

This solution is recommended as a best practice until it is fully specified. In this example this would deliver the following accept header expression:

```
Accept: /application/vnd.BerlinGroup.camt.054+xml;q=0.9,
/application/vnd.BerlinGroup.camt.053+xml;q=0.8
```

Request Body

No request body.

6.4.2 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

In case the ASPSP returns a **camt.05x** XML structure, the response body consists of either a camt.052 or camt.053 format. The camt.052 may include pending payments which are not yet finally booked. The ASPSP will decide on the format due to the chosen parameters, specifically on the chosen dates relative to the time of the request. In addition the ASPSP might offer camt.054x structure e.g. in a corporate setting.

In case the ASPSP returns a **MT94x** content, the response body consists of an MT940 or MT942 format in a text structure. The MT942 may include pending payments which are not yet finally booked. The ASPSP will decide on the format due to the chosen parameters, specifically on the chosen dates relative to the time of the request.

A JSON response is defined as follows:

Attribute	Type	Condition	Description
loanAccount	Account Reference	optional	Identifier of the addressed loan account.

Attribute	Type	Condition	Description
			Remark for Future: It is recommended to use this data element. The condition might change to "mandatory" in a next version of the specification.
transactions	Account Report	Optional	<p>JSON based account report.</p> <p>This account report contains transactions resulting from the query parameters.</p>
balances	Array of Balance	Optional	A list of balances regarding this account, which might be restricted to the current balance.
_links	Links	Optional	<p>A list of hyperlinks to be recognised by the TPP.</p> <p>Type of links admitted in this response:</p> <p>"download": a link to a resource, where the transaction report might be downloaded from in case where transaction reports have a huge size.</p> <p>Remark: This feature shall only be used where camt-data is requested which has a huge size.</p>

6.4.3 Example

```
GET https://api.testbank.com/v1/loans/3dc3d5b3-7023-4848-9853-f5400a64e81g/transactions?dateFrom=2020-08-30?dateTo=2020-10-31?bookingStatus=both
```

Accept: application/json

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: Thu, 29 Oct 2020 15:05:38 GMT

Content-Type: application/json

```
{  
  "loanAccount": {"iban": "DE2310010010123456788"},  
  "transactions":  
  {  
    "booked":  
    [  
      {  
        "transactionId": "1234567",  
        "transactionAmount": {"currency": "EUR", "amount": "1250"},  
        "bookingDate": "2020-08-30",  
        "valueDate": "2020-08-31",  
        "remittanceInformationUnstructured": "Amortization Aug 2020"  
      },  
      {  
        "transactionId": "1234567",  
        "transactionAmount": {"currency": "EUR", "amount": "1250"},  
        "bookingDate": "2020-09-29",  
        "valueDate": "2020-09-30",  
        "remittanceInformationUnstructured": "Amortization Sep 2020"  
      },  
      {  
        "transactionId": "1234568",  
        "transactionAmount": {"currency": "EUR", "amount": "-10.00"},  
        "bookingDate": "2020-09-30",  
        "valueDate": "2020-09-30",  
        "remittanceInformationUnstructured": "Interest Q3 2020"  
      }  
    ],  
    "pending":  
    [ {  
        "transactionId": "1234569",  
        "transactionAmount": {"currency": "EUR", "amount": "1250"},  
        "valueDate": "2020-10-31",  
        "remittanceInformationUnstructured": "Amortization Oct 2020"  
      }]  
  }  
}
```



7 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.

7.1 Extension of existing Data Types

7.1.1 Account Access

Attribute	Type	Condition	Description
accounts	Array of Account Reference	Optional	<p>Is asking for detailed account information.</p> <p>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.</p>
balances	Array of Account Reference	Optional	<p>Is asking for balances of the addressed accounts.</p> <p>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 accounts or transactions shall be empty, if used.</p>
transactions	Array of Account Reference	Optional	<p>Is asking for transactions of the addressed accounts.</p> <p>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</p>

Attribute	Type	Condition	Description
			accounts or balances shall be empty, if used.
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.



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.	<p>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.</p> <p>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</p> <ul style="list-style-type: none"> • accounts • balances • transactions <p>is either not present or contains an empty array.</p> <p>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.</p>

7.1.2 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.

Attribute	Type	Condition	Description
iban	IBAN	Conditional	
bban	BBAN	Conditional	This data elements can be used for payment / savings / loan accounts when no IBAN is provided.
pan	Max35Text	Conditional	Primary Account Number (PAN) of a card, can be tokenised by the ASPSP due to PCI DSS requirements.
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.
other	Other Type	Conditional	<p>In cases where the criteria listed above (IBAN, BBAN, MSISDN) are not provided to identify the account (e.g. a savings account), the ASPSP shall support delivery of a proprietary ID of the respective account that uniquely identifies the account for this ASPSP. This ID will be delivered within the "other" structure.</p> <p>In this case, the ASPSP specifically shall support consent establishment for an account identified by its proprietary ID.</p> <p>Remark: An ASPSP does not have to support the "other" element for (regular payment) accounts.</p>
currency	Currency Code	Optional	ISO 4217 Alpha 3 currency code
cashAccountType	Cash Account Type	Optional, if supported by API provider.	<p>ExternalCashAccountType1Code from ISO 20022</p> <p>The API provider may restrict the accepted values further (e.g. only</p>

Attribute	Type	Condition	Description
			<p>"SVGS" and "CACC" may be supported).</p> <p>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).</p> <p>Remark:</p> <p>Savings: SVGS for saving accounts</p> <p>Loan: "LOAN" for loan accounts</p> <p>If the cashAccountType is not present, it indicates the cashAccountType</p> <ul style="list-style-type: none"> • "Card Account" in case of the account identification being provided as a maskedPan or a pan and • "Current Account" (CACC) otherwise.

7.1.3 Account Details

Attribute	Type	Condition	Description
resourceId	String	Mandatory	This is the data element to be used in the path when retrieving data from a dedicated account, cp. [XS2A-IG], Section 6.5.3 or Section 6.5.4 below.
iban	IBAN	Optional	This data element can be used in the body of the Consent Request Message for retrieving account access consent from this payment account, cp. [XS2A-IG], Section 6.3.1.1.

Attribute	Type	Condition	Description
bban	BBAN	Optional	This data element can be used in the body of the Consent Request Message for retrieving account access consent from this account, cp. [XS2A-IG], Section 6.3.1.1. This data elements is used for payment accounts which have no IBAN.
msisdn	Max35Text	optional	An alias to access a payment account via a registered mobile phone number. This alias might be needed e.g. in the payment initiation service, cp. [XS2A-IG], Section 5.3.1. The support of this alias must be explicitly documented by the ASPSP for the corresponding API Calls.
other	Other Type	Conditional	In cases where the criteria listed above (IBAN, BBAN, MSISDN) are not provided to identify an instance of the respective account type (e.g. a savings account), the ASPSP shall include a proprietary ID of the respective account that uniquely identifies the account for this ASPSP.
currency	Currency Code	Mandatory	Account currency
ownerName	Max140Text	Optional	<p>Name of the legal account owner. If there is more than one owner, then e.g. two names might be noted here.</p> <p>For a corporate account, the corporate name is used for this attribute.</p> <p>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.</p>
name	Max70Text	Optional	Name of the account, as assigned by the ASPSP, in agreement with the account



Attribute	Type	Condition	Description
			owner in order to provide an additional means of identification of the account.
displayName	Max70Text	Optional	Name of the account as defined by the PSU within online channels.
product	Max35Text	Optional	Product Name of the Bank for this account, proprietary definition
cashAccountType	Cash Account Type	Optional	ExternalCashAccountType1Code from ISO 20022
status	String	Optional	<p>Account status. The value is one of the following:</p> <ul style="list-style-type: none"> • "enabled": account is available • "deleted": account is terminated • "blocked": account is blocked e.g. for legal reasons <p>If this field is not used, than the account is available in the sense of this specification.</p>
bic	BICFI	Optional	The BIC associated to the account.
interest	Array of Interest (cp. 7.2)	Optional	<p>A set of interest rates associated to this account, e.g. interests for savings or credits.</p> <p>Optionally used for savings accounts and loan accounts.</p>
relatedDates	Related Dates (cp. 7.2)	Optional	Dates related to this account, e.g. start Date
collateralsInvolved	Boolean	Optional	Only used for loan accounts: Is set to true if a collateral is involved securing the loan (e.g. security deposit, physical collaterals like houses, cars). More information might be provided under the "details" attribute.



Attribute	Type	Condition	Description
guaranteeInvolved	Boolean	Optional	Only used for loan accounts: Is set to true in case of specific collaterals where a guarantee of payment of the loan is given by a different person.
linkedAccounts	Max70 Text	Optional	This data attribute is a field, where an ASPSP can name a cash account associated to pending loan, savings or card transactions.
usage	Max4 Text	Optional	Specifies the usage of the account - PRIV: private personal account - ORGA: professional account
details	Max500 Text	Optional	Specifications that might be provided by the ASPSP - characteristics of the account - characteristics of the relevant card - characteristics of the saving account, and the ASPSP will provide specification for each deposit - characteristics of the loan
balances	Array of Balances	Conditional	
_links	Links	Optional	Links to the account, which can be directly used for retrieving account information from this dedicated account. Links to "balances" and/or "transactions" These links are only supported, when the corresponding consent has been already granted.



7.1.4 Balance Type

The used balance type is restricted to the balancesTypes not marked in grey. balanceTypes marked in grey do not apply to loans or savings.

Type	Description
closingBooked	<p>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 the period and all entries booked to the account during the pre-agreed account reporting period.</p> <p>For card-accounts, this is composed of</p> <ul style="list-style-type: none"> invoiced, but not yet paid entries
expected	<p>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.</p> <p>For card accounts, this is composed of</p> <ul style="list-style-type: none"> invoiced, but not yet paid entries, not yet invoiced but already booked entries and pending items (not yet booked) <p>For savings and loans:</p> <p>Estimated balance (e.g. including an upcoming interest payment) for the referenced date.</p>
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	<p>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.</p> <p>For card-accounts, this is composed of</p> <ul style="list-style-type: none"> invoiced, but not yet paid entries, not yet invoiced but already booked entries
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 day. The interim balance is calculated on the basis of booked credit and debit items during the calculation time/period specified.

Type	Description
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.

7.1.5 Links

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

Attribute	Type	Condition	Description
savingsAccount	href Type	Optional	A link to the resource providing the details of a saving account.
loanAccount	href Type	Optional	A link to the resource providing the details of a saving account.

Note: There are now dedicated link types needed for transactions and balances. These links will be inherited from current accounts.

7.2 New Data Types

7.2.1 Other Type

The "other" type is defined in the same way as in [XS2A-DOM-IG]:

Attribute	Type	Condition	Description
identification	Max35Text	Mandatory	
schemeName Code	Code	Optional	An entry provided by an external ISO code list
schemeName Proprietary	Max35Text	Optional	A scheme name defined in a proprietary way.
issuer	Max35Text	Optional	Issuer of the identification

7.2.2 Related Dates

The new "Related Dates" data type is used for saving accounts as well as for loan accounts:

Attribute	Type	Condition	Description
contractStartDate	ISODate	Optional	Start of the account contract
contractEndDate	ISODate	Optional	End of the account contract
contractAvailabilityDate	ISODate	Optional	Next Date where money can be taken off a saving account without loss of interest, if initiated now (in case of a saving account). Next Date where a loan can be fully repaid without any extra fee.

Remark: In the future, the "relatedDates" structure might be extended by an "proprietary" element containing an array of dates in connection with a type that describes the usage of the respective date.

7.2.3 Interest

The new "Interest" data type is used for saving accounts as well as for loan accounts:

Attribute	Type	Condition	Description
type	Interest Type Code	Optional	FIXD and INDE are the only permitted code for now
relatedIndices	Array of Index	Optional	List of Indices where the interest rate is related to.
rate	Array of AmountDependentRate	Mandatory	An array of interest rates, which might apply to different amount ranges
fromDateTime	ISODateTime	Optional	The date from which this interest rate is applicable. If no exact time is applicable, 00:00:00 is chosen as time definition.

Attribute	Type	Condition	Description
toDateTime	ISODateTime	Optional	The date until this interest rate is applicable. If no exact time is applicable, 23:59:59 is chosen as time definition.
reason	Max35Text.	Optional	<p>Specifies the reason of the interest.</p> <p>The following key values are pre-defined:</p> <p>arrears:</p> <p>The addressed interest rate applies only in case of arrears.</p> <p>alternateRateMaximumOf:</p> <p>The addressed alternate interest rate applies in case where this rate implies a larger interest in a dedicated interest period than the regular interest rate provided without reason element.</p> <p>alternateRateMinimumOf:</p> <p>The addressed alternate interest rate applies in case where this rate implies a smaller interest in a dedicated interest period than the regular interest rate provided without reason element.</p> <p>ASPSP may define further key values and shall publish them in their documentation.</p>
change Mechanism	Max1024Text	Optional	An explanation of a mandated change mechanism.

Remark: The following ISO definitions apply for these codes (ISO Interesttype3code):

FIXD: Indicates that the type of interest is fixed. This is a fixed interest for the period defined either in the interest entry or implicitly by the contract period.

INDE: Indicates that the type of interest is index. This rate could relate e.g. to interest rates of central banks.

7.2.4 Index

Attribute	Type	Condition	Description
index	Max35Text	Optional	The following codes are supported: "CPI" – customer Price Index "FC" – foreign currency "other" – for others, not clearly specified index relations
rootIndexValue	Max35Text	Optional	A number giving the basic index value which is the basis for the loan contract.
exchangeRate	AmountDependentRate	Optional	Used in case of FC index
additional Information	Max500Text	Optional	Explanations e.g. on the "other" type.

7.2.5 AmountDependentRate

Attribute	Type	Condition	Description
percentage	Signed Percentage	Mandatory	The (signed) rate of the interest.
fromAmount	Amount	Optional	Amount from which the interest rate applies.
toAmount	Amount	Optional	Amount until the interest rate applies.

Remark: ISO 20022 is defining Percentage as a decimal type, where 5.0 expresses 5% interest rate. This specification is using a signed percentage to be able to express also negative percentage codes, i.e. -1.2 will express -1,2% of interest.

7.2.6 Examples for Interest Elements

7.2.6.1 Fixed Interest Rate for five Years

If the interest rate is fixed at 1.5% for a period of five years (2021-01-01 to 2025-12-31), the "interest" object shall at least include exactly one item of the following form:

```
"interest": [
    {"type": "FIXD",
     "rate": [
         {"percentage": "1.5"}
     ],
     "toDateTime": "2025-12-31T23:59:59"
   }
]
```

7.2.6.2 Annually increasing Interest Rate for two Years

If the interest rate is set at 1% for the first year and increasing by 0.2 percentage points per year for a period of five years (2021-01-01 to 2022-12-31), the "interest" object should include items of the following form:

```
"interest": [
    {"type": "FIXD",
     "rate": [
         {"percentage": "1.0"}
     ],
     "toDateTime": "2021-12-31T23:59:59"
   },
   {"type": "FIXD",
     "rate": [
         {"percentage": "1.2"}
     ],
     "fromDateTime": "2022-01-01T00:00:00",
     "toDateTime": "2022-12-31T23:59:59"
   }
]
```

Remark: Delivery of historic interest rates is not required.

7.2.6.3 Annually increasing Interest Rate for two Years with indication of arrear interest rates

If the interest rate is set at 1% for the first year and increasing by 0.2 percentage points per year for a period of five years (2021-01-01 to 2022-12-31), and in addition a specific interest rate of 10% is defined in case of arrears, the "interest" object should include items of the following form:

```
"interest": [
    {"type": "FIXD",
     "rate": [
         {"percentage": "1.0"}
     ],
     "toDateTime": "2021-12-31T23:59:59"
    },
    {"type": "FIXD",
     "rate": [
         {"percentage": "1.2"}
     ],
     "fromDateTime": "2022-01-01T00:00:00",
     "toDateTime": "2022-12-31T23:59:59"
    },
    {"type": "FIXD",
     "rate": [
         {"percentage": "10.0"}
     ],
     "reason": "arrears"
    }
]
```

7.2.6.4 Interest Rate composed of a fixed Component plus the Prime Rate

If the interest rate is set at 1.0% plus the ECB's interest rate on the main refinancing operations ("Prime Rate") for a period of five years (2021-01-01 to 2025-12-31), the "interest" object shall at least include items of the following form:

```
"interest": [
    {"type": "FIXD",
     "rate": [
         {"percentage": "1.0"}
     ],
     "primeRate": "true"
    }
]
```

```

    "toDateTime": "2025-12-31T23:59:59"
  },
  {"type": "INDE" ,
   "relatedIndices":
    [
      {
        "index": "other",
        "additionalInformation": "ECB MRO Interest Rate"
      }
    ],
   "rate":
    [
      {"percentage": "0.0"}
    ]
  }
]

```

If the ECB's interest rate would change to 1.0% effective 2021-06-01, the "interest" object shall change and afterwards contain at least items of the following form:

```

"interest": [
  {"type": "FIXD" ,
   "rate":
    [
      {"percentage": "1.0"}
    ],
   "toDateTime": "2025-12-31T23:59:59"
  },
  {"type": "INDE" ,
   "relatedIndices":
    [
      {
        "index": "other",
        "additionalInformation": "ECB MRO Interest Rate"
      }
    ],
   "rate":
    [
      {"percentage": "1.0"}
    ],
   "fromDateTime": "2021-06-01T00:00:00+02:00"
  }
]

```

7.2.6.5 Interest Rate as a maximum of a fixed rate and a rate composed of a fixed component with a lower fixed rate plus the Prime Rate

If the interest rate is set at the maximum of

- 1.0% plus the ECB's interest rate on the main refinancing operations ("Prime Rate") and
- 3%

for a period of five years (2021-01-01 to 2025-12-31), the "interest" object shall at least include items of the following form:

```
"interest": [
    {"type": "FIXD",
     "rate":
        [{"percentage": "1.0"}],
     "toDateTime": "2025-12-31T23:59:59"
    },
    {"type": "INDE",
     "relatedIndices":
        [{"index": "other",
       "additionalInformation": "ECB MRO Interest Rate"}]
    },
    {"type": "FIXD",
     "rate":
        [{"percentage": "1.25"}]
    },
    {"type": "FIXD",
     "rate":
        [{"percentage": "3.0"}]
    },
    {"toDateTime": "2025-12-31T23:59:59",
     "reason": "alternateRateMaximumOf"
    }
]
```

7.2.6.6 Interest Rate composed of a fixed Component plus inflation

Assuming the interest rate is set at 1.0% plus inflation rate measured by the change of the consumer price index (CPI). If the CPI was 120 on 2021-01-01 (reference date for CPI

changes) and changed to 120,1 for March 2021 (published in 2021-04-01), the "interest" object for a response from April 2021 should contain the following items

```
"interest": [
    {"type": "FIXD",
     "rate": [
         {"percentage": "1.0"}
     ],
     "toDateTime": "2025-12-31T23:59:59"
    },
    {"type": "INDE",
     "relatedIndices": [
        [
            {
                "index": "CPI",
                "rootIndexValue": "120"
            }
        ],
        "rate": [
            {"percentage": "0.08"}
        ],
        "fromDateTime": "2021-03-01T00:00:00+02:00"
    ]
}
```

7.2.6.7 Interest Rate composed of a fixed Component plus an Index in foreign Currency

An example that includes an indexed component in foreign currency will be provided in a later version of the document.



8 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 1.3.12, published 01 July 2022
- [XS2A-DOM-IG] NextGenPSD2 XS2A Framework Domestic PIS and AIS Definitions, Implementation Guidelines, The Berlin Group Joint Initiative on a PSD2 Compliant XS2A Interface, version 1.3.11, published 05 May 2022.
- [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
- [PSD2] Directive (EU) 2015/2366 of the European Parliament and of the Council on payment services in the internal market, published 23 December 2015

