PSD2 APIs testing documentation

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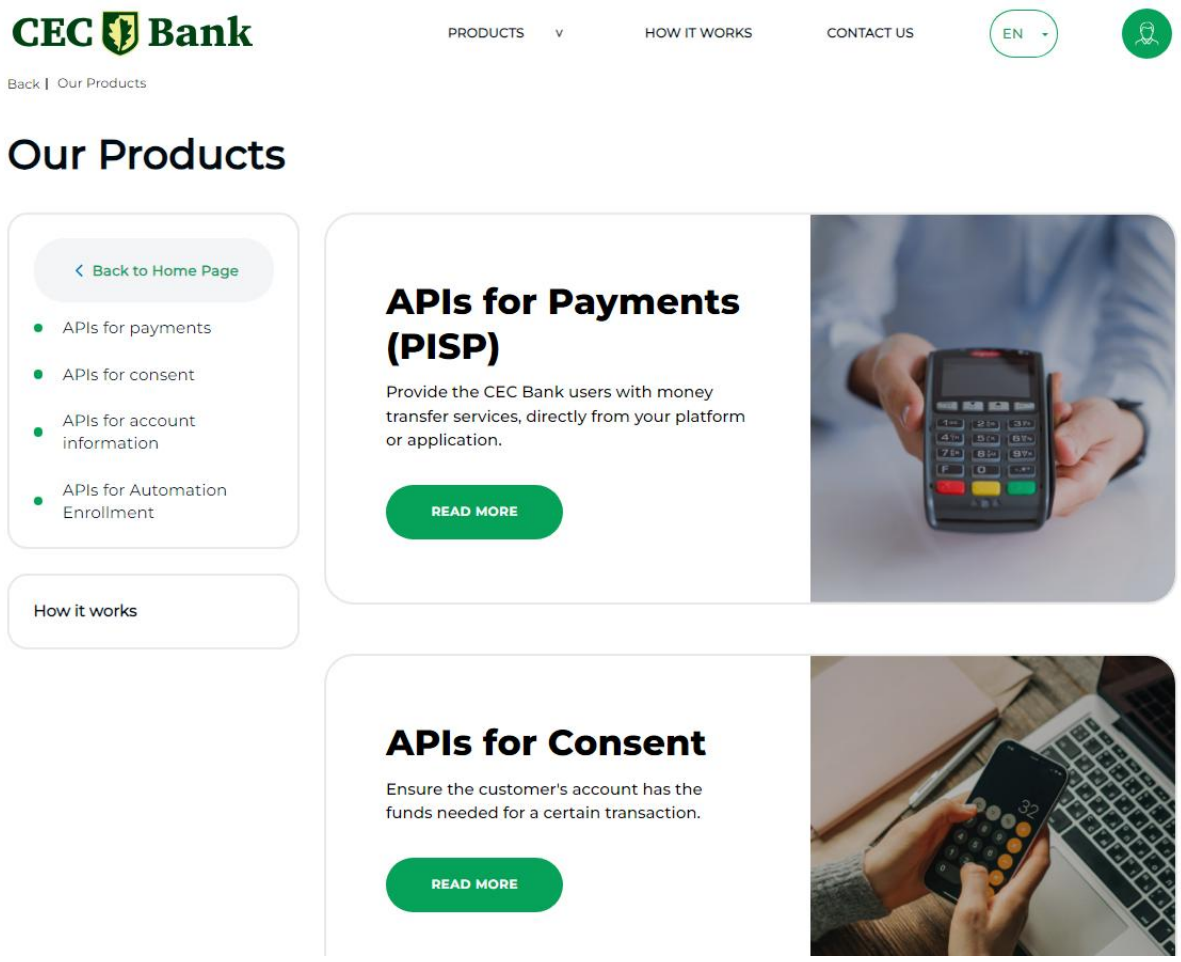
1 Automatic enrolment:

In order to start the APIs testing, user enrollment is required. To be able to do this, follow these steps:

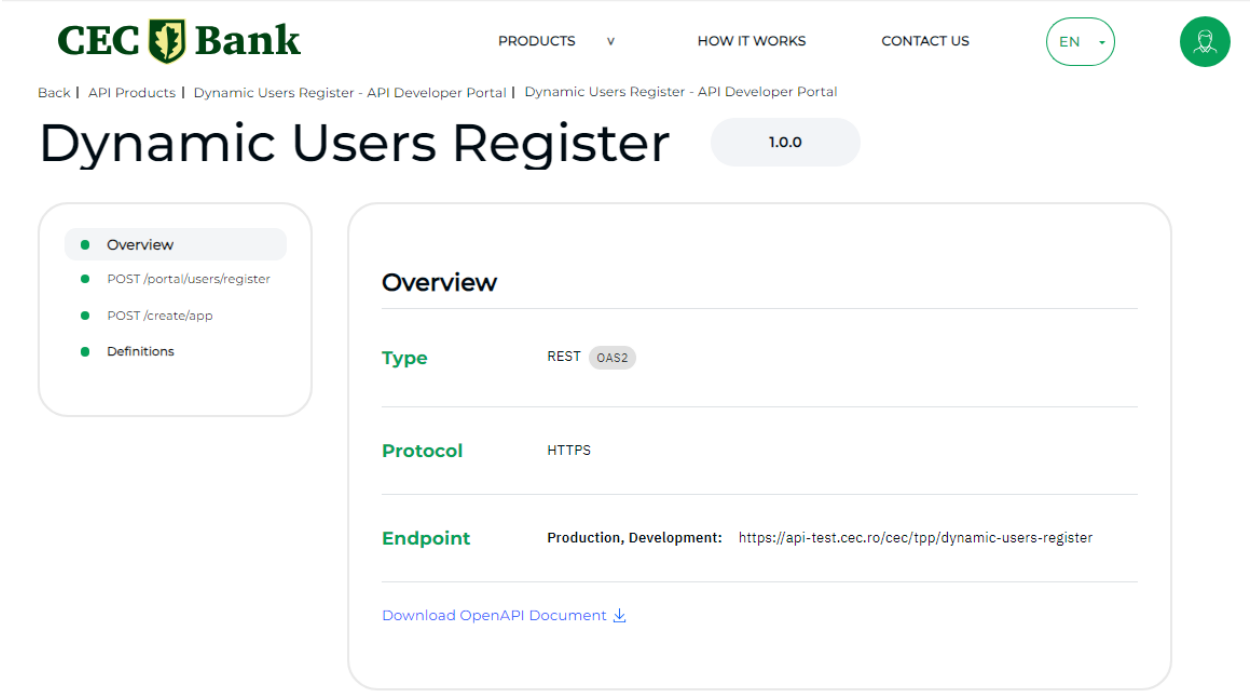
- Creating the user

- Creating an application



In the portal we will go to the "Our Products" window and select the api: API's for Automation Enrollment.

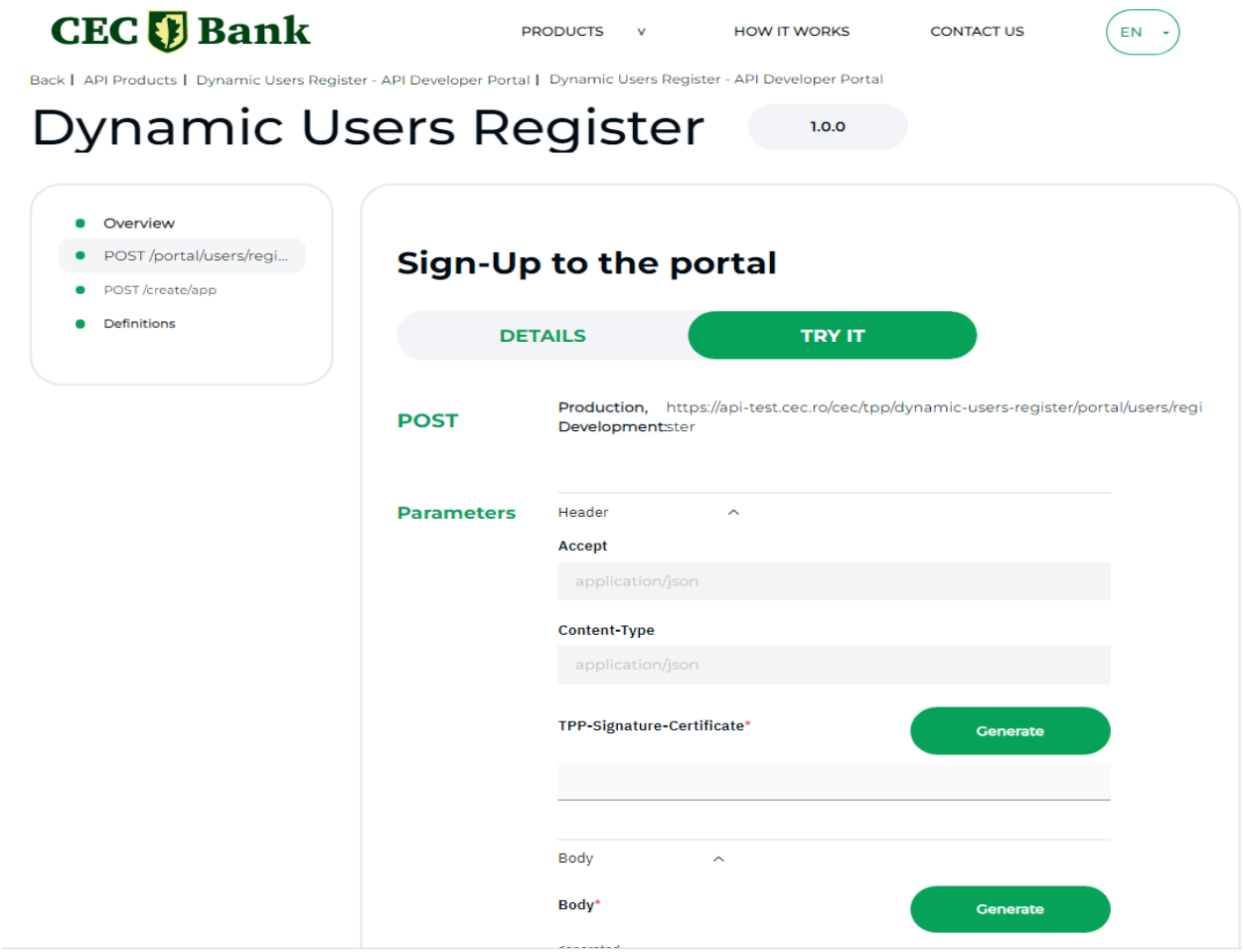
After selection we will see the "Dynamic Users Register" api:



1.1 Creating the user:

The first call must be selected: "POST /portal/users/register" to make the user creation call.

The data filled in the body must be retained as it will be used in the application creation call.



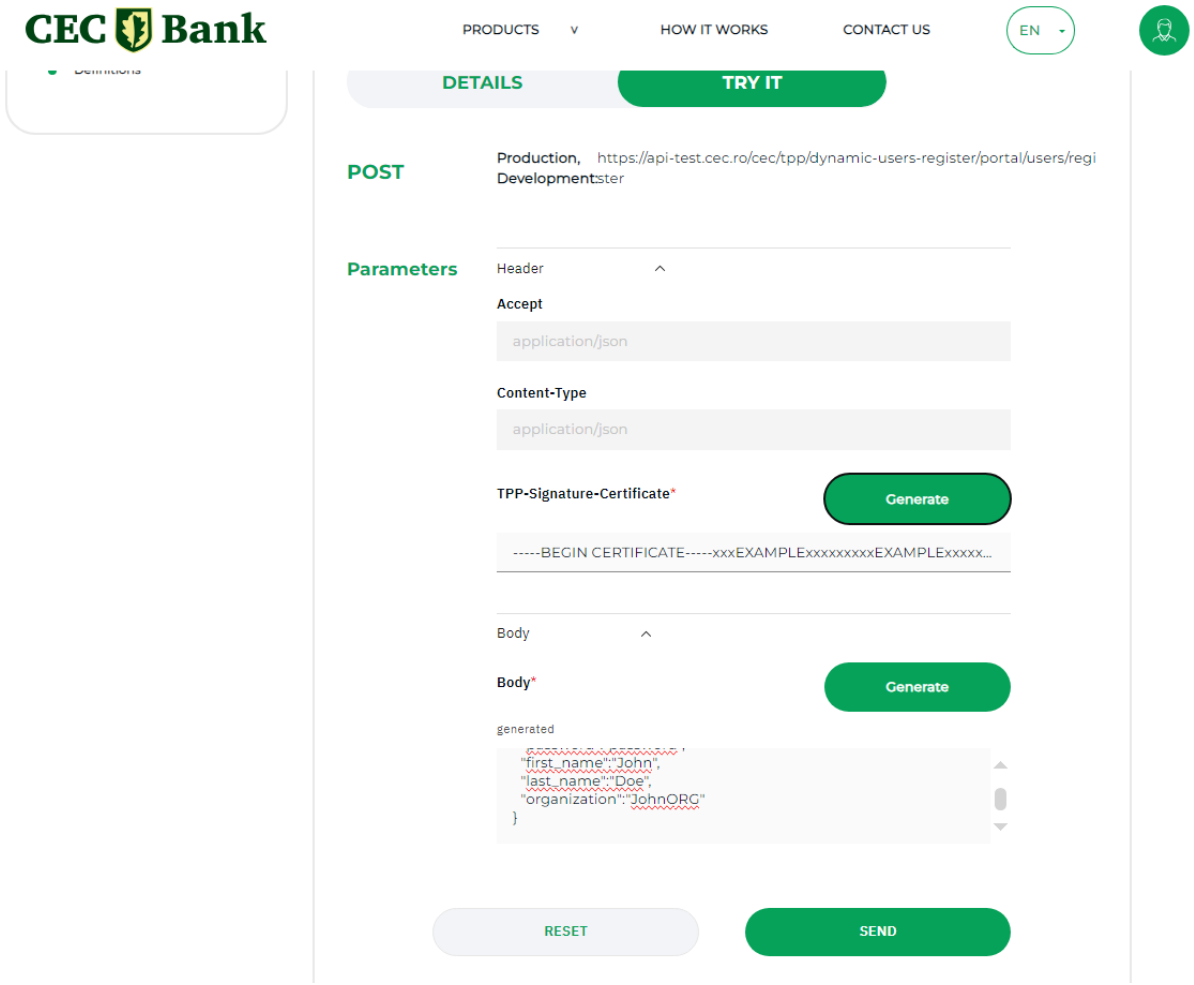
The following headers must be filled in in order to make the call:

- TPP-Signature-Certificate = -----BEGIN CERTIFICATE-----
xxxEXAMPLExxxxxxxxxEXAMPLExxxxxxxxxEXAMPLExxxxxxxxxEXAMPLExxxxxxxEXAMPLExxxxxxxxxEXAMPLExxxxxxxxxEXAMPLExxxxxxxxxEXAMPLExxxxxxxEXAMPLExxxxxxxxxEXAMPLExxxxxxxxxEXAMPLExxxxxxxxxEXAMPLExxxxxxxEXAMPLExxxxxxxxxEXAMPLExxxxxxxxxEXAMPLExxxxxxxxxEXAMPLExxxx-----END CERTIFICATE-----

- Content-Type = application/json

In the body part, the following body model must be filled in:

```
body : {
  "username":"john.doe@yahoo.com",
  "password":"password",
  "first_name":"John",
  "last_name":"Doe",
  "organization":"JohnORG"
}
```



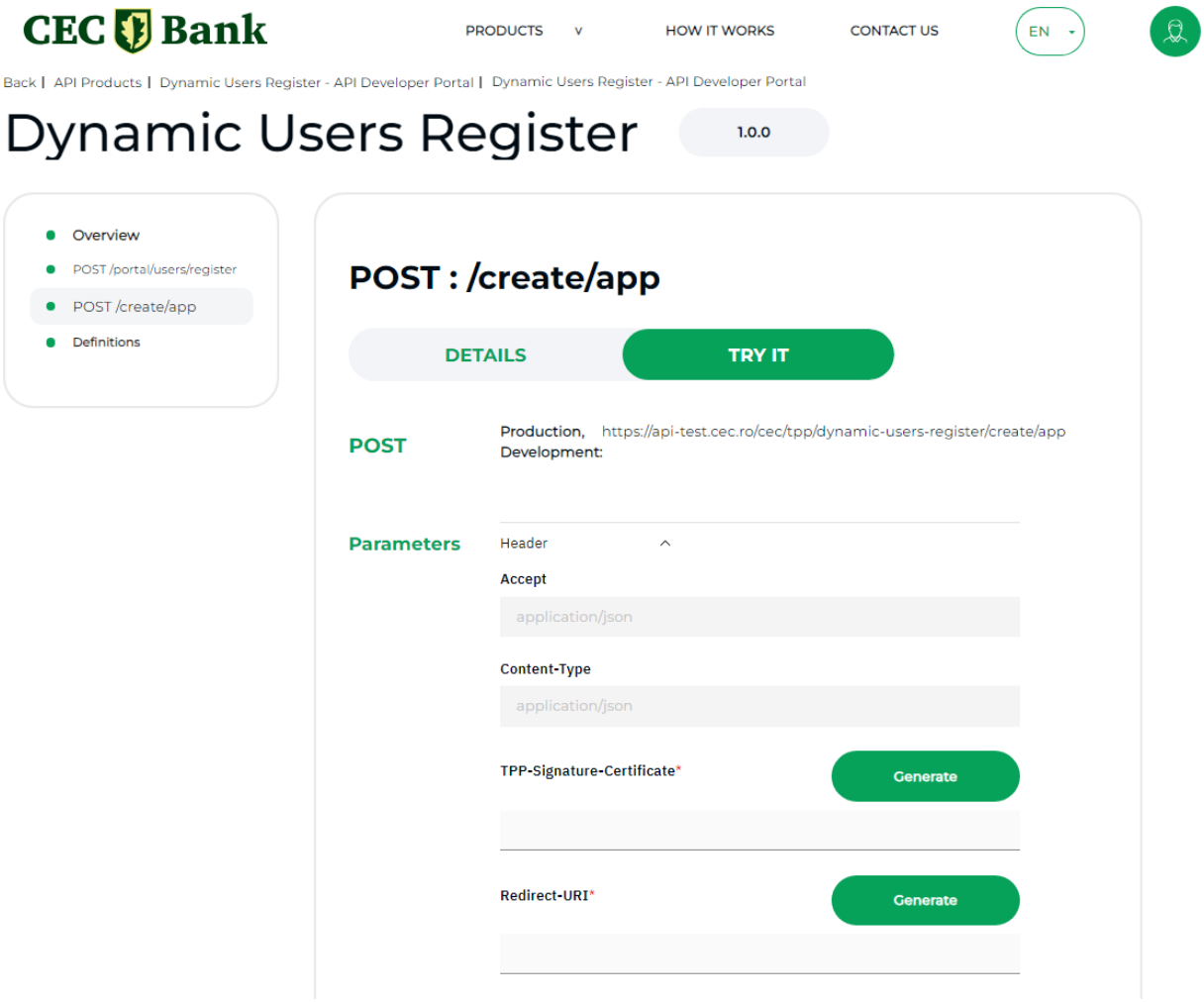
<PUBLIC>

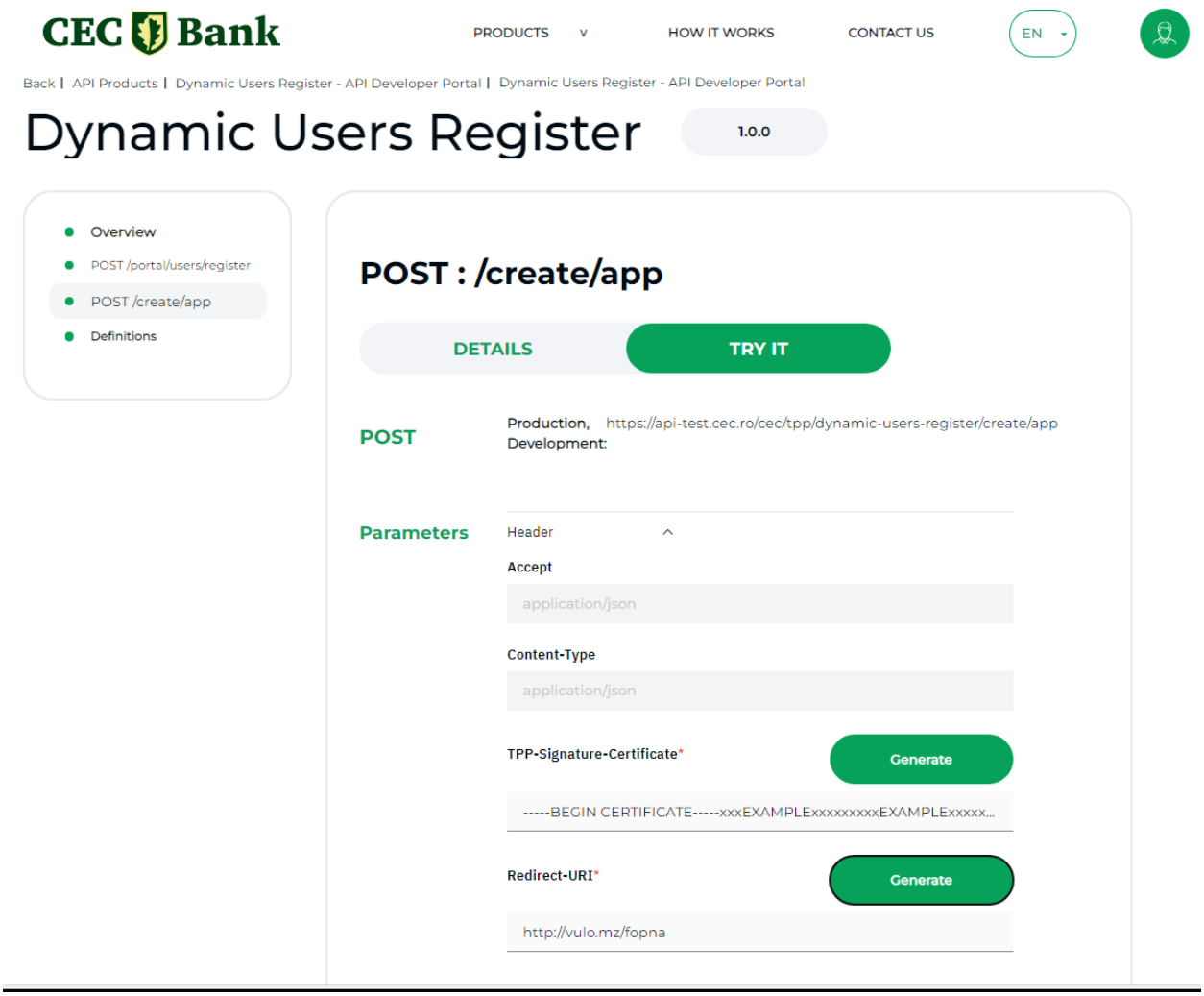
If the data entered are valid, the call will return a "201 created" response and you will receive a confirmation email on the email address you filled in the body with the activation link.

The link must be clicked on the webpage to complete the registration step.

1.2 Creating an application:

The second call must be selected: "POST /create/app" to make the call creating the application and getting a set of test credentials.





The following headers must be filled in in order to make the call:

-TPP-Signature-Certificate = -----BEGIN CERTIFICATE-----
xxxEXAMPLExxxxxxxxxEXAMPLExxxxxxxxxEXAMPLExxxxxxxxxEXAMPLExxxxxxxEXAMPLExxxxxxxxxEXAMPLExxxxxxxxxEXAMPLExxxxxxxxxEXAMPLExxxxxxxEXAMPLExxxxxxxxxEXAMPLExxxxxxxxxEXAMPLExxxxxxxxxEXAMPLExxxxxxxEXAMPLExxxxxxxxxEXAMPLExxxxxxxxxEXAMPLExxxxxxxxxEXAMPLExxxx-----END CERTIFICATE-----

- Content-Type = application/json

- Redirect-Uri = "https://www.google.com (the passed link is an example and you can pass any redirect link)

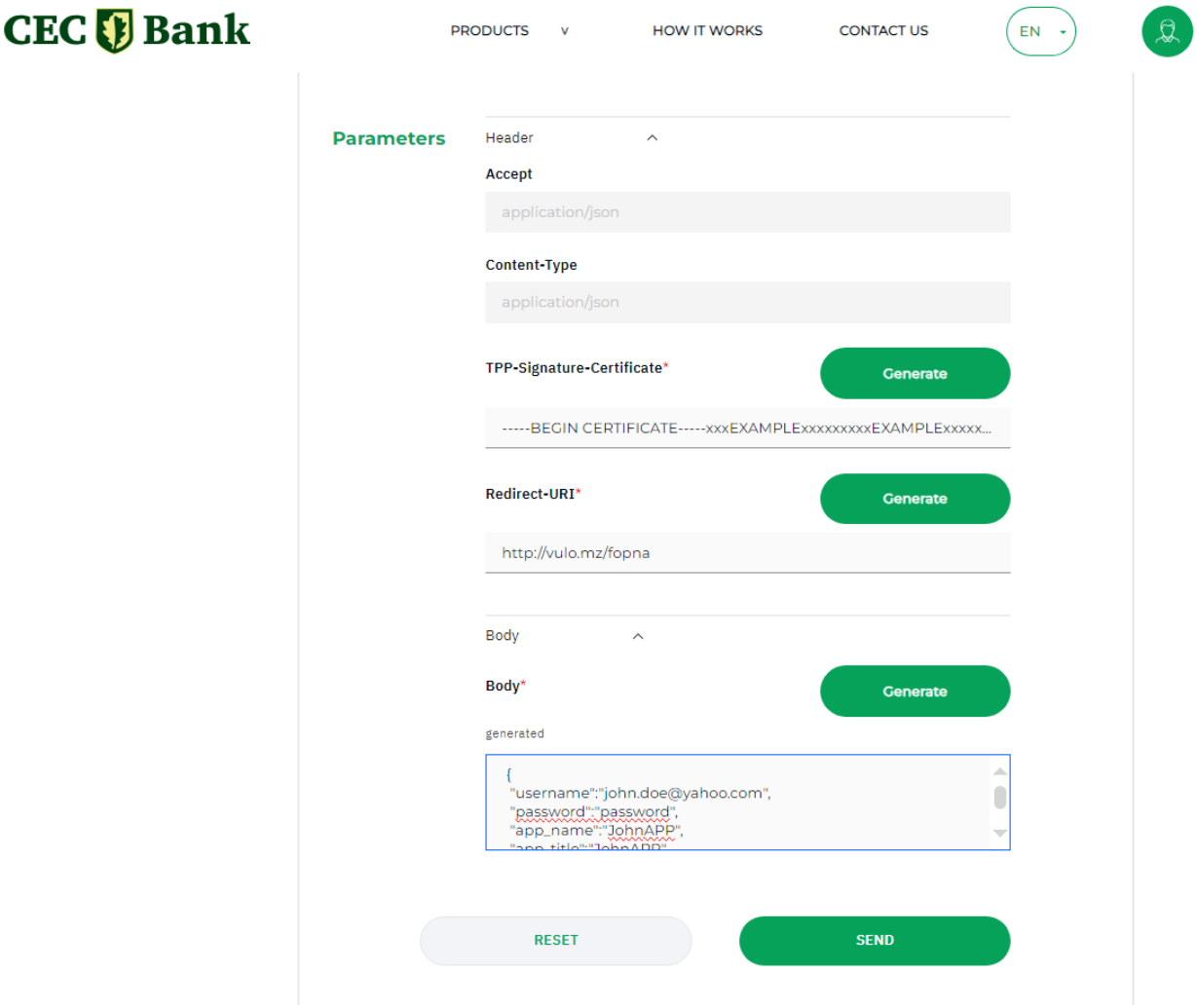
In the body part, the following body model must be filled in:

```
body : {
  "username":"john.doe@yahoo.com",
  "password":"password",
  "app_name":"JohnAPP",
  "app_title":"JohnAPP",
  "organization":"JohnORG"
}
```

If the organization name filled in the enrollment step contains spaces ("organization":"John ORG"), when filling in the request body for the application creation call we have to replace the spaces with "-".

E.g.:

```
body : {
  "username":"john.doe@yahoo.com",
  "password":"password",
  "app_name":"JohnAPP",
  "app_title":"JohnAPP",
  "organization":"John-ORG"
}
```



Following the call we will receive a formal reply:

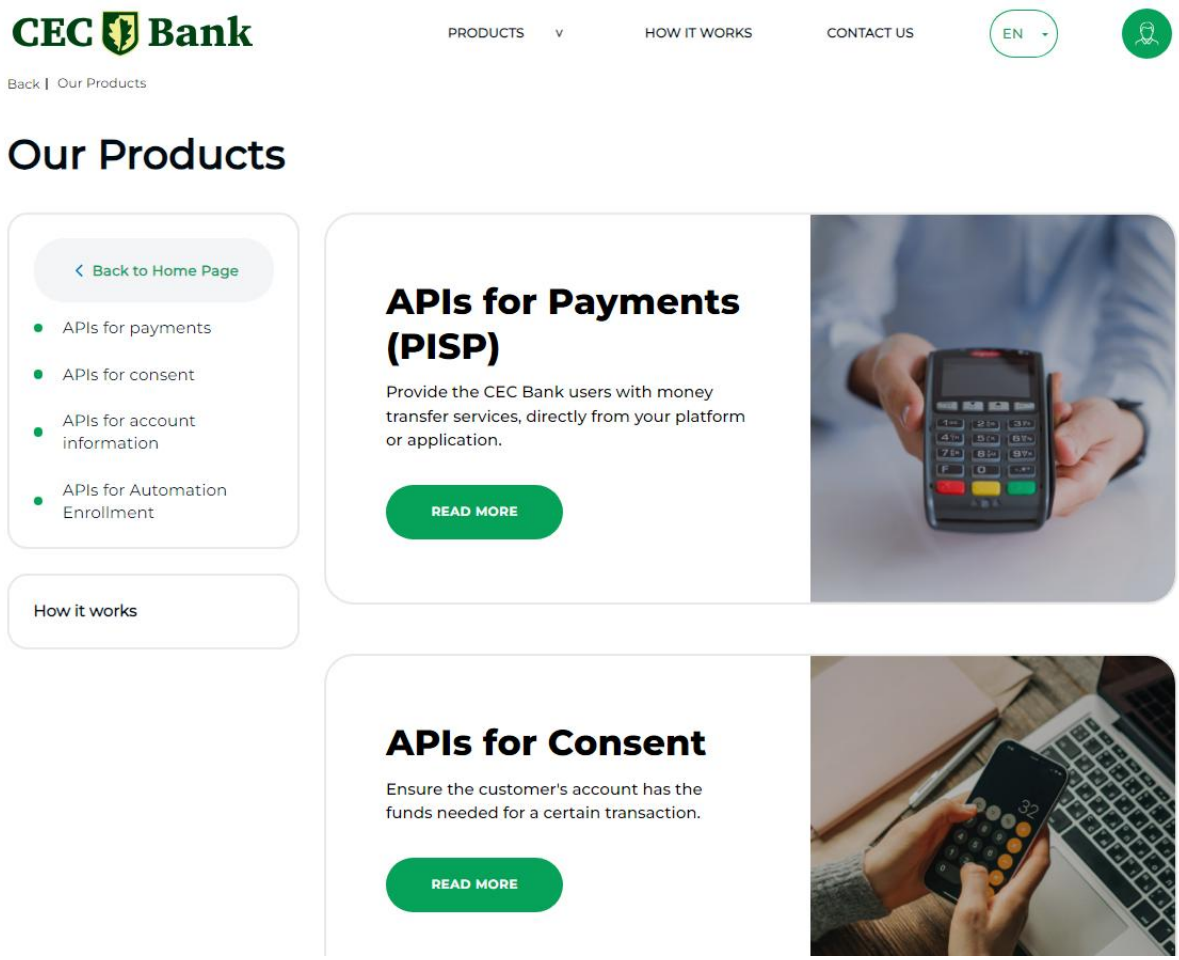
201 Created


```
{
  "Application_Name": " JohnAPP",
  "Application_Title": " JohnAPP",
  "client_id": "f9dTESTa5798TESTc76a837a",
  "client_secret": "b0fTEST5a70TEST2e8460TEST23b50"
}
```

With these credentials we will be able to make the calls shown below and they must be saved to have them whenever you need to use them.

2 Description of PSD2-CECAPIC product features

After logging in on the portal, registered users have access to the PSD2-CECAPIC product



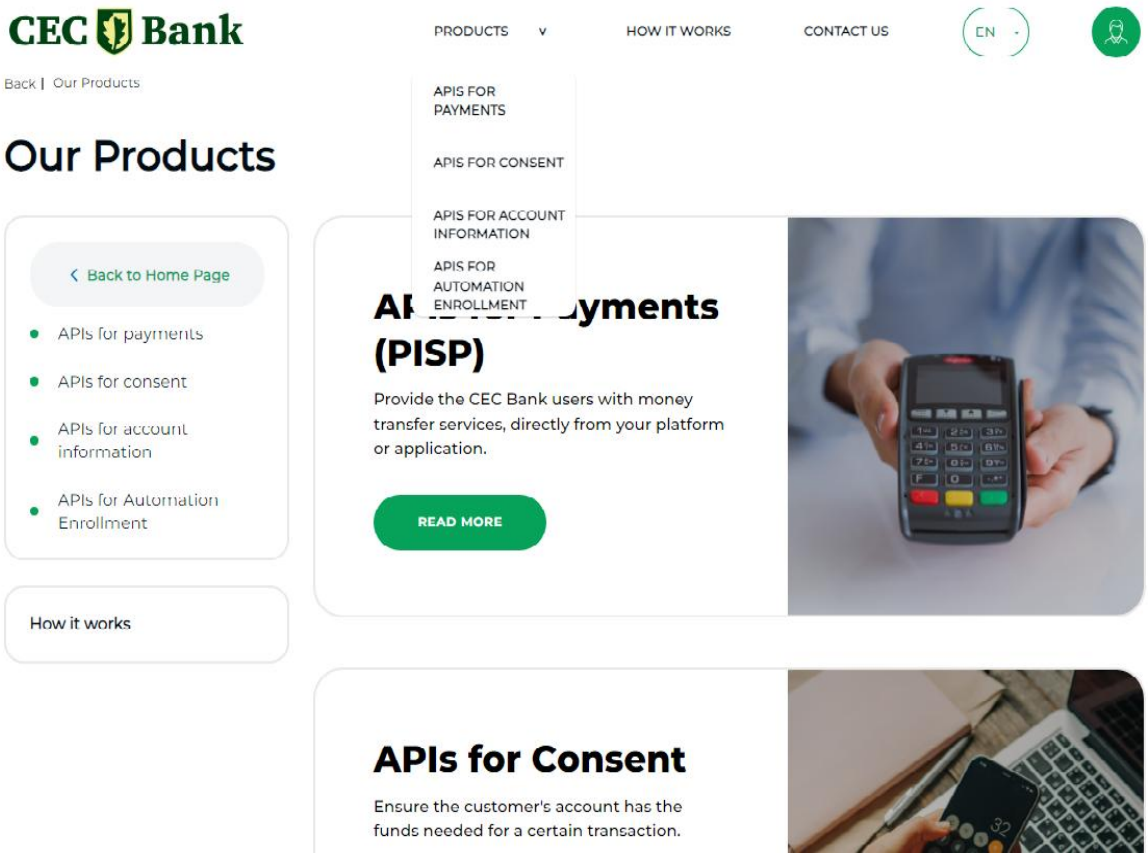
This product includes the APIs needed to develop TPP applications with AIS/PIS functionalities:

- PSD2 API-ConsentC: contains the operations necessary to obtain the customer's consent for accessing accounts opened with CEC Bank;
- PSD2 API-AccountsC: contains the operations necessary to develop AIS functionalities (data about accounts is extracted with the limitations specified in the customer consent);

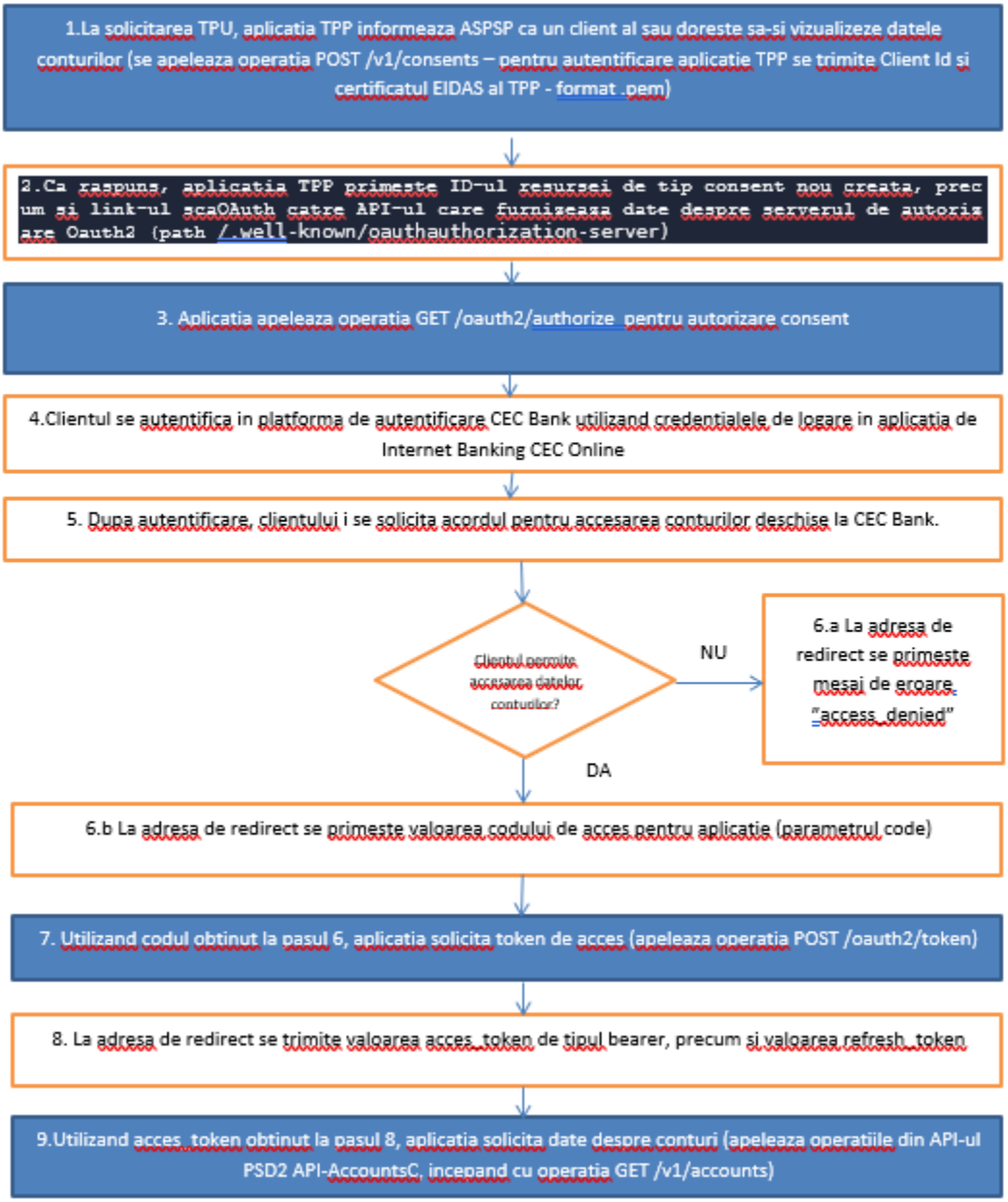
- PSD2 API-PaymentsC: contains the operations necessary to develop the PIS (you can initiate transactions for which the customer authorization is required) and PIIS (you can confirm the availability of a certain amount in the account based on a valid account consultation agreement) functionalities.

In order to access/test the above APIs, the TPP application must subscribe to use them. When calling API operations, application authentication parameters are required: Client Id and Client Secret. Also, calling APIs: PSD2 API-ConsentC, PSD2 API-AccountsC, PSD2 API-PaymentsC is allowed only if the Tpp-Signature-Certificate header parameter of each call is filled with the EIDAS certificate of the TPP of the form:

-----BEGIN CERTIFICATE-----
xxxEXAMPLExxxxxxxxxxEXAMPLExxxxxxxxxxEXAMPLExxxxxxxxxxEXAMPLExxxxxxxxEXAMPLExxxxxxxxxxEXAMPLExxxxxxxxxxEXAMPLExxxxxxxxxxEXAMPLExxxxxxxxEXAMPLExxxxxxxxxxEXAMPLExxxxxxxxxxEXAMPLExxxxxxxxxxEXAMPLExxxxxxxxEXAMPLExxxxxxxxxxEXAMPLExxxxxxxxxxEXAMPLExxxxxxxxxxEXAMPLExxxx-----END CERTIFICATE-----



2.1 Flow description for obtaining customer accounts data



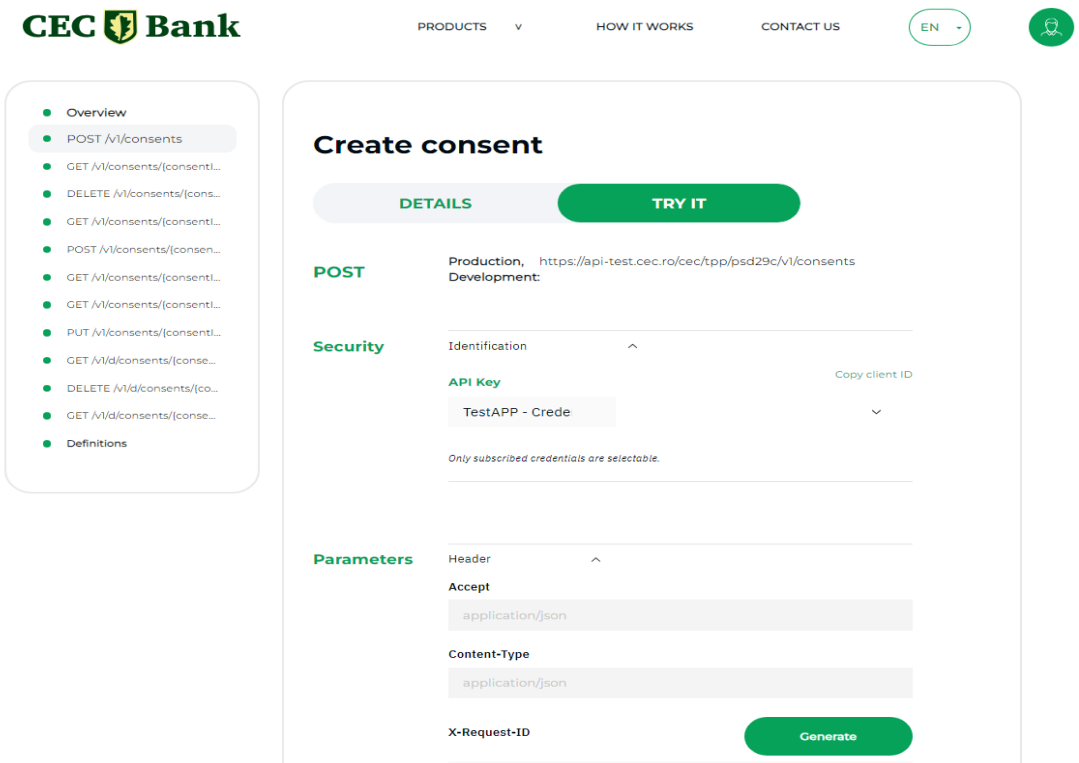
2.1.1 Send request for taking over customer account access agreement: create consent.

Call the POST operation /v1/consents in the PSD2 API API-Consent. In the Header the following is mandatory:

- X-Request-ID
- TPP-Redirect-URI
- Tpp-Signature-Certificate.

In the "Security" section you will see the Log In button and after logging in, the subscribed product application will be automatically selected.

In Body no information should be passed on. The content of the consent will be determined by the customer after logging into the bank's system, in the consent authorization interface exposed by the bank.



Response

201 Created

Body | Headers


```
{
    "consentStatus": "received",
    "consentId": "c9740868-b3de-11ef-a368-0a0800410000",
    "_links": {
        "scaOAuth": {
            "href": "https://api-test.cec.ro/cec/tpp/oaut
h/.well-known/oauthauthorization-server"
        },
        "self": {
            "href": "https://api-test.cec.ro/cec/tpp/psd29
c/v1/consents/c9740868-b3de-11ef-a368-0a0800410000"
        },
        "status": {
            "href": "https://api-test.cec.ro/cec/tpp/psd29
c/v1/consents/c9740868-b3de-11ef-a368-0a0800410000/status"
        }
    }
}
```


In the response structure, the identifier of the newly created consent resource "consentId" is received, as well as the link "scaOAuth" where the metadata of the Oauth 2.0 authorization server is provided.

The TPP application must redirect the PSU to the bank authentication page, using the authorization endpoint provided by the scaOAuth link.

The example of the URL formation for Redirect can be found in the "Location" attribute of the response header of the POST operation /v1/consents:

Location:

https://api-test.cec.ro/cec/tpp/oauthcec/oauth2/authorize?

response_type=code

&scope=AIS:43a5a1a0-a456-11ec-b4e2c-00a0800270000

&redirect_uri=https://example.com/redirect

&client_id=28xxxxxxxxxxfe8a3

&code_challenge=<code challenge value>

&code_challenge_method=<code challenge method>

Before use, the link in the "Location" header must be filled in by the TPP application with the value of the code_challenge parameter (PKCE challenge according to cryptographic RFC 7636 - https://tools.ietf.org/html/rfc7636 used to prevent code injection attacks, code_challenge_method= "S256")

2.1.2 Customer authentication in the bank system

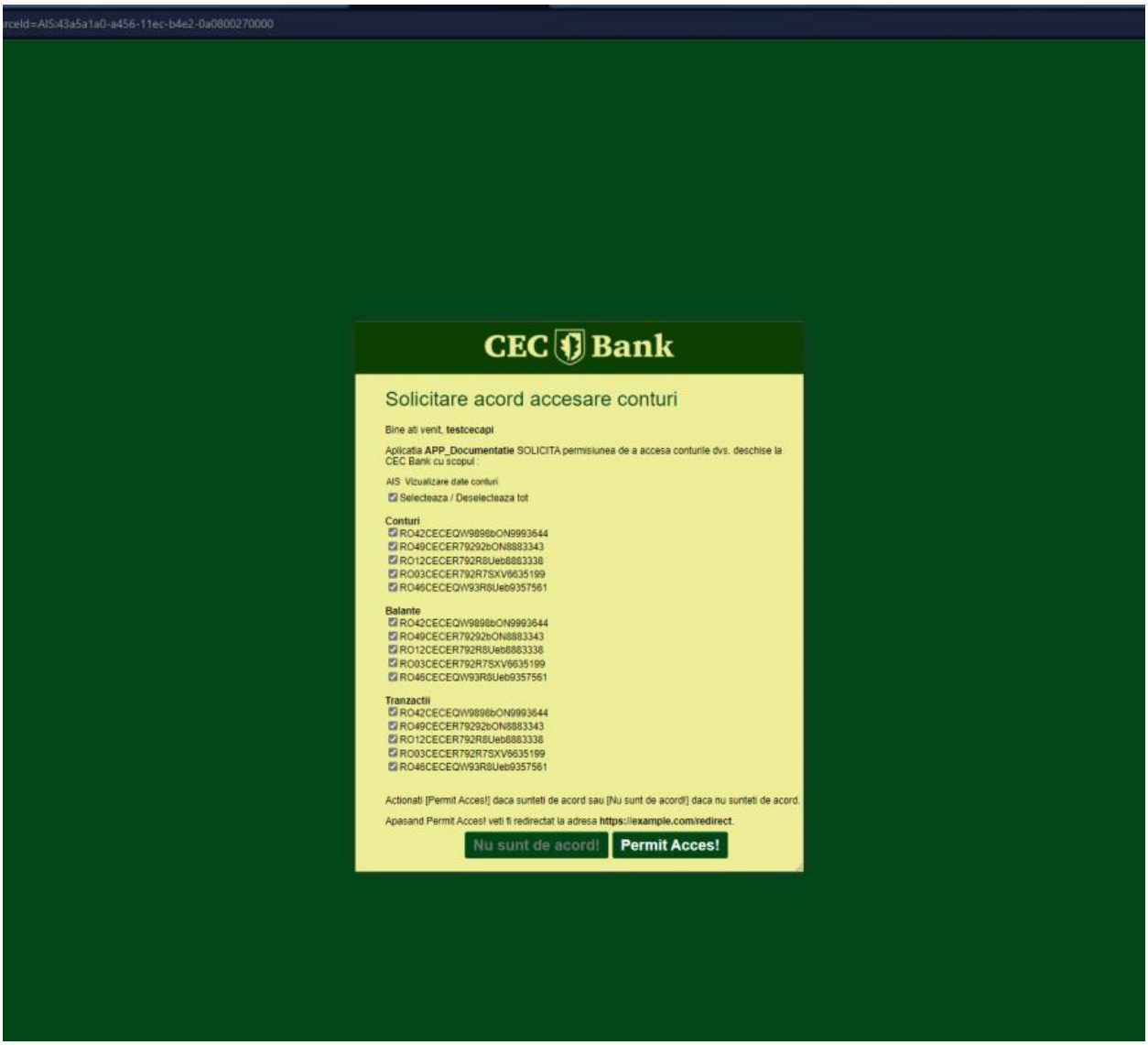
The TPP application redirects the client to the authorization URL formed in the previous step, where the login window in the authentication platform opens.

The customer can log in using the username from the Internet Banking-CEC Online application and the code generated by the code generating device or eToken application.

2.1.3 Customer agreement to consult account data

After successfully logging in and identifying the logged in customer, the agreement takeover window for accessing the accounts by the TPP application appears.

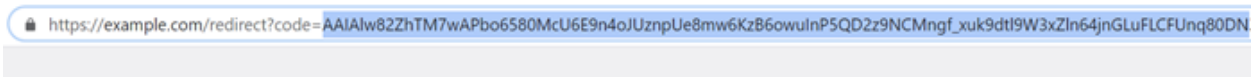
Depending on the permissions granted by the customer for each payment account in the list, the TPP application will be able to visualize the accounts' IBANs and will have access to the balance visualization, respectively to the transaction list



If you click 'I don't agree!' , the redirect address of the TPP application will send "error=acces_denied"

2.1.4 Application access code generation

After the customer allows access to the accounts, the access code for the application ("code") is sent to the redirect address provided by the TPP application.



2.1.5 Get access tokens to consult accounts

The TPP application will provide the above access code in exchange for a resource access token (Bearer Token), by calling the POST method /oauth2/token from the URL indicated in the metadata "token_endpoint", with the purpose "AIS:consentId" (the same purpose contained in the access code provided in the previous step)

The request body must be sent in *x-www-form-urlencoded* format and must contain the parameters below (the values shown correspond to the in/out parameters of the authorization operation presented in the previous step):

- grant_type=authorization_code

- client_id=28xxxxxxxxxxfe8a3

- code= AAIAlw82ZhTM7wAPbo6580McU6E9n4oJUznpUe8mw6KzB6owuInP5QD2z9NCMngf_xuk9dtl9W3xZln64jnGLuFLCFUnq80DN3CaEGTxfkwE5fp2I17DuxPacZovpRCGplsj7Vfo9lqphLkdxPDVKL3j

- redirect_uri= https://example.com/redirect

- scope= AIS:43a5a1a0-a456-11ec-b4e2c-00a0800270000

- code_verifier=ginfeftejiscu

curl --request POST \

--url https://api-test.cec.ro/cec/tpp/oauthcec/oauth2/token \
--header 'accept: application/json' \
--header 'content-type: application/x-www-form-urlencoded' \
--header 'x-ibm-client-id: 28xxxxxxxxxxfe8a3\
--data 'grant_type=authorization_code&client_id=28xxxxxxxxxxfe8a3&code= AAIAlw82ZhTM7wAPbo6580McU6E9n4oJUznpUe8mw6KzB6owuInP5QD2z9NCMngf_xuk9dtl9W3xZln64jnGLuFLCFUnq80DN3CaEGTxfkwE5fp2I17DuxPacZovpRCGplsj7Vfo9lqphLkdxPDVKL3j&redirect_uri= https://example.com/redirect&scope= AIS:a2308f60-76e3-11eb-9881-0a06001a0000&code_verifier=ginfeftejiscu'

200 OK

{

"token_type": "bearer",

"access_token":
"AAIkMjg2Yjk1NmYtZDQxMS00OTM4LTljMGUtYmI1ODE1YWZlOGEzIjPNvUaB8KIeDg
PgFbjI7AANcFyG-HCnV-hiqPVlo17k5DjRoCB7PSv8--
qKI1JuneC52uXWAgU7iE1OA_NYC6JJTRYtYBi6I2DL88f4_uxormO0Bi6zBj6lld1D3rtNI9u
T0dUAL2WHk5L5VjhJFQ",

"expires_in": 3595,

"consented_on": 1614240924,

"scope": "AIS:43a5a1a0-a456-11ec-b4e2c-00a0800270000",

"refresh_token": "AAJzRQj3N2Wd-
3pb005516_i9ISl6ZL3Ut5n1w2gbh8YK5vxjb86zMQcwILT29Dq-
4ZNHvcpBSr90uoemjU9LhUgkF0-dpHPTdShGuPJOwi6gCbfaxD3PSFu-
oTgKQzReCKxIOxPldguuu5M7Xquy4NudJ7LDVWRxI52JBNpxtCGYQ",

"refresh_token_expires_in": 2682000

}

In the response of the POST operation /oauth2/token, the access token value required by the calls of the APIs PSD2 API-AccountsC, PSD2 API-ConsentC and the POST operation /v1/funds-confirmations in PSD2 API-PaymentsC is found. It also specifies the refresh_token value, with a validity period corresponding to the validity of the consent (max. 180 days), which can be used to generate a new access_token without PSU involvement.

2.1.6 Get refresh_token

To get a new valid access_token in exchange for the refresh_token, use the same POST /oauth2/token operation, but with grant_type=refresh_token, as in the example below.

```
curl --request POST \
--url https://api-test.cec.ro/cec/tpp/oauthcec/oauth2/token \
--header 'accept: application/json' \
--header 'content-type: application/x-www-form-urlencoded' \
--header 'x-ibm-client-id: 28xxxxxxxxxxfe8a3\
--data 'grant_type=refresh_token&client_id=28xxxxxxxxxxfe8a3&refresh_token=
AAJzRQj3N2Wd-3pb005516_i9ISl6ZL3Ut5n1w2gbh8YK5vxjb86zMQcwILT29Dq-
4ZNHvcpBSr90uoemjU9LhUgkF0-dpHPTdShGuPJOwi6gCbfaxD3PSFu-
oTgKQzReCKxIOxPldguuu5M7Xquy4NudJ7LDVWRxI52JBNpxtCGYQ
```

2.1.7 Get account data

The GET /v1/accounts operation is called from the PSD2-AccountsC API, transmitting in the header:

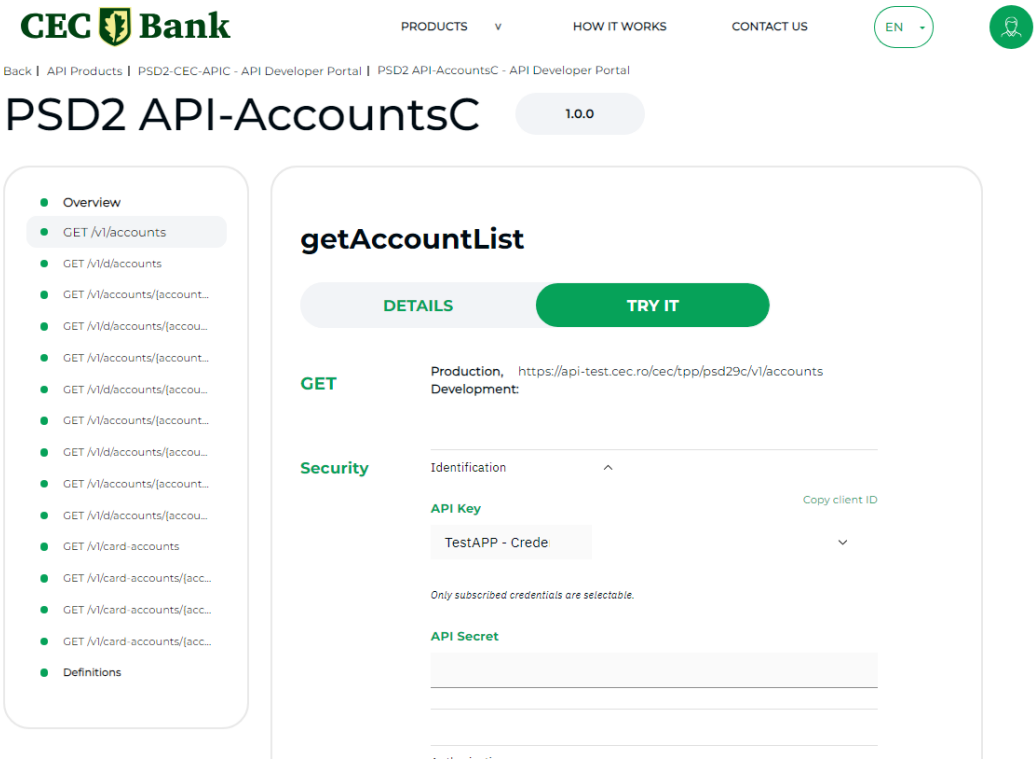
"x-ibm-client-id" :"the client_id generated in the application creation step of the Dynamic Enrollment api"

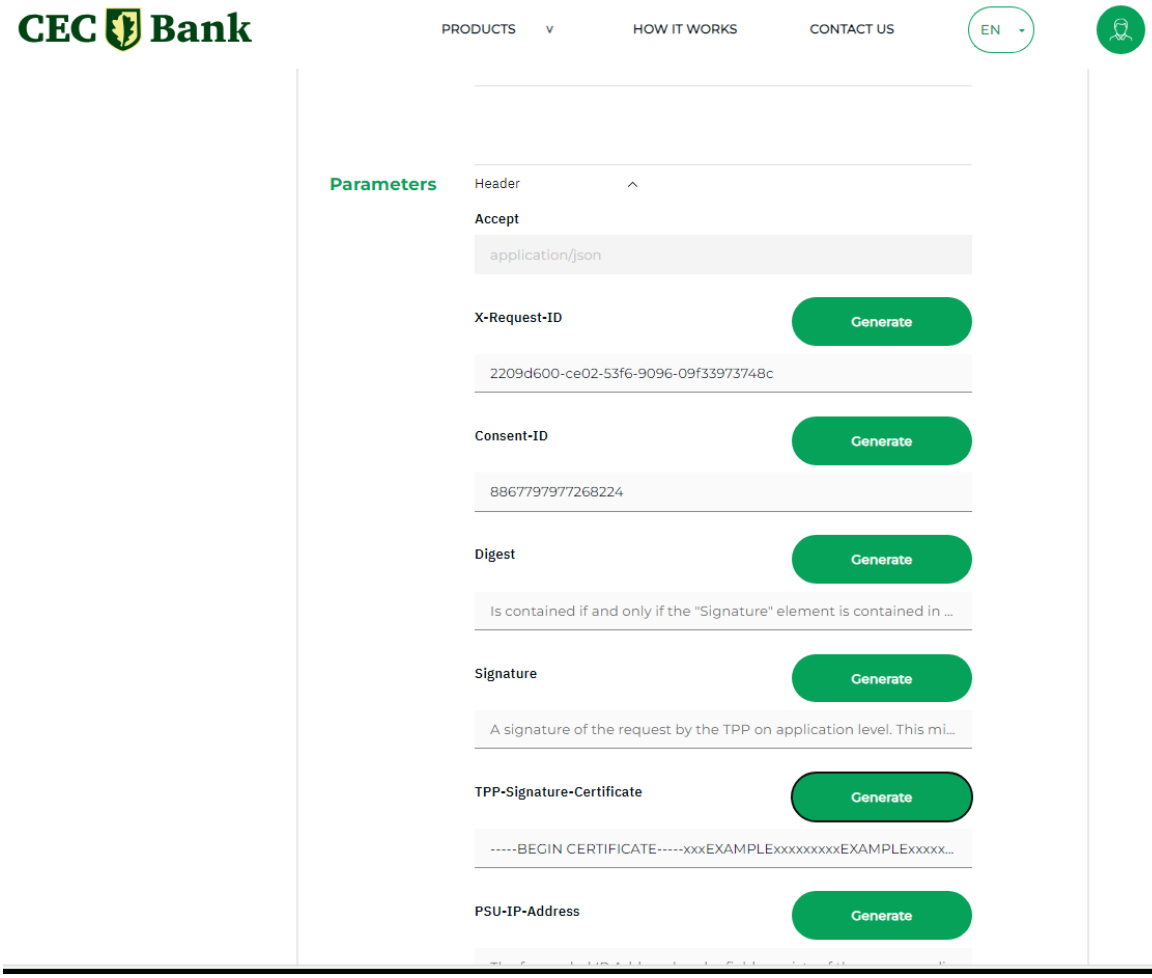
"x-Request-ID": "id such as: 123e4567-e89b-12d3-a456-426655440000"

"Authorization": "access the Bearer token obtained in the previous step",

"Consent-ID": "consentId value for viewing account data",

"TPP-Signature-Certificate":"EIDAS certificate of the TPP with PSP_AI role"




CEC Bank
PRODUCTS
HOW IT WORKS
CONTACT US
EN
Parameters
Header
Accept
application/json
X-Request-ID
Generate
2209d600-ce02-53f6-9096-09f33973748c
Consent-ID
Generate
8867797977268224
Digest
Generate
Is contained if and only if the "Signature" element is contained in ...
Signature
Generate
A signature of the request by the TPP on application level. This mi...
TPP-Signature-Certificate
Generate
-----BEGIN CERTIFICATE-----xxxEXAMPLExxxxxxxxxEXAMPLExxxxx...
PSU-IP-Address
Generate

<PUBLIC>

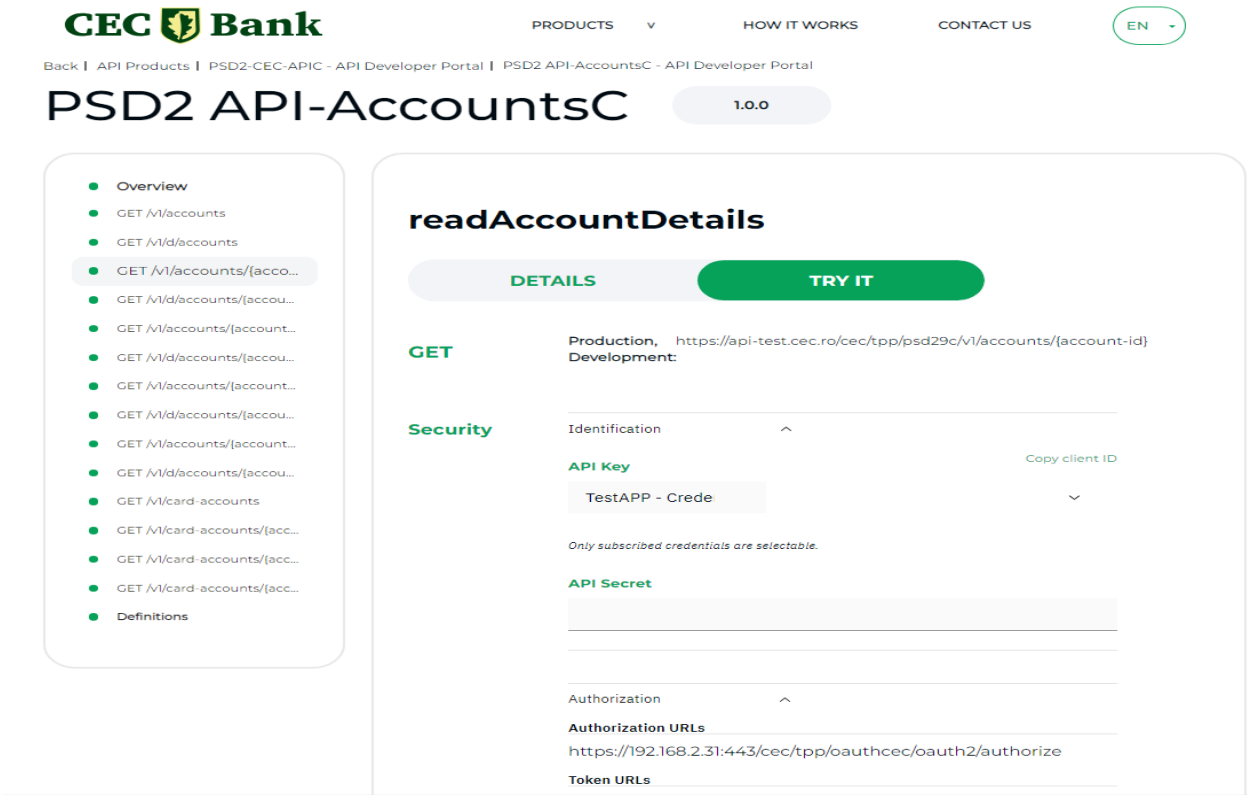
Response

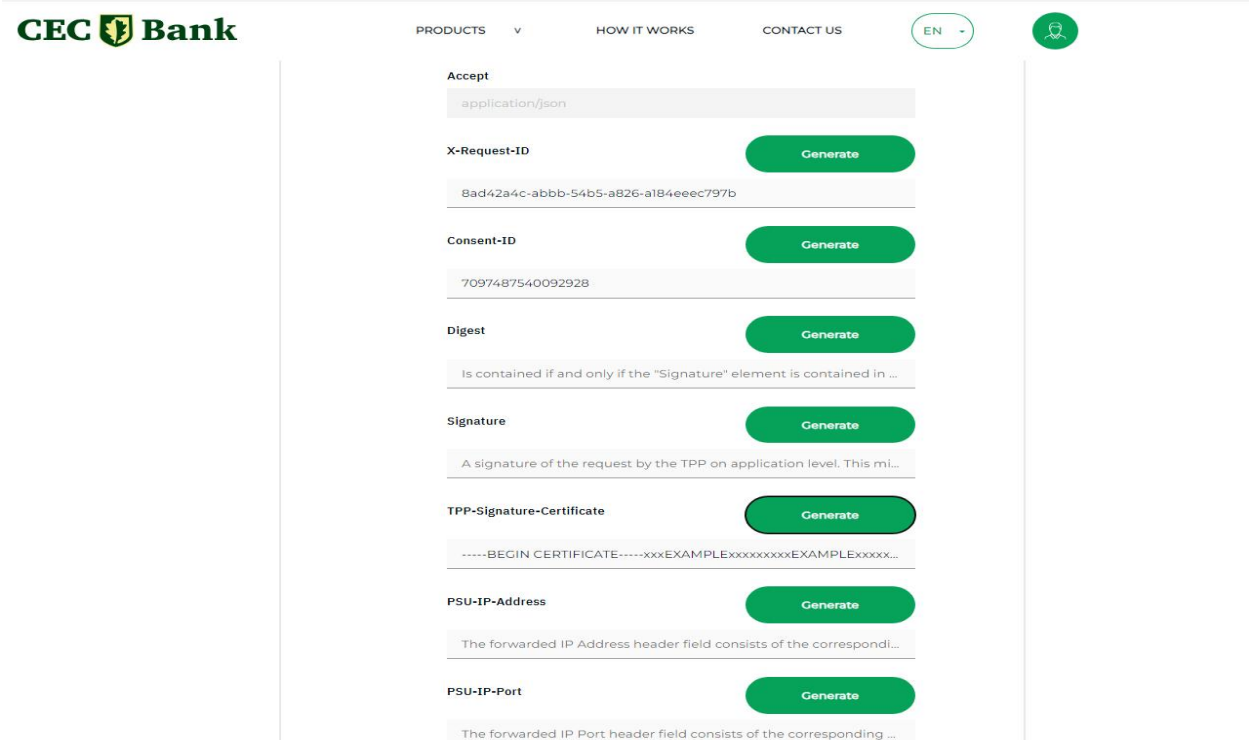
200 OK

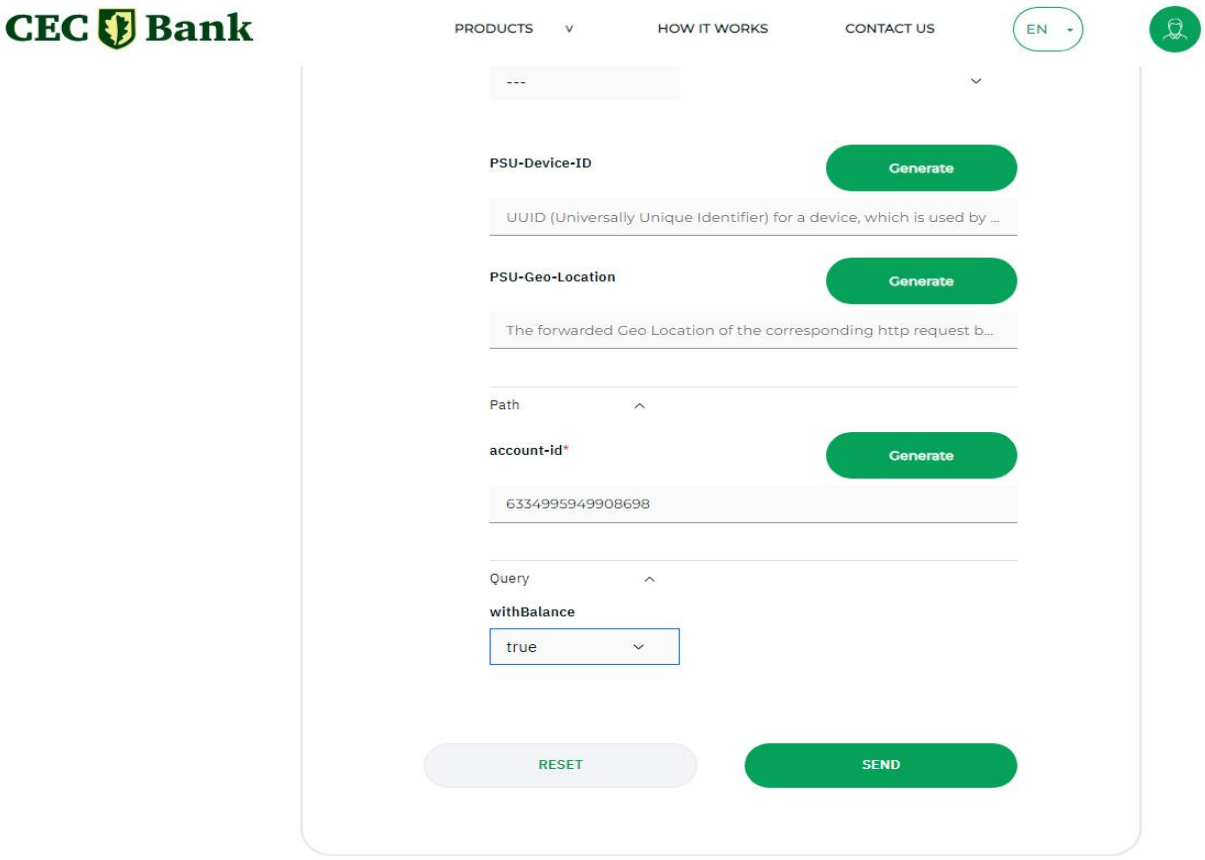
Body | Headers


```
{
    "accounts": [
        {
            "resourceId": "25511978",
            "iban": "RO42CECEAG0202RON0007466",
            "currency": "RON",
            "product": "Cont curent - persoane fizice - LE
I",
            "cashAccountType": "CurrentAccount",
            "name": "421642",
            "balances": [
                {
                    "balanceAmount": {
                        "currency": "RON",
                        "amount": 26.46
                    },
                    "balanceType": "closingBooked",
                    "referenceDate": "2024-12-06"
                }
            ],
            "_links": {
                "balances": {
                    "href": "/v1/accounts/25511978/balance
s"
                },
                "transactions": {
                    "href": "/v1/accounts/25511978/transac
tions"
```

2.1.8 Get account details






CEC Bank
PRODUCTS
HOW IT WORKS
CONTACT US
EN

PSU-Device-ID
Generate
UUID (Universally Unique Identifier) for a device, which is used by ...
PSU-Geo-Location
Generate
The forwarded Geo Location of the corresponding http request b...
Path
account-id*
Generate
6334995949908698
Query
withBalance
true
RESET
SEND

<PUBLIC>

Response

200 OK

Body | Headers


```
{
    "accounts": [
        {
            "resourceId": "25511978",
            "iban": "RO42CECEAG0202RON0007466",
            "currency": "RON",
            "product": "Cont curent - persoane fizice - LE
I",
            "cashAccountType": "CurrentAccount",
            "name": "421642",
            "balances": [
                {
                    "balanceAmount": {
                        "currency": "RON",
                        "amount": 26.46
                    },
                    "balanceType": "closingBooked",
                    "referenceDate": "2024-12-06"
                }
            ],
            "_links": {
                "balances": {
                    "href": "/v1/accounts/25511978/balance
s"
                },
                "transactions": {
                    "href": "/v1/accounts/25511978/transac
tions"
```


Call the GET /v1/accounts/{account-id} operation in the PSD2-AccountsC API as follows:

In the Header the following is transmitted:

"x-ibm-client-id" :" the client_id generated in the application creation step of the Dynamic Enrollment api "

"x-Request-ID": "id such as: 123e4567-e89b-12d3-a456-426655440000"

"Authorization": "access the Bearer token obtained in the previous step",

"Consent-ID": "consentId value for viewing account data",

"TPP-Signature-Certificate":"EIDAS certificate of the TPP with PSP_AI role"

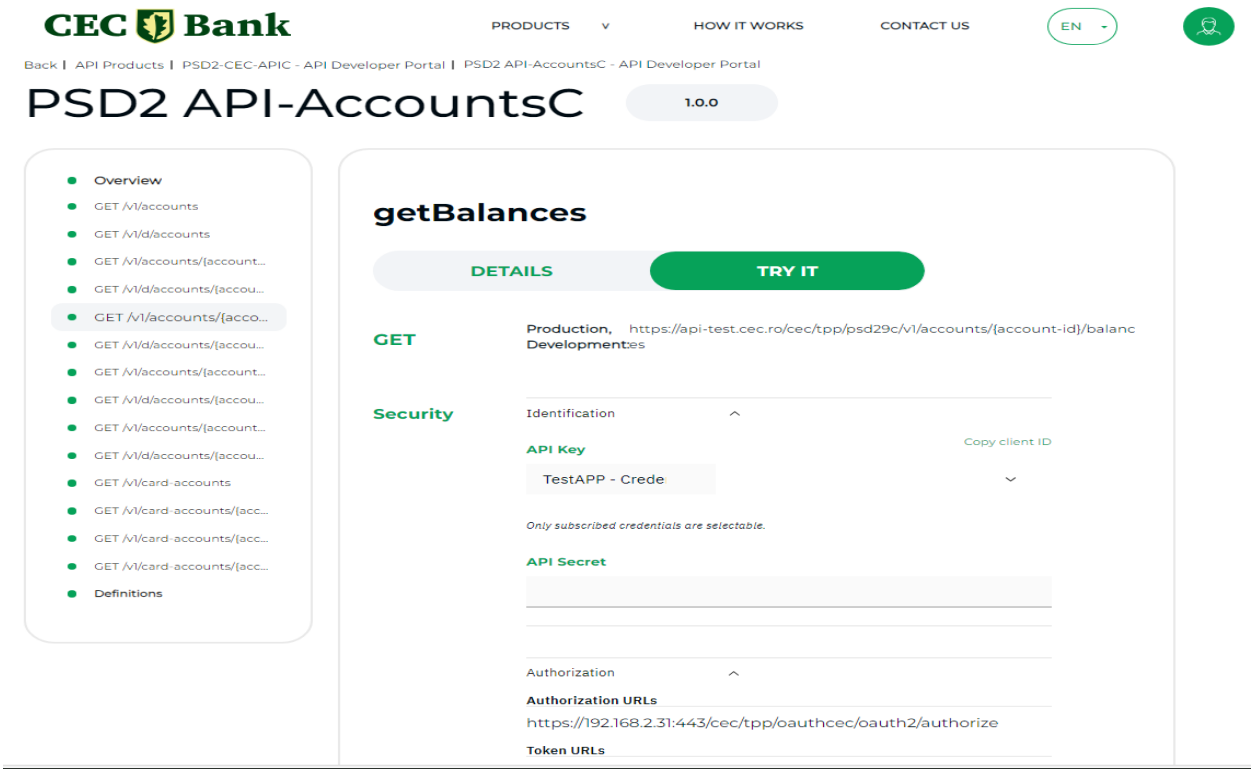
Parameters:

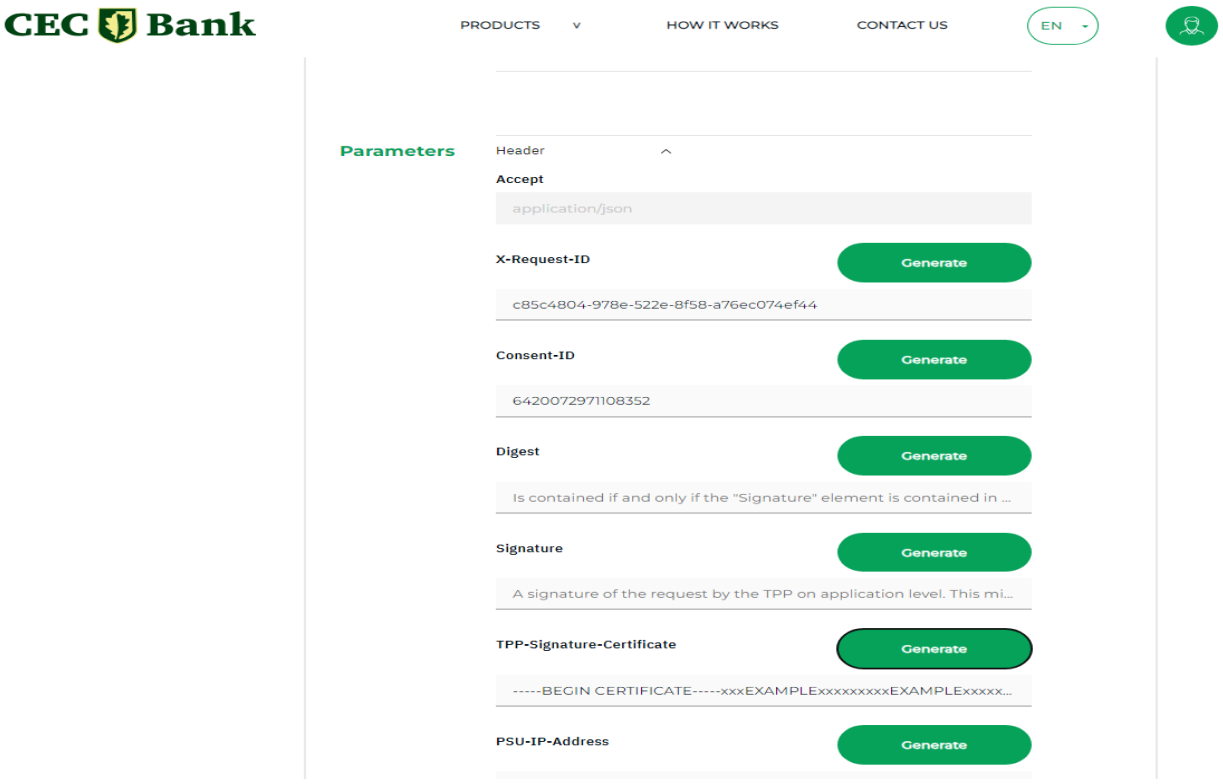
"account-id": "Account id for which details are required"

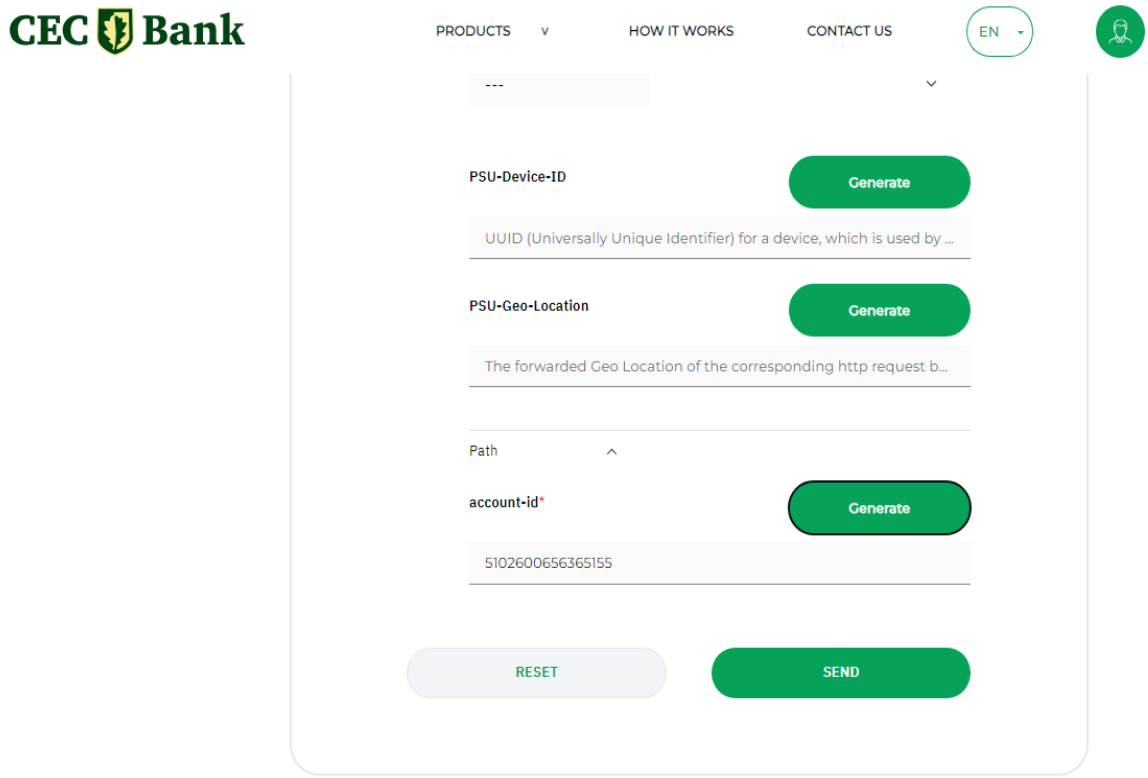
Response:


```
{
   "accounts": [
      {
         "resourceId": "25511978",
         "iban": "RO42CECEQW9898bON9993644",
         "currency": "RON",
         "product": "Cont curent - persoane fizice - LEI",
         "cashAccountType": "CurrentAccount",
         "name": "421642",
         "balances": [
            {
               "balanceAmount": {
                  "currency": "RON",
                  "amount": 320.02
               },
               "balanceType": "closingBooked",
               "referenceDate": "2022-03-16"
            }
         ],
         "_links": {
            "balances": {
               "href": "/v1/accounts/25511978/balances"
            },
            "transactions": {
               "href": "/v1/accounts/25511978/transactions"
            }
         }
      }
   ]
}
```

2.1.9 Get account balance




CEC Bank
PRODUCTS
HOW IT WORKS
CONTACT US
EN
Parameters
Header
Accept
application/json
X-Request-ID
Generate
c85c4804-978e-522e-8f58-a76ec074ef44
Consent-ID
Generate
6420072971108352
Digest
Generate
Is contained if and only if the "Signature" element is contained in ...
Signature
Generate
A signature of the request by the TPP on application level. This mi...
TPP-Signature-Certificate
Generate
-----BEGIN CERTIFICATE-----xxxEXAMPLExxxxxxxxxEXAMPLExxxxx...
PSU-IP-Address
Generate


CEC Bank
PRODUCTS
HOW IT WORKS
CONTACT US
EN

PSU-Device-ID
Generate
UUID (Universally Unique Identifier) for a device, which is used by ...
PSU-Geo-Location
Generate
The forwarded Geo Location of the corresponding http request b...
Path
account-id*
Generate
5102600656365155
RESET
SEND

<PUBLIC>

Response

200 OK

Body | Headers


```
{
    "account": {
        "iban": "RO42CECEAG0202RON0007466",
        "currency": "RON"
    },
    "balances": [
        {
            "balanceAmount": {
                "currency": "RON",
                "amount": "26.46"
            },
            "balanceType": "closingBooked",
            "referenceDate": "2024-12-06"
        }
    ]
}
```


Call the GET /v1/accounts/{account-id}/balances operation in the PSD2-AccountsC API as follows:

In the Header the following is transmitted:

"x-ibm-client-id" :"client_id generated by the application created on the portal"

"x-Request-ID": "id such as: 123e4567-e89b-12d3-a456-426655440000"

"Authorization": "access the Bearer token obtained in the previous step",

"Consent-ID": "consentId value for viewing account data",

"TPP-Signature-Certificate":"EIDAS certificate of the TPP with PSP_AI role"

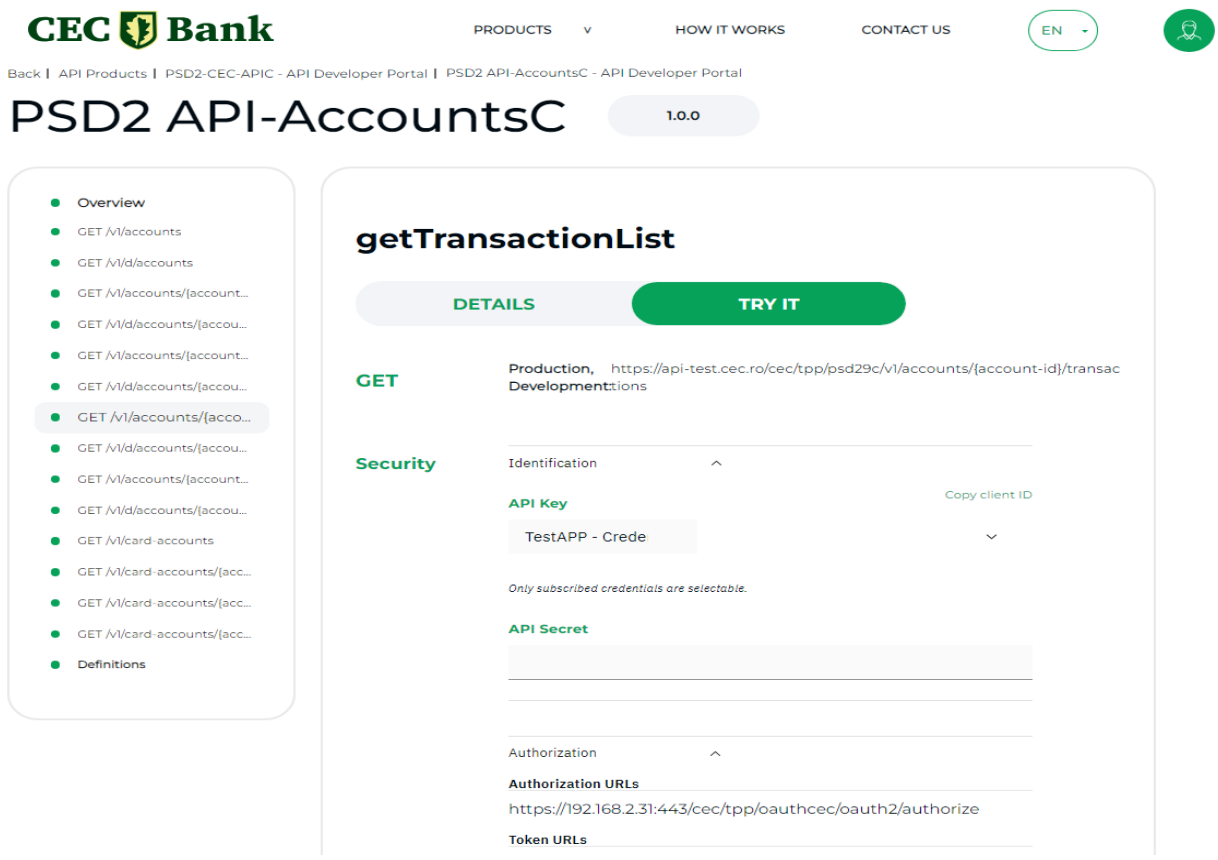
Parameters:

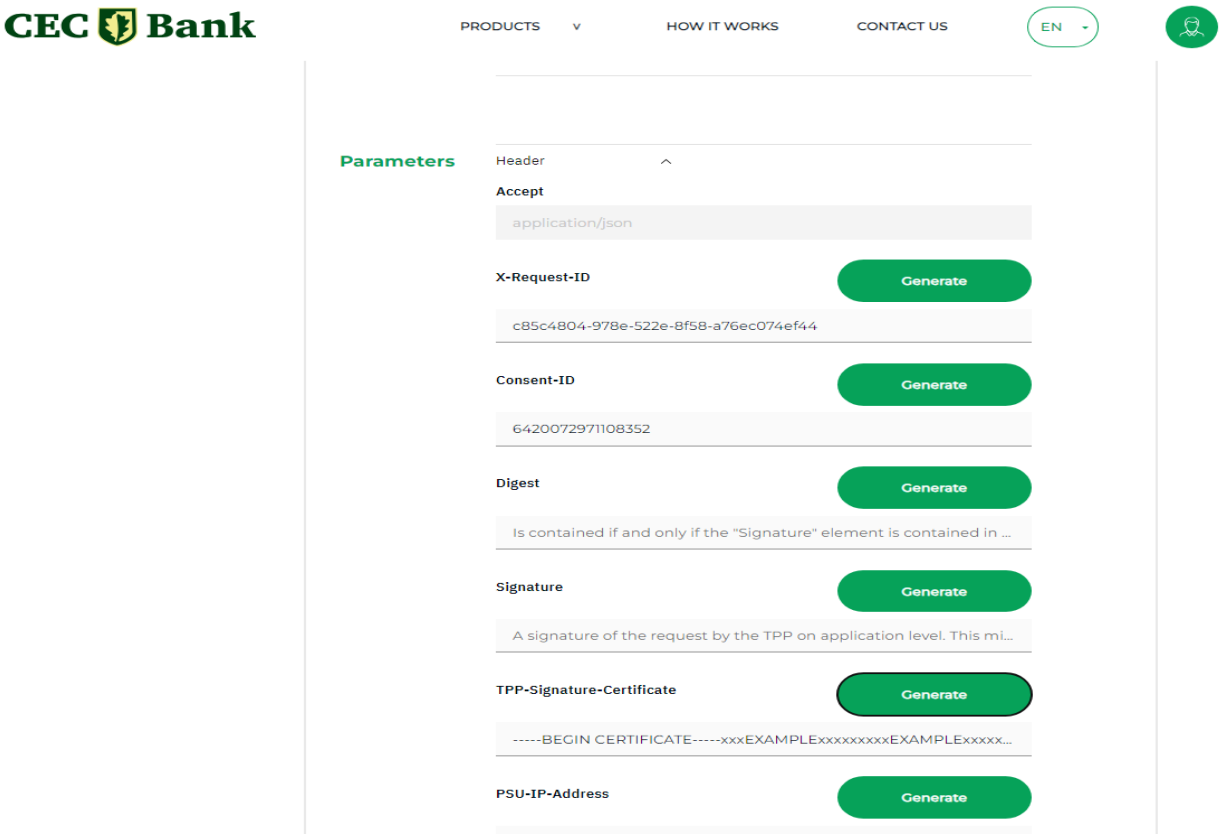
"account-id": "Account id for which details are required"

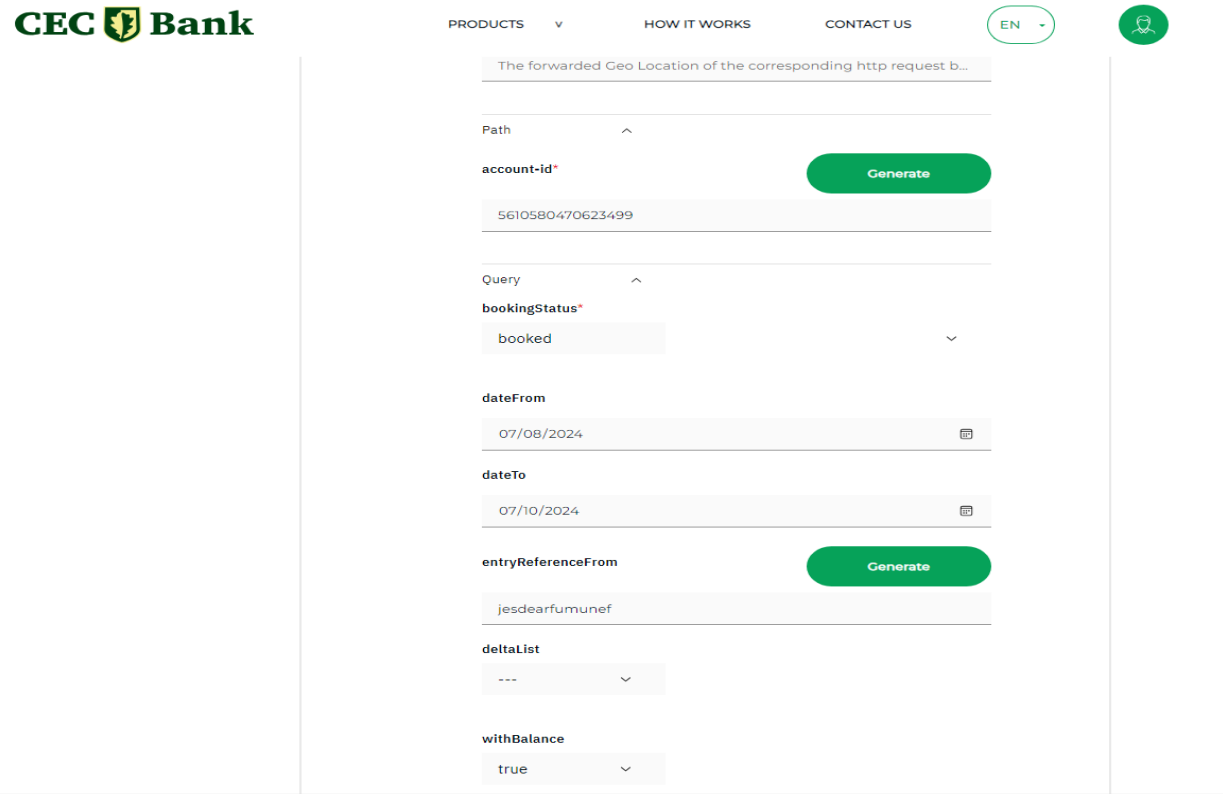
Response:


```
{
  "account": {
    "iban": "RO42CECEQW9898bON9993644",
    "currency": "RON"
  },
  "balances": [
    {
      "balanceAmount": {
        "currency": "RON",
        "amount": "320.02"
      },
      "balanceType": "closingBooked",
      "referenceDate": "2022-03-16"
    }
  ]
}
```


2.1.10 Get transaction list by account




CEC Bank
PRODUCTS
HOW IT WORKS
CONTACT US
EN
Parameters
Header
Accept
application/json
X-Request-ID
Generate
c85c4804-978e-522e-8f58-a76ec074ef44
Consent-ID
Generate
6420072971108352
Digest
Generate
Is contained if and only if the "Signature" element is contained in ...
Signature
Generate
A signature of the request by the TPP on application level. This mi...
TPP-Signature-Certificate
Generate
-----BEGIN CERTIFICATE-----xxxEXAMPLExxxxxxxxxEXAMPLExxxxx...
PSU-IP-Address
Generate


CEC Bank
PRODUCTS
HOW IT WORKS
CONTACT US
EN
The forwarded Geo Location of the corresponding http request b...
Path
account-id*
Generate
5610580470623499
Query
bookingStatus*
booked
dateFrom
07/08/2024
dateTo
07/10/2024
entryReferenceFrom
Generate
jesdearfumunef
deltaList
---
withBalance
true

<PUBLIC>

Response

200 OK

Body | Headers


```
{
    "account": {
        "iban": "RO42CECEAG0202RON0007466"
    },
    "transactions": {
        "booked": [
            {
                "transactionId": "1566614557",
                "creditorName": "",
                "creditorAccount": {
                    "iban": ""
                },
                "transactionAmount": {
                    "currency": "RON",
                    "amount": -102.59
                },
                "bookingDate": "2024-12-06",
                "valueDate": "2024-12-06",
                "remittanceInformationUnstructured": "Capi
talizare dobanda-Achitare dobanda neta la scadenta din con
t curent pentru contractul nr  207493400"
            },
            {
                "transactionId": "1566614556",
                "creditorName": "",
                "creditorAccount": {
                    "iban": ""
                },
```


Call the GET /v1/accounts/{account-id}/transactions operation in the PSD2-AccountsC API as follows:

In the Header the following is transmitted:

"x-ibm-client-id" :"client_id generated by the application created on the portal"

"x-Request-ID": "id such as: 123e4567-e89b-12d3-a456-426655440000"

"Authorization": "access the Bearer token obtained in the previous step",

"Consent-ID": "consentId value for viewing account data",

"TPP-Signature-Certificate":"EIDAS certificate of the TPP with PSP_AI role"

Parameters:

"bookingStatus": can be: "booked", "pending", "both"

"dateFrom": "start date ieterval search transactions"

"dateTo": "end date ieterval search transactions"

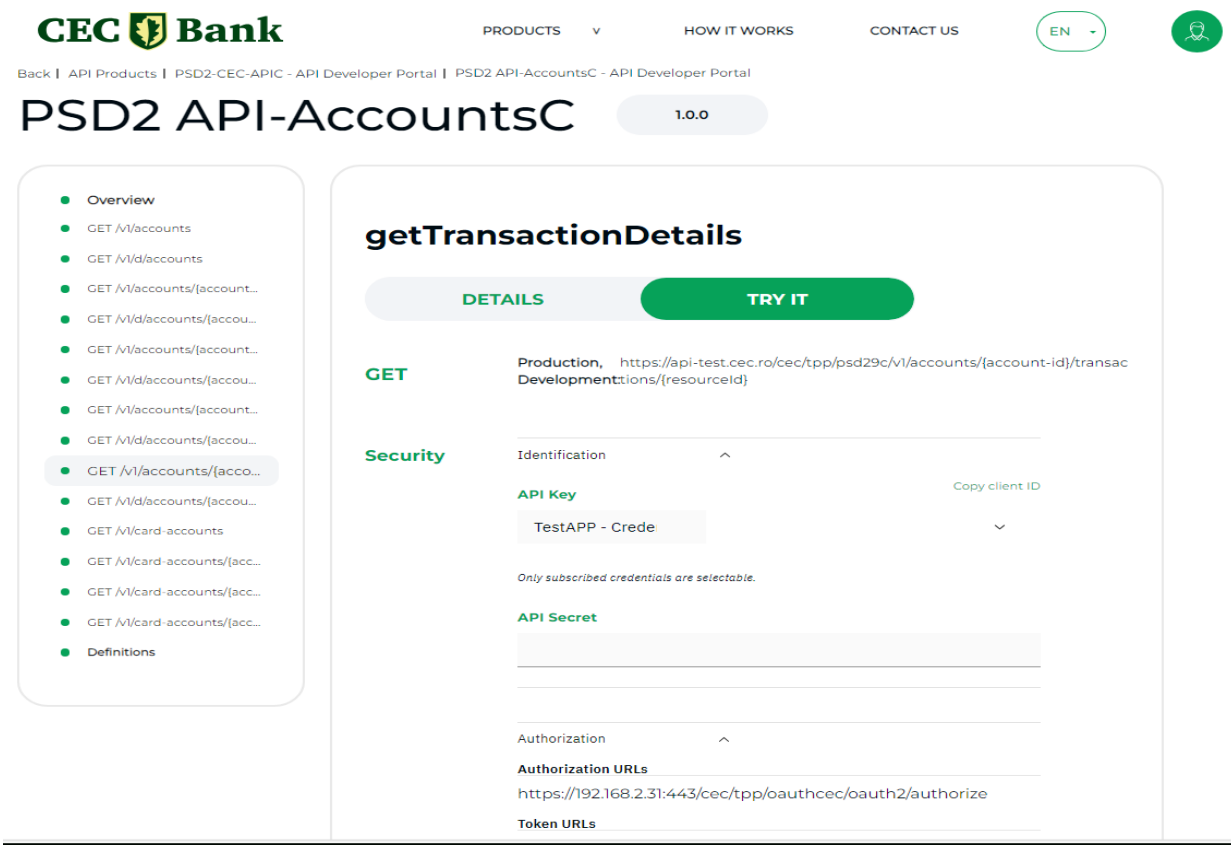
"account-id": "Account id for which details are required"

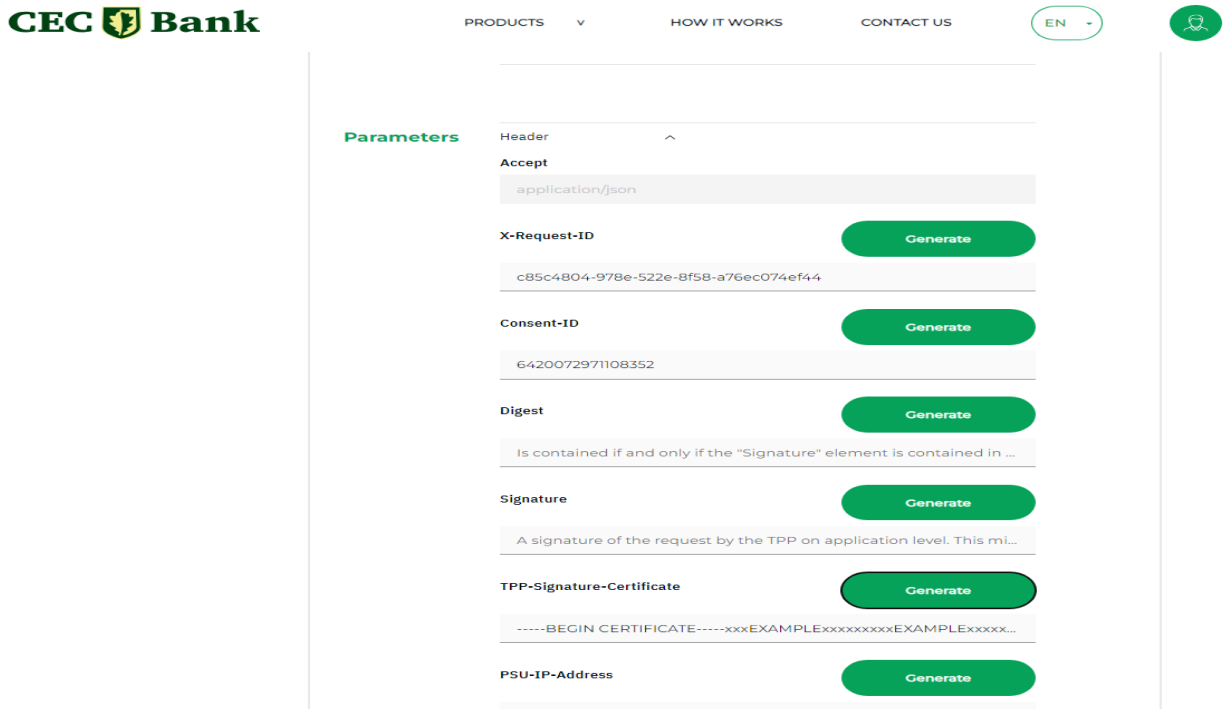
Answer:

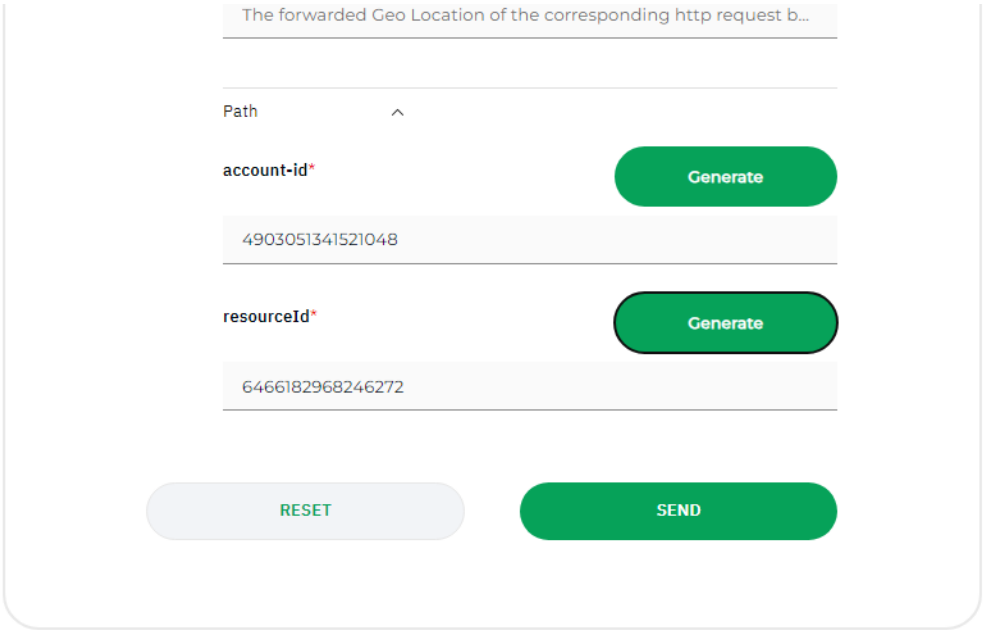

```
{
   "account": {
      "iban": "RO42CECEQW9898bON9993644"
   },
   "transactions": {
      "booked": [
         {
            "transactionId": "1174425360",
            "creditorAccount": {},
            "transactionAmount": {
               "currency": "RON",
               "amount": -19.8
            },
            "bookingDate": "2021-10-10",
            "valueDate": "2021-10-10",
            "remittanceInformationUnstructured": "Sqpytqlyzqru torqntq-
Qsxytqru torqntq nutq lq ssqtuntq tyn sont surunt puntru sontrqstul nr  894414336"
         },
         {
            "transactionId": "1174425359",
            "creditorAccount": {},
            "transactionAmount": {
               "currency": "RON",
               "amount": -2.2
            },
            "bookingDate": "2021-10-10",
            "valueDate": "2021-10-10",
            "remittanceInformationUnstructured": "Plqtq ympozyt-
Plqtq ympozyt lq ssqtuntq tyn sont surunt puntru sontrqstul nr  894414336"
         },
         {
            "transactionId": "1174425358",
            "debtorAccount": {},
```

```
            "transactionAmount": {
               "currency": "RON",
               "amount": 22
            },
            "bookingDate": "2021-10-10",
            "valueDate": "2021-10-10",
            "remittanceInformationUnstructured": "Sqpytqlyzqru torqntq-
Sqpytqlyzqru torqntq rrutq lq ssqtuntq yn sont surunt puntru sontrqstul nr  894414336"
         },
```

2.1.11 Get transaction details







Response

200 OK

Body | Headers


```
{
    "transactions": {
        "booked": [
            {
                "transactionId": "1444173462",
                "creditorName": "",
                "creditorAccount": {
                    "iban": ""
                },
                "transactionAmount": {
                    "currency": "RON",
                    "amount": -271.46
                },
                "bookingDate": "2023-10-11",
                "valueDate": "2023-10-11",
                "remittanceInformationUnstructured": "Capi
talizare dobanda-Achitare dobanda neta la scadenta din con
t curent pentru contractul nr  209304160"
            }
        ]
    },
    "account": {
        "iban": "RO42CECEAG0202RON0007466"
    }
}
```

Call the GET /v1/accounts/{account-id}/transactions/{resourceId} operation in the PSD2-AccountsC API as follows:

In the Header the following is transmitted:

"x-ibm-client-id" :"client_id generated by the application created on the portal"

"x-Request-ID": "id such as: 123e4567-e89b-12d3-a456-426655440000"

"Authorization": "access the Bearer token obtained in the previous step",

"Consent-ID": "consentId value for viewing account data",

"TPP-Signature-Certificate":"EIDAS certificate of the TPP with PSP_AI role"

Parameters:

"account-id": "Account id for which details are required"

"resourceId": "Transaction Id"

Response:


```
{
   "transactions": {
      "booked": [
         {
            "transactionId": "1174425360",
            "creditorAccount": {},
            "transactionAmount": {
               "currency": "RON",
               "amount": -19.8
            },
            "bookingDate": "2021-10-10",
            "valueDate": "2021-10-10",
            "remittanceInformationUnstructured": "Sqpytqlyzqru torqntq-
Qsxytqru torqntq nutq lq ssqtuntq tyn sont surunt puntru sontrqstul nr  894414336"
         },
```

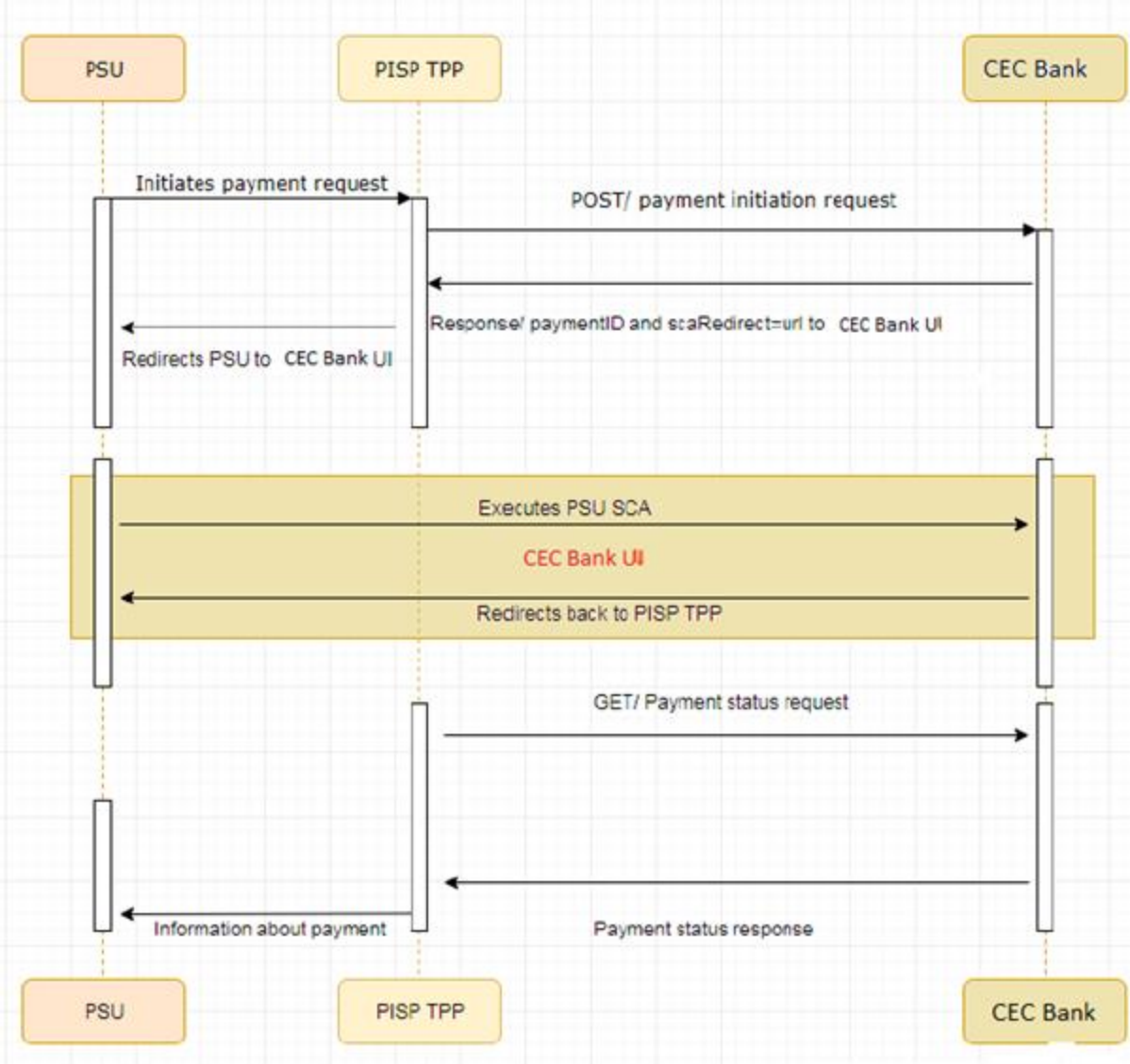
```
        {
          "debtorName": "",
          "debtorAccount": {
            "iban": ""
          },
          "transactionAmount": {}
        }
      ]
  },
  "account": {
    "iban": "RO42CECEQW9898bON9993644"
  }
}
```

2.2 Initiate and authorize payments using PSD2 API-PaymentsC service operations

The PSD2 API-PaymentsC service can be used by TPP with PISP role (EIDAS certificate that includes the PSP_PI role) in order to initiate payments on behalf of a customer.

It is assumed that the data about the debtor account involved in the transaction has been obtained previously, usually by using the GET /v1/accounts operation in the PSD2 API-AccountsC service.

The payment initiation/processing flow diagram is shown in the figure below:



The following steps are distinguished in the flow:

1. The (PSU) customer requests the payment initiation in the TPP application. The TPP application uses the POST operation /v1/{payment-service}/{payment-product} to transmit to the Bank the payment data requested by the customer.
2. The Bank service verifies the correctness of the data and stores the payment data, the response returned to the TPP application specifying the payment identifier and the scaOAuth link (used to determine the URL of the interface exposed by the bank for payment authorization).
3. The TPP application redirects the customer to the authorization interface exposed by the bank.

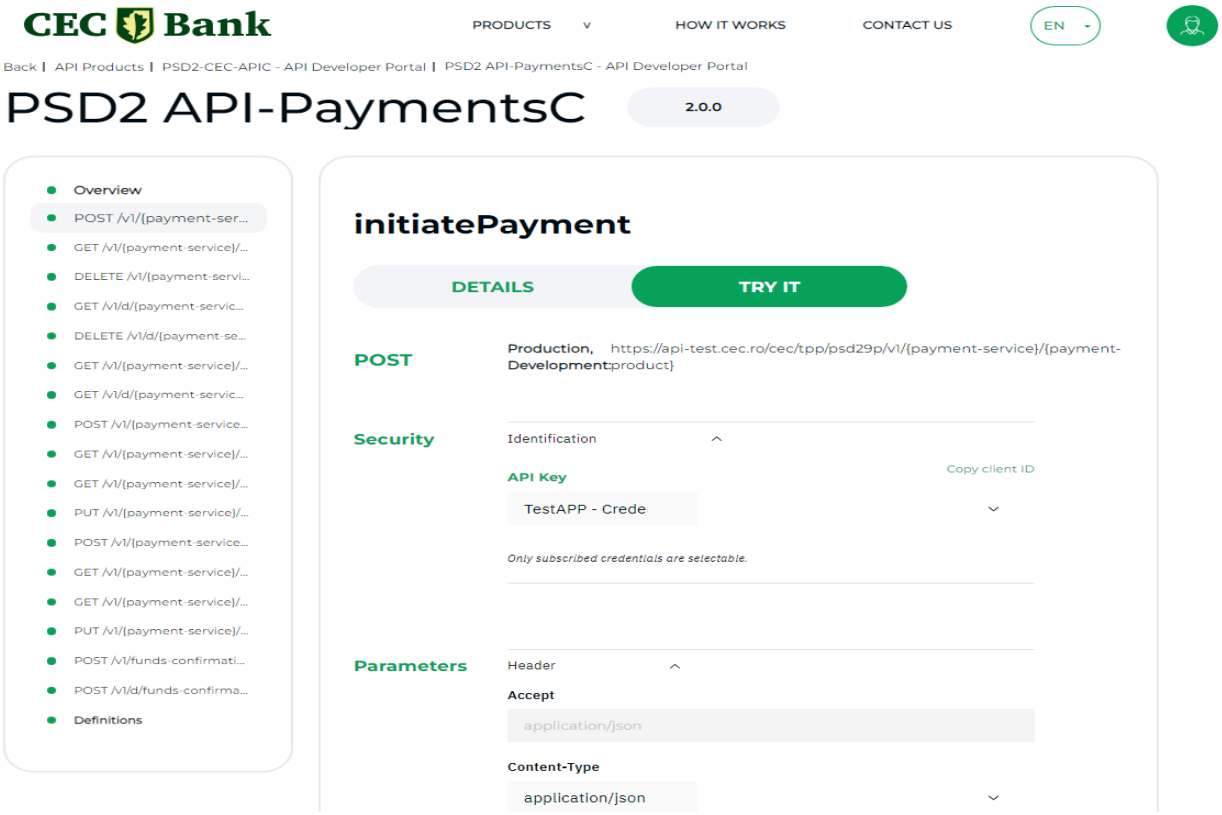
4. In the CEC Bank Authorization Server interface, the customer is authenticated in the bank's system based on the login credentials in the Internet Banking-CEC Online application.
5. After successful authentication, the customer agrees to process the payment or can reject it.
6. The customer is redirected to the TPP application. If the payment has been authorized by the customer, a code is sent to the redirect address of the TPP application, which can be used by the TPP application to obtain the token to access the payment status/data.
7. The TPP application obtains tokens to access data and payment status. To check the payment status use the GET /v1/{payment-service}/{payment-product}/{paymentId}/status operation.
8. The bank service returns the payment status to the TPP application, which displays it to the customer.

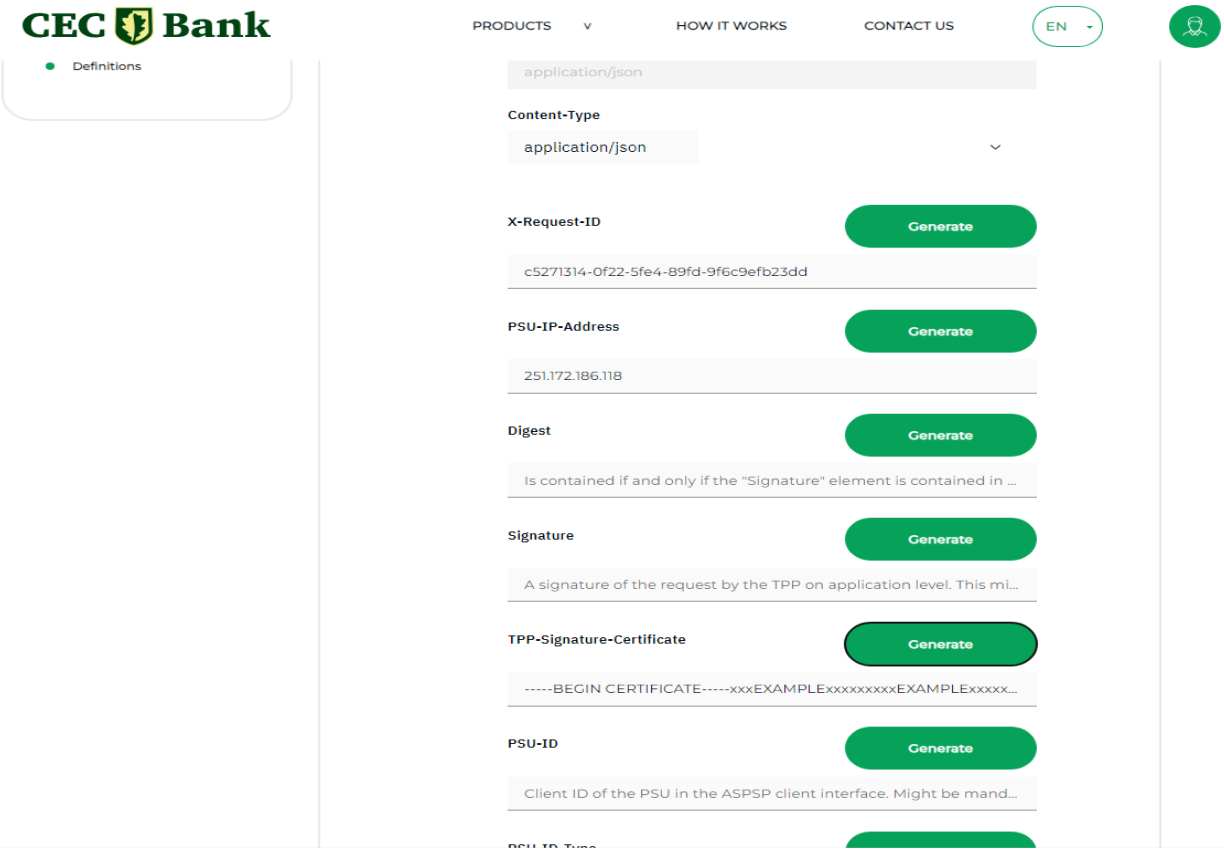
Example of flow:

2.2.1 POST operation

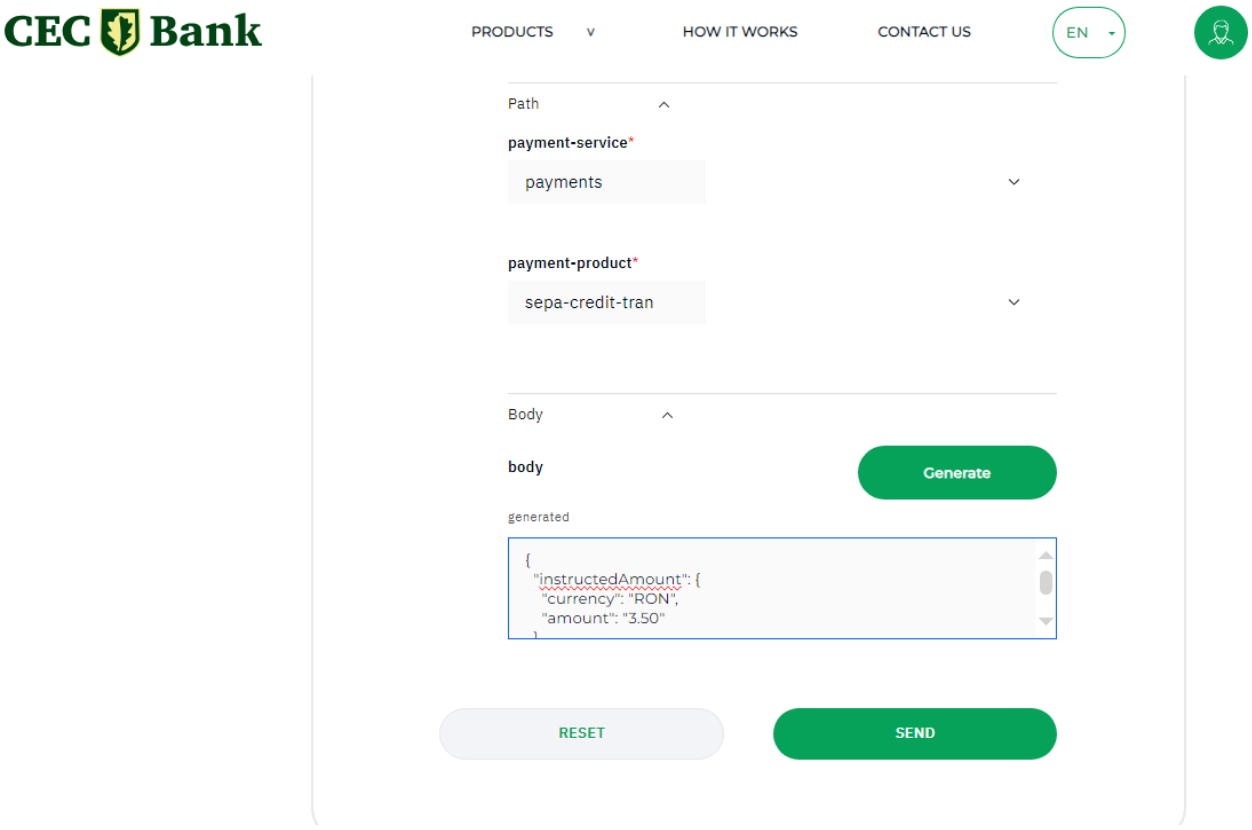
/v1/{payment-service}/{payment-product} can be used with the values *payment-service=payments* and *payment-product=sepa-credit-transfer*, and the payment data is sent in JSON format. The parameters TPP-Redirect-URI, X-IBM-Client-Id , X-Request-ID and TPP-Signature-Certificate in the request header are mandatory.

The debtorAccount parameter is optional in the flow. You can choose the option to introduce in the request body or select it on the authorization page if it is not sent in the body.


CEC Bank
PRODUCTS
HOW IT WORKS
CONTACT US
EN
Back | API Products | PSD2-CEC-APIC - API Developer Portal | PSD2 API-PaymentsC - API Developer Portal
PSD2 API-PaymentsC
2.0.0
Overview
POST /v1/{payment-ser...
GET /v1/{payment-service}/...
DELETE /v1/{payment-servi...
GET /v1/d/{payment-servic...
DELETE /v1/d/{payment-se...
GET /v1/{payment-service}/...
GET /v1/d/{payment-servic...
POST /v1/{payment-service...
GET /v1/{payment-service}/...
GET /v1/{payment-service}/...
PUT /v1/{payment-service}/...
POST /v1/{payment-service...
GET /v1/{payment-service}/...
GET /v1/{payment-service}/...
PUT /v1/{payment-service}/...
POST /v1/funds-confirmati...
POST /v1/d/funds-confirma...
Definitions
initiatePayment
DETAILS
TRY IT
POST
Production, Development: https://api-test.cec.ro/cec/tpp/psd29p/v1/{payment-service}/{payment-product}
Security
Identification
API Key
Copy client ID
TestAPP - Crede
Only subscribed credentials are selectable.
Parameters
Header
Accept
application/json
Content-Type
application/json


CEC Bank
PRODUCTS
HOW IT WORKS
CONTACT US
EN
Definitions
application/json
Content-Type
application/json
X-Request-ID
Generate
c5271314-0f22-5fe4-89fd-9f6c9efb23dd
PSU-IP-Address
Generate
251.172.186.118
Digest
Generate
Is contained if and only if the "Signature" element is contained in ...
Signature
Generate
A signature of the request by the TPP on application level. This mi...
TPP-Signature-Certificate
Generate
-----BEGIN CERTIFICATE-----xxxEXAMPLExxxxxxxxxEXAMPLExxxxx...
PSU-ID
Generate
Client ID of the PSU in the ASPSP client interface. Might be mand...

<PUBLIC>


CEC Bank
PRODUCTS
HOW IT WORKS
CONTACT US
EN
Path
payment-service*
payments
payment-product*
sepa-credit-tran
Body
body
Generate
generated
{
"instructedAmount": {
"currency": "RON",
"amount": "3.50"
RESET
SEND

<PUBLIC>

Response

201 Created

Body | Headers


```
{
    "transactionStatus": "RCVD",
    "paymentId": "d9a7b868-b3e0-11ef-9a7b-0a0800410000",
    "_links": {
        "scaOAuth": {
            "href": "https://api-test.cec.ro/cec/tpp/oaut
h/.well-known/oauthauthorization-server"
        },
        "self": {
            "href": "v1/payments/sepa-credit-transfers/d9a
7b868-b3e0-11ef-9a7b-0a0800410000"
        },
        "status": {
            "href": "v1/payments/sepa-credit-transfers/d9a
7b868-b3e0-11ef-9a7b-0a0800410000/status"
        }
    }
}
```


The response indicates the status "RCVD" (transaction registered for authorization), the payment reference-paymentId, and the scaOAuth link to be used to determine the payment authorization endpoint, based on the Oauth 2.0 authorization server metadata.

2.2.2 The TPP application must redirect the PSU to the bank login page

using the authorization endpoint provided by the scaOAuth link.

The example of the URL formation for Redirect can be found in the "Location" attribute of the response header of the POST operation /v1/{payment-service}/{payment-product}:

Location :

https://api-test.cec.ro/cec/tpp/oauthcec/oauth2/authorize?

response_type=code

&scope=PIS:5d935a04-7756-11eb-a2f7-0a06001a0000

&redirect_uri=https://example.com/redirect

&client_id=286xxxxxxxxxxxxxxxxxfe8a3

&code_challenge=<code challenge value>

2.2.3 The TPP application redirects the customer to the URL formed in point 2.2.2

which opens the customer login screen in the bank system. The customer is authenticated by the bank based on the user defined in the Internet Banking-CECOnline application and the access code generated by the physical device he/she owns or by the eToken application installed on the mobile phone

2.2.4 If successfully logged in, the customer can view the initiated payment data from the TPP application.

If the IBAN has been transmitted in the <debtorAccount> parameter it is displayed in the <Iban Account Payer> area.(see figure below)

If the <debtorAccount> parameter has not been filled in when initiating the payment, in the authorization window you can select from a list. The list is filled in with all the IBANs from which the payment can be made (see figure below)

You can authorize the payment by pressing the "Confirm payment!" button or cancel it by pressing the "Reject payment!" button

2.2.5 If the payment has been authorized by the customer, a code is sent to the redirect address of the TPP application, which can be used by the TPP application to obtain the token to access the payment status.

2.2.6 The TPP application will provide the above access code in exchange for a token to access the payment data (Bearer Token)

by calling the POST method /oauth2/token from the URL indicated in the metadata "token_endpoint", with the purpose "PIS:paymentId" (same purpose contained in the access code provided in the previous step)

The request body must be sent in *x-www-form-urlencoded* format and must contain the parameters below (the values shown correspond to the in/out parameters of the authorization operation presented in the previous step):

- grant_type=authorization_code

- client_id=28xxxxxxxxxxfe8a3

- code= AAKhmcq8TtkkADrV-Ooq-fA1GGehJASxTsabVdBDyTiO2wJgCOgtXOlQWf0u6UX4m-b2eegYS-gFmyGZu3eTGC4R0QGZls6fLVI2XrKjsgJlqwE9gd6cF5YxsxgLqWyCoU8sg_MhhedaRianFHhD6JPF

- redirect_uri= https://example.com/redirect

- scope= PIS:5d935a04-7756-11eb-a2f7-0a06001a0000

- code_verifier=ginfeftejiscu

200 OK

{ "token_type": "bearer",

"access_token":
"AAIkMjg2Yjk1NmYtZDQxMS00OTM4LTljMGUtYmI1ODE1YWZlOGEzckcP8z5nf6w2H6
KjCNXCtdGSONM3-
wBIlrrZcI6kSrgUMFmHWWeJL7jJ6V6TyF4IPrDJ5j7bYt_LBiRxZW_YkFIoN2qn1mHlqEjFFb
Epy2PxFpCn5RrgruyLBdc8r5-0vnAB5q2ThhRWQzw8LJXIKw",

"expires_in": 3595,

"consented_on": 1614253740,

scope": "PIS:5d935a04-7756-11eb-a2f7-0a06001a0000",

"refresh_token": "AAJE8ZA8occfs5oiHN6ImOYwlwLaTkXDVv9jO1xyNDe3JMRVXMOd8e-
Q0Wfu0Q5TOLvDa5OW_4UqiMrhLSDa79xiwI-
7kplVeT_a57AclheDIftRzR1eDWJYoHan34yutNrXMU7KY3XMe_rItRIQXSEzbs98FiMc_jU5
AlklZPXGQw",

"refresh_token_expires_in": 2682000

}

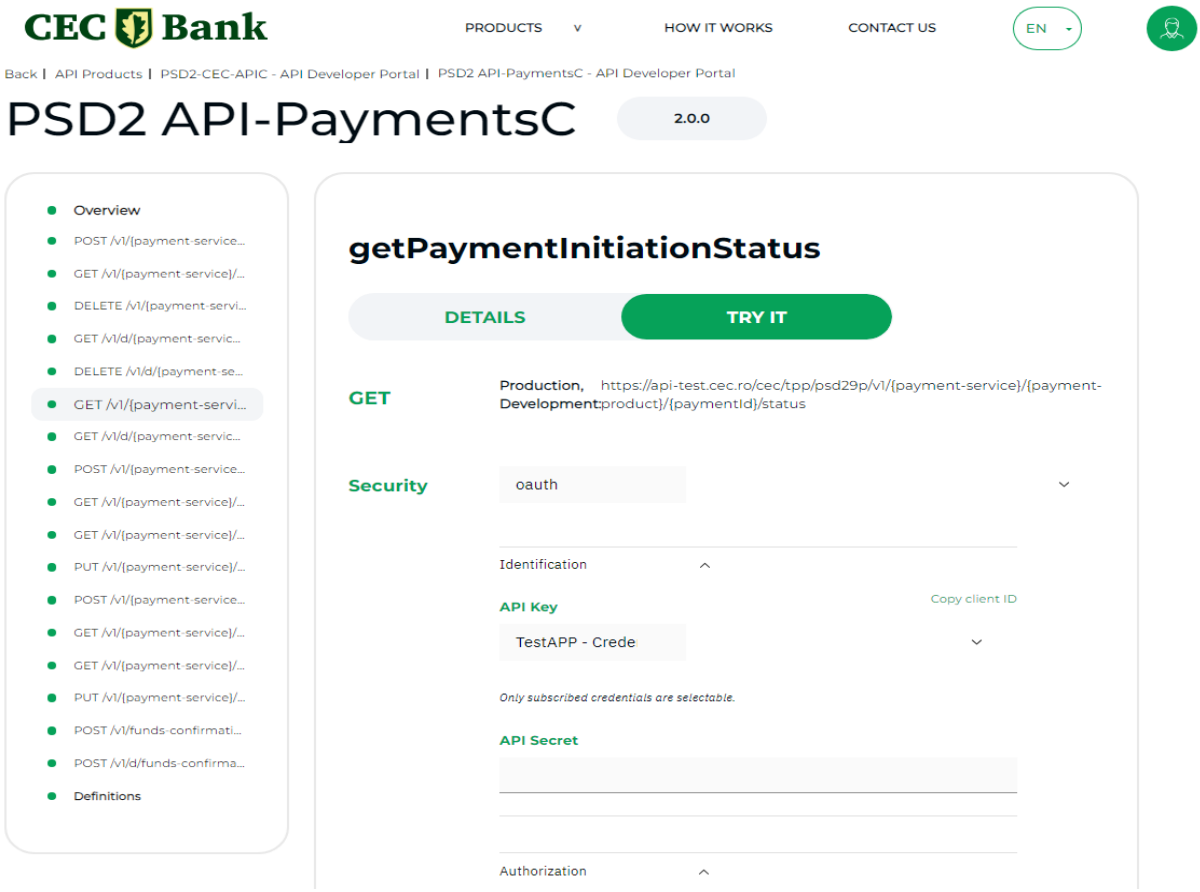
In the response of the POST /oauth2/token operation, the access token value needed to call the other operations in the PSD2 API API-PaymentsC API is found. It also specifies the refresh_token value, with a validity period corresponding to the validity of the consent (max. 90 days), which can be used to generate a new access_token without PSU involvement.

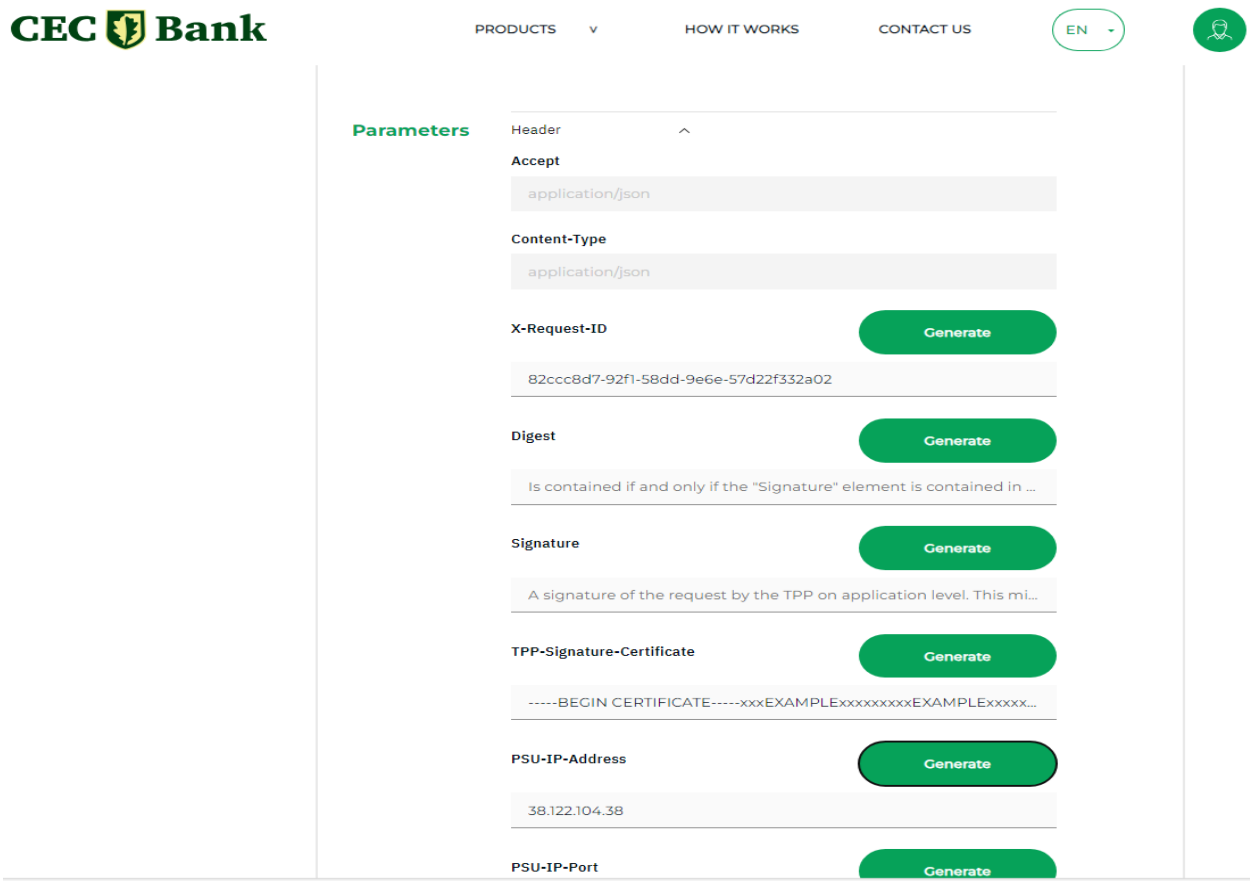
To get a new valid access_token in exchange for the refresh_token, use the same POST /oauth2/token operation, but with grant_type=refresh_token and the required client_id and refresh_token parameters, as in the example below.

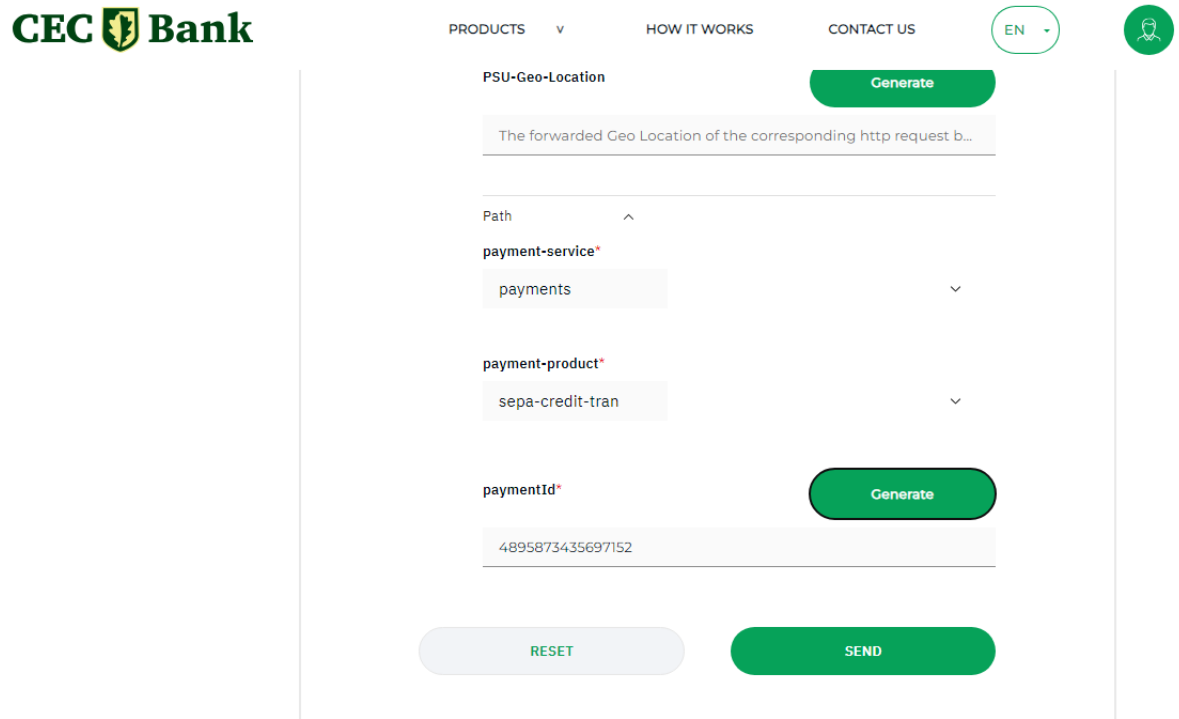
```
curl --request POST \
--url https://api-test.cec.ro/cec/tpp/oauthcec/oauth2/token \
--header 'accept: application/json' \
--header 'content-type: application/x-www-form-urlencoded' \
--header 'x-ibm-client-id: 28xxxxxxxxxxfe8a3\
--data 'grant_type=refresh_token&client_id=28xxxxxxxxxxfe8a3&refresh_token
AAJE8ZA8occfs5oiHN6ImOYwlwLaTkXDVv9jO1xyNDe3JMRVXMOd8e-
Q0Wfu0Q5TOLvDa5OW_4UqiMrhLSDa79xiwI-
7kplVeT_a57AclheDIftRzR1eDWJYoHan34yutNrXMU7KY3XMe_rItRIQXSEzbs98FiMc_jU5
AlklZPXGQw
```

2.2.7 Payment status

You get it with GET /v1/{payment-service}/{payment-product}/{paymentId}/status . In the Authorization parameter of the header, enter the value access_token obtained in step 7.




CEC Bank
PRODUCTS
HOW IT WORKS
CONTACT US
EN
Parameters
Header
Accept
application/json
Content-Type
application/json
X-Request-ID
Generate
82ccc8d7-92f1-58dd-9e6e-57d22f332a02
Digest
Generate
Is contained if and only if the "Signature" element is contained in ...
Signature
Generate
A signature of the request by the TPP on application level. This mi...
TPP-Signature-Certificate
Generate
-----BEGIN CERTIFICATE-----xxxEXAMPLExxxxxxxxxEXAMPLExxxxx...
PSU-IP-Address
Generate
38.122.104.38
PSU-IP-Port
Generate


CEC Bank
PRODUCTS
HOW IT WORKS
CONTACT US
EN
PSU-Geo-Location
Generate
The forwarded Geo Location of the corresponding http request b...
Path
payment-service*
payments
payment-product*
sepa-credit-tran
paymentId*
Generate
4895873435697152
RESET
SEND

<PUBLIC>

Payment status can be (ISO 20022):

'RCVD': 'Received' - Payment initiation has been received by the receiving agent (status before payment authorization by the customer)

'ACCP': 'AcceptedCustomerProfile' - Preceding check of technical validation was successful. Customer profile check was also successful(payment status after customer authorization).

'ACTC': 'AcceptedTechnicalValidation' - Authentication and syntactical and semantical validation are successful(payment technically verified).

'ACSP': 'AcceptedSettlementInProcess' - All preceding checks such as technical validation and customer profile were successful and therefore the payment initiation has been accepted for execution (payment in progress)

'ACSC': 'AcceptedSettlementCompleted' - Settlement on the debtor’s account has been completed (the amount to pay has been debited from the payer's account)

'ACCC': 'AcceptedSettlementCompleted' - Settlement on the creditor's account has been completed (the amount paid has been registered to the creditor's account)

'RJCT': 'Rejected' - Payment initiation or individual transaction included in the payment initiation has been rejected.(payment not authorized by the customer)

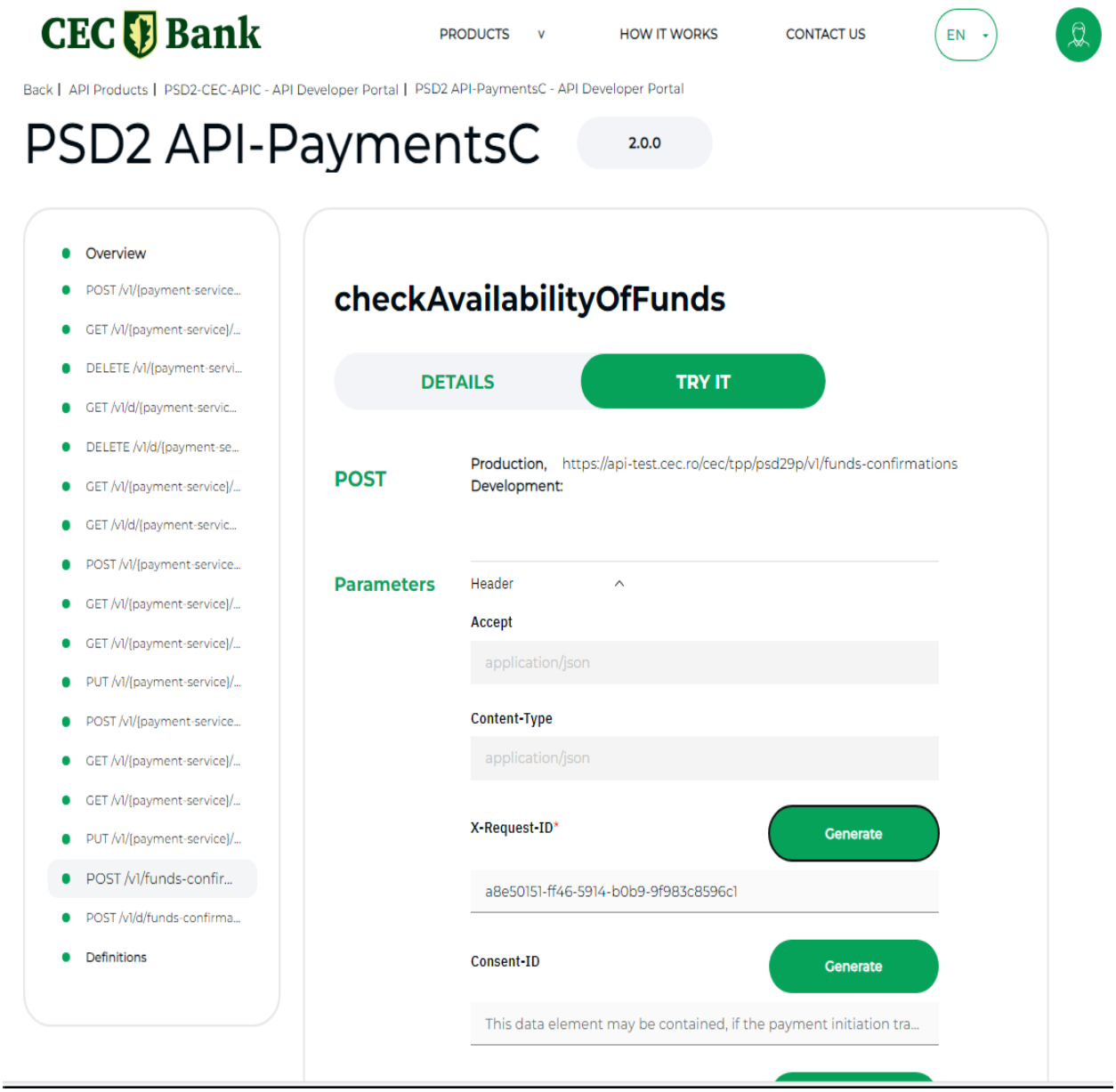
'CANC': 'Cancelled'-Payment initiation has been cancelled before execution(payment refused by the bank for various reasons: lack of availability, AML/Embargo restrictions, etc.).

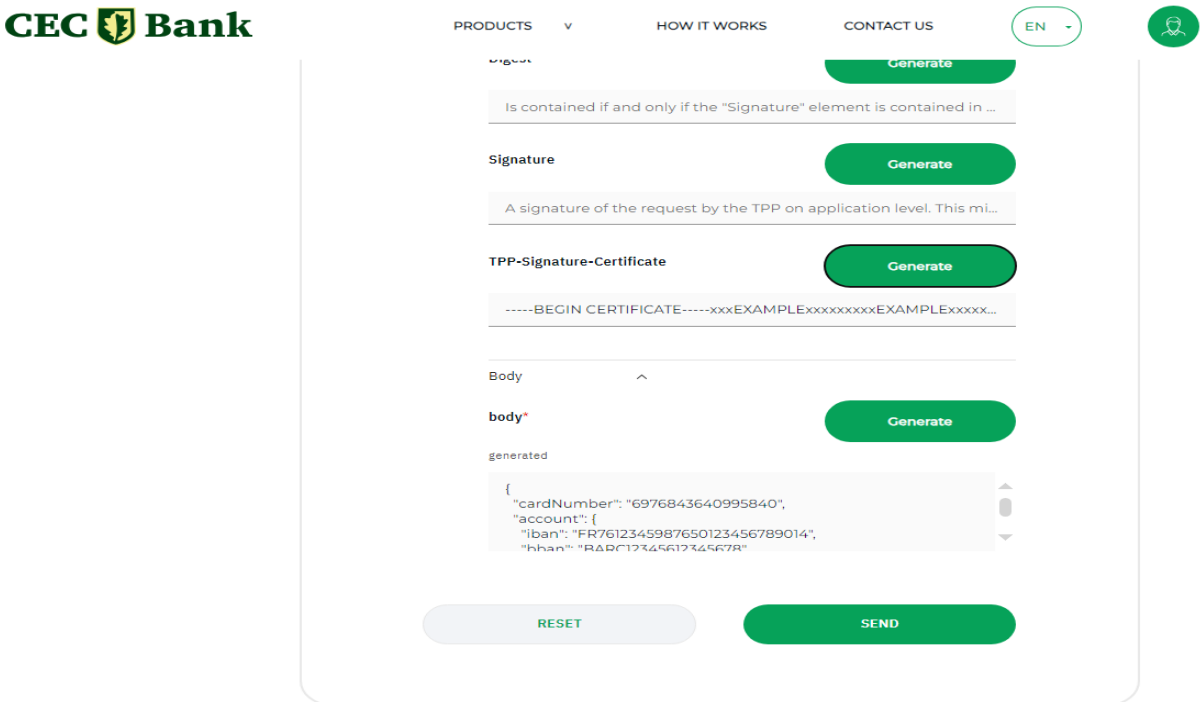
<PUBLIC>

2.3 Funds confirmation service - PIIS functionality

The operation that can be used to confirm the existence of an amount in the account is POST /v1/funds-confirmations and is developed in the PSD2 API-PaymentsC API.

When calling this operation, a valid bearer access token is requested for the purpose "AIS:consented", where the consent identifier (consented) identifies a valid consent given by the customer to consult the balance of the respective account.





If the access token is not fit for purpose or has expired or the consent resource does not include the account for which confirmation is requested, error codes 401 (UNAUTHORIZED) and 403 (FORBIDDEN) are returned.

2.4 Initiate and authorize bulk payments using PSD2 API-PaymentsC service operations

The following steps are distinguished in the flow:

2.4.1 The (PSU) customer requests the payment initiation in the TPP application.

The TPP application uses the POST operation **https://api-test.cec.ro/tpp/psd29p/v1/bulk-payments/sepa-credit-transfer** to transmit to the Bank the payment data requested by the customer.

The image below shows an example of a call using POSTMAN and the body used:

POST https://api-test.cec.ro/cec/tpp/psd29p/v1/bulk-payments/sepa-credit-transfers

Params Authorization Headers (14) Body Pre-request Script Tests Settings

none form-data x-www-form-urlencoded raw binary GraphQL JSON

```
{
    "debtorAccount": {
        "iban": "RO30CECEB002003765290100",
        "debtor name": "Ion Popescu",
        "endToEndId": "767543"
    },
    "paymentExecutionType": "instant",
    "requestedExecutionDate": "tbd",
    "payments": [
        {
            "requestId": "2bbbbbbb-32bz-bejt-c4q5-b7c8ca72bb5b",
            "instructedAmount": {
                "currency": "RON",
                "amount": "1"
            },
            "creditorName": "Ion Popescu 10",
            "creditorAccount": {
                "iban": "RO59RNCB0857169988050001"
            },
            "remittanceInformationUnstructured": "test plata bulk cont BCR"
        },
        {
            "requestId": "3cczcc2b-32bz-bejt-c4q5-b7c8ca727c3c",
            "instructedAmount": {
                "currency": "RON",
                "amount": "1"
            },
            "creditorName": "Ion Popescu 11",
            "creditorAccount": {
                "iban": "RO82RZBR0000060023923579"
            },
            "remittanceInformationUnstructured": "test plata bulk cont Raiffeisen"
        }
    ]
}
```

2.4.2 The Bank Service checks the correctness of the data and stores the payment data

In the response returned to the TPP application specifying the payment identifier and the scaOAuth link (used to determine the URL of the interface exposed by the bank for payment authorization).

In the figure below there is an example of the response to initiate the payment if using the developer portal https://apiportal-test.cec.ro/cec/tpp

cURL Ruby Python PHP Java Node Go Swift Subscribe

```
201 Created
content-type: application/json
x-global-transaction-id: 37198f4566052d642c565950
x-ratelimit-limit: name=rate-limit,100;
x-ratelimit-remaining: name=rate-limit,98;
{
    "transactionId": "767543",
    "paymentIdBulk": "12e79d38-ecdf-11ee-879e-0a1200740000",
    "transactionStatus": "RCVD",
    "creationDateTime": "TIMESTAMP '2024-03-28 10:42:13'",
    "paymentsResponse": [
        {
            "requestId": "2bbbbbbb-32bz-bejt-c4q5-b7c8ca72bb5b",
            "response": {
                "result": {
                    "transactionStatus": "RCVD",
                    "paymentId": "12e79edc-ecdf-11ee-879e-0a1200740000"
                }
            }
        },
        {
            "requestId": "3cczcc2b-32bz-bejt-c4q5-b7c8ca727c3c",
            "response": {
                "result": {
                    "transactionStatus": "RCVD",
                    "paymentId": "12e90010-ecdf-11ee-879e-0a1200740000"
                }
            }
        }
    ],
    "_links": {
        "scaOAuth": {
            "href": "https://api-test.cec.ro/cec/tpp/oauth/.well-known/oauthauthorization-server"
        },
        "self": {
            "href": "v1/bulk-payments/sepa-credit-transfers/12e79d38-ecdf-11ee-879e-0a1200740000"
        },
        "status": {
            "href": "v1/bulk-payments/sepa-credit-transfers/12e79d38-ecdf-11ee-879e-0a1200740000/status"
```

2.4.3 The TPP application redirects the customer to the authorization interface exposed by the bank

which is the same as a single payment. In the CEC Bank Authorization Server interface, the customer is authenticated in the bank's system based on the login credentials in the Internet Banking-CEC Online application.

2.4.4 After successful authentication, the customer agrees to process the bulk payment or can reject it.

2.4.5 The customer is redirected to the TPP application.

If the bulk payment has been authorized by the customer, a code is sent to the redirect address of the TPP application, which can be used by the TPP application to obtain the token to access the payment status/data.

2.4.6 The TPP application obtains tokens to access data and bulk payment status.

To check bulk payment status use the GET operation**https://api-test.cec.ro/cec/tpp/psd29p/v1/d/{payment-service}/{payment-product}/{paymentId}**

The bank service returns the status of the bulk payment to the TPP application, which displays it to the customer (see figures below)

The figure below shows that the bulk payment has the status "ACCP".


```
200 OK
content-type: application/json
x-global-transaction-id: 37198f4566052e981e69bf91
x-ratelimit-limit: name=rate-limit,100;
x-ratelimit-remaining: name=rate-limit,93;
{
    "transactionId": "767543",
    "paymentIdBulk": "12e79d38-ecdf-11ee-879e-0a1200740000",
    "transactionStatus": "ACCP",
    "creationDateTime": "TIMESTAMP '2024-03-28 10:42:13'",
    "debtorAccount": {
        "iban": "RO30CECEB002003765290100"
    },
    "paymentsResponse": [
        {
            "requestId": "2bbbbbbb-32bz-bejt-c4q5-b7c8ca72bb5b",
            "response": {
                "result": {
                    "transactionStatus": "ACCP",
                    "paymentId": "12e79edc-ecdf-11ee-879e-0a1200740000",
                    "creditorAccount": {
                        "iban": "RO59RNCB0085716998805000l"
                    },
                    "creditorName": "Ion Popescu 10",
                    "instructedAmount": {
                        "currency": "RON",
                        "amount": "1.00"
                    },
                    "remittanceInformationUnstructured": "test plata bulk cont BCR"
                }
            }
        },
        {
            "requestId": "3cczcc2b-32bz-bejt-c4q5-b7c8ca727c3c",
            "response": {
                "result": {
                    "transactionStatus": "ACCP",
                    "paymentId": "12e90010-ecdf-11ee-879e-0a1200740000"
```

Following the execution of the bulk payments the status can be changed to "PART" following the failed execution of a single bulk payment as in the figure below:

Response

```
200 OK
content-type: application/json
x-global-transaction-id: 37198f4566052eff2d9c77b2
x-ratelimit-limit: name=rate-limit,100;
x-ratelimit-remaining: name=rate-limit,92;
{
    "transactionId": "767543",
    "paymentIdBulk": "12e79d38-ecdf-11ee-879e-0a1200740000",
    "transactionStatus": "PART",
    "creationDateTime": "TIMESTAMP '2024-03-28 10:42:13'",
    "debtorAccount": {
        "iban": "RO30CECEB002003765290100"
    },
    "paymentsResponse": [
        {
            "requestId": "2bbbbbbb-32bz-bejt-c4q5-b7c8ca72bb5b",
            "response": {
                "result": {
                    "transactionStatus": "ACCP",
                    "paymentId": "12e79edc-ecdf-11ee-879e-0a1200740000",
                    "creditorAccount": {
                        "iban": "RO59RNCB0085716998805000l"
                    },
                    "creditorName": "Ion Popescu 10",
                    "instructedAmount": {
                        "currency": "RON",
                        "amount": "1.00"
                    },
                    "remittanceInformationUnstructured": "test plata bulk cont BCR"
                }
            }
        },
        {
            "requestId": "3cczcc2b-32bz-bejt-c4q5-b7c8ca727c3c",
            "response": {
                "result": {
```

```
        {
            "requestId": "3cczcc2b-32bz-bejt-c4q5-b7c8ca727c3c",
            "response": {
                "result": {
                    "transactionStatus": "CANC",
                    "paymentId": "12e90010-ecdf-11ee-879e-0a1200740000",
                    "creditorAccount": {
                        "iban": "RO82RZBR0000060023923579"
                    },
                    "creditorName": "Ion Popescu 11",
                    "instructedAmount": {
                        "currency": "RON",
                        "amount": "1.00"
                    },
                    "remittanceInformationUnstructured": "test plata bulk cont Raiffeisen"
                }
            }
        }
    ]
}
```


NOTE:
PART, ACSC - final statuses for a bulk payment initiation transaction // PART status is provided in Berlin Group
Any other status up to this point is an intermediate status.
PART - at least one bulk payment was not successfully completed.
ACSC- all bulk payments have been successfully completed.
PATC - payment requires additional signatures