Íslenskir staðlar

Tækniforskrift - Erlendar greiðslur

Technical Specification - Foreign payments

Íslenskir staðlar

ÍST TS 313:2022

Participants in TN-FMÞ Financial services (is. Fjármálaþjónusta) during the development of the ÍST TS 313 Foreign payments documents, and ÍST Workshop VH-8 during the 2022 revision.

Name	Company	Name	Company
Árni Geir Valgeirsson	Íslandsbanki	Jóhannes Þór Ágústarson	Íslandsbanki
Ásgeir Halldórsson	Debitum - Gjaldskil	Kristinn Stefánsson	Arion banki
Ásgeir Helgi Jóhannsson	Ekkibanki, Atlas lögmenn	Kristján Theódór Sigurðsson	Arion banki
Atli Guðmundsson	Rapyd, Kortaþjónustan	Markús Guðmundsson	Unimaze
Bergljót Kristinsdóttir	ICEPRO	Ólafur Eiríksson	Landsbankinn
Bjarni Þór Pálsson	RB	Ólafur Tryggvason	Advania
Björgólfur G Guðbjörnsson	Origo	Sigrún Gunnarsdóttir	WISE
Eiríkur Gestsson	Creditinfo	Sigurður Gauti Hauksson	Alskil
Gísli Konráð Björnsson	Landsbankinn	Sigurður Másson	Advania
Guðjón Karl Arnarson	RB	Sigurvin Frank Garðarsson	Íslandsbanki
Guðmundur Jón Halldórsson	CTL	Sigurvin Sigurjónsson	KPMG
Halldór Vagn Hreinsson	Landsbankinn	Snorri Karlsson	Íslandsbanki
Halldór Pétursson	Fjármálaeftirlitið	Steinar Þorbjörnsson	Arion banki
Hermann Snorrason	Landsbankinn	Styrmir Kristjánsson	Independent
Hjálmar Brynjólfsson	Seðlabanki Íslands	Sveinn G. Gunnarsson	Landsbankinn
Hrannar Már Hallkelsson	Arion banki	Védís Ingólfsdóttir	Arion banki
Ingveldur Lárusdóttir	Landsbankinn	Védís Sigurðardóttir	Landsbankinn

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Foreword

This ÍST Technical Specification was developed in accordance with "ÍST Reglur um tækniforskriftir, tækniskýrslur og vin-nustofusamþykktir" (*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 standardisation) following a public call for participation within TN-FMÞ. The final draft was sent to the TN-FMÞ on the 2022-01-XX and approved by correspondence on the 2022-03-XX. The text of ÍST TS-313 was submitted to IST for publication on 2022-03-YY.

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-313.

The document "ÍST TS 313_2022 Foreign payments.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. 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 ongoing monitoring of submitted issues or pull requests made to the repository, which fall outside the permit 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-313 was primarily funded by Íslandsbanki, Arion Banki and Landsbankinn, with participation by Alskil hf, Eignaumsjón hf, Payday ehf, Wise lausnir ehf and Seðlabanki Íslands.

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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-313, but this does not guarantee, either explicitly or implicitly, its correctness. Users of ÍST TS-313 should be aware that neither the TN-FMÞ nor ÍST can be held liable for damages or losses of any kind whatsoever which may arise from its application. Users of ÍST TS-313 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 foreign payments.

Previous versions of IOBWS, released in 2007 and 2013 respectively, used the most recent OASIS SOAP standards 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, to act on behalf of the customers and with full access to their data.

Most of the banks offered comparable web services for foreign payments and associated transactions but until the work on the IOBWS version 3.0 started, a common specification had not been in scope for the IOBWS work. As the underlying cross-border payment mechanisms are quite similar, the TN-FMÞ decided this time around to include payment functionality and the associated account and transaction information retrieval in the form of this shared specification.

The participants in the TN-FMÞ reviewed existing and emerging specifications in the global or mostly European financial industry to look for ways to merge the various domestic schemas with a more widely adopted framework.

The Open Banking regulation in the UK and 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 met a broad acceptance in the EEA. The data model references ISO 20022 [2] and is close enough to the direction of the Icelandic market to make it relatively straightforward to adapt it as the new base for the IOBWS, instead of continuing to maintain an independent linage of API specifications.

Another goal of the IOBWS version 3 charter set forth by TN-FMÞ and achieved by adopting the NextGenPSD2 Framework is the transition from SOAP to a REST-like API 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 fore after the release of the previous IOBWS versions.

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1 Scope

ÍST TS-313 defines web application programming interfaces implemented by Icelandic commercial and savings banks to expose shared functionality and information for foreign payments, under the auspices of the Icelandic Online Banking Web Services (IOBWS).

Other ÍST Technical Specifications exist that 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 approach in ÍST TS-313 is to focus on the domestic adaptations to the relevant parts of the NextGenPSD2 framework, and the information needed to tie that to earlier IOBWS versions or other such implementations, and even the Core Banking systems involved.

The intended audience for the specification document ÍST TS-313 is the implementors of banking services as well as of those 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 the banks in question as they can involve service agreements and the end customers' contractual preferences and benefits.

Consequently, the ÍST TS-313 specification avoids the unnecessary repetition of information found in the technical contract IOBWS3.0.yaml. Instead, the rest of the document focuses on the essential information needed to understand the domestic context of services, schema types and service flows in relation to the NextGenPSD2 framework, and what constitutes the common core required to implement ÍST TS-313.

2 Normative references, definitions, and symbols

2.1 Normative references

The following documents are referred to in ÍST TS-313 as part of their content constitutes the requirements of this document. Only the edition cited applies if newer editions exist.

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 harmonisation 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 pure technical standardisation body, focusing on detailed technical and organisational 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, 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-313 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.

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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 linage 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** to be used by Payment Instrument Issuing Service Provider (PIISP) TPP a 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**). The end-user of payment services, and customer of the bank in the IOBWS context.

– **Strong Customer Authentication** (**SCA**), refers in the scope of PSD2 to an authentication mechanism based on the use of two or more elements that are independent, so 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**) is referenced in the OpenAPI specification reflecting the PSD2 background when the client system is initiating operations or requesting information on behalf of the end-consumer.

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 the 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 Holders Kennitala
Description	IS	2 digits	2 digits	2 digits	2 digits	6 digits	10 digits
Example	IS	14	01	59	26	007654	5510730339

3 Implementation

3.1 Service Overview

When the decision was made by TN-FMÞ-VH-1 on Business Requirments and TN-FMÞ-VH-2 on Technical Requirements, to adopt the NextGenPSD2 framework the intant was to stay as true to the original specification as possible.

However, not unlike 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 so 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 still remained opaque for those migrating from earlier IOBWS versions so more transparancy was needed.

Workgroup TN-FMÞ-VH-8 was therefore charged with revising the 3.0 version of IOBWS. The group tried to address two primary concerns; Clarify how the foreign payments products fit into NextGenPSD2 as well as simplifying comparison against later releases by the Berlin Group. The result should additionally make it straightforward to adapt future updates and consider replacing current domestic adaptations in the IOBWS with newer NextGenPSD2 data elements.

The decision made by the TN-FMÞ-VH-8 was therefore to keep most of the original NextGenPSD2 OpenAPI definition intact, even those services and types that are not currently applicable to the Icelandic context or intended uses of the IOBWS. The foreign payments 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 along with 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 list the implications for the OpenAPI YAML contract. It contains the Constents and Signing Basket services, as removing or commenting those out would have had a high impact on the contract structure. They will, however, not be implemented as part of this specification, though this does not preclude their use in other contexts.

Table 3.1: Service support in ÍST TS-313.

Payment Initiation Service (PIS)	Supported by all implementors of TS-313 in accordance with the specification (see later notes on Periodic Payments).
Account Information Service (AIS)	Supported by all implementors of TS-313 in accordance with the specification.
Confirmation of Funds Service (PIIS)	Supported by all implementors of TS-313, in accordance with the specification.
Consent Service	Explicitly not part of the TS-313 specification, but included for comparison and compatability with the NextGenPSD2 OpenAPI contract.
Signing Baskets Service (SBS)	Explicitly not part of the TS-313 specification, but included for comparison and compatability with the NextGenPSD2 OpenAPI contract.

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3.2 Payment Initiation Service

3.2.1 Overview

The foreign payments products supported by ÍST TS-313 are as shown in table 3.2 below. All those are defined as JSON objects, and other payment types are not supported by the specification.

Variations in procedures for foreign payments will apply within each bank e.g. concerning routing or acceptance flows. Accordingly, service consumers should expect all of the available payment processing statuses to apply per the specification.

Table 3.2: Foreign payment products.

SEPA - Credit Transfers	Payments using the Single European Payment Area Credit Transfer (SEPA) schema.
Cross-Border - Credit Transfers	Cross Border Payments, using the Society for Worldwide Interbank Financial Telecommunication (SWIFT) Network.

For each of the payment products, the support for payment services is given in table 3.3. At this time, behaviour for periodic payments is not supported by the ÍST TS-313 for foreign payments.

Table 3.3: Availability of payment service.

payments	Supported by all implementors of TS-313 in accordance with the specification, for domestic adaptation of foreign payment products.
bulk-payments	Supported by all implementors of TS-313 in accordance with the specification, for domestic adaptation of foreign payment products.
periodic-payments	Explicitly not part of the TS-313 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 under scope for ÍST TS-313. The schema type *paymentInitiationDomestic_json* should be used to define JSON data instances.

Table 3.4: Data elements for foreign payments.

Data Element	SEPA - Credit Transfers	Cross-Border - Credit Transfers
endToEndIdentification	N/A	N/A
instructionIdentification	Optional	Optional
debtorAccount	Mandatory	Mandatory
debtorId	N/A	N/A
chargesAccount	Optional	Optional

Data Element	SEPA - Credit Transfers	Cross-Border - Credit Transfers
ultimateDebtor	N/A	N/A
ultimateDebtorId	N/A	N/A
instructedAmount	Mandatory	Mandatory
creditorAccount	Mandatory	Mandatory
creditorAgent	N/A	Optional
creditorAgentAddress	N/A	Optional
creditorName	Mandatory	Mandatory
creditorId	N/A	N/A
creditorAddress	Optional	Mandatory
ultimateCreditor	N/A	N/A
ultimateCreditorId	N/A	N/A
icelandicPurposeCode	N/A	N/A
chargeBearer	Optional	Optional
remittanceInformationUnstructured	Optional	Optional
remittanceInformationStructured	N/A	N/A
requestedExecutionDate	N/A	N/A
partialPayment	N/A	N/A
serviceLevel	N/A	Optional
centralBankPurposeCode	Mandatory	Mandatory

To elaborate on the use of particular attributes the following table 3.5 contains additional information on top of the schema definitions. Notes on individual data elements or usage patterns follow in the subsections. Should further information be required, consult the matching section in the ÍST TS-310 on Domestic Payments specification.

Table 3.5: Detailed description of ÍST TS-313 payments properties.

Field	Description
centralBankPurposeCode	An element mandated by the Central Bank of Iceland, using a domestic coding schema that does not match any of ISO 20022 references such as the ExternalPurpose1Code used used by the purposeCode element available in the NextGenPSD2 framework, but not used by ÍST TS-313.

Field	Description
serviceLevel	Applies to SWIFT Payments and is constrained by ISO 20022 ExternalServiceLevel1Code. However only URGP is suggested for use by domestic banks, which means payment will be executed as an urgent transaction cleared through a real-time gross settlement system, which is typically identified as a wire or high value transaction. The use might be further constrained and it is therefore reccomended to consult the product documentation specific to each bank and its implementation of ÍST TS-313.

3.3 Bulk Payments

Bulk payments are supported for all ÍST TS-313 payment types. For a bulk payment all collected payments shall be based on the same payment product and initiated from the same debtor account, consistent with the approach of the NextGenPSD2 framework for native bulk types. The *bulkPaymentInitiationDomestic_json* schema type should be used for the top level bulk initiation according to ÍST TS-313 and the *paymentInitiationBulkElementDomestic_json* type for the child payments contained in an array on the parent.

No debtor or charge accounts should be specified on child bulk payment elements, as batch booking applies to all cross-border payment bulks with the implication that there is only one withdraval on the deptor side.

Table 3.6: Description of domestic bulk payment main body.

Data Element	Type	Condition	Description
batchBookingPreferred	Boolean	N/A	All foreign payments are implicitly processed as bulk payments, so this element should no be included or set to true.
debtorAccount	Account Reference	Mandatory	No child payments may contain a debtor account, only this top parent bulk element.
paymentInformationId	Max35Text	Optional	Unique identification assigned by the sending party to unambiguously identify this bulk. Replaces **NameOfBatch** in IOBWS 2.0 and 3.0, 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	N/A	Not applicable to foreign payments.

Data Element	Type	Condition	Description
payments	Bulk Entry	Mandatory	The Bulk Entry is a JSON Type which mirrors the supported domest payment products for single payments, excluding the data elements: debtorAccount, requestedExecutionDate and chargesAccount.
chargesAccount	Account Reference	Optional	Set if fees applicable to foreign payments should be debited to another account than the debtorAccount.

4 Accounts Service

The way account transaction information is retrieved bears strong similarities to the previous versions of IOBWS while adapted from the Berlin Group NextGenPSD2 framework.

When querying information about domestic accounts, there exists an option to additionally 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 assocciated the simply named "Overdraft" used in previous IOBWS versions.

Listing 4.1: Example of information about a currency account.

```
1   {
2     "balances":
3        [{"balanceAmount": {"currency": "EUR", "amount": "500.00"},
4          "balanceType": "closingBooked",
5          "referenceDate": "2017-10-25"
6             },
7          {"balanceAmount": {"currency": "EUR", "amount": "900.00"},
8          "balanceType": "expected",
9          "lastChangeDateTime": "2017-10-25T15:30:35.035Z"
10           }]
11   }
```

The definition of the transaction details returned as a list, includes elements that are applicable to the relatively broad range of use cases the NextGenPSD2 covers. In table 4.1 the elements that are applicable to the domestic context and might need further explanation are given further description.

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.
creditorAgent	Optional	The BICFI, Business Identifier Code of the financial institution, or other organization identification.
ultimateCreditor	Optional	Ultimate creditor.
debtorName	Optional	Debtor name.

Field	Rule	Description
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 used currently for similar reasons as purposeCode.
proprietaryBankTransactionCode	N/A	Not used currently, similar to the previous 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 currency 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.

```
 1   {
 2   "account": {"iban": "IS0605372600020623066711449"},
 3    "transactions":
 4      {"booked":
 5        [{
 6          "transactionId": "1234567",
 7          "creditorName": "John Miles",
 8          "creditorAccount": {"iban": "DE67100100101306118605"},
 9          "transactionAmount": {"currency": "EUR", "amount": "-256.67"},
10          "bookingDate": "2017-10-25",
11          "valueDate": "2017-10-26",
12          "remittanceInformationUnstructured": "Example 1"
13        },{
14          "transactionId": "1234568",
15          "debtorName": "Paul Simpson",
16          "debtorAccount": {"iban": "NL76RABO0359400371"},
17          "transactionAmount": {"currency": "EUR", "amount": "343.01"},
18          "bookingDate": "2017-10-25",
19          "valueDate": "2017-10-26",
20          "remittanceInformationUnstructured": "Example 2"
21        },{
22          "transactionId": "1234569",
23          "debtorName": "Pepe Martin",
24          "debtorAccount": {"iban": "SE9412309876543211234567"},
25          "transactionAmount": {"currency": "EUR", "amount": "100"},
26          "bookingDate": "2017-10-25",
27          "valueDate": "2017-10-26",
28          "remittanceInformationUnstructured": "Example 3"
29        }],
30      "pending":
31        [{
32          "transactionId": "1234570",
33          "creditorName": "Claude Renault",
34          "creditorAccount": {"iban": "FR7612345987650123456789014"},
35          "transactionAmount": {"currency": "EUR", "amount": "-100.03"},
36          "valueDate": "2017-10-26",
37          "remittanceInformationUnstructured": "Example 4"
38        }],
39      "_links": {"account": {"href": "/v1/accounts/3dc3d5b3-7023-4848-9853-f5400a64e80f"}}
40      }
41   }
```

5 Payment processing flow

The NextGenPSD2 framework [4] includes a handful of authentication methods that can be combined into authorisation flow mostly geared towards intermediary service providers acting on behalf of end-users. ÍST TS-313 addresses the needs of IOBWS by adding an "IOBWS" method for confirming authorisation and defining that as the only supported transaction flow when authorising payments. It deviates from what was supported in the previous IOBWS standards by separating payment initiation and authorisation. 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 authorised and processed without an explicit confirmation in a later step. The main scenarios supported are e.g. an immediate authorisation after initiation which will be executed using straight-through processing (STP), as well as a variation of the decoupled flow where the authorisation takes place in the UI of the mobile app or online banking Web interface offered by the bank.

To simplify the usage of the APIs and to distinguish the IOBWS approach from e.g. the NextGenPSD2 Decoupled transaction flow, ÍST TS-313 considers the authorisation 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 authorisation resource, which would then trigger straight-through processing for an initiated payment. ÍST TS-313 does not include specific authorisation 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 authorisation resources. The end result also closely aligns with how most banks handle similar cases in support of earlier IOBWS versions.

In fig. 5.1 an example of accounting system is shown 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 it is representing. Certificates issued by Auðkenni ehf. under the "Traustur búnaður" intermediary are the common denominator supported by all IOBWS service providers.

The first initiation would receive a response in line with the one below, and the header ASPSP-SCA-Approach contains the method "IOBWS".

Listing 5.1: Example of a response containing a link to the confirmation resource.

```
1   {
2     "transactionStatus": "RCVD",
3     "paymentId": "1234-b2b-983",
4     "_links":
5       {
6         "self": {"href": "/v1/payments/cross-border-credit-transfers/1234-b2b-983"},
7         "status": {"href": "/v1/payments/1234-b2b-983/status"},
8         "scaStatus":": {"href": "/v1/payments/1234-b2b-983/authorisations/123auth456"},
9         "confirmStraightThroughProcessingAuthorisation": {"href": "/v1/payments/1234-b2b-983/
              authorisations/123auth456"}
10      }
11   }
```

The confirmation of the payment initiation takes the form a PUT update to the authorisation resource, using the "iobwsAuthorisationConfirmation" type. The confirmation message is an optional description that might potentially be used by service implementors for display in a UI available to users e.g. for decoupled authorisations, to communicate the method used to approve these payments.
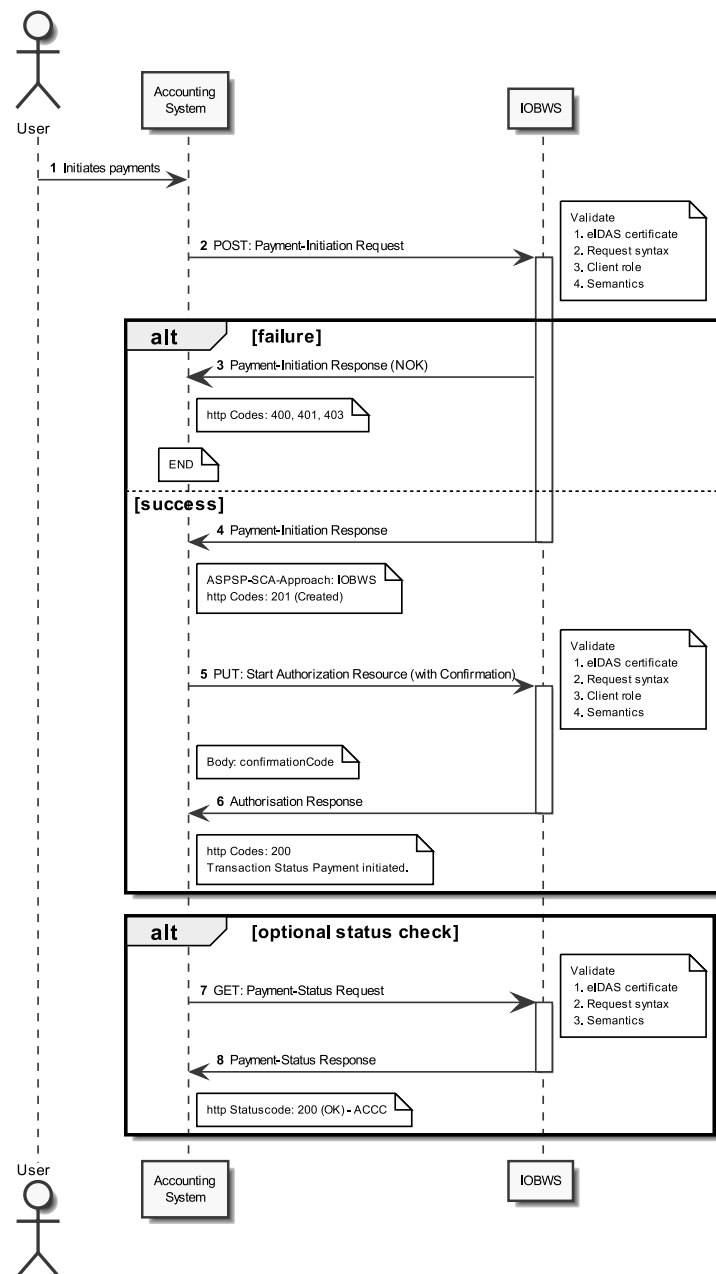
Figure 5.1: IOBWS authorisation flow with confirmation

Listing 5.2: Example of an IOBWS authorisation confirmation,

```
1  {
2    "confirmationMessage": "Confirmed by the automatic ERP system."
3  }
```

The response to the confirmation is shown below:

Listing 5.3: Example of authorisation confirmation return.

```
1  {
2    "scaStatus": "finalised",
3    "_links":{
4      "status":  {"href":"/v1/payments/cross-border-credit-transfers/1234-b2b-983/status"}
5    }
6  }
```

Optionally the links given can be used to check the status of payments As foreign payments are unilateral or one-sided credit transfers, the transaction status expected is "ACSC", which stands for "AcceptedSettlementCompleted", indicating the debtors accounts has been settled. However, as mentioned before the full range of codes are available and could potentially apply.

Listing 5.4: Example of a payment status query response.

```
1  {
2  "transactionStatus": "ACSC"
3  }
```

6 Error reporting and handling

The NextGenPSD2 framework [4] has an opinionated approach to error

Bibliography

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

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

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

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

[5]   Lög 114/2021. *Lög um greiðsluþjónustu*.

[6]   Lög 55/2019. *Lög um rafræna auðkenningu og traustþjónustu fyrir rafræn viðskipti*.

[7]   Semver 2.0.0. *Semantic Versioning Specification*.

[8]   EU 2015/2366. *Directive of the European Parliament and of the Counci on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC.*

[9]   EU 910/2014. *Regulation of the European Parliament and of the Council of on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC.*