**Skandiabanken
Technical documentation Open Banking**

skandia:

1 Introduction
Welcome to Skandiabanken Open Banking-solutions!

1.1 Background
This document and information found at our information-site is created to provide the information you need to access our APIs. If you have questions or suggestions, you are welcome to contact us here.

Info site: www.skandia.se/openbanking
Portal: https://developer.skandia.se/open-banking/core-bank/

This document is found on the information site. A glossary of abbreviations and acronyms is also found on the information site.

1.2 Status
This section will clarify what we have in place and the status of the functionality. Please read the rest of this documentation for further information and details.

Functionality	Available	Comments
SCA	Yes	A redirect solution using Swedish BankID. We are investigating embedded/decoupled solutions.
TPP-identification (eIDAS)	Yes	We support eIDAS/QWAC. QSealC is currently not required but we are investigating it.
Relevant standards	Yes	Berlin Group NextGenPSD2 Framework version 1.3.3 OAuth2 including OpenID Connect TLS 1.2
AIS	Yes	Payment account information for private customers over 18 years is available for 90 days. We have no business customers with payment accounts.
PIS	Yes	Domestic transfer with same date is available. Other PIS such as bill payments, international payments etc will be available later.
PIIS	No	Not currently available

1.3 Contact us and channels for communication
If you have questions, feedback or general problems you are welcome to contact us via mail openbanking@skandia.se. This mailbox is mainly monitored during business hours. Please use this for technical questions or business inquires.

If you have very urgent issues outside business hours, please contact our customer and TPP support:
https://www.skandia.se/kontakta-skandia/kontakta-oss/.
Mainly use phone: +46771555500
Open hours 06-24 all days, year around.

2 Test environment and sandbox

2.1 General information
We currently do not have test environments/Sandbox.

3   Onboarding of TPP

3.1   Process overview
Note that all this applies for the production environment. Currently we have no test environment.

This section provides a process overview how a TPP can gain access to our production environment including portal and API gateway.

1. Get an approval from a local NCA (Finansinspektionen in Sweden) as an AISP or PISP. If you are a bank you already have an approval.
2. Obtain a <u>production</u> eIDAS-certificate from a QTSP. QWAC is required.
    a. Note 1: you cannot use a CA root certificate
    b. Note 2: you cannot use a test certificate
3. Register in our portal and create apps and subscriptions. You will need the public key of your <u>production</u> eIDAS QWAC certificate in this process.
4. When you add a subscription to an app there will be a manual step for us to grant your app access. You will receive an e-mail when your app is granted access.
5. You can access the APIs (AIS and/or PIS) your certificate allows you to invoke

Business partners have a similar process which is not covered in this documentation.

3.2   Create an account in the portal
Browse to the portal (https://developer.skandia.se/open-banking/core-bank). We strongly recommend that you use Firefox as a browser when using the portal.

Step by step to register an account
Navigate to the portal.
Click the "CREATE ACCOUNT" button (top right corner). Enter the fields:
- user name (please make a note of the selected user name, it is required for login)
- email address (will be used for communication with your organization)
- first name
- last name
- phone (optional but recommended)
- consumer organization (defines the name of the collective under which client applications will be created)
- password and confirm password and captcha
1. Press the "Sign up" button
2. Open the email received from the portal and follow the activation link
    - Following the activation link of the e-mail, the user account becomes enabled
3. Login using the username and password selected by you

3.3   Adding a colleague to your consumer organization
It is possible to invite additional users to your consumer organization. This can be done while logged in as the consumer organization owner/creator or if you possess the administrator role of that specific consumer organization.

The new user is invited using an e-mail address. An e-mail containing a registration link is sent to the provided e-mail address. If the e-mail is registered to an existing user account, following the link will add that user to the specific consumer organization. If the e-mail is previously unused, following the link will require the user to step through the process for creating an account except that no new consumer organization needs to be created.

3.4   How top setup your apps and subscriptions
Product
The API Products view provides an overview of the products available in the portal. A product acts as a collection of APIs. To enable invocation of an API, you must subscribe with an app to a product's plan containing the desired API.

API

An API is a set of functions and procedures allowing the creation of applications that access the features or data of an operating system, application, or other service. The API can be protected by various security mechanism, including, but not limited to, client id identification, MTLS and OAuth.

We expose a set of APIs which makes it possible for third parties to create applications using payment account information and payment initiation.

Plan

A plan represents a collection of APIs from a specific product. Subscribing to a plan allows the consuming app to invoke the APIs included in the plan given the correct security protocols are satisfied. A plan can contain terms of the usage of its APIs, including invocation rate limits and debit.

Apps

Apps are the components that are used to invoke the APIs. An app has its own set of security credentials, client id and client secret. To create an app, navigate to the apps page and click the "Create new app" button.

To create an app, the following fields are required:

Field	Comment
Title	The name of the app (only visible to you and us)
QWAC Certificate	Paste the content of the public part of your eIDAS QWAC x509 Certificate in PEM format with base 64 encoding. Please provide PEM encapsulation (BEGIN CERTIFICATE, END CERTIFICATE) on separate lines with the base 64 encoded certificate on a single line between the encapsulations. This certificate will be used for both MTLS and to determine your TPP accessibility. The certificate should contain the whole certificate chain.
QSEAL Certificate (optional)	Paste the content of the public part of your eIDAS QSEAL x509 Certificate in PEM format with base 64 encoding. We currently do not validate QSEAL but will do later, by entering this field the process will be easier for you when we require QSEAL. The certificate should contain the whole certificate chain.
Application OAuth Redirect URL(s)	A list of redirect urls to be used in the OAuth Authorization code flow. These addresses will be used to receive the authorization code required when claiming the access token for the API invocation. The url: • Must follow the format (?=\w+:\/\/?*?\w+) • Cannot contain intermediate white spaces
Sign Redirect Url (optional)	The provided url will be used when redirecting the user after a successful payment. If no value is provided, the user will maintain at the default page after signing a payment. The url: • Must follow the format (?=\w+:\/\/?*?\w+) • Cannot contain intermediate white spaces

```
-----BEGIN·CERTIFICATE-----CRLF
MIIHoDCCBoigAwIBAgIKBllyT7rSlPwDBDANBgkqhkiG9w.....CRLF
-----END·CERTIFICATE-----CRLF
```

Above: *example of a correctly PEM-formatted public part of a QWAC Certificate*

After creating an app, client id and client secret will be provided. Take note, <u>this is the only time the client secret will be shown for you</u>. It is possible to reset the client secret by navigating to apps, select an app, click subscriptions, select the menu present in the top right corner of the credentials window and click reset client secret.

It is possible to update an app. Updating an app requires the same input parameters as when creating it. However, it is not possible to change the QWAC Certificate provided when the app was initially created. I.e. if you desire to use another QWAC Certificate, a new app must be created, entailing a new client id and client secret. This is for example how you as a TPP handle updating a certificate about to expire.

Step by step to invite a user to your Consumer Organization
1. While logged in, view the "Organization" label on the right side of the top menu.
2. Ensure that the selected consumer organization is the one that you wish to invite a new member to by observing the name displayed under the organization label.
3. Click the "Organization" label on the right side of the top menu.
4. Click "My Organization" from the drop-down-menu.
5. Ensure that you are in the correct consumer organization by viewing the name displayed in the top left corner.
6. Click the green "Invite" button on the right side of the screen.
7. Provide the e-mail address of the member you wish to invite (existing or new user).
8. Assign a role that the new member should possess.
    a. Administrator – Manage members, apps and subscriptions of this consumer organization.
    b. Developer – Manage apps and subscriptions of this consumer organization.
    c. Viewer – View apps and subscriptions of this consumer organization.
9. Click "Submit"
10. Once the e-mail is received by the new member, the activation link should be followed to activate the invitation.

Step by step to create an App
1. While logged in, click the "APPS" label from the top menu
2. Click the "Create new app" button
3. Enter mandatory fields title, QWAC-certificate[1], application OAuth redirect URL(s) (minimum 1) and click the 'Submit' button
4. Take note of the API Key (Client-Id) and Secret and click the "Continue" button

Step by step to update an App
1. While logged in, click the "APPS" label from the top menu
2. Select and click the App to edit
3. Click the three vertical dots in the top right corner and select "Edit" from the drop-down menu
4. Change any of the available fields, including title, application OAuth Redirect URL(s) and Sign Redirect Url.
5. Click the 'Submit' button

Step by step to reset client secret
1. While logged in, click the "APPS" label from the top menu
2. Select and click the app to which you would like to reset client secret
3. Click the "Subscription" link located below the app name
4. Click the three vertical dots located in the top right corner of the credentials window and select "Reset Client Secret" from the drop-down menu
5. Click the "Reset" button
6. Check the 'Show' checkbox at to the top of the page
7. Take note of the new client secret

Step by step to delete an App
1. While logged in, click the "APPS" label from the top menu
2. Select and click the app to be deleted

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[1] The eIDAS-certificate holds authorization/the role you have a regulates if you can access AIS and/or PIS. If you as an ASIP creates an app/subscription for PIS the subscription will be denied.

3. Click the three vertical dots in the top right corner and select "Delete" from the drop-down menu
4. Click the "Delete" button

Subscription

A subscription defines a connection between a plan and an app. The plan defines the how and what of the subscription, including what APIs and how the APIs are accessible. The app defines the which of the subscriptions and hence details what credentials that are to be used against the gateway when attempting to invoke any of the APIs. Without a valid subscription, an app can never invoke a published API in the production environment.

To subscribe to a plan, go to the product overview page, select a product, click the plan you desire to subscribe to. Choose the App to which the subscription should be created for and confirm the subscription.

The act of requesting a new subscription will require a manual approval from us before the client app is enabled to invoke the API. It is possible to track the approval status by navigating to the app's subscriptions overview. If you know in advance that you need to get a fast approval, please contact us via mail and let us know a business day ahead.

Step by step to create a subscription
1. While logged in, click "API PRODUCTS" from the top menu
2. Select and click the product that the subscription should regard
3. Select and click the 'Subscribe' button of the desired Plan
4. Select and click the 'Select App' button of the desired app
5. Overview the subscription details and press the "Next" button
6. Click the "Done" button

Step by step to view Subscription status
1. While logged in, click the "APPS" label from the top menu
2. Select and click the app to which the subscription belongs to
3. Click the 'Subscription' link located below the app name
4. View the status of subscriptions in the subscriptions window

Step by step to remove a Subscription
1. While logged in, click the "APPS" label from the top menu
2. Select and click the app to which the subscription belongs to
3. Click the "Subscription" link located below the app name
4. Click the three vertical dots located to the right of the specific subscription located in the Subscriptions window
5. Select "Unsubscribe" from the drop-down menu
6. Click the "Unsubscribe" button

4 Security and authentication and of TPP including SCA of PSU
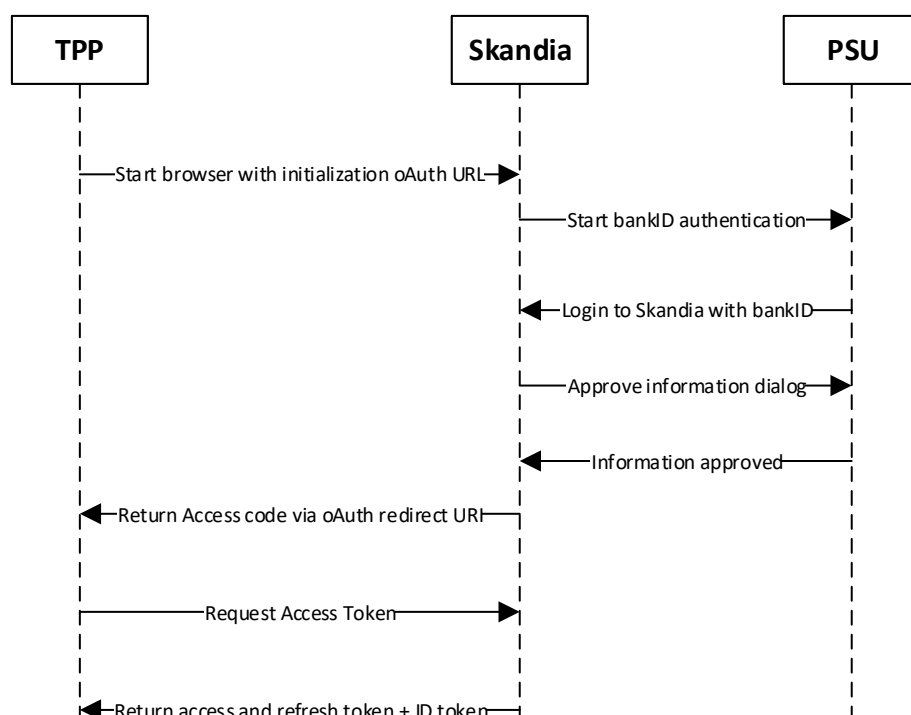
4.1 OAuth2

We use OAuth 2.0 for authentication and authorization. Our APIs are protected by the OAuth Authorization Code Grant type which is depicted in detail at https://oauth.net/2/.

4.2 Request Access code and ultimately Access token

To enable the you access to the PSU:s accounts the PSU need to be authenticated by us. This is performed using a redirect approach. We are however investigating supporting other approaches such as decoupled and embedded. Swedish BankID is currently the only supported SCA.

4.2.1 Authorization flow using redirect for authentication

This section provides information how to perform SCA with the redirect solution.

```
    TPP                        Skandia                     PSU

     |—Start browser with initialization oAuth URL—►|     |
     |                            |—Start bankID authentication—►|
     |                            |◄—Login to Skandia with bankID—|
     |                            |—Approve information dialog—►|
     |                            |◄—Information approved—|
     |◄—Return Access code via oAuth redirect URI—|     |
     |—Request Access Token—►|                          |
     |◄—Return access and refresh token + ID token—|     |
```

1. The authentication of the PSU starts upon request from you (TPP). You need to provide your ClientID, a redirect URI and requested scopes.
2. The PSU gets identified using Swedish BankID (*note 1)
3. We display an information dialogue to the PSU. The PSU simply clicks OK. (*note 2)
4. If BankID sign and PSU clicked OK in the information dialogue, we return an access code to the redirect URI provided by you
5. TPP can now request access token using the access code and client secret

Note 1:

If the PSU cancels/aborts the authentication with BankID or the authentication in BankID fails for some reason, we will show a default error page to the PSU. Currently we cannot redirect to an URI's given by you.

Note 2:

If the PSU choose to click cancel in the information dialogue Skandia will use the redirect URI given by the TPP with an added query parameter indicating an error.
Ex. <redirect_uri>?error=access_denied&description=null

Applying the OAuth 2.0 Authorization code grant type:
Use the client_id and client_secret received when you created the App in the developer portal along with the redirect uris that you provided for that specific App.
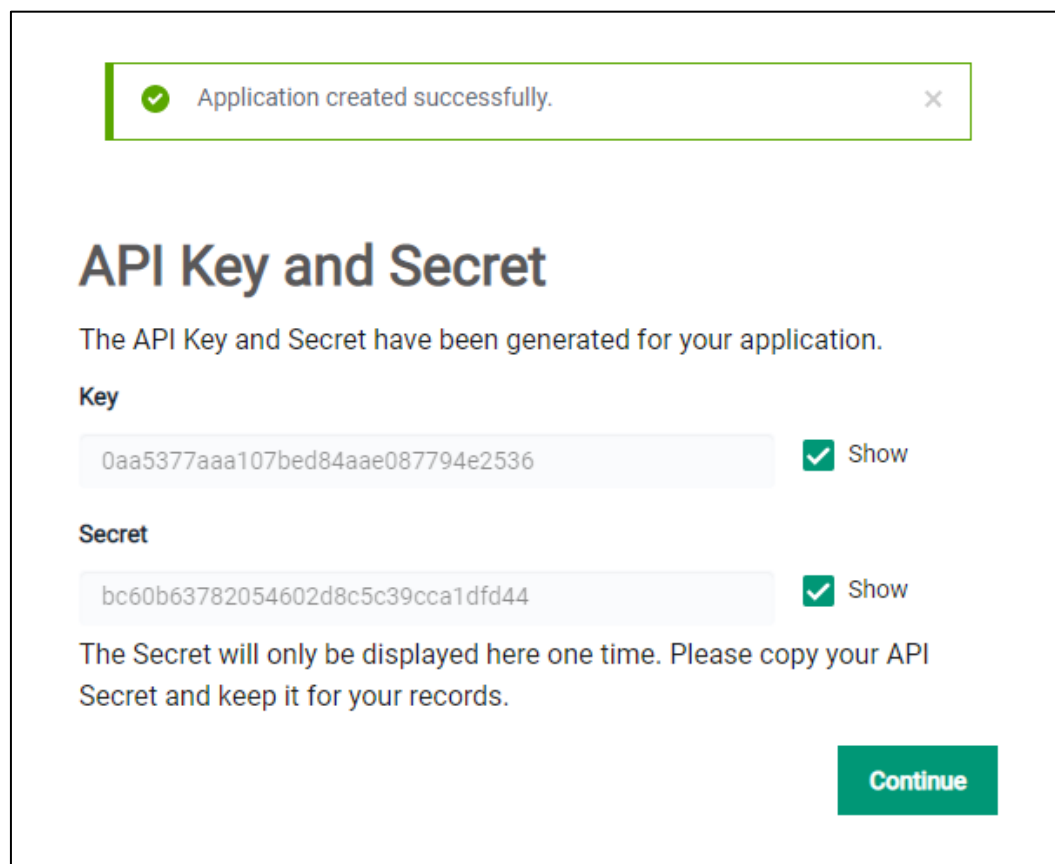
Against the authorization endpoint the invocation should adhere to the following structure:
HTTP Method: GET
Parameters
reponse_type: code
client_id: The client_id of your created App in the portal, denoted Key in the image above.
redirect_uri: A redirect uri that you have provided for the App in the portal.
scope: Should at least contain the API specific scope, i.e. psd2.aisp for AIS or psd2.pisp for PIS.
state: A random string that should be validated to be identical in the redirect return after the user authorizes the app.

Example Authorization Request:
HTTP Method: GET
Endpoint:
https://fsts.skandia.se/as/authorization.oauth2?response_type=code&client_id=0aa5377aaa107bed84aae08
7794e2536&redirect_uri=https%3A%2F%2Flocalhost/&scope=psd2.aisp&state=ca17f9d039024a789493641
d8cdbba14

Against the token endpoint the following structure should be used:
HTTP Method: POST
Content-Type: application/x-www-form-urlencoded

Body Parameters
grant_type: authorization_code
code: Access code received in the redirect as a result of the authorization request.
redirect_uri: Same redirect uri that was used in the authorization request.

client_id: The client_id of your created App in the portal, denoted Key in the image above.
client_secret: The client_secret received when creating the App, denoted Secret in the image above.

Example Token Request:
HTTP Method: POST
Endpoint: https://fsts.skandia.se/as/token.oauth2
Content-Type: application/x-www-form-urlencoded
Body
grant_type=authorization_code&code= 661e9996602e47f7b23039a441c91061&redirect_uri=
https%3A%2F%2Flocalhost/&client_id= 0aa5377aaa107bed84aae087794e2536&client_secret=
bc60b63782054602d8c5c39cca1dfd44

4.2.2 Token types and its uses
To access the PSD2 APIs you need a valid access token. The access token is a short-lived token valid only for a short time. If the access token has expired, you use the refresh token to get a new access token.

The refresh token is valid for 90 days. After the refresh token has expired the PSU need to be authenticated again as previously described.

The ID token (of type Open ID-Connect) is a representation of the identity (ssn, "*personnummer*") of the authenticated PSU. This enables you as a TPP to validate that the PSU using your services corresponds to the PSU authenticated by us.

4.2.3 AIS consent
You as a TPP is responsible of having and handle the consent the customer gives you and act according to it. We do not

We will inform the PSU in the SCA process for the AIS the he/she will give you as TPP access to account information. The PSU simply clicks OK that he/she understands. You will after this have access to account information for 90 days without a renewed authentication by the PSU. You will have access to the accounts present at the time of the SCA and including new payment accounts the PSU creates.

## 5   General information about API invocation

5.1   Gateway

Invoking the PSD2 REST APIs requires 3 security measures, including:

1.   Http header named "client-id" containing a client id of an app created in the portal. The app holds a valid subscription containing the specific API.
2.   MTLS with the eIDAS QWAC certificate provided when creating the App
3.   An Authorization header containing a bearer access token of type reference containing the scope demanded by the API definition

5.2   Headers for API invocation

Please view swagger files for specific API headers in the Portal.

To find the swagger file. Follow the link: https://developer.skandia.se/open-banking/core-bank/
Choose product >> Click on the API >> There is a button for downloading the swagger.
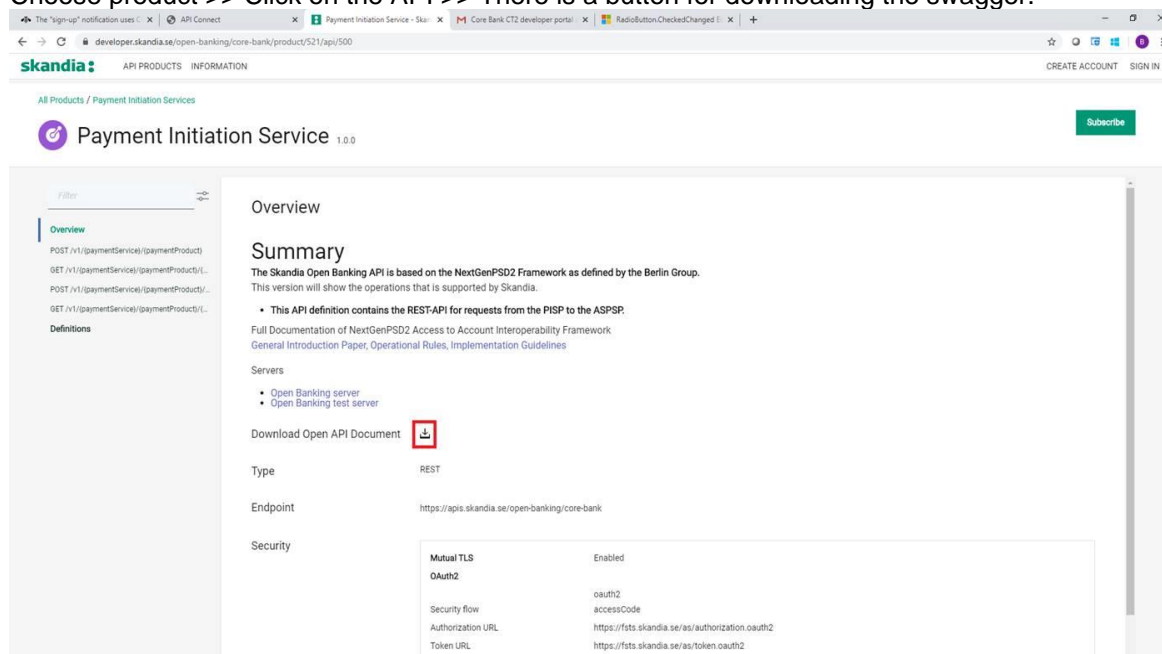
5.2.1 Error messages

Common 401 Unauthorized response messages and their implication.

- **Invalid client id or secret:** You are attempting to invoke the API using a client-id that is not valid for the specific API.
- **Client certificates for mutual TLS in the API request doesn't match the registered certificate:** The provided client-id is correct, but you are using a certificate that is not related to that client-id.
- **Cannot find valid subscription for the incoming API request:** The provided client-id is valid, but you are not authorized to invoke this API as that client-id (App) does not possess an approved subscription.
- **Cannot pass the security checks that are required by the target API or operation, enable debug headers for more details:** Could be one of the following three reasons.
    - Access token is not a valid reference token.
    - Access token has expired.
    - Access token does not contain the scope required by the API

6   AIS-operations

6.1   Introduction

The Account Information Services API is used to get account information, such as transactions and balances, about customers payment accounts.

Pre-requisites:
1. Have registered a user account in the portal
2. Have an app setup in the portal with an eIDAS-certificate of QWAC-type telling us you are an AISP

Flow for first time access for a give customer:
1. The PSU agrees with you to use your services to retrieve account information from us
2. OAuth2/SCA – customer is informed about giving information to the you
   a. The OAuth token will contain the ID of the customer
3. AISP invokes the AIS-operation of choice and receives a response with the requested information

Please view the swagger file for more information.

6.2   Overview of available accounts and customers

The AIS expose payment accounts owned by private consumers over the age of 18.

Summary:
- payments accounts owned by private consumer where the consumer is at least 18 years old
  - "Allt i Ett-konto", typically used for everyday transactions and bill payments
  - "Sparkonto", typically a savings account. Only domestic transfers possible.
- the consumer must own the account
  - We have no co-owned accounts
- payment accounts in SEK
- savings account in SEK (no fixed rate accounts are available)
  - This is also an "AiE-konto" but only domestic transfers are allowed (not bill payments etc)

The AIS will allow a TPP to access all payments accounts for a given PSU. Only the account owner can give consent to an account. We do not offer shared ownership of accounts.

A customer AIS-consent will give a TPP access to the customer's payment accounts (present and future created) for 90 days.

6.3   Get Account List

The operation will return a list of all payment accounts for a given PSU. Only the accounts which is owned by the PSU will be listed.

GET/v1/accounts

6.3.1   Request description

Name	Type	Information
X-Request-ID	string	In: header Required: true Format: uuid Description: ID of the request, unique to the call, as determined by the initiating party.
PSU-Accept	String	In: header Required: recommended by Skandia Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Accept-Charset	String	In: header Required: recommended by Skandia Description: he forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Accept-Encoding	String	In: header Required: recommended by Skandia Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Accept-Language	String	In: header Required: recommended by Skandia Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Device-ID	String	In: header Required: recommended by Skandia Description: UUID for a device, which is used by the PSU
PSU-Geo-Location	String	In: header Required: recommended by Skandia Description: The forwarded Geo Location of the corresponding http request between PSU and TPP
PSU-Http-Method	String	In: header Required: recommended by Skandia Description: HTTP method used at the PSU TPP interface, if available. Valid values are: * GET * POST * PUT * PATCH * DELETE
PSU-IP-Adress	String	In: header Required: recommended by Skandia Description: The forwarded IP Address header field consists of the corresponding HTTP request IP Address field between PSU and TPP. It shall be contained if and only if this request was actively initiated by the PSU
PSU-IP-Port	String	In: header

		Required: recommended by Skandia Description: The forwarded IP Port header field consists of the corresponding HTTP request IP Port field between PSU and TPP, if available
PSU-Referer	String	In: header Required: recommended by Skandia Description: "Referer" header field sent by the PSU terminal when connecting to the TPP
PSU-TimeStamp	String	In: header Required: recommended by Skandia Description: Timestamp of the most relevant PSU's terminal request to the TTP
PSU-User-Agent	String	In: header Required: recommended by Skandia Description: The forwarded Agent header field of the HTTP request between PSU and TPP, if available

6.3.2 Response description

Name	Type	Description
AccountList	list	The list of accounts for the given customer
Parameters of accountList		
accountsDetails		
resourceId	string	Id of an account (used to call other AIS operations)
bban	string	Bban identifier (clearing + number)
bic	string	BIC code of Skandiabanken: SKIASESS
cashAccountType	string	Always "CACC"
currency	string	The currency code of the account ISO 4217
iban	string	Iban of an account
name	string	Our product name of the account type Example: • "Allt i Ett-konto" (transaction account) • "Sparkonto" (savings account)
usage	string	Always "PRIV" (private personal account, natural person)
_links		linked resources
_links		
balances	string	link to get balances (1)
transactions	string	link to get transactions

(1) link to balances currently not supported. Please use "/v1/{accountId}/balances"

6.3.3 Response example
Body:

```
{
  "accounts": [
    {
      "resourceId": "957054871102373",
      "bban": "91598570120",
      "bic": "SKIASESS",
      "cashAccountType": "CACC",
      "currency": "SEK",
      "iban": "SE0791500000091598570120",
      "name": "Allt i Ett-konto",
      "usage": "PRIV",
      "_links": {
        "balances": {
          "href": "/v1/accounts/957054871102373/balances"
        },
        "transactions": {
          "href": "/v1/accounts/957054871102373/transactions"
        }
      }
    }
  ]
}
```

6.4 Get Account Details
The operation will return detailed information for the account addressed by accountId.

GET /v1/accounts/{accountId}

6.4.1 Request description

Name	Type	Information
accountId	String	In: path Required: true Description: This identification is denoting the addressed account. The accountId is retrieved by using a "Get Account List" call.
X-Request-ID	string	In: header Required: true Format: uuid Descriptio n: ID of the request, unique to the call, as determined by the initiating party.
PSU-Accept	String	In: header Required: recommended by Skandia Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Accept-Charset	String	In: header Required: recommended by Skandia Description: he forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Accept-Encoding	String	In: header Required: recommended by Skandia Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Accept-Language	String	In: header Required: recommended by Skandia Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Device-ID	String	In: header Required: recommended by Skandia Description: UUID for a device, which is used by the PSU
PSU-Geo-Location	String	In: header Required: recommended by Skandia Description: The forwarded Geo Location of the corresponding http request between PSU and TPP
PSU-Http-Method	String	In: header Required: recommended by Skandia Description: HTTP method used at the PSU TPP interface, if available. Valid values are: * GET * POST * PUT * PATCH * DELETE
PSU-IP-Adress	String	In: header Required: recommended by Skandia

		Description: The forwarded IP Address header field consists of the corresponding HTTP request IP Address field between PSU and TPP. It shall be contained if and only if this request was actively initiated by the PSU
PSU-User-Agent	String	In: header Required: recommended by Skandia Description: The forwarded Agent header field of the HTTP request between PSU and TPP, if available
PSU-Referer	String	In: header Required: recommended by Skandia Description: "Referer" header field sent by the PSU terminal when connecting to the TPP
PSU-IP-Port	String	In: header Required: recommended by Skandia Description: The forwarded IP Port header field consists of the corresponding HTTP request IP Port field between PSU and TPP, if available
PSU-Referer	String	In: header Required: recommended by Skandia Description: "Referer" header field sent by the PSU terminal when connecting to the TPP
PSU-TimeStamp	String	In: header Required: recommended by Skandia Description: Timestamp of the most relevant PSU's terminal request to the TTP
PSU-User-Agent	String	In: header Required: recommended by Skandia Description: The forwarded Agent header field of the HTTP request between PSU and TPP, if available

6.4.2 Response description

Name	Type	Description
accountDetails	list	Detailed information for the account addressed by accountId
Parameters of accountList		
accountDetails		
resourceId	string	Id of an account (used to call other AIS operations)
bban	string	Bban identifier (clearing + number)
bic	string	BIC code of Skandiabanken: SKIASESS
cashAccountType	string	Always "CACC"
currency	string	The currency code of the account ISO 4217
iban	string	Iban of an account
name	string	Our product name of the account type Example: • "Allt i Ett-konto" (transaction account) • "Sparkonto" (savings account)
usage	string	Always "PRIV" (private personal account, natural person)
_links		LinksAccountDetails
_links		
balances	string	link to get balances
transactions	string	link to get transactions

6.4.3 Response example
Body:
```
{
  "accounts": [
   {
    "resourceId": "957054871102373",
    "bban": "91598570120",
    "bic": "SKIASESS",
    "cashAccountType": "CACC",
    "currency": "SEK",
    "iban": "SE0791500000091598570120",
    "name": "Allt i Ett-konto",
    "usage": "PRIV",
    "_links": {
     "balances": {
       "href": "/v1/accounts/957054871102373/balances"
     },
     "transactions": {
       "href": "/v1/accounts/957054871102373/transactions"
     }
    }
   }
  ]
}
```

6.5 Get Balance List
The Operation will return the balances for the account addressed by accountId.

GET /v1/accounts/{accountId}/balances

6.5.1 Request description

Name	Type	Information
accountId	String	In: path Required: true Description: This identification is denoting the addressed account. The account-id is retrieved by using a "Read Account List" call.
X-Request-ID	string	In: header Required: true Format: uuid Description: ID of the request, unique to the call, as determined by the initiating party.
PSU-Accept	String	In: header Required: recommended by Skandia Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Accept-Charset	String	In: header Required: recommended by Skandia Description: he forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Accept-Encoding	String	In: header Required: recommended by Skandia Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Accept-Language	String	In: header Required: recommended by Skandia Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Device-ID	String	In: header Required: recommended by Skandia Description: UUID for a device, which is used by the PSU
PSU-Geo-Location	String	In: header Required: recommended by Skandia Description: The forwarded Geo Location of the corresponding http request between PSU and TPP
PSU-Http-Method	String	In: header Required: recommended by Skandia Description: HTTP method used at the PSU TPP interface, if available. Valid values are: * GET * POST * PUT * PATCH * DELETE
PSU-IP-Adress	String	In: header Required: recommended by Skandia

		Description: The forwarded IP Address header field consists of the corresponding HTTP request IP Address field between PSU and TPP. It shall be contained if and only if this request was actively initiated by the PSU
PSU-IP-Port	String	In: header Required: recommended by Skandia Description: The forwarded IP Port header field consists of the corresponding HTTP request IP Port field between PSU and TPP, if available
PSU-Referer	String	In: header Required: recommended by Skandia Description: "Referer" header field sent by the PSU terminal when connecting to the TPP
PSU-TimeStamp	String	In: header Required: recommended by Skandia Description: Timestamp of the most relevant PSU's terminal request to the TTP
PSU-User-Agent	String	In: header Required: recommended by Skandia Description: The forwarded Agent header field of the HTTP request between PSU and TPP, if available

6.5.2 Response description

Name	Type	Description
account		
iban	String	Iban of an account
currency	String	the currency code of the account ISO 4217
balances		**list of balances**
balanceType "closingBooked"	List	booked transactions
balanceAmount		
amount		Balance amount of booked credit and debit transactions when the request was initiated
currency	String	The currency of the amount
balances		
balanceType "available"	List	booked transactions
balanceAmount		
amount		Balance amount of booked credit and debit transactions when the request was initiated. Reserved card authorizations are not included.
currency	String	The currency of the amount
referenceDate	Date	Now

6.5.3 Response example
Body:
```
{
  "account": {
    "iban": "SE0791500000091598570120",
    "currency": "SEK"
  },
  "balances": [
    {
      "balanceAmount": {
        "amount": "-1333.26",
        "currency": "SEK"
      },
      "balanceType": "closingBooked"
    },
    {
      "balanceAmount": {
        "amount": "8566.74",
        "currency": "SEK"
      },
      "balanceType": "available",
      "referenceDate": "2019-02-22T00:00:00"
    }
  ]
}
```

6.6 Get transaction list of an account

The Operation will return the transactions for the account addressed by accountId. Transactions list reports depending on the parameter "bookingStatus" together with balances. For a given account, additional parameters are e.g. the attributes "dateFrom" and "dateTo"

GET /v1/accounts/{accountId}/transactions

6.6.1 Request description

Name	Type	Information
bookingStatus	String	In: query Required: true Description: Permitted codes are * "booked", * "pending". To get both booked and pending transactions you will need to call the operation twice. We are investigating supporting "both"-option.
dateFrom	string (date-time)	In: query Required: false Description: Starting date (inclusive the date dateFrom) of the transaction list. For booked transactions, the relevant date is the booking date. For pending transactions, the relevant date is the current date.
dateTo	string (date-time)	In: query Required: false Description: End date (inclusive the data dateTo) of the transaction list, default is "now" if not given.
accountId	String	In: path Required: true Description: This identification is denoting the addressed account. The account-id is retrieved by using a "Read Account List" call.
X-Request-ID	string	In: header Required: true Format: uuid Description: ID of the request, unique to the call, as determined by the initiating party.
PSU-Accept	String	In: header Required: recommended by Skandia Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Accept-Charset	String	In: header Required: recommended by Skandia Description: he forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Accept-Encoding	String	In: header Required: recommended by Skandia Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Accept-Language	String	In: header Required: recommended by Skandia

		Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Device-ID	String	In: header Required: recommended by Skandia Description: UUID for a device, which is used by the PSU
PSU-Geo-Location	String	In: header Required: recommended by Skandia Description: The forwarded Geo Location of the corresponding http request between PSU and TPP
PSU-Http-Method	String	In: header Required: recommended by Skandia Description: HTTP method used at the PSU TPP interface, if available. Valid values are: * GET * POST * PUT * PATCH * DELETE
PSU-IP-Adress	String	In: header Required: recommended by Skandia Description: The forwarded IP Address header field consists of the corresponding HTTP request IP Address field between PSU and TPP. It shall be contained if and only if this request was actively initiated by the PSU
PSU-IP-Port	String	In: header Required: recommended by Skandia Description: The forwarded IP Port header field consists of the corresponding HTTP request IP Port field between PSU and TPP, if available
PSU-Referer	String	In: header Required: recommended by Skandia Description: "Referer" header field sent by the PSU terminal when connecting to the TPP
PSU-TimeStamp	String	In: header Required: recommended by Skandia Description: Timestamp of the most relevant PSU's terminal request to the TTP
PSU-User-Agent	String	In: header Required: recommended by Skandia Description: The forwarded Agent header field of the HTTP request between PSU and TPP, if available

6.6.2 Response description
Information for each transaction will differ depending on payment type.

Name	Type	Description
transactions	list	list of transactions for the given account
Account		
iban	string	Iban of the account
currency	string	Currency code of the account
Transactions		
booked	list	List of booked transactions (based on input parameter)
pending	list	List of pending transactions (based on input parameter)
transactionsid	string	The Id of the payment initiation request
entryReference	string	A reference based on execution date and time
endToEndId	string	The Id of the payment initiation request
transactionAmount		
amount	string	
currency	string	
remittanceInformation Unstructured	string	Remittance information regarding the transaction
Parameters of pending and booked list		
bookingDate	string	Date when entry was posted to the account
valueDate	string	Date when assets become available (credit)

6.6.3 "Pagination" for transactions
This section describes what often is referred to as pagination for transactions. Our solution does not support pagination.

Functionality:
- Use dateFrom and dateTo get all transactions for a period.

6.6.4 Response example

Body:

```json
{
  "account": {
    "iban": "SE0791500000091598570120",
    "currency": "SEK"
  },
  "transactions": {
    "booked": [
      {
        "transactionId": "957054871102373@YGCB0169@2019-01-02@2019-01-02-20.57.38.059727",
        "entryReference": "2019-01-02-20.57.38.059727",
        "bookingDate": "2019-01-02T00:00:00",
        "valueDate": "2019-01-01T00:00:00",
        "transactionAmount": {
          "amount": "-200",
          "currency": "SEK"
        },
        "remittanceInformationUnstructured": "Avgift"
      },
      {
        "transactionId": "957054871102373@YICB0149@2019-01-01@2019-01-02-15.03.22.103711",
        "entryReference": "2019-01-02-15.03.22.103711",
        "bookingDate": "2019-01-01T00:00:00",
        "valueDate": "2019-01-02T00:00:00",
        "transactionAmount": {
          "amount": "-842.89",
          "currency": "SEK"
        },
        "remittanceInformationUnstructured": "Kontraktsränta"
      },
      {
        "transactionId": "957054871102373@YICB0149@2018-12-31@2019-01-02-15.03.22.095046",
        "entryReference": "2019-01-02-15.03.22.095046",
        "bookingDate": "2018-12-31T00:00:00",
        "valueDate": "2019-01-01T00:00:00",
        "transactionAmount": {
          "amount": "-7.07",
          "currency": "SEK"
        },
        "remittanceInformationUnstructured": "Ränta på skuld"
      }
    ]
  }
}
```

7 PIS-operations

7.1 Introduction

The PIS API is available to you to initiate payments.

Pre-requisites:
1. Have registered a user account in the portal
2. Have an app setup in the portal with an eIDAS-certificate of QWAC-type telling us you are an PISP

Note: due to technical issues we are currently not able to expose operations for foreign payments, bill payments or future dated transfers. Currently we only support domestic transfers in SEK in the PIS API.

Please view the swagger file for more information.

7.1.1 Overview of possible payments to initiate
Payments can be initiated for the same customers and accounts that are available for AIS as previously described in this document.

7.1.2 Payment Initiation flow
Skandiabanken is using a one-step Payment flow. When the TPP has initiated the payment, it is completed. Once the payment initiation request is signed by the PSU, Skandiabanken will finalize the payment with no further input from the TPP.
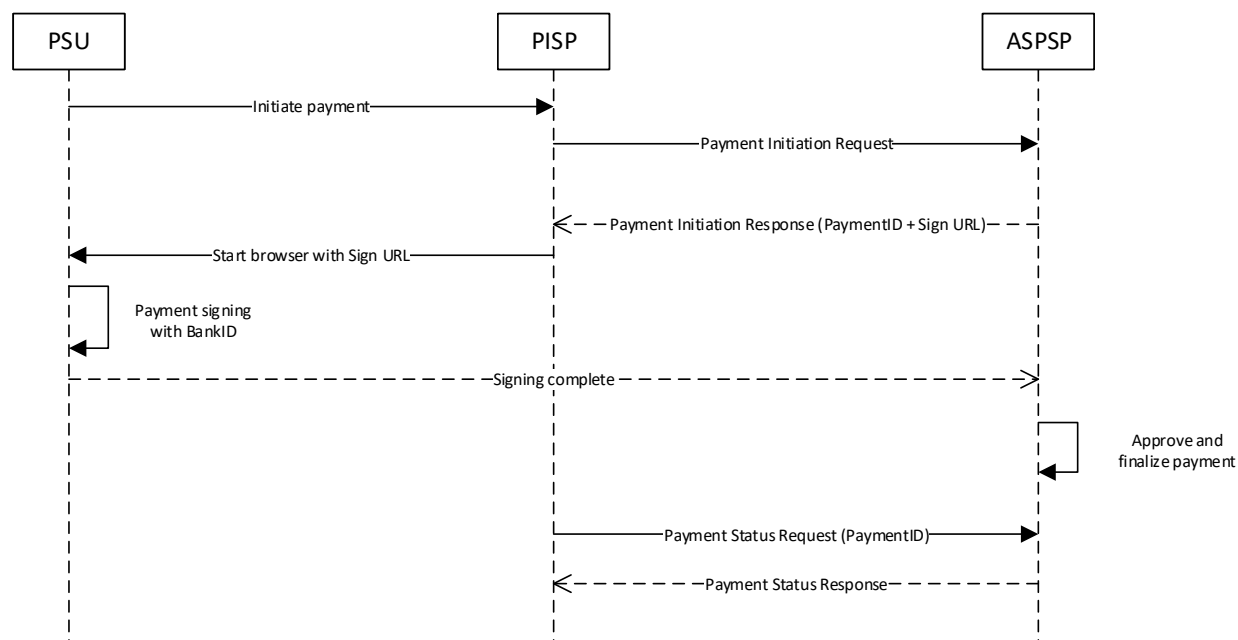
7.2 Post Payment initiation request

The operation to initiate a payment is depending on the payment product in the path. Supported values is Swedish domestic credit transfer.

We support request media type: application/json.

POST /v1/{paymentService}/{paymentProduct}

7.2.1 Request description

Name	Type	Description
PaymentProduct	String	In: path Required: true Description: Supported values for Payment Product is Swedish 'domestic-credit-transfer'
PaymentService	String	In: path Required: true Description: Supported values for Payment Service is 'payments' a single payment initiation
PSU-IP-Address	String	In: header Required: true Description: The forwarded IP Address header field consists of the corresponding HTTP request IP Address field between PSU and TPP. It shall be contained if and only if this request was actively initiated by the PSU
X-Request-ID	string	In: header Required: true Format: uuid Description: ID of the request, unique to the call, as determined by the initiating party.
PSU-Accept	String	In: header Required: recommended by Skandia Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Accept-Charset	String	In: header Required: recommended by Skandia Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Accept-Encoding	String	In: header Required: recommended by Skandia Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Accept-Language	String	In: header Required: recommended by Skandia Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available

PSU-Device-ID	String	In: header Required: recommended by Skandia Description: UUID for a device, which is used by the PSU
PSU-Geo-Location	String	In: header Required: recommended by Skandia Description: The forwarded Geo Location of the corresponding http request between PSU and TPP
PSU-Http-Method	String	In: header Required: recommended by Skandia Description: HTTP method used at the PSU TPP interface, if available. Valid values are: * GET * POST * PUT * PATCH * DELETE
PSU-IP-Port	String	In: header Required: recommended by Skandia Description: The forwarded IP Port header field consists of the corresponding HTTP request IP Port field between PSU and TPP, if available
PSU-Referer	String	In: header Required: recommended by Skandia Description: "Referer" header field sent by the PSU terminal when connecting to the TPP
PSU-TimeStamp	String	In: header Required: recommended by Skandia Description: Timestamp of the most relevant PSU's terminal request to the TTP
PSU-User-Agent	String	In: header Required: recommended by Skandia Description: The forwarded Agent header field of the HTTP request between PSU and TPP, if available

7.2.2 Request example

POST https: //apis.skandia.se/open-banking/core-bank/v1/payments/domestic-credit-transfer HTTP/1.1
Accept-Encoding: gzip,deflate
X-Request-ID: <Guid>
PSU-IP-Address: fake
Client-Id: <Your Client_Id>
Authorization: Bearer <Token>
Content-Type: application/json
Content-Length: 528
Host: apis.skandia.se
Connection: Keep-Alive
User-Agent: Apache-HttpClient/4.5.2 (Java/1.8.0_181)

7.2.3 Body description single payment initiation
Please view swagger file for details regarding formats.

Name	Type	Description
EndToEndIdentification	String	The Id of the payment initiation request, maximum of 35 characters
DebtorAccount		Iban or Bban can be used not both.
Iban	String	
Bban	String	Ad country code, ex "SE" in front of account number. When using Swedbank account, take away the fifth number in the clearingnr, the "9".
Currency	String	ISO 4217 code for the currency. Supported values: "SEK"
InstructedAmount		
Amount	Number	Minimum 1 SEK. Max 6 integers and 2 decimals. Example: "123.50"
Currency	String	ISO 4217 code for the currency. Supported values: "SEK"
CreditorAccount	String	Bban account number, clearing number 4-5 characters and account number 7-10 characters
CreditorName	String	Beneficiary name max 70 characters
CreditorAddress		
Country	String	
RemittanceInformation Unstructured	String	Max 12 characters can be used.
requestedExecutionDate	String	Only used for future payment (not supported)

7.2.4 Example Body
```
{
    "debtorAccount": {
        "bban": "<X>"
    },
    "instructedAmount": {
        "amount": "1",
        "currency": "SEK"
    },
    "creditorAccount": {
```

```json
        "bban": "<Y>"
    },
    "creditorName": "",
    "creditorAddress": {
        "country": "SE"
    },
    "remittanceInformationUnstructured": "",
    "EndToEndIdentification": "<Your text(maxlength 35)>"
}
```

7.3 Get Payment information
Returns the content of a payment initiation.

GET /v1/{paymentService}/{paymentProduct}/{paymentId}

7.3.1 Request description

Name	Type	Description
paymentId	String	In: path Required: true Description: The id of the created transaction
PaymentProduct	String	In: path Required: true Description: Supported values for Payment Product is Swedish 'domestic-credit-transfer'
PaymentService	String	In: path Required: true Description: Supported values for Payment Service is 'payments' a single payment initiation
X-Request-ID	string	In: header Required: true Format: uuid Description: ID of the request, unique to the call, as determined by the initiating party.
PSU-Accept	String	In: header Required: recommended by Skandia Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Accept-Charset	String	In: header Required: recommended by Skandia Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Accept-Encoding	String	In: header Required: recommended by Skandia Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Accept-Language	String	In: header Required: recommended by Skandia Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Device-ID	String	In: header Required: recommended by Skandia Description: UUID for a device, which is used by the PSU
PSU-Geo-Location	String	In: header Required: recommended by Skandia Description: The forwarded Geo Location of the corresponding http request between PSU and TPP

PSU-Http-Method	String	In: header Required: recommended by Skandia Description: HTTP method used at the PSU? TPP interface, if available. Valid values are: * GET * POST * PUT * PATCH * DELETE
PSU-IP-Address	String	In: header Required: recommended by Skandia Description: The forwarded IP Address header field consists of the corresponding HTTP request IP Address field between PSU and TPP. It shall be contained if and only if this request was actively initiated by the PSU
PSU-IP-Port	String	In: header Required: recommended by Skandia Description: The forwarded IP Port header field consists of the corresponding HTTP request IP Port field between PSU and TPP, if available
PSU-Referer	String	In: header Required: recommended by Skandia Description: "Referer" header field sent by the PSU terminal when connecting to the TPP
PSU-TimeStamp	String	In: header Required: recommended by Skandia Description: Timestamp of the most relevant PSU's terminal request to the TTP
PSU-User-Agent	String	In: header Required: recommended by Skandia Description: The forwarded Agent header field of the HTTP request between PSU and TPP, if available

7.3.2 Response description

Information about a payment initiation.

Name	Type	Description
EndToEndIdentification	String	The Id of the payment initiation request
DebtorAccount		
Bban	String	
CreditorAccount		
Bban	String	
InstructedAmount		
Amount	Number	
Currency	String	ISO 4217 code for the currency. Supported values: "SEK"
RemittanceInformation Unstructured	String	Remittance information regarding the transaction
remittanceInformation Structured	String	Remittance information regarding the transaction
startDate	String	The date when the amount is drawn from the debtor account

7.3.3 Response example

Body:
```
"endToEndIdentification": "string",
 "debtorAccount": {
     "bban": "91598570120",
 },
 "creditorAccount": {
   "bban": "91500053920",
 },
 "instructedAmount": {
   "amount": "1000",
   "currency": "SEK"
 },
 "remittanceInformationUnstructured": "Överföring",
 "remittanceInformationStructured": "Överföring",
 "startDate": "2020-01-02T14:41:48.694Z"
```

7.4 Payment initiation status request
Check the transaction status of a payment initiation.

GET /v1/{paymentService}/{paymentProduct}/{paymentId}/status

3.1.1 Request description

Name	Type	Description
paymentId	String	In: path Required: true Description: The id of the created transaction
PaymentProduct	String	In: path Required: true Description: Supported values for Payment Product is Swedish 'domestic-credit-transfer'
PaymentService	String	In: path Required: true Description: Supported values for Payment Service is 'Payments' a single payment initiation
X-Request-ID	string	In: header Required: true Format: uuid Description: ID of the request, unique to the call, as determined by the initiating party.
PSU-Accept	String	In: header Required: recommended by Skandia Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Accept-Charset	String	In: header Required: recommended by Skandia

		Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Accept-Encoding	String	In: header Required: recommended by Skandia Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Accept-Language	String	In: header Required: recommended by Skandia Description: The forwarded IP Accept header fields consist of the corresponding HTTP request Accept header fields between PSU and TPP, if available
PSU-Device-ID	String	In: header Required: recommended by Skandia Description: UUID for a device, which is used by the PSU
PSU-Geo-Location	String	In: header Required: recommended by Skandia Description: The forwarded Geo Location of the corresponding http request between PSU and TPP
PSU-Http-Method	String	In: header Required: recommended by Skandia Description: HTTP method used at the PSU TPP interface, if available. Valid values are: * GET * POST * PUT * PATCH * DELETE
PSU-IP-Address	String	In: header Required: recommended by Skandia Description: The forwarded IP Address header field consists of the corresponding HTTP request IP Address field between PSU and TPP. It shall be contained if and only if this request was actively initiated by the PSU
PSU-IP-Port	String	In: header Required: recommended by Skandia Description: The forwarded IP Port header field consists of the corresponding HTTP request IP Port field between PSU and TPP, if available
PSU-Referer	String	In: header Required: recommended by Skandia Description: "Referer" header field sent by the PSU terminal when connecting to the TPP
PSU-TimeStamp	String	In: header Required: recommended by Skandia Description: Timestamp of the most relevant PSU's terminal request to the TTP
PSU-User-Agent	String	In: header Required: recommended by Skandia Description: The forwarded Agent header field of the HTTP request between PSU and TPP, if available
PSU-IP-Adress	String	In: header Required: recommended by Skandia

		Description: The forwarded IP Address header field consists of the corresponding HTTP request IP Address field between PSU and TPP. It shall be contained if and only if this request was actively initiated by the PSU

7.4.1 Response description
Status information about a payment initiation.

Name	Type	Description
TransactionsStatus	String	Status of the transaction. Possible values [ACSC]

3.3.4 Response example

Body:
{
  "transactionStatus": "ACSC"
}

8 Document revision history

Version	Description
1.05	Miscellaneous clarifications to PIS.
1.04	Updated to include PIS - domestic transfers with same date. AIS updated.
1.03	Clarifications and examples. Mainly regarding OAuth2 flows.
1.02	Updates for production portal registration and APIs
1.01	Updates for testing with mocked data
1.00	Initial version