THE Berlin GROUP

A EUROPEAN STANDARDS INITIATIVE

NextGenPSD2 XS2A Framework

Implementation Guidelines

Extended Services

AIS for Single Cards

Version 1.3

30 June 2021

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  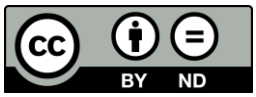

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1 Introduction

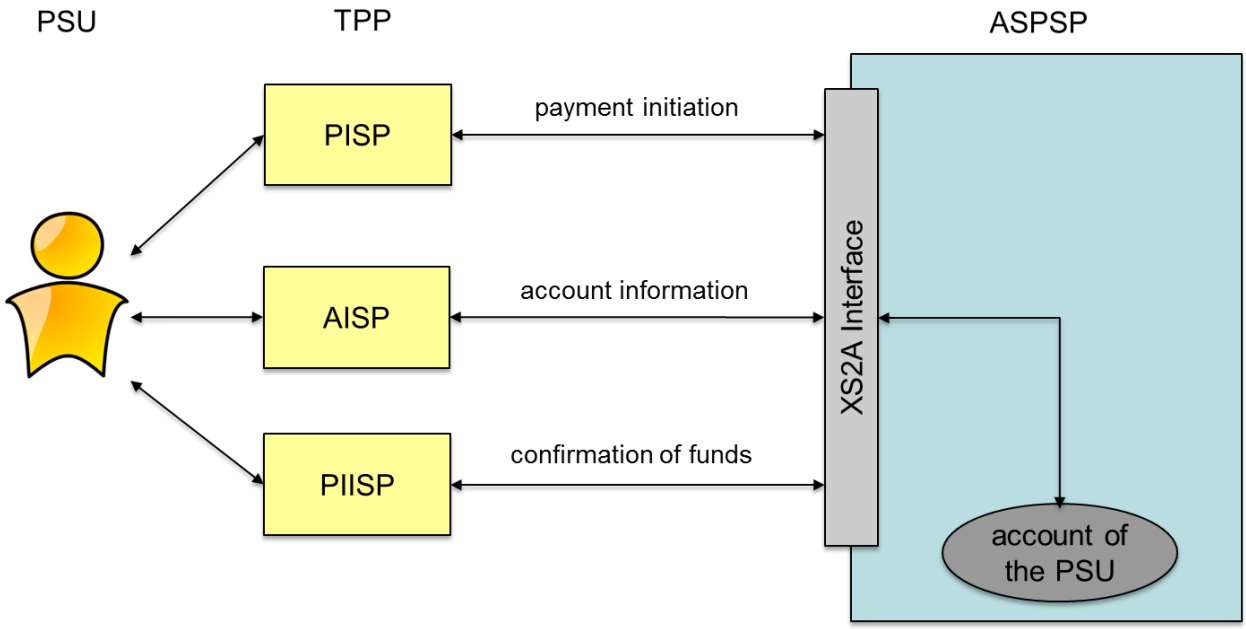
1.1 Background

With [PSD2] the European Union has published a new directive on payment services in the internal market. Member States had to adopt this directive into their national law until 13th of January 2018.

Among others [PSD2] contains regulations of new services to be operated by so called Third Party Payment Service Providers (TPP) on behalf of a Payment Service User (PSU). These new services are

- Payment Initiation Service (PIS) to be operated by a Payment Initiation Service Provider (PISP) TPP as defined by article 66 of [PSD2],
- Account Information Service (AIS) to be operated by an Account Information Service Provider (AISP) TPP as defined by article 67 of [PSD2], and
- Confirmation of the Availability of Funds service to be used by Payment Instrument Issuing Service Provider (PIISP) TPP as defined by article 65 of [PSD2].

For operating the new services a TPP needs to access the account of the PSU which is usually managed by another PSP called the Account Servicing Payment Service Provider (ASPSP). As shown in the following figure, an ASPSP has to provide an interface (called "PSD2 compliant Access to Account Interface" or short "XS2A Interface") to its systems to be used by a TPP for necessary accesses regulated by [PSD2]:



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Further requirements on the implementation and usage of this interface are defined by a Regulatory Technical Standard (short RTS) from the European Banking Authority (short EBA), published in the Official Journal of the European Commission.

Specifically, the Account Information Service offers the possibility for a TPP to request Information of so-called "card-accounts", i.e. accounts that are used to reconcile credit card transactions with the PSU. Currently, a card account does not provide further possibility of distinction. If, for example, a card account is identified by a leading PAN P_1 but also covers a secondary PAN P_2, then all requests for information on this card account will always contain information on P_1 and P_2. In some cases information provided for one card-account cannot be assigned to one specific PAN by the TPP and / or PSU.

Also, current global consent models cannot be used to restrict access to only accounts of one type (e.g. card-accounts). In addition, the bank offered consent model does currently not support a restriction of the consent request to a type of accounts. That is, if a PSU wants to grant a TPP access to all of his card-accounts he might end up granting the TPP access to all of his accounts instead.

These two points will be addressed in the following extension of the AIS protocol. For this aim, the term "multi card-account" will be introduced to describe card accounts that might cover more than one PAN. Complementary, a "single card account" will be the term used for a card account covering only one PAN. Note that even a single card account may represent more than one card, e.g. an old physical card and its renewal generally are identified via the same PAN and therefore would be covered by the same single card account.

To achieve this two downward compatible changes will be made to the protocol:

1. The response to a request for a card account list will be extended such that an ASPSP can provide single card accounts or multi card accounts and also mark single card accounts distinguishable from multi card accounts.
2. The request for a consent will be adjusted such that a TPP can specifically request access to only one accountType (e.g. card accounts).

1.2 XS2A Interface Specification

This document is an extension of the NextGenPSD2 XS2A Specification which defines a standard for an XS2A Interface and by this reaching interoperability of the interfaces of ASPSPs at least for the core services defined by [PSD2].

The XS2A Interface is designed as a B2B interface between a TPP server and the ASPSP server. For the time being, the protocol defined in this document is a pure client-server protocol, assuming the TPP server being the client, i.e. all API calls are initiated by the TPP. In future steps, this protocol might be extended to a server-server protocol, where also the ASPSP initiates API calls towards the TPP.

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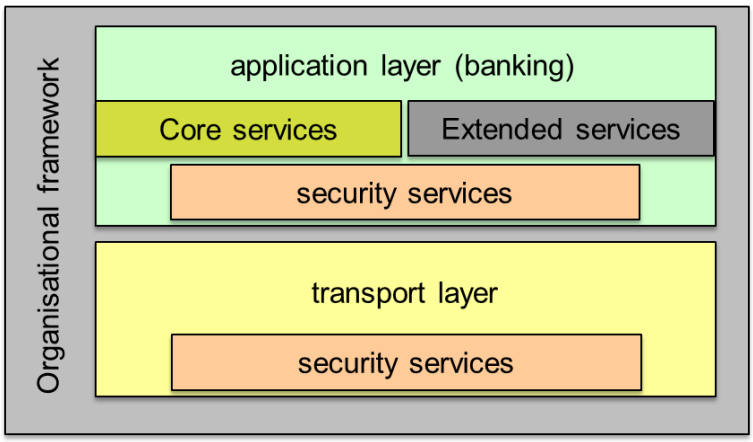
The Interoperability Framework defines operational rules, requirements on the data model and a process description in [XS2A-OR].

This document details the standard in defining messages and detailed data structures for **extended services** of the XS2A Interface. For the specification the two layers shown in the following figure are distinguished:



This document now describes how the existing services for account information can be extended to specifically grant consent only on card accounts and to specifically provide account information on card accounts on the level of single cards, i.e. of PANs.

Remark for Future: Please note that the Berlin Group NextGenPSD2 XS2A interface is still under constant development. Technical issues, which are already in discussion within the Berlin Group NextGenPSD2 working structure are mentioned in this document by "Remark for Future" to make the reader aware of upcoming potential changes.

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1.3 Document History

Version	Change/Note	Approved
1.0	First Version published, integrating market consultation feedback	14 July 2020 by NextGenPSD2 Task Force
1.1	Added a remark on different balance semantics for /cards and /card-accounts at the beginning of Section 4. Added closingBooked balance for reporting monthly volumes with the related semantic regarding an account period with the following change effects: • Added a query parameter dateFrom in Section 5.3 for Read Card Balance Call and the related changes in the access method description in Section 4.1 • Corrected and added examples in Section 5.3 for Read Card Balance Call. • Added remarks in the description of closingBooked and interimBooked Balance Types in Section 6.5 Corrected example in Section 5.4 regarding the X-Request-ID in the http header. Deleted the reference to the proprietary code "CARD" for the account reference sub attribute cashAccountType in Section 6.3, since CARD is now a code in the ISO20020 external code lists. Adapted all examples to a revert order between balanceAmount and balanceType Corrected example for interimAvailale balance and added an example for closingBooked balance.in Section 6.6	30 October 2020 by NextGenPSD2 TaskForce
1.2	A note was added in Section 4.2 to clarify that the additionalInofrmation attribute can also be used for cards to retrieve the card owner name	openFinance TaskForce 14 Dec 2020

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Version	Change/Note	Approved
	if supported by the ASPSP. The related attribute was added in Section 6.2. A new flag debitAccounting has been added to card account details, card balances and card transaction responses to indicate whether debted card transactions are quoted positively or not in reports and balances. This change applies to Section 5.2, 5.3, 5.4 as well as 6.4 and 6.6. The transaction amount and balance amount signs have been adapted in all examples where applicable. An example on balance types for prepaid cards have been added in Section 6.6.	
1.3	Included optional "debitAccounting" indicators for balances and transactions Response. Format extension of "details" elements in accordance with the basic Implementation Guidelines. Added reference to a new errata on core XS2A Implementation Guidelines, which introduce new attributes for the card transaction report for instalment payment and the date of invoicing.	openFinance Taskforce 30 June 2021

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2 Character Sets and Notations

For definition on character Sets and Notations as well as for request and response notations refer to Chapter 2 of [XS2A-IG].

3 Transport Layer

For details on the transport Layer, please refer to Chapter 3 in [XS2A-IG].

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4 Application Layer: Guiding Principles

The following extension will define requests for a TPP to get information on one single card. However, in this context "single card" does not necessary refer to only one physical card. Specifically, if a card is renewed and its successor does have the same PAN as the first card, both of them will treated as one single card. There is (intentionally) no method to distinguish the two.

To specifically request information on one single card, a new "/cards" endpoint is defined. Access to the "/cards" endpoint works most regards analogously to access to a card-accounts endpoint with the exception, that the "/card" endpoint provides information on one single card instead of a card account, that might consist of more than one card. In addition, the /cards endpoint will deliver also information about monthly volumes of cards.

An important difference between the /card-accounts and the /cards endpoint is the underlying semantics of the balance type. The balance for /card-accounts does not involve entries which are pending between card schemes and the ASPSP because it is the sole view of the card reconciliation account and has no view on the dedicated credit card processing system. The /cards endpoint takes all pending transactions into account.Signing Messages at Application Layer

The ASPSP may require the TPP to sign request messages. This requirement shall be stated in the ASPSP documentation. The signing requirements are defined in [XS2A-IG]. No specific requirements are defined for the Account Information Services on Single Cards.

4.1 API Access Methods

The following table gives an overview on the HTTP access methods supported by the new API endpoint and by resources created through this API.

Endpoints/Resources	Method	Condition	Description
cards	GET	Optional	Read all identifiers of the card (usually a credit card), to which an access has been granted to through the /consents endpoint by the PSU. In addition, relevant information about the cards and hyperlinks to corresponding card information resources are provided if a related consent has been already granted. Section 5.1
cards/{card-id}	GET	Mandatory	Read detailed information about the addressed card.

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Endpoints/Resources	Method	Condition	Description
			Section 5.2
cards/{card-id}/balances[?dateFrom]	GET	Mandatory	Read detailed balance information about the addressed card. For a given card, an optional parameter "dateFrom" defines the begin of a period from which to obtain available balance related information. Section 5.3
cards/{card-id}/transactions	GET	Mandatory	Read transaction reports or transaction lists related to a given card. For a given card, additional parameters are e.g. the attributes "dateFrom" and "dateTo". Section 5.4

4.2 Card Specifics in Submission of Consents

As before, specific card reconciliation accounts (called “card accounts” in [XS2A-IG]) can be addressed in a consent request by identifying the card account by its corresponding masked PAN. Please note that the card accounts are providing card information in an accumulated way.

In addition, this specification adds to this consent model, that a masked PAN is addressing a single card.

It is up to the ASPSP if this consent grants access

- to the single card identified by the masked PAN,
- the card account identified by the masked PAN or
- both,

delivering these information on the related endpoints /card-accounts or /cards. The ASPSP's respective decision must be documented by the ASPSP.

Additionally, a card account or single cards can be addressed by an Account Access Object containing an identifier of the reconciliation account accompanied by the specification of the cashAccountType to Type "CARD" (see Section 6.3). A consent of this type will grant the respective access to both,

- all cards reconciled through this account and

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- the related card account,

if the ASPSP supports the corresponding endpoints at all.

As a third / fourth way to establish a card specific consent, the TPP can request a bank-offered consent or a global consent but restricting the requested access to a certain cashAccountType – e.g. CARD. A consent of this type will grant the respective access to both

- cards and
- card accounts,

if the ASPSP supports the related endpoints at all.

NOTE: The usage of the additionalInformation sub attribute in the consent access attribute is defined in the same way as for payment accounts. This applies e.g. for requesting account owner data, here the card owner.

Examples for Establish Consent Requests

Remark: No specific requirements for responses, for examples for responses cp. Section 6.3.1 of [XS2A-IG].

Request for a dedicated consent on transactions and balances of a single card

```
POST https://api.testbank.com/v1/consents
Content-Type:           application/json
X-Request-ID:           99391c7e-ad88-49ec-a2ad-99ddcb1f7756
PSU-IP-Address:         192.168.8.78
PSU-User-Agent:          Mozilla/5.0 (Windows NT 10.0; WOW64; rv:54.0)
Gecko/20100101 Firefox/54.0
Date:                   Sun, 06 Aug 2017 15:05:37 GMT

{
  "access": {
      "balances": [
          { "maskedPAN": "123456******1234" }, /* balances of a single card
        ],
       "transactions": [
          { "maskedPAN": "123456******1234" }, /* transactions of a single
card
        ]
    },
  "recurringIndicator": true,
  "validUntil": "2017-11-01",
  "frequencyPerDay": "4"

}
```


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Request for access to all single cards behind a specific reconciliation account

```
POST https://api.testbank.com/v1/consents
Content-Type:           application/json
X-Request-ID:           99391c7e-ad88-49ec-a2ad-99ddcb1f7756
PSU-IP-Address:         192.168.8.78
PSU-User-Agent:          Mozilla/5.0 (Windows NT 10.0; WOW64; rv:54.0)
Gecko/20100101 Firefox/54.0
Date:                   Sun, 06 Aug 2017 15:05:37 GMT

{
  "access": {
      "balances": [
          { "iban": "DE40100100103307118608" }, /* balances of a dedicated
payment account
          { "iban": "DE02100100109307118603",
            "cashAccountType": "CARD" /* balances of all cards behind this
reconciliation account, e.g. main card and partner card
          }
        ],
       "transactions": [
          { "iban": "DE02100100109307118603",
            "cashAccountType": "CARD"} /* transactions of all cards behind
this reconciliation account, e.g. main card and partner card
        ]
    },
  "recurringIndicator": true,
  "validUntil": "2017-11-01",
  "frequencyPerDay": "4"

}
```

Request for a bank driven consent, restricted to the related credit cards

```
POST https://api.testbank.com/v1/consents
Content-Type            application/json
X-Request-ID            99391c7e-ad88-49ec-a2ad-99ddcb1f7756
PSU-IP-Address          192.168.8.78
PSU-User-Agent           Mozilla/5.0 (Windows NT 10.0; WOW64; rv:54.0)
Gecko/20100101 Firefox/54.0
Date                    Sun, 06 Aug 2017 15:05:37 GMT

{"access":
      {"balances": [],
```


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```
       "transactions": [],
      "restrictedTo": ["CARD"]},
 "recurringIndicator": true,
 "validUntil": "2017-11-01",
 "frequencyPerDay": "4"
}
```

Request for a global consent, restricted to cash account types (ignoring cards)

```
POST https://api.testbank.com/v1/consents
Content-Type            application/json
X-Request-ID            99391c7e-ad88-49ec-a2ad-99ddcb1f7756
PSU-IP-Address          192.168.8.78
PSU-User-Agent           Mozilla/5.0 (Windows NT 10.0; WOW64; rv:54.0)
Gecko/20100101 Firefox/54.0
Date                    Sun, 06 Aug 2017 15:05:37 GMT

{"access":
      {"allPSD2": "allAccounts",
      "restrictedTo": ["CACC"]
      },
 "recurringIndicator": true,
 "validUntil": "2017-11-01",
 "frequencyPerDay": "4"
}
```

Remark: The latter example is relevant only in communities or for ASPSP which are offering the single card endpoint.

Card Specifics in Reading Consents

Additionally to _links element of type "account" or "cardAccount", the hyperlink section may also contain "card" links to request specific information on single cards.

Multicurrency cards

Some ASPSPs offer credit card products where transactions can be booked in several currencies, typically in local currency and in the related reconciliation currency of the card system (e.g. US Dollar), depending on the usage of the card (e.g. domestic transactions or inter-regional transactions.

In difference to the current account approach, this specification only supports to show the results on addressed multicurrency cards in an aggregated level, i.e. the card details will be associated with the “XXX” currency and balances and transactions will be provided aggregated on one card endpoint in all the related transaction currencies.

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For this reason, consent submissions where card related Account Information Services are requested and where a currency is added to the card account reference will be rejected.

4.3 Additional Error Information

No specific addition error information is needed for this extended service.

4.4 Status Information

Status Information for the AIS within the Establish Consent Process

No specific status information needed for this extended service.

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5 New Message types

New message types / endpoints are defined for this extended service:

5.1 Read Card List

Request

Call

```
GET /v1/cards
```

Reads a list of cards potentially with additional information, e.g. balance information. It is assumed that a consent of the PSU to this access is already given and stored on the ASPSP system. The addressed list of cards depends then on the stored consent addressed by consentId, respectively the OAuth2 access token.

Query Parameters

No specific query parameter.

Request Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.
PSU-IP-Address	String	Conditional	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.
Consent-ID	String	Mandatory	Identification of the corresponding consent as granted by the PSU.
Authorization	String	Conditional	Is contained only, if an OAuth2 based SCA was performed in the corresponding mandate transaction or if OAuth2 has been used in a pre-step.

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Request Body

No request body.

Response

Response Code

HTTP Response Code equals 200.

Response Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.

Response Body

Attribute	Type	Condition	Description
cards	Array of Card Account Details	Mandatory	Descriptions of the accessible cards.

Remark: The same syntactical structure is used to transport card information as card account information. In difference to the card-accounts context, in some attributes properties of the dedicated card are provided instead of properties of the underlying reconciliation account. This applies for examples to the status attribute.

NOTE: If one of the card is a multicurrency card, then the account currency equals “XXX” as for current accounts.

Examples

```
{
  "cards": [
    {
      "resourceId": "4d9a81b3-a47d-4130-8765-a9c0ff861b99",
      "maskedPan": "525412******3241",
      "currency": "EUR",
      "name": "Main",
      "product": "Basic Credit Card",
```


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```
      "debitAccounting": false,
      "status": "enabled",
      "creditLimit": { "currency": "EUR", "amount": "5000" },
      "balances": [
        {
          "balanceAmount": { "currency": "EUR", "amount": "-1390.10"},
          "balanceType": "interimBooked"
        },{
          "balanceAmount": { "currency": "EUR", "amount": "3609.90" },
          "balanceType": "interimAvailable",
          "creditLimitIncluded": true
        }
      ]
    },{
      "resourceId": "4d9a81b3-a47d-4130-8765-a9c0ff861b98",
      "maskedPan": "525412******3242",
      "currency": "EUR",
      "name": "PartnerCard",
      "product": "Basic Credit Card",
      "debitAccounting": false,
      "status": "enabled",
      "creditLimit": { "currency": "EUR", "amount": "5000" },
      "balances": [
        {
          "balanceAmount": { "currency": "EUR", "amount": "-559.10" },
          "balanceType": "interimBooked"
        },{
          "balanceAmount": { "currency": "EUR", "amount": "4440.90" },
          "balanceType": "interimAvailable",
          "creditLimitIncluded": true
        }
      ]
    }
  ]
}
```


5.2 Read Card Details

Request

Call

```
GET /v1/cards/{card-id}
```


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Reads details about a card. It is assumed that a consent of the PSU to this access is already given and stored on the ASPSP system. The addressed details of this account depends then on the stored consent addressed by consentId, respectively the OAuth2 access token.

Path Parameters

Attribute	Type	Description
card-id	String	This identification is denoting the addressed card. The card-id is retrieved by using a "Read Card List" call. The card-id is the "resourceId" attribute of the card structure. Its value is constant at least throughout the lifecycle of a given consent.

Query Parameters

No specific query parameter.

Request Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.
PSU-IP-Address	String	Conditional	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.
Consent-ID	String	Mandatory	Identification of the corresponding consent as granted by the PSU.
Authorization	String	Conditional	Is contained only, if an OAuth2 based SCA was performed in the corresponding mandate transaction or if OAuth2 has been used in a pre-step.

Request Body

No request body.

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Response

Response Code

HTTP Response Code equals 200.

Response Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.

Response Body

Attribute	Type	Condition	Description
card	Card Account Details	Mandatory	Description of the addressed card.

Remark: The same syntactical structure is used to transport card information as card account information.

NOTE: If the card is a multicurrency card, then the account currency equals “XXX” as for current accounts.

Example 1 (standard card)

```
{
  "card":
    {
      "resourceId": "4d9a81b3-a47d-4130-8765-a9c0ff861b99",
      "maskedPan": "525412******3241",
      "currency": "EUR",
      "debitAccounting": false,
      "name": "Main",
      "product": "Basic Credit Card",
      "status": "enabled",
      "creditLimit": { "currency": "EUR", "amount": "5000" },
      "balances": [
```

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```
        {
          "balanceAmount": { "currency": "EUR", "amount": "-1390.10" },
          "balanceType": "interimBooked"
        },{
          "balanceAmount": { "currency": "EUR", "amount": "3609.90" },
          "balanceType": "interimAvailable",
          "creditLimitIncluded": true
        }
      ],
      "_links": {
        "self": {
          "href": "/v1/cards/4d9a81b3-a47d-4130-8765-a9c0ff861b99"
        },
        "transactions": {
          "href": "/v1/cards/4d9a81b3-a47d-4130-8765-
a9c0ff861b99/transactions"
        }
      }
    }
}
```

Example 2 (multicurrency card with balances)

```
{
  "card":
    {
      "resourceId": "4d9a81b3-a47d-4130-8765-a9c0ff861b99",
      "maskedPan": "525412******3241",
      "currency": "XXX",
      "name": "Main",
      "product": "Basic Credit Card",
      "debitAccounting": false,
      "status": "enabled",
      "creditLimit": { "currency": "EUR", "amount": "5000" },
      "balances": [
        {
          "balanceAmount": { "currency": "EUR", "amount": "-1390.10" },
          "balanceType": "interimBooked",
        },{
          "balanceAmount": { "currency": "EUR", "amount": "3155.17" },
          "balanceType": "interimAvailable",
          "creditLimitIncluded": true
        },
        {
          "balanceAmount": { "currency": "USD", "amount": "-500.20" },
          "balanceType": "interimBooked"
```


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```
          /*454,73 EUR equivalent with exchange rate 1,10 USD for 1 Euro
        },{
          "balanceAmount": { "currency": "USD", "amount": "3470.69" },
          "balanceType": "interimAvailable",
          "creditLimitIncluded": true
        } /* equivalent of 3.155.17 Euro
      ],
      "_links": {
        "self": {
          "href": "/v1/cards/4d9a81b3-a47d-4130-8765-a9c0ff861b99"
        },
        "transactions": {
          "href": "/v1/cards/4d9a81b3-a47d-4130-8765-
a9c0ff861b99/transactions"
        }
      }
    }
}
```

5.3 Read Card Balances

Request

Call

```
GET /v1/cards/{card-id}/balances
```

Reads balance data from a given card addressed by "card-id". Please note, that the current credit line of a given card might be tighter than what a response to this request will suggest due to general credit limits on the card account and transactions by other cards to the same card account.

Path Parameters

Attribute	Type	Description
card-id	String	This identification is denoting the addressed card. The card-id is retrieved by using a "Read Card List" call. The card-id is the "resourceId" attribute of the card structure. Its value is constant at least throughout the lifecycle of a given consent.

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Query Parameters

Attribute	Type	Condition	Description
dateFrom	ISODate	optional	Requests in addition to the balances of the current accounting period all booked balances at the end of previous accounting periods (e.g. monthly periods) from the provided date on if still retrievable under the given consent. **Note:** The accounting period is the invoicing period of the related card. This parameter is ignored by the ASPSP if it is not supported.

Request Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.
PSU-IP-Address	String	Conditional	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.
Consent-ID	String	Mandatory	Identification of the corresponding consent as granted by the PSU.
Authorization	String	Conditional	Is contained only, if an OAuth2 based SCA was performed in the corresponding mandate transaction or if OAuth2 has been used in a pre-step.

Request Body

No request body.

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Response

Response Code

HTTP Response Code equals 200.

Response Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.

Response Body

Attribute	Type	Condition	Description
card	Account Reference	Optional	Identifier of the addressed card. **Remark for Future**: Might be mandated in a later version.
debitAccounting	Boolean	Optional	If true, the amounts of debits on the reports are quoted positive with the related consequence for balances. If false, the amount of debits on the reports are quoted negative.
balances	Array of Balance	Mandatory	

Examples

Example on current balance only

Request for a request without PSU involvement

```
GET https://api.testbank.com/v1/cards/12345678912-ef56/balances

Accept:           application/json
X-Request-ID:           99391c7e-ad88-49ec-a2ad-99ddcb1f7756
PSU-User-Agent:          Mozilla/5.0 (Windows NT 10.0; WOW64; rv:54.0)
Gecko/20100101 Firefox/54.0
```


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```
Date:                   Sun, 20 Sep 2020 15:05:37 GMT
```

Response

```
HTTP/1.x 200 Ok
X-Request-ID:           99391c7e-ad88-49ec-a2ad-99ddcb1f7756
Content-Type:           application/json
Date:                   Sun, 20 Sep 2020 15:05:38 GMT

{
  "card": {"maskedPan": "525412******3241"},
  "debitAccounting": false,
  "balances":[
    {
      "balanceAmount": { "currency": "EUR", "amount": "5654.22" },
      "balanceType": "interimAvailable",
      "creditLimitIncluded": true

    },{
      "balanceAmount": { "currency": "EUR", "amount": "-4355.78" },
      "balanceType": "interimBooked"
    }
  ]
}
```

Example on booked balances of the past requested in addition

Request for a request without PSU involvement

```
GET https://api.testbank.com/v1/cards/12345678912-
ef56/balances?dateFrom=2020-06-01

Accept:                 application/json
X-Request-ID:           99391c7e-ad88-49ec-a2ad-99ddcb1f7757
PSU-User-Agent:          Mozilla/5.0 (Windows NT 10.0; WOW64; rv:54.0)
Gecko/20100101 Firefox/54.0
Date:                   Sun, 20 Sep 2020 15:05:39 GMT
```

Response body

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```
HTTP/1.x 200 Ok
X-Request-ID:           99391c7e-ad88-49ec-a2ad-99ddcb1f7757
Content-Type:           application/json
Date:                   Sun, 20 Sep 2020 15:05:40 GMT


{
  "card": {"maskedPan": "525412******3241"},
  "debitAccounting": false,
  "balances":[
    {
      "balanceAmount": { "currency": "EUR", "amount": "5654.22" },
      "balanceType": "interimAvailable",
      "creditLimitIncluded": true,

    },{
      "balanceAmount": { "currency": "EUR", "amount": "-4355.78" },
      "balanceType": "interimBooked"
    },{
      "balanceAmount": { "currency": "EUR", "amount": "-2255.45" },
      "balanceType": "closingBooked",
      "referenceDate": "2020-06-30"
    },{
      "balanceAmount": { "currency": "EUR", "amount": "-1234.56" },
      "balanceType": "closingBooked",
      "referenceDate": "2020-07-31"
    },{
      "balanceAmount": { "currency": "EUR", "amount": "-234.01" },
      "balanceType": "closingBooked",
      "referenceDate": "2020-08-31"
     }
  ]
}
```

5.4 Read Card Transaction List

Request

Call

GET /v1/cards /{card-id}/transactions {query-parameters}

Reads account data from a given card addressed by "card-id".

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Remark: This card-id can be a tokenised identification due to data protection reason since the path information might be logged on intermediary servers within the ASPSP sphere. This card-id then can be retrieved by the "GET Card List" call, cp. Section 5.1.

Note: The ASPSP might use standard compression methods on application level for the response message as indicated in the content encoding header.

Remark: Please note that the PATH might be already given in detail by the response of the "Read Card List" call within the _links subfield.

Path Parameters

Attribute	Type	Description
card-id	String	This identification is denoting the addressed card. The card-id is retrieved by using a "Read Card List" call. The card-id is the "resourceId" attribute of the card structure. Its value is constant at least throughout the lifecycle of a given consent.

Query Parameters

Attribute	Type	Condition	Description
dateFrom	ISODate	Conditional	Starting date (inclusive the date dateFrom) of the transaction list, mandated if no delta access is required
dateTo	ISODate	Optional	End date (inclusive the data dateTo) of the transaction list, default is "now" if not given.
bookingStatus	String	Mandatory	Permitted codes are "booked", "pending" and "both" "booked" shall be supported by the ASPSP. To support the "pending" and "both" feature is optional for the ASPSP, Error code if not supported in the online banking frontend

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Attribute	Type	Condition	Description
deltaList	Boolean	Optional if supported by API provider	This data attribute is indicating that the AISP is in favour to get all transactions after the last report access for this PSU on the addressed account. This delta indicator might be rejected by the ASPSP if this function is not supported.

Request Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.
PSU-IP-Address	String	Conditional	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.
Consent-ID	String	Mandatory	Identification of the consent for this access as granted by the PSU.
Authorization	String	Conditional	Is contained only, if an OAuth2 based authentication was performed in a pre-step or an OAuth2 based SCA was performed in the related consent authorisation.

Request Body

No request body.

Response

Response Code

HTTP Response Code equals 200.

Response Header

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Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.

Response Body

Attribute	Type	Condition	Description
card	Account Reference	Optional	Identifier of the addressed card. **Remark for Future**: Might be mandated in a later version.
debitAccounting	Boolean	Optional	If true, the amounts of debits on the reports are quoted positive with the related consequence for balances. If false, the amount of debits on the reports are quoted negative.
cardTransactions	Card Account Report	Optional	JSON based account report including only transactions for the specifically requested card. For more details, see [XS2A-IG].
balances	Array of Balance	Optional	A list of balances regarding this card, which might be restricted to the current balance.
_links	Links	Optional	A list of hyperlinks to be recognised by the TPP. Type of links admitted in this response: "download": a link to a resource, where the transaction report might be downloaded from in case where transaction reports have a huge size.

Example

```
GET https://api.testbank.com/v1/cards/4d9a81b3-a47d-4130-8765-
a9c0ff861b99/transactions?dateFrom=2017-10-01&dateTo=2017-10-30
Accept: application/json
```

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```
X-Request-ID:           99391c7e-ad88-49ec-a2ad-99ddcb1f7721
```

Response (Example 1)

Response in JSON format for an access on a regular account

```
HTTP/1.x 200 Ok
X-Request-ID:           99391c7e-ad88-49ec-a2ad-99ddcb1f7721
Date:                   Sun, 06 Aug 2017 15:05:47 GMT
Content-Type:           application/json

{
  "card": {
    "maskedPan": "525412******3241"
  },
  "debitAccounting": false,
  "cardTransactions": {
    "booked": [
      {
        "cardTransactionId": "201710020036959",
        "transactionAmount": { "currency": "EUR", "amount": "-256.67" },
        "grandTotalAmount": { "currency": "EUR", "amount": "-2566.70" },
        "transactionDate": "2017-10-25",
        "bookingDate": "2017-10-26",
        "valueDate": "2017-11-01",
        "cardAcceptorAddress": {
          "city" : "STOCKHOLM",
          "country" : "SE"
        },
                "proprietaryBankTransactionCode" : "INSTALMENT",
        "invoiced": false,
        "transactionDetails": "WIFIMARKET.SE"
      }, {
        "cardTransactionId": "201710020091863",
        "transactionAmount": { "currency": "EUR", "amount": "-10.72" },
        "transactionDate": "2017-10-25",
        "bookingDate": "2017-10-26",
        "valueDate": "2017-11-01",
        "originalAmount": { "currency": "SEK", "amount": "-99" },
        "cardAcceptorAddress": {
          "city" : "STOCKHOLM",
          "country" : "SE"
        },
                "proprietaryBankTransactionCode" : "PURCHASE",
        "invoiced": false,
        "transactionDetails": "ICA SUPERMARKET SKOGHA"
```


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```
      }
    ],
    "pending": [ ],
    "_links": {
      "card": {
        "href": "/v1/cards/4d9a81b3-a47d-4130-8765-a9c0ff861b99"
      }
    }
  }
}
```


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6 Extension of Complex Data Types

To support the more detailed selection of consents existing Data types must be extended. This chapter describes the new data type definitions. Changes to the existing definition are highlighted.

6.1 Links

In addition to the already defined links ([XS2A-IG], cp. 14.6), the following link shall be supported:

Attribute	Type	Condition	Description
card	href Type	Optional	A link to the resource providing the details of one card.
cardTransactions	href Type	Optional	A link to the resource providing the transaction history of a dedicated card or a card account.

6.2 Account Access

Attribute	Type	Condition	Description
accounts	Array of Account Reference	Optional	Is asking for detailed account information. If the array is empty, the TPP is asking for an accessible account list. This may be restricted in a PSU/ASPSP authorization dialogue. If the array is empty, also the arrays for balances or transactions shall be empty, if used.
balances	Array of Account Reference	Optional	Is asking for balances of the addressed accounts. If the array is empty, the TPP is asking for the balances of all accessible account lists. This may be restricted in a PSU/ASPSP authorization dialogue. If the array is empty, also the arrays for

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Attribute	Type	Condition	Description
			accounts or transactions shall be empty, if used.
transactions	Array of Account Reference	Optional	Is asking for transactions of the addressed accounts. If the array is empty, the TPP is asking for the transactions of all accessible account lists. This may be restricted in a PSU/ASPSP authorization dialogue. If the array is empty, also the arrays for accounts or balances shall be empty, if used.
additional Information	Additional Information Access	Optional if supported by API provider	Is asking for additional information as added within this structured object. The usage of this data element requires at least one of the entries "accounts", "transactions" or "balances" also to be contained in the object. If detailed accounts are referenced, it is required in addition that any account addressed within the additionalInformation attribute is also addressed by at least one of the attributes "accounts", "transactions" or "balances".
availableAccounts	String	Optional if supported by API provider	Only the value "allAccounts" is admitted.
availableAccounts WithBalance	String	Optional, if supported by API provider	Only the value "allAccounts" is admitted.

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Attribute	Type	Condition	Description
allPsd2	String	Optional if supported by API provider	Only the value "allAccounts" is admitted.
restrictedTo	Array of Cash Account Type	Conditional if supported by API provider.	If the TPP requests access to accounts via availableAccounts (List of available accounts), global or bank driven consents, the TPP may include this element to restrict access to the referred account types. Absence of the element is interpreted as "no restriction" (therefore access to accounts of all types is requested). The element may only occur, if each of the elements • accounts • balances • transactions is either not present or contains an empty array. **Remark for Future**: In a future version of the XS2A-Interface the data model for consents will be changed and therefore this element will most likely become obsolete.

6.3 Account Reference

This type is containing any account identification which can be used on payload-level to address specific accounts. The ASPSP will document which account reference type it will support. Exactly one of the attributes defined as "conditional" shall be used.

> **Remark:** The currency of the account is needed, where the currency is an account characteristic identifying certain sub-accounts under one external identifier like an IBAN. These sub-accounts are separated accounts from a legal point of view and have separated balances, transactions etc.

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Attribute	Type	Condition	Description
iban	IBAN	Conditional	
bban	BBAN	Conditional	This data elements is used for payment accounts which have no IBAN.
pan	Max35Text	Conditional	Primary Account Number (PAN) of a card, can be tokenised by the ASPSP due to PCI DSS requirements. Note: If this element is used in a card account context, it might refer to a whole card account (covering more than one card), represented by its leading card's PAN. In the context of a (single) card, this PAN will always represent (only) the card(s) with this PAN
maskedPan	Max35Text	Conditional	Primary Account Number (PAN) of a card in a masked form.
msisdn	Max35Text	Conditional	An alias to access a payment account via a registered mobile phone number.
currency	Currency Code	Optional	ISO 4217 Alpha 3 currency code
cashAccountType	Cash Account Type	Optional, if supported by API provider.	ExternalCashAccountType1Code from ISO 20022 The API provider may restrict the accepted values further (e.g. only "CARD" and "CACC" may be supported). The TPP includes this element, if the account reference may identify several accounts of different types, but the TPP only requests access to a specific type (e.g. card accounts).

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6.4 Card Account Details

Attribute	Type	Condition	Description
resourceId	String	Conditional	This is the data element to be used in the path when retrieving data from a dedicated account. This shall be filled, if addressable resource are created by the ASPSP on the /card-accounts endpoint.
maskedPan	Max35Text	Mandatory	Primary Account Number (PAN) of the ~~main~~ card in masked form. In the context of a response to a "/card-accounts" endpoint, this is the PAN of the main card; in the context of a "/cards" endpoint, this identifies the specific card for that the information is presented. This data element can be used in the body of the Consent Request Message for retrieving account access consent from this card..
currency	Currency Code	Mandatory	Account currency
ownerName	Max140Text	Optional	Name of the legal account owner. If there is more than one owner, then e.g. two names might be noted here. For a corporate account, the corporate name is used for this attribute. Even if supported by the ASPSP, the provision of this field might depend on the fact whether an explicit consent to this specific additional account information has been given by the PSU.
name	Max70Text	Optional	Name of the card / card account, as assigned by the ASPSP, in agreement with the account owner in order to provide an additional means of identification of the card/ card account.

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Attribute	Type	Condition	Description
displayName	Max70Text	Optional	Name of the card / card account as defined by the PSU within online channels.
product	Max35Text	Optional	Product Name of the Bank for this ~~account~~card / card account, proprietary definition.
debitAccounting	Boolean	Optional	If true, the amounts of debits on the reports are quoted positive with the related consequence for balances. If false, the amount of debits on the reports are quoted negative.
status	String	Optional	Account status. The value is one of the following: • "enabled": account / card is available • "deleted": account / card is terminated • "blocked": account / card is blocked e.g. for legal reasons If this field is not used, than the account / card is available in the sense of this specification.
usage	Max140 Text	Optional	Specifies the usage of the account/ card - PRIV: private personal account/ card - ORGA: professional account/ card
details	Max1000 Text	Optional	Specifications that might be provided by the ASPSP - characteristics of the account - characteristics of the relevant card
creditLimit	Amount	Optional	In the context of a response to a "card-accounts" endpoint, this element defines the credit limit of the PSU aggregated for

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Attribute	Type	Condition	Description
			all cards related to this card account in total. In the context of a response to a "cards " endpoint, it is up to the ASPSP whether this element contains an aggregated limit for all associated cards or a specific limit for the requested card. This decision must be contained in the documentation of the ASPSP.
balances	Array of Balances	Optional	The specific card account balances associated to this card / card account. In the context of a response to a "cards" endpoint, each balance that indicates that credit limit is included must respect all applicable credit limits relevant for this card (cp. Section 6.6)
_links	Links	Optional	Links to the card / cardAccount, which can be directly used for retrieving account information from this dedicated account. Links to "balances" and/or "cardTransactions" These links are only supported, when the corresponding consent has been already granted.

6.5 Balance Type

The following balance types are excluding credit limits unless the creditLimitIncluded element is present and equals true in the corresponding balance element. Changes for the balances for dedicated cards are highlighted.

Remark: This definition is following ISO20022 logic for defining balance types.

Type	Description
closingBooked	Balance of the account at the end of the pre-agreed account reporting period. It is the sum of the opening booked balance at the beginning of

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Type	Description
	the period and all entries booked to the account during the pre-agreed account reporting period. For card-accounts, this is composed of • invoiced, but not yet paid entries For cards the account entries are booking entries from the card processor or invoices paid by the PSU.
expected	Balance composed of booked entries and pending items known at the time of calculation, which projects the end of day balance if everything is booked on the account and no other entry is posted. For card accounts, this is composed of • invoiced, but not yet paid entries, • not yet invoiced but already booked entries and • pending items (not yet booked)
openingBooked	Book balance of the account at the beginning of the account reporting period. It always equals the closing book balance from the previous report.
interimAvailable	Available balance calculated in the course of the account 'servicer's business day, at the time specified, and subject to further changes during the business day. The interim balance is calculated on the basis of booked credit and debit items during the calculation time/period specified. For card-accounts, this is composed of • invoiced, but not yet paid entries, • not yet invoiced but already booked entries For cards, this is composed of • invoiced, but not yet paid entries • not yet invoiced but already booked entries • pending items (not yet booked)
interimBooked	Balance calculated in the course of the account servicer's business day, at the time specified, and subject to further changes during the business

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Type	Description
	day. The interim balance is calculated on the basis of booked credit and debit items during the calculation time/period specified. **Remark:** For cards, this time period consists of the accounting period of the related card, e.g. the interim booked items during a month.
forwardAvailable	Forward available balance of money that is at the disposal of the account owner on the date specified.
nonInvoiced	Only for card accounts, to be defined yet.

6.6 Example: calculation of balance types

Balance type interimAvailable

The following table give two examples on how the "interimAvailable" is calculated in case of "creditLimitIncluded" (true or false) in a setting, where

- Card 1 is associated with a partner card (Card 2),
- both cards have an individual limit and
- there is an additional "aggregated limit" applicable for both of them.

Please note that "debitAccounting" flag in all these cases equals `false`.

Note: The “interimAvaillable” balance where “creditLimitIncluded” equals true is the open to buy limit of the relevant card, while the "interimBooked" limit is referring to bookings between the card scheme and the bank, and the bank and the PSU respectively during the accounting period.

Aggregated Credit Limit	Credit Limit Card 1	Credit Limit Card 2	Spendings Card 1	Spendings Card 2	Interim Available Card 1 (Credit Limit included)	Interim Booked Card 1 (Credit Limit not included)
700	500	500	100	500	100	-100
700	500	500	400	50	100	-400

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Balance Types closingBooked and interimBooked for credit cards

The "closingBooked" balance is the balance of the card at the end of an accounting period, i.e. at the end of the related invoicing period for credit cards. In case of the "debitAccounting" flag equals `false`, the example would be e.g.:

- closingBooked Balance at 31st July (end of invoicing period): -3456,12 Euro
- interimBooked Balance at 1st August (invoicing period not yet paid, new card transaction of 20 Euro): -3476,12 Euro
- interimBooked Balance at 2nd August (invoice had been paid): -20 Euro.

Balance Types closingBooked and interimAvailable for prepaid cards

The "closingBooked" balance is the balance of the card at the end of an accounting period, i.e. at the end of the day for prepaid cards. In case of the "debitAccounting" flag equals `false`, the example would be e.g.:

- closingBooked Balance at 14 June 123,12 Euro
- interimAvailable Balance at 14 June, 1 pm. 103,12 Euro (20 Euro was used for shopping)
- closingBooked Balance at 15 June 103,12 Euro

7 References

[XS2A-OR] NextGenPSD2 XS2A Framework, Operational Rules, The Berlin Group Joint Initiative on a PSD2 Compliant XS2A Interface, version 1.3, published 21 December 2018

[XS2A-IG] NextGenPSD2 XS2A Framework, Implementation Guidelines, The Berlin Group Joint Initiative on a PSD2 Compliant XS2A Interface, version 1.3.9, published 29 March 2021 .

[XSA-IG-ERR] NextGenPSD2 XS2A Framework, Errata Version 1.3.9, 30 June 2021

[XS2A-DP] NextGenPSD2 XS2A Framework, Domestic Payment Definitions, The Berlin Group Joint Initiative on a PSD2 Compliant XS2A Interface, current version

[EBA-RTS] Commission Delegated Regulation (EU) 2018/389 of 27 November 2017 supplementing Directive 2015/2366 of the European Parliament and of the Council with regard to Regulatory Technical Standards for Strong Customer Authentication and Common and Secure Open Standards of Communication, C(2017) 7782 final, published 13 March 2018

[eIDAS] Regulation (EU) No 910/2014 of the European Parliament and of the Council on Electronic Identification and Trust Services for Electronic Transactions in the Internal Market, 23 July 2014, published 28 August 2014

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[PSD2] Directive (EU) 2015/2366 of the European Parliament and of the Council on payment services in the internal market, published 23 December 2015

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