Íslenskir staðlar

ÍST TS 310:2022

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Tækniforskrift - Innlendar greiðslur og innlán

Technical Specification - Domestic payments and deposits

Íslenskir staðlar

ÍST TS 310:2022

Participants in ÍST Workshop VH-8 during the development of Innlendar greiðslur og innlán (e. Domestic payments and deposits).

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1st edition

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Foreword

This ÍST Technical Specification was developed in accordance with “ÍST Reglur um tækniforskriftir, tækniskýrslur og vinnustofusamþykktir” (*e.* IST rules on Technical Specifications, Technical Reports and Workshop Agreements). The TS (Technical specification) was prepared by the technical committee TN-FMÞ (The Technical Committee on Financial Services) that operates within FUT (Sector committee for ICT standardization) following a public call for participation within TN-FMÞ. The final draft was sent to the TN-FMÞ on the 2022-04-XX and approved by correspondence on the 2022-04-XX. The text of ÍST TS-310 was submitted to IST for publication on 2022-04-XX.

The accompanying OpenAPI 3.0.1 definition “IOBWS3.0.yaml” located at https://github.com/stadlar/IST-FUT-FMTH/tree/master/Deliverables, should be viewed as an integral part of ÍST TS-310.

The document “ÍST TS 310_2022 Domestic payments and deposits.md” is the source of this rendition, and versions of that document will be used for future errata and clarifications per the procedures to be laid out in the workshop agreement ÍST WA-316, IOBWS 3.0 Technical Guidelines. The rules are outlined in the README.md accompanying the Github Git repository and are accepted by the participants in TN-FMÞ alongside this specification. These guidelines establish the workgroup TN-FMÞ-VH-7 as in charge of monitoring submitted issues and pull requests made to the repository when they fall outside the purview of other regular workgroups. TN-FMÞ-VH-7 will evaluate if changes are ready to be accepted into the repository and when or if they warrant patches or minor releases to the specification. Versioning will adhere to the Semantic Versioning[7] scheme and each minor release will require a workgroup agreement under the “ÍST reglur” referenced above.

The work on the ÍST TS was primarily funded by Arion Banki, Íslandsbanki and Landsbankinn. It is the result of the workgroup TN-FMÞ-VH-8. In part, the work is based on the earlier workshop agreement WA-310 authored by TN-FMÞ-VH-2 on Technical Requirements, and TN-FMÞ-VH-1 on Business Requirements, with the participation of an external consultant. WA-310 was approved within TN-FMÞ on 2019-12-12. ÍST TS-310 should, however, not be viewed as a direct successor to that agreement, which focused on laying groundwork for PSD2 compliance. ÍST TS-310 is not related to PSD2 compliance, though it could be used by participants as a foundation for their dedicated interface, if so desired. Instead TS-310 is the next version of the Icelandic Online Banking Services, replacing TS 161:2013 *Greiðslur* and TS 164:2013 *Yfirlit bankareikninga*.

The Technical Committee’s participants have made every effort to ensure the reliability and accuracy of the technical and non-technical content of ÍST TS-310, but this does not guarantee its correctness, explicitly or implicitly. Users of ÍST TS-310 should be aware that neither the TN-FMÞ nor ÍST can be held liable for damages or losses of any kind which may arise from its application. Users of ÍST TS-310 do so on their own responsibility and at their own risk.

Introduction

This Technical Specification (TS) presents version 3.0 of the Icelandic Online Banking Services (IOBWS) for domestic payments and deposits.

Previous versions of IOBWS, released in 2007 and 2013 respectively, used the OASIS SOAP standards which were current at the time to define common web service interfaces for the Icelandic commercial and savings banks. This enabled software vendors, enterprises, and service providers to integrate their accounting, payment, and information systems with the bank's services, allowing them to act on behalf of the customers and with full access to their data.

Iceland, with its homogeneous financial infrastructure based on Reiknistofa bankanna (RB) as a central service hub, has enjoyed real-time gross settlements and instant credit transfers nationwide since 1987. Other universally accepted services include the common collection solution (Kröfupotturinn) for issuing and paying claims, as well as topping up credit cards, or A/B Giro. All this functionality has been available through IOBWS v1 and v2, which is comparable to the functionality enjoyed by users of the online banking Web user interfaces.

When initiating work on the previous versions, the participants in the TN-FMÞ reviewed existing and emerging specifications in the global and European financial industries. At the time, none were deemed a good fit for local adaptation; they reflected the inherent legacy in inter-bank communications outside of Iceland. This was true even in the case of the other Nordic countries. Therefore, v1 and v2 of IOBWS were somewhat specific to the current functionality available in the underlying RB systems.

Meanwhile, Europe and the broader market has been catching up and the Icelandic banks have migrated to new core banking systems; along with the Central Bank of Iceland, they have implemented new clearing and settlement mechanisms (CSM). One of the goals of IOBWS v3, set forward by TN-FMÞ, was to move closer to the standards used by systems such as ISO 20022 [2], at least through the application of a comparable dictionary and data elements.

The Open Banking regulation in the UK along with the PSD2 regulation issued by the European Parliament, has triggered initiatives to standardize access to payment functionality and account information on behalf of customers by third parties. One such effort, the NextGenPSD2 Framework developed by the Berlin Group [4], has been broadly accepted in the EEA. The data model references ISO 20022 [2] and is close enough to the direction of the Icelandic market to make it suitable as the new base for the IOBWS, instead of maintaining an independent linage of API specifications.

Another goal of the IOBWS version 3.0 charter, which was set forth by TN-FMÞ and achieved by adopting the NextGenPSD2 Framework, is the transition from SOAP to a REST-like API, which is defined by a recent iteration of the Open API Specification [3]. Along with support for modern authentication and authorization standards, this should address some of the perceived complexity in adapting IOBWS to various use cases, platforms, and programming languages that have come to the forefront after the release of the previous IOBWS versions.

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1 Scope

ÍST TS-310 defines web application programming interfaces implemented by Icelandic commercial and savings banks to expose shared functionality and information for domestic payments and deposits, under the Icelandic Online Banking Web Services (IOBWS) framework of specifications.

Other ÍST Technical Specifications exist which address related but discrete units of the overall IOBWS framework, either as new additions or upgrades to the previous specifications. Some crosscutting guidelines and shared concerns are addressed in the workshop agreement ÍST WA-316. As the consumption and implementation of each part of IOBWS are optional, the documents aim to be independent of each other.

However, due to the origin of the underlying OpenAPI specification in the Berlin Group NextGenPSD2 Framework, ÍST TS-310 on Domestic Payments and Deposits and ÍST TS-313 on Foreign Payments overlap quite significantly. Both are based on the “IOBWS3.0.yaml” definition document and share schema type and API service definitions. They will still be treated as separate entities, but stakeholders are advised to reference the other document if more context is required.

The focus in ÍST TS-310 is the following: the domestic adaptations to the relevant parts of the NextGenPSD2 framework; as well as the information needed to tie that to earlier IOBWS versions or other such implementations, including the Core Banking systems involved.

The intended audience for the specification document ÍST TS-310 is those who are implementing banking services and systems that will consume them as API clients. The reader is expected to have a basic understanding of the Icelandic financial products involved. Further documentation on business aspects of those products will be available from each bank, as they may involve service agreements and the end customers’ contractual preferences and benefits.

Out of necessity, the previous IOBWS technical specifications largely consisted of expressing the intent and actual content in a human-readable format, otherwise found in the associated XML Schema and SOAP definitions. The expectation for ÍST TS-310 is that the technical service definitions and JSON data schemas in the accompanying OpenAPI specification can be understood using utilities that can convert them into documentation or navigatable user interfaces.

Consequently, the ÍST TS-310 specification avoids the unnecessary repetition of information found in the technical contract IOBWS3.0.yaml. Instead, the rest of the document focuses on the information needed to understand the domestic context of services, schema types and service flows in relation to the NextGenPSD2 framework, as well as what constitutes the common core required to implement ÍST TS-310.

2 Normative references, definitions and data elements

2.1 Normative references

The following documents are referenced in ÍST TS-310, as part of their content constitutes the requirements of this document. If newer editions exist, only the edition cited applies.

ISO 13616-1:2020. *Financial services - International bank account number (IBAN). Part 1: Structure of the IBAN.*

ISO 20022. *Financial services - universal financial industry message scheme*.

NextGenPSD2 v1.3.8. *The Berlin Group NextGenPSD2 Access to Account Framework*.

OpenAPI v3.0.1. The OpenAPI Specification (OAS) by the OpenAPI Initiative, a Linux Foundation Collaborative Project.

2.2 Terms and definitions

- **Berlin Group** is a pan-European payments interoperability standards and harmonization initiative with the primary objective of defining open and common scheme- and processor-independent standards in the interbanking domain between Creditor Bank (Acquirer) and Debtor Bank (Issuer), complementing the work carried out by e.g. the European Payments Council. As such, the Berlin Group has been established as a purely technical standardization body, focusing on detailed technical and organizational requirements to achieve this primary objective.
- **Clearing and Settlement Mechanisms** (**CMS**) refers to the processes or systems used in the exchange between two payment service providers. In Iceland, the Central Bank acts as the interbank mediator in this scope.
- **Core Banking Systems** (**CBS**) is the umbrella term for those systems handling payments and transaction accounts in relation to this specification.
- **Electronic IDentification, Authentication and trust Services** (**eIDAS**) refers to regulation 910/2014 [9], which replaced previous directive 1999/93/EC. It was introduced to Iceland law through act no. 2019/55 [6].
- **ISO 20022** is an ISO standard [2] for electronic data interchange between financial institutions.
- **Kennitala** (often abbreviated as **KT**) is the unique national identification number issued by the Registers Iceland (ic. Þjóðskrá Íslands) and used by governmental bodies and enterprises to identify individuals, and through a comparable schema under the Iceland Revenue and Customs (ic. ríkisskattstjóri), legal entities in Iceland.
- **Kröfupotturinn** (often identified as **IK**) is the domestic billing and claim system supported by all current financial institutions in Iceland. Through the system, claims can be issued against any *kennitala*, and the functionality is similar to the intended *request-to-pay* system in Europe, though services in IK extend beyond that scope.
- **NextGenPSD2 Access to Accounts Framework** (**NextGenPSD2 Framework** or just **NextGenPSD2**) is the framework established by *the Berlin Group* to define a common PSD2 compliance interface [4]. Since then, parts of the framework have extended beyond compliance and into other Open Banking aspects.
- **The OpenAPI Specification** (**OAS**) defines a programming language-agnostic interface description for HTTP APIs, which allows both humans and computers to discover and understand the capabilities of a service without requiring access to source code, additional documentation, or inspection of network traffic.

2.3 Payment service directive terms

As the ÍST TS-310 owes much of its core to the NextGenPSD2 framework, the terms found in the OpenAPI specification and this document may reflect that background. Some of the main definitions are included here for context.

- **Payment Services Directive 2** (**PSD2**) was instituted by the European Parliament as EU 2015/2366 [8] and meant to further open up payment services on the internal EEA market. It was introduced to Iceland law through act no.

2021/114 [5]. PSD2 contains regulations of new services to be operated by so-called Third-Party Payment Service Providers on behalf of a Payment Service User, by leveraging Strong Customer Authentication. Due to the lineage connecting PSD2 with IOBWS v3.0, the main terms are described:

  - **Account Information Service Provider** (**AISP**) are *TPPs* with permission to connect to a transaction account and use the information to provide a **Account Information Services** (**AIS**) as defined in article 67 of EU 2015/2366 [8].
  - **Confirmation of the Availability of Funds Service** is used by Payment Instrument Issuing Service Provider (PIISP) TPP as defined by article 65 of EU 2015/2366 [8].
  - **Payment Initiation Service Provider** (**PISP**) can, given customers' consent, initiate payments and transactions on their behalf from their bank account, thereby providing **Payment Initiation Service** (**PIS**) as defined by article 66 of EU 2015/2366 [8].

- **Payment Service User** (**PSU**) is the end-user of payment services and customer of the bank in the IOBWS context.
- **Strong Customer Authentication** (**SCA**), in the scope of PSD2, refers to an authentication mechanism based on the use of two or more elements that are independent; a breach of one does not compromise the others. The recognized elements or factors can be based on:

  1) Knowledge: something only the user knows, e.g. a password.
  2) Possession: something only the user possesses, e.g. a particular cell phone and number.
  3) Inherence: something the user is or has, e.g. a fingerprint or iris pattern.

- **Third Party Provider** (**TPP**) refers in the scope of PSD2 to the party that uses the API to initiate operations or request information on behalf of the end-customer (PSU).

2.4 Data elements

The International Bank Account Number (**IBAN**) format for Icelandic accounts should follow the specification set forth in ISO 13616-1:2020 [1] as shown in Table 2.1 below. Description of the implementation of the checksum calculation is outside the scope of this document but should be discernable from the ISO standard and examples available online.

Table 2.1: Icelandic IBAN with example.

	Country Code	Check Digits	National Bank Code	Branch ID	Account type	Account Number	Account Holder's Kennitala
Description	IS	2 digits	2 digits	2 digits	2 digits	6 digits	10 digits
Example	IS	14	01	59	26	007654	5510730339

The Unique Claim Identifier references the ID of a claim based on the collection solution Kröfupotturinn. To initiate a payment to settle a claim, or relate transaction information about a previous payment, the claim ID should be formatted as a Basic Bank Account Number (BBAN). The method is shown below in Table 2.2. Claim Payments will therefore include BBAN, rather than IBAN, as a creditor account reference.

Table 2.2: Claim key transformed to BBAN with example.

	Claimant Id (kennitala)	National Bank Code	Branch ID	Fixed Ledger Id	Account Number	Delimiter	Due Date
Description	10 digits	2 digits	2 digits	2 digits	6 digits	Plus sign	DDMMYY
Example	5510730339	01	59	66	007654	+	311220

3 Implementation

3.1 Service Overview

When TN-FMÞ-VH-1 on Business Requirements and TN-FMÞ-VH-2 on Technical Requirements decided to adopt the NextGenPSD2 framework, the intent was to stay as true to the original specification as possible.

However, as with other European adaptations of NextGenPSD2 for domestic use, additional functionality was needed to support payment operations and account information expected by the Icelandic market. The original workgroup did this by extending existing schema types in the NextGenPSD2 OpenAPI contract, while removing elements and services not directly applicable to IOBWS. The intention was to streamline the specification, but developers with previous exposure to NextGenPSD2 found it challenging to understand the implications of the changes. Furthermore, the overall implementation details remained opaque for those migrating from earlier IOBWS versions, so more transparency was needed.

Therefore, workgroup TN-FMÞ-VH-8 was charged with revising the 3.0 version of IOBWS. The group tried to address two primary concerns: Clarify how the domestic payments and deposits products fit into NextGenPSD2, and simplify comparison against later releases by the Berlin Group. Additionally, the result should make it straightforward to adapt future updates and consider replacing current domestic adaptations in the IOBWS with newer NextGenPSD2 data elements.

The decision by the TN-FMÞ-VH-8 was to keep most of the original NextGenPSD2 OpenAPI definition intact, including those services and types that are not currently applicable to the Icelandic context or intended uses of the IOBWS. The domestic payments and deposits products (see section 3.2.1 and Table 3.2 below) are defined separately with applicable JSON schema types, leaving the original, e.g. SEPA message types, intact. They share the generic data elements and the ‘native’ payment types, reusing the services and operations for payments that are at the core of the NextGenPSD2 specification.

The Table 3.1 below lists the implications for the OpenAPI YAML contract. It contains the Consents and Signing Basket services, as removing or commenting those out would have impacted the contract structure. They will not be implemented as part of this specification.

Table 3.1: Service support in ÍST TS-310.

Payment Initiation Service (PIS)	Supported by all implementors of TS-310, in accordance with the specification (see later notes on Periodic Payments).
Account Information Service (AIS)	Supported by all implementors of TS-310, in accordance with the specification.
Confirmation of Funds Service (PIIS)	Supported by all implementors of TS-310, in accordance with the specification.
Consent Service	Explicitly not part of the TS-310 specification, but included for comparison and compatability with the NextGenPSD2 OpenAPI contract.
Signing Baskets Service (SBS)	Explicitly not part of the TS-310 specification, but included for comparison and compatability with the NextGenPSD2 OpenAPI contract.

3.2 Payment Initiation Service

3.2.1 Overview

The domestic payments and deposits products supported by ÍST TS-310 are shown in Table 3.2 below. They are defined as JSON objects. Other payment types are not supported by the specification.

The only available payment type in Iceland for an account-to-account transfer between domestic banks is usually classified as an instant credit transfer. The term ‘instant’ does not preclude additional business rules from applying within each bank: e.g. future payments, high-value payment processing, or variations in the payment lifecycle within e.g. the ‘end-of-business-day’ window. This could result in consumers of the IOBWS ÍST TS-310 services being exposed to intermediary transaction status codes during steps in the payment execution, some of which have not previously been visible or mapped in IOBWS return codes. Future changes in Core Banking Services and Clearing and Settlement Mechanisms might also affect statuses returned to consumers. All of the available status codes in the specification can be expected as return values.

Table 3.2: Domestic payment products.

Credit Transfers	Credit transfer of an amount between two accounts, within the same bank or between two domestic banks.
Claim Payments	Make a withdrawal from an account to pay a claim (e.g. a bill). The claim can be created in any domestic bank.
Payment Card Deposits	Make a withdrawal from an account to pay onto the account behind a payment card, within the same bank or between two domestic banks.

For each of the payment products, the support for payment services is shown in Table 3.3. A periodic payment is distinct from future-dating a payment, which is part of creating a payment, similar to previous versions of IOBWS (see requestedExecutionDate). At this time, behavior for periodic payments is not supported by the ÍST TS-310.

Table 3.3: Payment services available.

payments	Supported by all implementors of TS-310, in accordance with the specification, for all domestic payment products.
bulk-payments	Supported by all implementors of TS-310 in accordance with the specification, for all payment products.
periodic-payments	Explicitly not part of the TS-310 specification, but included for comparison and compatability with the NextGenPSD2 OpenAPI contract.

3.2.2 Domestic Payment Product Data Elements

The elements listed in Table 3.4 are used in the domestic payment products within the scope of ÍST TS-310. The schema type *paymentInitiationDomestic_json* should be used to define JSON data instances.

Table 3.4: Data elements for domestic payments.

Data Element	Credit Transfers	Claim Payments	Credit Card Deposits
endToEndIdentification	Optional	Optional	Optional
instructionIdentification	Optional	Optional	Optional
debtorAccount	Mandatory	Mandatory	Mandatory
debtorId	Optional	Optional	Optional
chargesAccount	N/A	N/A	N/A
ultimateDebtor	Optional	Optional	Optional
ultimateDebtorId	Optional	Optional	Optional
instructedAmount	Mandatory	Mandatory	Mandatory
creditorAccount	Mandatory	Mandatory	Mandatory
creditorAgent	N/A	N/A	N/A
creditorAgentAddress	N/A	N/A	N/A
creditorName	N/A	N/A	N/A
creditorId	Optional	Optional	Optional
creditorAddress	N/A	N/A	N/A
ultimateCreditor	Optional	Optional	Optional
ultimateCreditorId	Optional	Optional	Optional
icelandicPurposeCode	Optional	Optional	Optional
chargeBearer	N/A	N/A	N/A
remittanceInformationUnstructured	Optional	Optional	Optional
remittanceInformationStructured	Optional	Optional	Optional
requestedExecutionDate	Optional	Optional	Optional
partialPayment	N/A	Mandatory	N/A
serviceLevel	N/A	N/A	N/A
centralBankPurposeCode	N/A	N/A	N/A

To elaborate on the use of particular attributes, Table 3.5 contains additional information on top of the schema definitions. Notes on individual data elements or usage patterns follow in the subsections.

Table 3.5: Detailed description of ÍST TS-310 payments properties.

Field	Description
endToEndIdentification	Intended for ID, short message or description that will be communicated to the creditor, across different banks. It replaces the **BillNumber** or bill number field in previous IOBWS versions (ic. *seðilnúmer*, TNUM_I/TNUM_U). While supporting 35 characters, only the first 7 can reliably flow between all possible CB systems, reports, and even client systems, due to legacy expectations and implementations.
instructionIdentification	Unique identification, assigned by the debtor to unambiguously identify the instruction and to be communicated for correlation in payment status information, though not available in later transaction details. This field plays a similar role to **BookingID** in earlier IOBWS versions.
debtorAccount	The account that money is being transferred from.
debtorId	For the domestic payment products, this element should contain the kennitala of the debtor (owner of the debtorAccount).
ultimateDebtor	Identifies the party that owes the cash to the creditor, e.g. as a result of receipt of goods or services. Used in cases where it is different from the debtor/payor.
ultimateDebtorId	Identifies the party that owes the cash to the Creditor as a result of receipt of goods or services. Ultimate debtor kennitala is included when different from the debtor Id.
instructedAmount	Amount and currency to be transferred.
creditorAccount	The account used to transfer money to Beneficiary's account. In the case of a claim payment, this would be contain the claim key represented as a BBAN number.
creditorId	Used for the kennitala of the creditor, whose account is credited with the payment. As the kennitala is part of the Icelandic IBAN, and BBAN numbers, this is an optional field.
creditorName	This is optional and ignored when kennitala is part of the Icelandic IBAN and BBAN numbers, or provided in creditorId.
creditorAddress	Not needed in domestic payments where kennitala can be used as lookup key through the National Registry.
ultimateCreditor	The creditor (for example a finance company or an intermediary in a business transaction) may be different from the ultimate creditor. The debtor can enter who the final/real beneficiary of the payment is. In the case of Payment Card Deposit using masked PAN, ultimate Creditor contains the owner of the card.
ultimateCreditorId	Contains the kennitala of the intended beneficiary of the payment. Contains kennitala of the card owner when payment Card Deposits use masked PAN.

Field	Description
icelandicPurposeCode	Equivalent to the category code (ic. *textalykill*) used to classify the transaction. Restricted to codes available in each originating bank.
remittanceInformationStructured	The debtor's information about the payment. An array of remittance elements but currently only used for the equivalent of the IOBWS 2.0 **Out.Reference** (ic. *tilvísun*). This single array element must be of type 'TILV_U'. Previously the equivalent data element was mainly used for the kennitala of the creditor, now a separate parameter. However, it can convey other information, so it is included.
remittanceInformationUnstructured	Used for payment description visible for both parties. Only 16 characters can reliably flow between all systems, even if the field accepts 140 characters. Replaces **Description** in previous IOBWS SOAP schema.
requestedExecutionDate	Execution date if in the future, fully equivalent to the IOBWS v2.0 **requestedExecutionDate** for future payments (ic. *framvirk greiðsla*).
partialPayment	Applies to Claim Payments when the debtor intends to only pay part of the amount owed toward an existing claim. The claim needs to allow partial payment, otherwise an error occurs.

The remittanceInformationStructured mentioned in Table 3.5 is currently used to carry the debtor's payment reference. For identification, the **type** is set to TILV_U, which clearly identifies this information.

Listing 3.1: Example of the *remittanceInformationStructured* data element.

```
remittanceInformationStructured: [
  {
   reference: "Maximum 16 chars"
   type: "TILV_U"
 }
]
```

3.3 Bulk Payments

Bulk payments are supported for all ÍST TS-310 payment types. For a bulk payment, all collected payments shall be based on the same payment product, consistent with the approach of the NextGenPSD2 framework. The *bulkPaymentInitiationDomestic_json* schema type should be used for the top-level bulk initiation, according to ÍST TS-310 and the *paymentInitiationBulkElementDomestic_json* type for the child payments contained in an array on the parent.

The domestic bulk types allow for specifying separate debtor accounts on child payment elements when *batchBookingPreferred* is false on the parent and the *debtorAccount* is not included on the bulk initiation top element. When the *batchBookingPreferred* element is set to true, the *debtorAccount* must either be omitted on the child payments or set to the exact same account as on the *bulkPaymentInitiationDomestic_json* instance, or an error will be returned.

Table 3.6: Description of domestic bulk payment main body.

Data Element	Type	Condition	Description
batchBookingPreferred	Boolean	Optional	When the element is included and set to true, the debtor prefers only one booking entry and debtorAccount must be included. If this element equals false, or is not included, the debtor prefers individual booking of payments.
debtorAccount	Account Reference	Optional	Should only be set when batchBookingPreferred is true.
paymentInformationId	Max35Text	Optional	Unique identification assigned by the sending party to unambiguously identify this bulk. Replaces **NameOfBatch** in IOBWS 1.0 and 2.0, as well as **PaymentsID** that was generated by the receiving bank. Note: This attribute might be considered mandatory in future versions of the specification.
requestedExecutionDate	ISODate	Optional	Determines if the payments contained in the bulk will be executed at the given, later date.
payments	Bulk Entry	Mandatory	The Bulk Entry is a JSON Type, which mirrors the supported domestic payment products for single payments, excluding the data element requestedExecutionDate. DebtorAccount should be excluded if batch booking is preferred, but it is mandatory if either batchBookingPreferred is ‘false’ or the element missing.
chargesAccount	Account Reference	N/A	Not applicable to domestic bulks.

3.4 Payment Bulk Errors

The NextGenPSD2 framework [4] has a structured approach to messages that convey information related to specific HTTP return codes. These should be largely transparent to consumers of ÍST TS-310 services implementations. The domestic adaptation, however, defines comparable message properties on the status response for bulk payment data elements in *bulkPaymentInitiationElementDomesticWithStatus*. The listing in 3.2 shows an example of such a response.

Listing 3.2: Example of bulk status response with errors on sub-elements.

```
{
  "batchBookingPreferred": false,
  "paymentInformationId": "75BA1A88418445C0BE88AABFBEEEE230",
  "requestedExecutionDate": "2020-08-01",
  "payments": [
    {
      "endToEndIdentification": "Short description",
      "instructionIdentification": "my_payment_1",
      "resourceId": "my_payment_1_uid",
      "debtorId": "0208714669",
      "debtorAccount": {
        "iban": "IS4010010010330711860 8"
      },
      "instructedAmount": {
        "currency": "ISK",
        "amount": "1235"
      },
      "creditorId": "0208714669",
      "creditorAccount": {
        "bban": "030013000001"
      },
      "icelandicPurposeCode": "87",
      "remittanceInformationUnstructured": "My description"
    },
    {
      "endToEndIdentification": "Short description",
      "instructionIdentification": "my_payment_2",
      "debtorId": "0208714669",
      "debtorAccount": {
        "iban": "IS4010010010330711860 8"
      },
      "instructedAmount": {
        "currency": "ISK",
        "amount": "1235"
      },
      "creditorId": "0208714669",
      "creditorAccount": {
        "bban": "045126123456"
      },
      "icelandicPurposeCode": "87",
      "remittanceInformationUnstructured": "My description",
      "errors": {
        "tppMessages": [
          {
            "category": "ERROR",
            "code": "DEBTOR_ACCOUNT_NOT_FOUND",
            "path": "https://github.com/stadlar/IST-FUT-FMTH/PIS/ErrorCodes",
            "text": "Úttektarreikningur ekki til"
          },
          {
            "category": "ERROR",
            "code": "FORMAT_ERROR",
            "path": "https://github.com/stadlar/IST-FUT-FMTH/PIS/ErrorCodes",
            "text": "Eigin villa banka"
          }
        ],
        "_links": {
          "self": {
            "href": "/v1/payments/credit-transfers/1234-wertiq-983"
          }
        }
      }
    }
  ],
  "transactionStatus": "ACTC"
}
```

4 Accounts Service

Account transaction information retrieval strongly resembles the previous versions of IOBWS, although it is adapted from the Berlin Group NextGenPSD2 framework.

When querying information about domestic accounts, there is an option to request information on the allowed credit limit (*withCreditLimitQuery* data element). This matches what Icelandic banks offer as “yfirdráttarheimild”, which refers to an applied overdraft limit. The returned data element is named *creditLimit*, to avoid confusion with the simply-named “Overdraft” used in previous IOBWS versions.

Listing 4.1: Example of information about an account with credit limit

```
{
    "balances":[
      {
        "balanceAmount":{"currency":"ISK", "amount": "1000.00"},
        "balanceType":"interimBooked"
          },
      {
          "balanceAmount":{"currency": "ISK", "amount": "300.00"},
          "balanceType":"interimAvailable"
      },
      {
          "balanceAmount":{"currency":"ISK", "amount": "5300.00"},
          "balanceType": "interimAvailable",
          "creditLimitIncluded": true
      }
    ]
}
```

The definition of the transaction details returned as a list includes elements that are applicable to the broad range of use cases covered by the NextGenPSD2. Table 4.1 has descriptions for the elements that are applicable to the domestic context which might need further explanation.

Table 4.1: Description of transaction details.

Field	Rule	Description
transactionId	Mandatory	Unique identifier for this record.
entryReference	Mandatory	Payment Correlation ID.
endToEndId	Optional	Short description.
currencyExchange	Optional	Returned when the transaction relates to any currency exchange.
bookingDate	Optional	The date when the entry was booked.
valueDate	Mandatory	The date at which assets became available.
transactionAmount	Mandatory	Amount and currency of this record.
creditorId	Optional	Creditor ID or kennitala.
creditorName	Optional	Creditor name.
creditorAccount	Optional	Creditor account.

Field	Rule	Description
creditorAgent	Optional	The Business Identifier Code of the financial institution (BICFI), or other organization identification.
ultimateCreditor	Optional	Ultimate creditor.
debtorName	Optional	Debtor name.
debtorAccount	Optional	Debtor account.
debtorAgent	Optional	The BICFI, Business Identifier Code of the financial institution.
ultimateDebtor	Optional	Ultimate debtor.
remittanceInformationUnstructured	Optional	Payment description visible for both parties.
remittanceInformationStructured	Optional	Array of remittance, though only used currently for the 16 character debtor reference.
additionalInformation	Optional	Additional transaction-related information.
purposeCode	N/A	Not returned, as these codes have currently not been adapted to the uses that the Icelandic purpose code covers. Future Core Banking or Clearing changes might affect this.
bankTransactionCode	N/A	Not currently used for similar reasons to purposeCode.
proprietaryBankTransactionCode	N/A	Not currently used for similar reasons to purposeCode and bankTransactionCode.
balanceAfterTransaction	Optional	Balance after the transaction has been performed.
_links	Optional	Link to transaction details.
transactionTimestamp	Mandatory	Execution datetime of the record.
ultimateCreditorId	Optional	Ultimate creditor kennitala, as applicable.
debtorId	Optional	Debtor kennitala.
ultimateDebtorId	Optional	Ultimate debtor kennitala.
icelandicPurpose	Optional	Returns the text codes used as simple transaction categorization (ic. *textalykill*), with description.

An example of how this would look for a domestic account is provided in listing 4.2. For other examples please refer to the IOBWS YAML schema.

Listing 4.2: Example result of a transaction detail query.

```
{
  "account": {"iban": "IS060537260002062306671449" },
  "transactions":
    {
    "booked":
      [{
      "transactionId": "1234567",
      "creditorName": "Jón Jónsson",
      "creditorAccount": {"iban": "IS67100100101306118605"},
      "transactionAmount": {"currency": "ISK", "amount": "256.67"},
      "bookingDate": "2017-10-25",
      "valueDate": "2017-10-26",
      "remittanceInformationUnstructured": "Example 1"
        },{
         "transactionId": "1234568",
         "debtorName": "LiljaÞÍ Kristjánsdóttir",
         "debtorAccount": {"iban": "IS620511040000171105551489"},
         "transactionAmount": {"currency": "ISK", "amount": "343.01"},
         "bookingDate": "2017-10-25",
         "valueDate": "2017-10-26",
         "remittanceInformationUnstructured": "Example 2"
        }],
    "pending":
      [{
         "transactionId": "1234569",
         "debtorName": "LiljaÞÍ Kristjánsdóttir",
         "debtorAccount": {"iban": "IS620511040000171105551489"},
         "transactionAmount": {"currency": "ISK", "amount": "-100.03"},
         "valueDate": "2017-10-26",
         "remittanceInformationUnstructured": "Example 3"
        }],
    "_links": {"account": {"href": "/v1/accounts/3dc3d5b3-7023-4848-9853-f5400a64e80f"}}
     }
}
```

5 Confirmation of Funds

This service offers functionality to check if funds up to a certain amount are available on a payment account. This can be useful before initiating a payment or account transfer with associated processing overhead.

Table 5.1: Description of confirmation of funds payload.

Field	Rule	Description
account	Mandatory	The account number of the creditor.
instructedAmount	Mandatory	Transaction amount to be checked, as determined to be available by the applicable business rules.

ÍST TS-310 only supports the elements shown in Table 5.1 for confirmation of funds request and consequently applies only to payment accounts. Card accounts are currently not supported and are only included in the OpenAPI schema for compatibility with the source framework. Further business rules on what funds on an account are available might apply per financial institutions and depend on account types. An example of a request for confirmation of funds is shown below.

Listing 5.1: Example result of a confirmation of funds query.

```
{
  "account": {"iban": "IS0605372600020623066711449"},
  "instructedAmount": {"currency": "ISK", "amount": "1234"}
}
```

The answer consists of a boolean value and is only valid at the particular point in time it is returned. A positive answer does not imply or include any reservation of said amount.

Listing 5.2: Example result of a confirmation of funds response.

```
{
  "fundsAvailable": "true"
}
```

6 Payment processing flow

The NextGenPSD2 framework [4] includes a handful of authentication methods that can be combined into authorization flow, mostly geared toward intermediary service providers acting on behalf of end-users. ÍST TS-310 has added an “IOBWS” method for confirming authorization and defining it as the only supported transaction flow when authorizing payments. It deviates from the previous IOBWS standards by separating payment initiation and authorization. This makes it possible for consumers of IOBWS version 3 to implement variations in their business logic through a two-step process: no payments created with an initiation request will be automatically authorized and processed without an explicit confirmation in a later step. The main scenarios supported are: e.g. an immediate authorization after initiation, which will be executed using straight-through processing (STP); as well as a variation of the decoupled flow where the authorization takes place in the UI of the mobile app or online banking Web interface offered by the bank.

To simplify API usage and distinguish the IOBWS approach from e.g. the NextGenPSD2 Decoupled transaction flow, ÍST TS-310 considers the authorization resources associated with a payment initiation to be implicitly created at the time of the original initiation request. This means payments can be directly confirmed without an intermediary step to create an authorization resource, which would trigger straight-through processing for an initiated payment. ÍST TS-310 does not include specific authorization for cancelling payments.

In decoupled IOBWS scenarios, payments would be available for confirmation in the appropriate user interface immediately after initiation. This matches the decoupled SCA method in the NextGenPSD2 framework, but without having to explicitly create the authorization resources. The end result also closely aligns with how most banks handle similar cases in support of earlier IOBWS versions.

Figure 6.1 shows an example of an accounting system using the IOBWS flow. The system would use OAuth 2.0 Client Credentials Grant Flow and authenticate itself over the transport using mutual TLS (mTLS) with an eIDAS compliant certificate, identifying the legal entity or person the system is representing. Certificates issued by Auðkenni ehf. under the “Traustur búnaður” intermediary issuing certificate are supported by all IOBWS service providers.

The first initiation would receive a response in line with the one below, with the header ASPSP-SCA-Approach containing the method “IOBWS”.

Listing 6.1: Example of a response containing a link to the confirmation resource.

```
{
  "transactionStatus": "RCVD",
  "paymentId": "1234-b2b-983",
  "_links":
    {
      "self": {"href": "/v1/payments/claim-payments/1234-b2b-983"},
      "status": {"href": "/v1/payments/1234-b2b-983/status"},
      "scaStatus":": {"href": "/v1/payments/1234-b2b-983/authorisations/123auth456"},
      "confirmIobwsStraightThroughProcessingAuthorisation": {"href": "/v1/payments/1234-b2b
          -983/authorisations/123auth456"}
    }
}
```

Confirmation of the payment initiation is a PUT update to the authorization resource, using the “iobwsAuthorisationConfirmation” type. The confirmation message is an optional description that can potentially be used by service implementors for display in a UI available to users, e.g. for decoupled authorizations to communicate the method used to approve these payments.

Listing 6.2: Example of an IOBWS authorisation confirmation,

```
{
  "confirmationMessage": "Confirmed by the automatic ERP system."
}
```

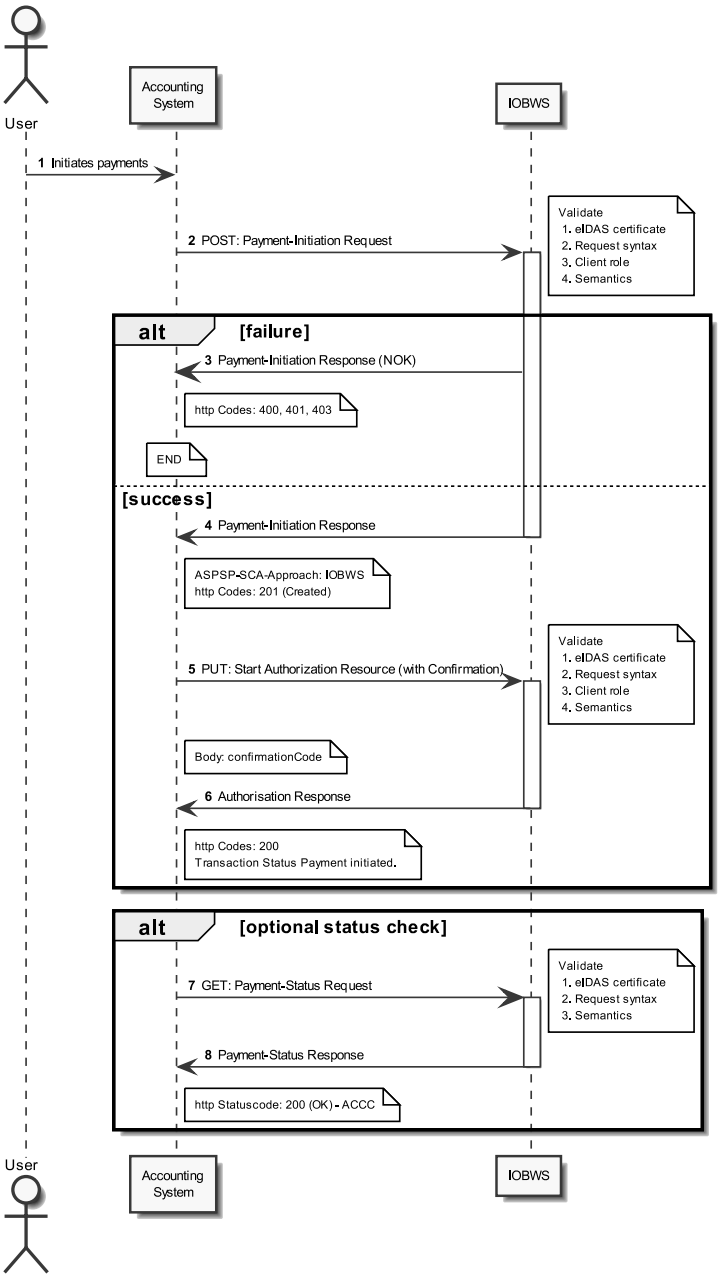

Figure 6.1: IOBWS authorization flow with confirmation

The response to the confirmation is shown below:

Listing 6.3: Example of authorisation confirmation return.

```
{
  "scaStatus": "finalised",
  "_links":{
    "status":  {"href":"/v1/payments/claim-payments/1234-b2b-983/status"}
  }
}
```

Optionally, the links provided can be used to check the status of payments, resulting in the response below. The transaction status “ACCC” stands for “AcceptedSettlementCompleted” in the case when both debtor and creditor accounts have been settled. As mentioned before, the full range of codes are available and could potentially apply.

Listing 6.4: Example of a payment status query response.

```
{
"transactionStatus": "ACCC"
}
```

7 Appendix

7.1 Mapping from older implementations

The ISO 20022 data model uses different terms than the previous versions of IOBWS. The following sections contain a non-authoritative guide on mapping the older implementations to the new version of IOBWS.

7.1.1 Payments

Payments is the IOBWS 2.0 bulk entity, containing the same child *Payment* data entities that can be used to issue individual payments.

Entity/Element	Equivalent data element	Comment
RollbackOnError	*No equivalent.*	Bulks are executed as a whole and not rolled back, but individual errors reported on each payment in the results.
IsOneToMany	batchBookingPreferred	
DateOfForwardPayment	requestedExecutionDate	
NameOfBatch	paymentInformationId	

7.1.2 Payments Out

Encapsulates the debtor side of the payment transfer in the previous version, for a single payment or child payments in a payment bulk.

Entity/Element	Equivalent data element	Comment
Account	debtorAccount > iban	The withdrawal should reference the IBAN number of the debtor account owner.
AccountOwnerID	debtorId	
CategoryCode	icelandicPurposeCode	
Reference	remittanceInformationStructured	
BillNumber	endToEndIdentification	
Receipt	*No equivalent.*	
SecurityCode	*No equivalent.*	Strong authentication replaces this as a security mechanism.

7.1.3 Payments In

Encapsulates the credit side of the payment transfer.

Entity/Element	Equivalent data element	Comment
ABGiro		See subsection 7.1.4.
CGiro		See subsection 7.1.5.
Claim		See subsection 7.1.6.
Transfer		See subsection 7.1.8.
Amount	instructedAmount	
Receipt	*No equivalent*	
Description (sic)	remittanceInformationUnstructured	
BookingID	instructionIdentification	

7.1.4 ABGiro

The *AB-Giro* data entity represented an AB-giro target in the previous version.

Entity/Element	Equivalent data element	Comment
Account	creditorAccount > bban	As in the older schemas, AB Giro is identified with a BBAN number.
Reference	*No equivalent*	Usually used for debtorId, which is now a separate field.
BillNumber	endToEndIdentification	
CategoryCode	icelandicPurposeCode	

7.1.5 CGiro

The *C-Giro* data entity represented a C-giro target in the previous version.

Entity/Element	Equivalent data element	Comment
Account	creditorAccount > bban	As in the older schemas, C Giro is identified with a BBAN compliant number.
AccountOwnerID	creditorId	
BillNumber	endToEndIdentification	
CategoryCode	icelandicPurposeCode	

7.1.6 Claim

The *Claim* data entity represented a request-to-pay instrument (ic. innheimtukröfu) in the previous version.

Entity/Element	Equivalent data element	Comment
Account		See data element Table 2.2.
Claimant		See Table 2.2.
PayorID	ultimateCreditorId	The creditor could be another party than the *kröfugreiðandi* entity whose *kennitala* is sometimes used as part of the claim key.
DueDate		See Table 2.2.
IsDeposit	partialPayment	

7.1.7 Bond

The *Bond* data entity represented a bond (ic. skuldabréf/víxill) in the previous version.

Entity/Element	Equivalent data element	Comment
Account	creditorAccount > bban	As in the older schemas, bonds are identified with a BBAN compliant number.
PayorID	ultimateCreditorId	The creditor could potentially be another party than the *kennitala* set as the payee of the bond.
DueDate	*No equivalent.*	

7.1.8 Transfer

The *Transfer* data entity represented the target for account-to-account transfers in the previous version.

Entity/Element	Equivalent data element	Comment
Account	creditorAccount > bban	The target account can be identified with a BBAN compliant number or full IBAN.
AccountOwnerID	creditorId	
CategoryCode	icelandicPurposeCode	
Reference	*No equivalent*	Usually used for debtorId, which is now a separate field
BillNumber	endToEndIdentification	

7.2 Domestic adaptations of the NextGenAPI framework

As mentioned, one of the guiding principles for ÍST TS-310 was to make the specification for domestic payments and accounts easy to compare against the original Berlin Group NextGenPSD2 document, as well as future versions. However, the OpenAPI definition in the first iteration of version 3.0 involved cards and currencies, making the overall contract even more complex than the original. The base then referenced NextGenPSD2 version 1.3.6. Though it was desirable to upgrade to 1.3.8, it turned out to be a considerable task. To facilitate maintenance of the specification throughout minor version updates, as well as simplify implementations of IOBWS, the cards and currencies APIs were split into their own separate contracts, and the domestic adaptations were reworked on top of an intact version 1.3.6. This approach was validated by upgrading to NextGenPSD2 version 1.3.8 without undue difficulties.

To make it even easier to do, see the deltas in e.g. text comparison tools, localized version of the source NextGenPSD2 API specifications are located in the appropriate “Stuðningsefni/Berlin-group/v.1.3.8” folder. Alongside that document, an intermediary document was created with some of the most common and repeated adaptations. The relationship between these documents looks like the following, though the actual filenames are longer:

> psd2-api 1.3.8 <|– psd2-api 1.3.8 localized <|– IOBWS3.0.yaml

The ‘localized’ document makes comparison in the final IOBWS3.0.yaml more transparent. The following sections show the breakdown of *all adaptations* made for Icelandic payments and accounts:

7.2.1 The localized file

Changes between “psd2-api 1.3.8 2020-12-14v2.yaml” and “psd2-api 1.3.8 2020-12-14v2-localized.yaml” (see Stuðningsefni/Berlin-group/v.1.3.8).

- Tag “Common Services” was removed completely, both the definition and all usage in Tags.
- Tags on Consents services changed from “Account Information Service (AIS)” to “Consent Service”.
- “Signing Baskets (SBS)” Tag renamed to “Signing Baskets Service (SBS)”.

7.2.2 The IOWBS3.0 specification document

Changes between “psd2-api 1.3.8 2020-12-14v2-localized.yaml” and “IOBWS3.0.yaml” (see final in /Deliverables).

Services:

- Path: “/v1/accounts”
  - Query Parameter: WithCreditLimitQuery - added
  - Header Parameter: ConsentId changed from Required to Optional
- Path: “/v1/accounts/{account-id}”
  - Query Parameter: WithCreditLimitQuery - added
  - Header Parameter: ConsentId changed from Required to Optional
- Path: “/v1/accounts/{account-id}/balances”
  - Header Parameter: ConsentId changed from Required to Optional
- Path: “/v1/accounts/{account-id}/transactions”
  - Header Parameter: ConsentId changed from Required to Optional

- Path: “/v1/accounts/{account-id}/transactions/{transactionId}”
  - Header Parameter: ConsentId changed from Required to Optional
- Path: “/v1/card-accounts”
  - Query Parameter: WithCreditLimitQuery - added
  - Header Parameter: ConsentId changed from Required to Optional
- Path: “/v1/card-accounts/{account-id}”
  - Query Parameter: WithCreditLimitQuery - added
  - Header Parameter: ConsentId changed from Required to Optional
- Path: “/v1/card-accounts/{account-id}/balances”
  - Header Parameter: ConsentId changed from Required to Optional
- Path: “/v1/card-accounts/{account-id}/transactions”
  - Header Parameter: ConsentId changed from Required to Optional
- Path: “/v1/{payment-service}/{payment-product}”
  - Only json, domestic types listed as ‘oneOf’ the accepted products
  - Header Parameter: Idempotency-Key - added

Components:

- paymentInitiation:
  - oneOf:
    - #/components/schemas/paymentInitiationDomestic_json - added
    - #/components/schemas/periodicPaymentInitiationDomestic_json - added
    - #/components/schemas/bulkPaymentInitiationDomestic_json - added
- accountDetails
  - creditLimit - added
- transactions:
  - transactionTimestamp - added
  - description - added
  - ultimateCreditorId - added
  - debtorId - added
  - ultimateDebtorId - added
  - icelandicPurpose - added
- cardTransaction:
  - posEntryMode - added

Schema types added for domestic payments and account information:

- ultimateDebtorId
- ultimateCreditorId
- partialPayment

- posEntryMode
- bank
- transactionFeesList
- transactionFeesDetail
- icelandicPurpose
- icelandicPurposeCode
- centralBankPurposeCode
- bicfiOrIdentification

Request bodies added for Domestic objects:

- paymentInitiationDomestic_json
- periodicPaymentInitiationDomestic_json
- bulkPaymentInitiationDomestic_json
- paymentInitiationBulkElementDomestic_json
- iobwsAuthorisationConfirmation
- paymentInitiationPaymentIdResponse-200_json
- *Response bodies added for Domestic objects:*
- paymentInitiationDomesticWithStatusResponse
- periodicPaymentInitiationDomesticWithStatusResponse
- bulkPaymentInitiationDomesticWithStatusResponse
- bulkPaymentInitiationElementDomesticError
- bulkPaymentInitiationElementDomesticWithStatus

See YAML for various examples added to demonstrate use of Domestic objects.

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