGlHc0hCekpwNVdvcFRTYWFBZ1JsVFVsUEhJYSIsIm5iZiI6MTY3Mzk4NDg1NywiYXpwIjoiSGlHc0hCekpwNVdvcFRTYWFBZ1JsVFVsUEhJYSIsInNjb3BlIjoiZGVmYXVsdCIsImlzcyI6Imh0d
        HBzOlwvXC9hcGkudXNlZ3JvdXAuZGU6OTQ0M1wvb2F1dGgyXC90b2tlbiIsImV4cCI6MTY3Mzk4ODQ1NywiaWF0IjoxNjczOTg0ODU3LCJqdGkiOiI2N2U1ZmZhOS02NDU2LTQ0MzYtYjUxZS1mYmQ5NmM0MDdkZjEifQ.
        a2pcsNkAEZEiN-tx1b2ERiVtRA9WxLkiYBP2SZRTaUXOYFJQuxYjOmkUa6_yBxvldgLp1lSGehrtvKWak36ldmuzmR6ZvhgxUycodUuU7s2T26Tt47d0uJcspKapmBKxdNiAMTrySBBrQTJ6Uld9BqSFGzAZD7moLQVcTLpBbRg5eSoL2FhVmyCufrBt8aVU2-6KQUszwnSwx
        iddZlSQsAJzdBhc44lJcsvFWyyZx67tk2ZxP48wbKXnB3Up97Umd_s7r0Fx2GBGJMlg_tdluv2usNcd7ohq5OHrQ9Jg7KZsnI5IGlkOM9M_YsBt1lHkoxxGkXvicLHunMbWm5rv8Q",
    "scope": "default",
    "token_type": "Bearer",
    "expires_in": 3600
}
```

```
▸ GET https://gw.usegroup.de:8243/mustang/v0.7.0/mustang/ping                                200 | 45 ms
▸ {id: "3cecaf9d-f433-4d9e-89fe-61e453b3a2f5", mutations: {…}, values: [0]}
▸ POST https://gw.usegroup.de:9443/oauth2/token?grant_type=client_credentials                200 | 575 ms
"eyJ4NXQiOiJORGRpWkdZME1tVmxPV1ptWW1Ga056VmpaakUyWmpNelpHWXlOVGhpTnpoa05HWTJNV0ZsWXciLCJraWQiOiJObUl4TldObE5qazNPV1E1WTJReU1tWTBORGN5TXprMU9URTVOV0l4TUdRNVpHRXdNbU5sTkdaak5EUTFNek0wWlRjNFpqVTFZMll5TkRRMlltRmxOQV9SUzI1NiIsImFsZyI6IlJTMjU2In0.eyJzdWIiOiJhZG1pb
iIsImF1dCI6IkFQUExJQ0FUSU9OIiwiYXVkIjoiSGlHc0hCekpwNVdvcFRTYWFBZ1JsVFVsUEhJYSIsIm5iZiI6MTY3Mzk4NDg1NywiYXpwIjoiSGlHc0hCekpwNVdvcFRTYWFBZ1JsVFVsUEhJYSIsInNjb3BlIjoiZGVmYXVsdCIsImlzcyI6Imh0dHBzOlwvXC9hcGkudXNlZ3JvdXAuZGU6OTQ0M1wvb2F1dGgyXC90b2tlbiIsImV4cCI6MTY
3Mzk4ODQ1NywiaWF0IjoxNjczOTg0ODU3LCJqdGkiOiI2N2U1ZmZhOS02NDU2LTQ0MzYtYjUxZS1mYmQ5NmM0MDdkZjEifQ.a2pcsNkAEZEiN-tx1b2ERiVtRA9WxLkiYBP2SZRTaUXOYFJQuxYjOmkUa6_yBxvldgLp1lSGehrtvKWak36ldmuzmR6ZvhgxUycodUuU7s2T26Tt47d0uJcspKapmBKxdNiAMTrySBBrQTJ6Uld9BqSFGzAZD7moLQ
VcTLpBbRg5eSoL2FhVmyCufrBt8aVU2-6KQUszwnSwxiddZlSQsAJzdBhc44lJcsvFWyyZx67tk2ZxP48wbKXnB3Up97Umd_s7r0Fx2GBGJMlg_tdluv2usNcd7ohq5OHrQ9Jg7KZsnI5IGlkOM9M_YsBt1lHkoxxGkXvicLHunMbWm5rv8Q"
```

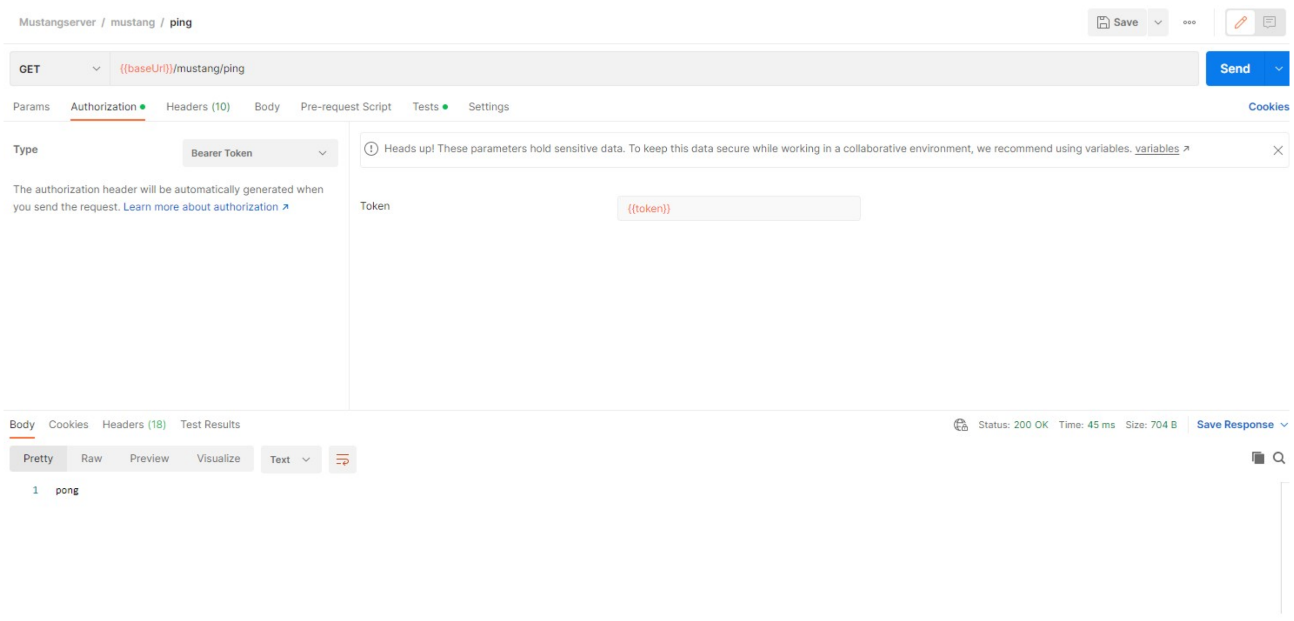
In the collection, click on the variables tab and add „token“ as a collection variable.



hese variables are specific to this collection and its requests. Learn more about collection variables ↗

	VARIABLE	INITIAL VALUE	CURRENT VALUE
✓	baseUrl	https://gw.usegroup.de:8243/mustang/v0.7.0	https://gw.usegroup.de:8243/mustang/v0.7.0
✓	token		
	Add a new variable		

You can now add the variable {{token}} as authorization to any request. The variable will be available and the requests work after you click on „Send“ of the Token Request for the first time.



GET {{baseUrl}}/mustang/ping

Type Bearer Token

The authorization header will be automatically generated when you send the request. Learn more about authorization ↗

Heads up! These parameters hold sensitive data. To keep this data secure while working in a collaborative environment, we recommend using variables. variables ↗

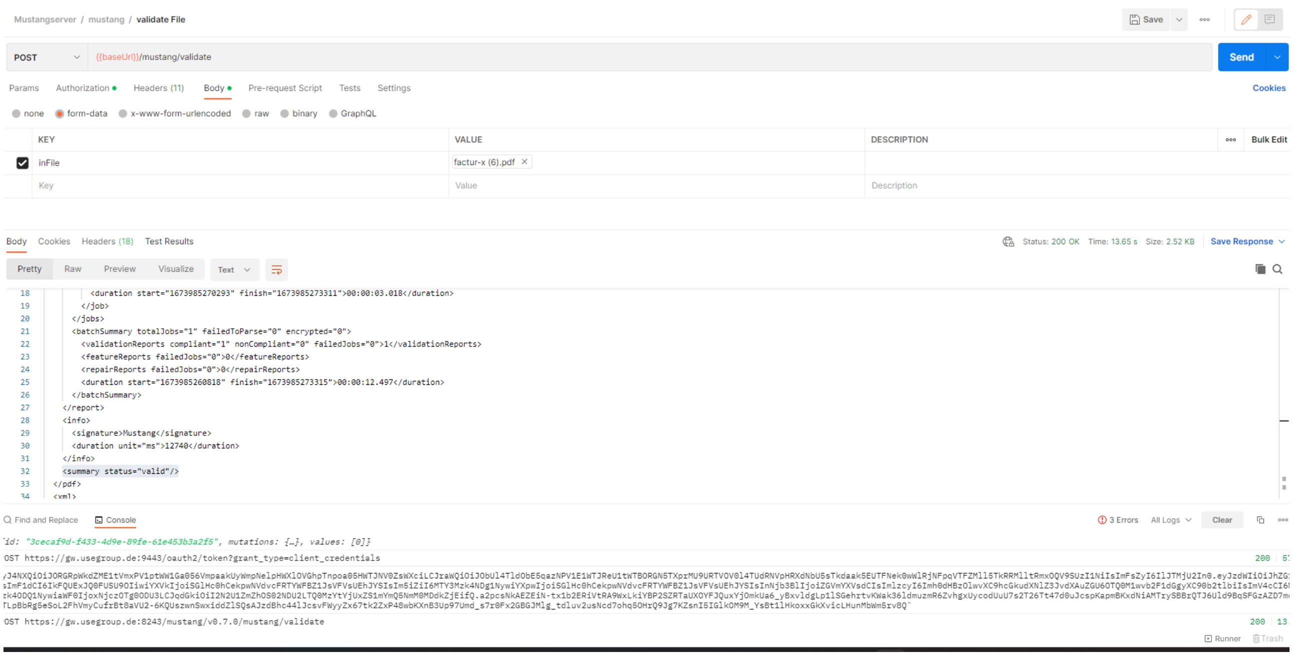
Token {{token}}

Status: 200 OK Time: 45 ms Size: 704 B

```
pong
```

Please note that ping was answered by pong.

Where appropriate, e.g. in the validation endpoint, Postman will allow you to select files, this being a valid factur-x:



POST {{baseUrl}}/mustang/validate

	KEY	VALUE	DESCRIPTION
✓	inFile	factur-x (6).pdf	
	Key	Value	Description

Status: 200 OK Time: 13.65 s Size: 2.52 KB

```
          <duration start="1673985270293" finish="1673985273311">00:00:03.018</duration>
        </job>
      </jobs>
      <batchSummary totalJobs="1" failedToParse="0" encrypted="0">
        <validationReports compliant="1" nonCompliant="0" failedJobs="0">1</validationReports>
        <featureReports failedJobs="0">0</featureReports>
        <repairReports failedJobs="0">0</repairReports>
        <duration start="1673985260818" finish="1673985273315">00:00:12.497</duration>
      </batchSummary>
    </report>
    <info>
      <signature>Mustang</signature>
      <duration unit="ms">12740</duration>
    </info>
    <summary status="valid"/>
  </pdf>
  <xml>
```

```
id: "3cecaf9d-f433-4d9e-89fe-61e453b3a2f5", mutations: {…}, values: [0]}
OST https://gw.usegroup.de:9443/oauth2/token?grant_type=client_credentials                200  5
```

yJ4NXQiOiJORGRpWkdZME1tVmxPV1ptWW1Ga056VmpaakUyWmpNelpHWXlOVGhpTnpoa05HWTJNV0ZsWXciLCJraWQiOiJObUl4TldObE5qazNPV1E1WTJReU1tWTBORGN5TXprMU9URTVOV0l4TUdRNVpHRXdNbU5sTkdaak5EUTFNek0wWlRjNFpqVTFZMll5TkRRMlltRmxOQV9SUzI1NiIsImFsZyI6IlJTMjU2In0.eyJzdWIiOiJhZG
sImF1dCI6IkFQUExJQ0FUSU9OIiwiYXVkIjoiSGlHc0hCekpwNVdvcFRTYWFBZ1JsVFVsUEhJYSIsIm5iZiI6MTY3Mzk4NDg1NywiYXpwIjoiSGlHc0hCekpwNVdvcFRTYWFBZ1JsVFVsUEhJYSIsInNjb3BlIjoiZGVmYXVsdCIsImlzcyI6Imh0dHBzOlwvXC9hcGkudXNlZ3JvdXAuZGU6OTQ0M1wvb2F1dGgyXC90b2tlbiIsImV4cCI6
zk4ODQ1NywiaWF0IjoxNjczOTg0ODU3LCJqdGkiOiI2N2U1ZmZhOS02NDU2LTQ0MzYtYjUxZS1mYmQ5NmM0MDdkZjEifQ.a2pcsNkAEZEiN-tx1b2ERiVtRA9WxLkiYBP2SZRTaUXOYFJQuxYjOmkUa6_yBxvldgLp1lSGehrtvKWak36ldmuzmR6ZvhgxUycodUuU7s2T26Tt47d0uJcspKapmBKxdNiAMTrySBBrQTJ6Uld9BqSFGzAZD7m
TLpBbRg5eSoL2FhVmyCufrBt8aVU2-6KQUszwnSwxiddZlSQsAJzdBhc44lJcsvFWyyZx67tk2ZxP48wbKXnB3Up97Umd_s7r0Fx2GBGJMlg_tdluv2usNcd7ohq5OHrQ9Jg7KZsnI6IGlkOM9M_YsBt1lHkoxxGkXvicLHunMbWm5rv8Q"

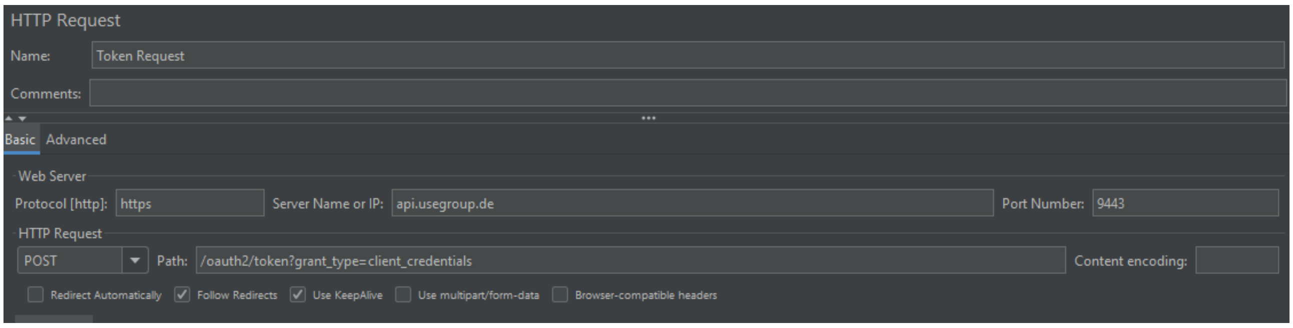
```
OST https://gw.usegroup.de:8243/mustang/v0.7.0/mustang/validate                            200  13
```

Jmeter

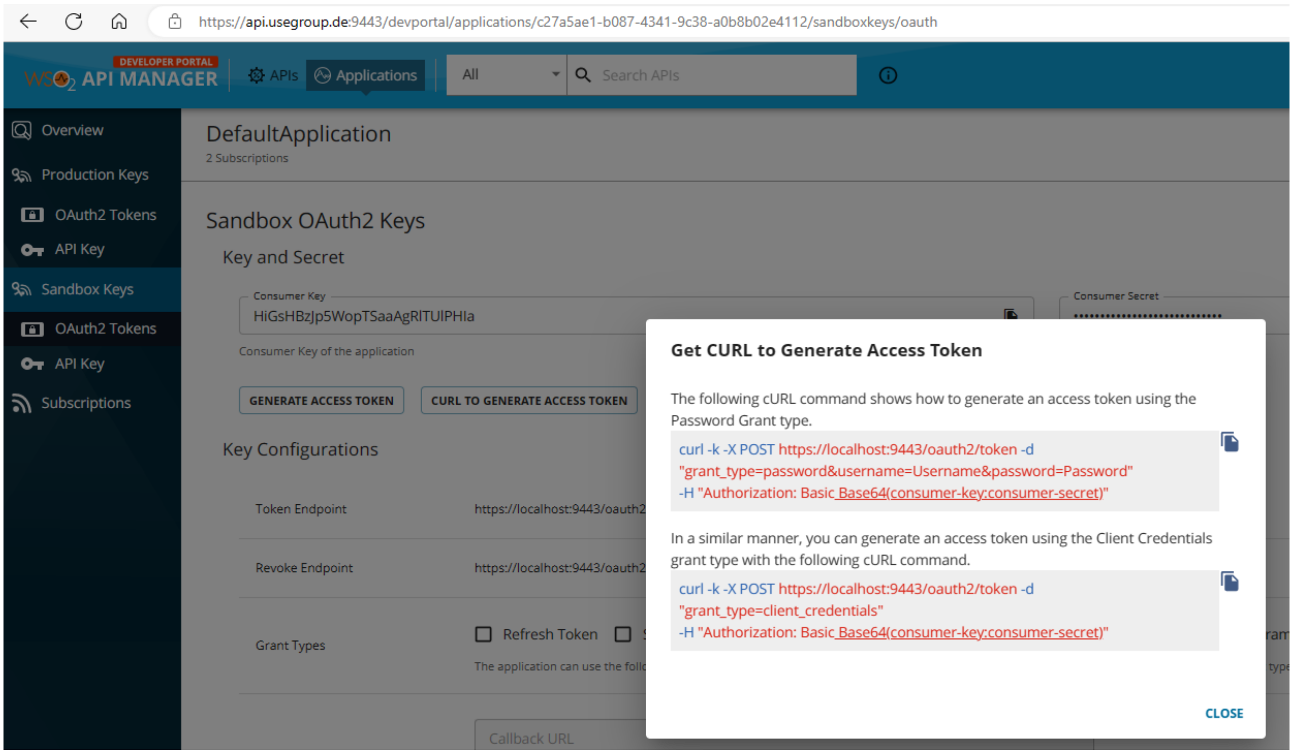
https://openapi-generator.tech/ supports a Jmeter export but that does not handle authentication so this is a simple way to do some performance testing manually.

For this example, you will need enabled client credentials as described on page 7 in Allowing Client Credentials.

In your Test plan, add a Thread Group with a Once Only controller. Below that, add a HTTP request sampler, we'll call it Token Request. This is how it is defined: Change protocol to https, method to POST, add server name and port number, and add the path:


HTTP Request
Name: Token Request
Comments:
Basic Advanced
Web Server
Protocol [http]: https Server Name or IP: api.usegroup.de Port Number: 9443
HTTP Request
POST Path: /oauth2/token?grant_type=client_credentials Content encoding:
☐ Redirect Automatically ✓ Follow Redirects ✓ Use KeepAlive ☐ Use multipart/form-data ☐ Browser-compatible headers

Base64encode your <consumer key>:<consumer secret> as described on the applications page of the API management:



https://api.usegroup.de:9443/devportal/applications/c27a5ae1-b087-4341-9c38-a0b8b02e4112/sandboxkeys/oauth

DefaultApplication
2 Subscriptions

Sandbox OAuth2 Keys
Key and Secret

Consumer Key: HiGsHBzJp5WopTSaaAgRITUIPHIa
Consumer Key of the application

Key Configurations
Token Endpoint: https://localhost:9443/oauth2
Revoke Endpoint: https://localhost:9443/oauth2

Get CURL to Generate Access Token

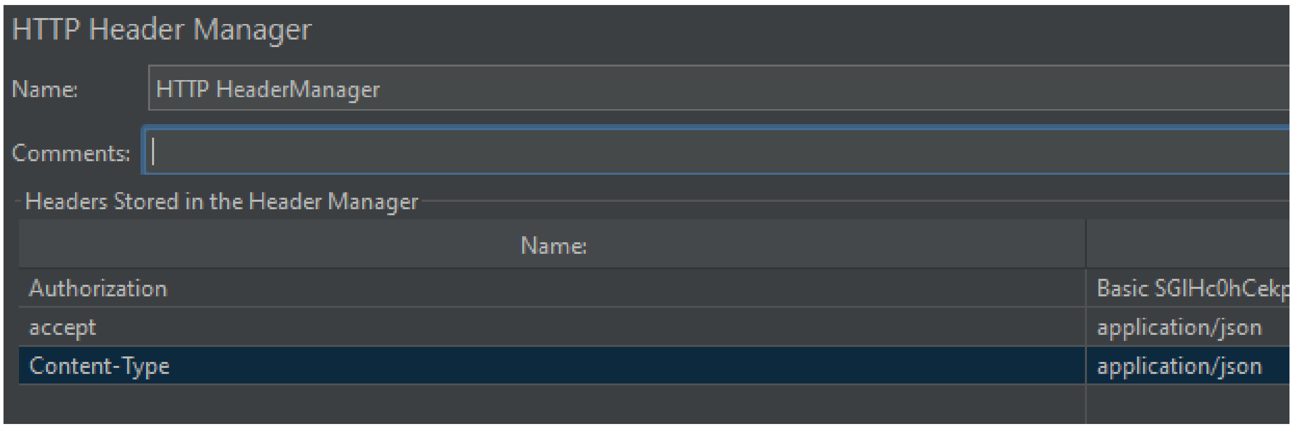
The following cURL command shows how to generate an access token using the Password Grant type.

```
curl -k -X POST https://localhost:9443/oauth2/token -d
"grant_type=password&username=Username&password=Password"
-H "Authorization: Basic Base64(consumer-key:consumer-secret)"
```

In a similar manner, you can generate an access token using the Client Credentials grant type with the following cURL command.

```
curl -k -X POST https://localhost:9443/oauth2/token -d
"grant_type=client_credentials"
-H "Authorization: Basic Base64(consumer-key:consumer-secret)"
```

In Jmeter, below the Token request, add a HeaderManager with Basic Authorization as described:



HTTP Header Manager

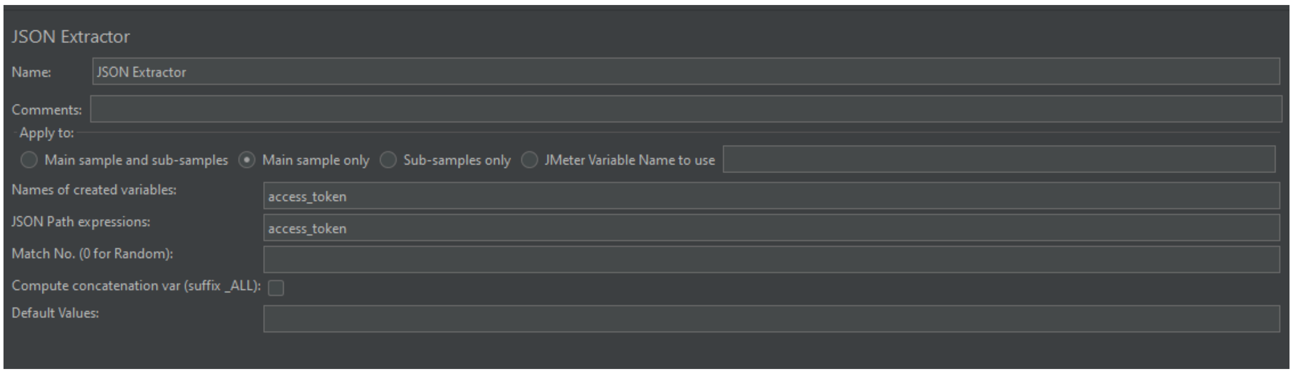
Name: HTTP HeaderManager

Comments:

Headers Stored in the Header Manager

Name:	
Authorization	Basic SGIHc0hCekp
accept	application/json
Content-Type	application/json

And from the response, also below Token Request, extract the JSON value access token into a Jmeter Variable access token using a JSON Extractor:



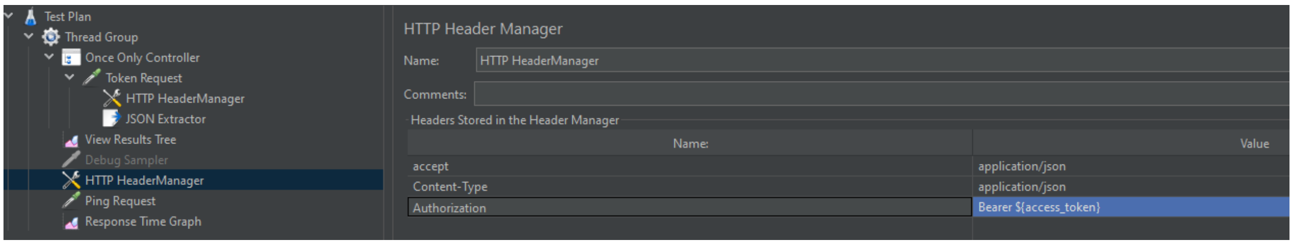
JSON Extractor

Name:	JSON Extractor
Comments:	
Apply to:	Main sample and sub-samples [✓ Main sample only] Sub-samples only JMeter Variable Name to use
Names of created variables:	access_token
JSON Path expressions:	access_token
Match No. (0 for Random):	
Compute concatenation var (suffix _ALL):	☐
Default Values:	

Add a sampler View Result Tree to confirm the results and a debug sampler if you like (in the results tree you will then be able to e.g. see the current variables when you click on the results of the debug sampler).

Run|Start should give you green entries in the results tree.

Now we will set the ordinary authentication as header: add another Header Manager outside of the Token request and add the variable as token, i.e. Authorization being Bearer ${access_token}



```
Test Plan
  Thread Group
    Once Only Controller
      Token Request
        HTTP HeaderManager
        JSON Extractor
    View Results Tree
    Debug Sampler
    HTTP HeaderManager
    Ping Request
    Response Time Graph
```

HTTP Header Manager

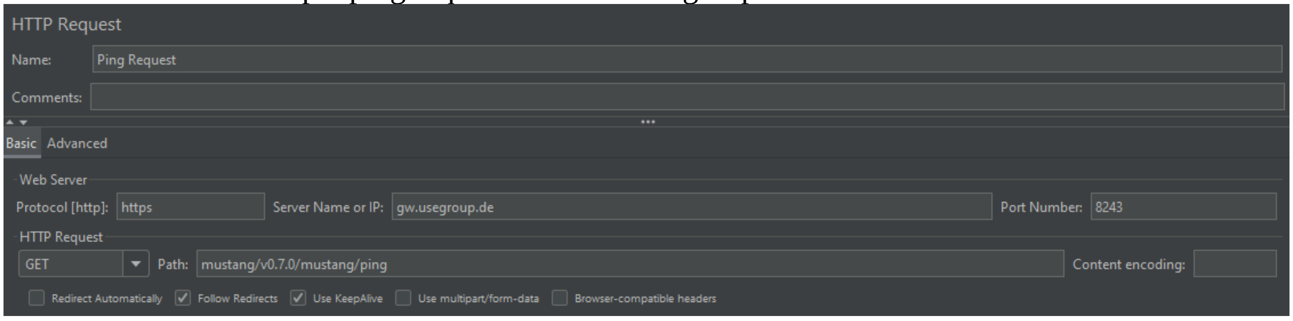
Name: HTTP HeaderManager

Comments:

Headers Stored in the Header Manager

Name:	Value
accept	application/json
Content-Type	application/json
Authorization	Bearer ${access_token}

You can then add a simple ping request in the thread group



HTTP Request

Name: Ping Request

Comments:

Basic Advanced

Web Server

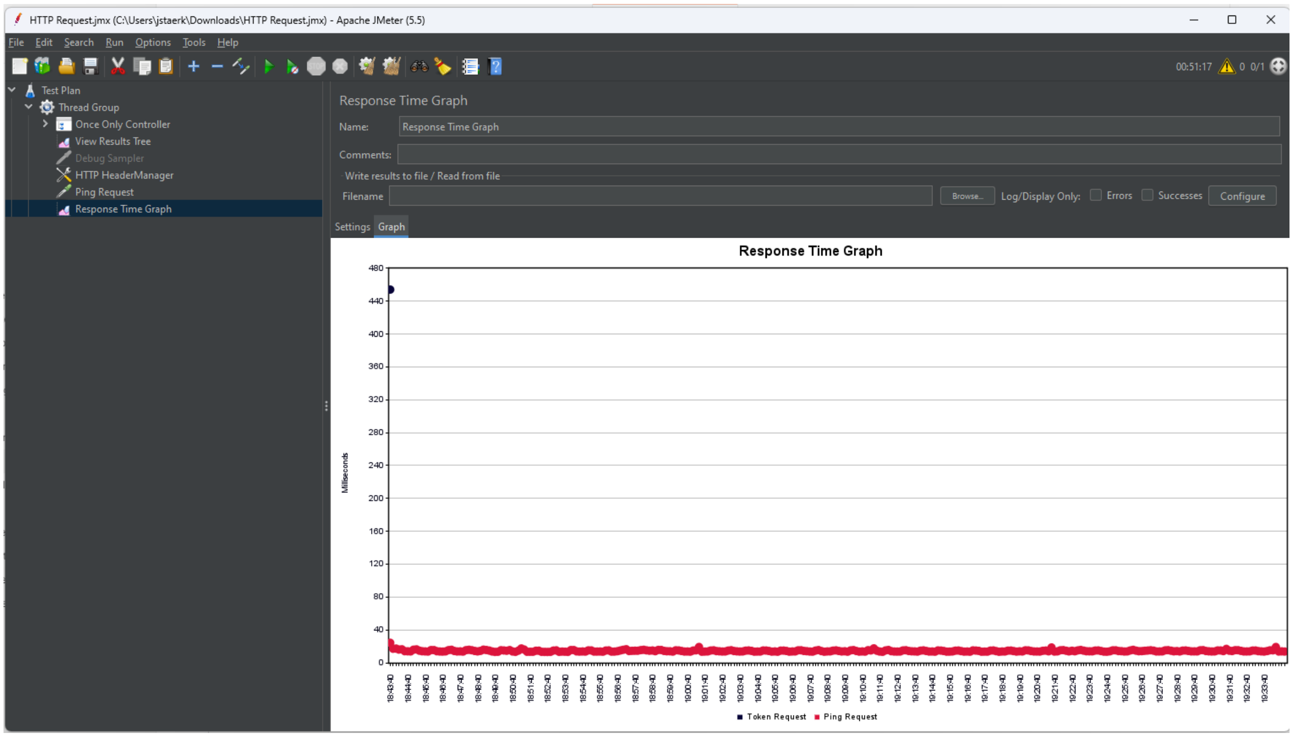
Protocol [http]: https Server Name or IP: gw.usegroup.de Port Number: 8243

HTTP Request

GET Path: mustang/v0.7.0/mustang/ping Content encoding:

☐ Redirect Automatically ☑ Follow Redirects ☑ Use KeepAlive ☐ Use multipart/form-data ☐ Browser-compatible headers

and e.g. a Response time graph.You can then set the Thread group loop count to infinite, start the sampling and check the results tree. After a while the response time graph will look like this, indicating the initial login took ~440ms and the usual response time to our „ping“ is ~20ms.



Response Time Graph

Name: Response Time Graph

Comments:

Write results to file / Read from file

Filename

Terms of service

Test terms

To test and evaluate the service a valid email address has to be provided. Unless otherwise agreed (info@usegroup.de) test access is restricted to one account per legal entity, i.e. usually company. This email address will also be used to send availability, information about the roadmap, development and status with an expected maximum volume of one per week. You can terminate your test phase by unsubscribing from the announcements newsletter list. After the signup, access can then happen free of charge, with a limit of 1,000 operations/month, unless access is revoked by usegroup. You are not allowed to share personal data (e.g. real invoice recipient's names, addresses, email addresses, bank credentials or real invoice contents). Access may be revoked because the general test phase has ended, the test phase is over for a certain customer, or due to other terms which do not need to be disclosed. Under this test terms we also do not guarantee the availability nor the correctness of the service.

https://api.usegroup.de:9443/authenticationendpoint/privacy_policy.do

Production terms

To access Mustangserver productively including a data processing agreement a Mustang Pro license is required. Further info can be obtained at https://www.mustangproject.org/pro/