



CHES Replacement Project

Connectivity & Integration
Working Group

19 February 2020

Important Information – Competition Law Policy

Working group members are reminded to have regard to their obligations under competition law. In particular, please note recent changes to the Competition and Consumer Act to prohibit a corporation from engaging with one or more persons in a concerted practice that has the purpose, effect or likely effect of substantially lessening competition.

Agenda

> CDE Updates

> Connectivity Updates

> API Contracts

> ISO 20022 XML Message Signing

> ITE Order Forms

> Q&A

> Next Working Groups

CDE Update

CDE 6 – Functional Release

The sixth release of functional code drop is targeted for end of February 2020

It will include the following functional drops;

- **Batch Settlement**
 - Settlement Fails & Primary Market Facility
- **Collateral Management (ETO and CMM)**
- **Corporate Action Processing**
 - Takeovers and Buybacks, Reconstructions, Rights, Holdings Adjustments, Bonus and Dividend

*Noting Diary Adjustments scheduled for CDE7

CDE 6 – New Testing Features

Static Configuration

- New Corporate Event IDs & option numbers to support the testing of takeovers & buy backs along with a new UIC to support the role of offeror.
- New security codes for reconstructions 'xxxDA', rights 'yyyR' and 'zzzBN' processing.
- New CA events for dividends, bonus, renounceable rights issues, reconstructions, take over codes, buy backs (equal access)

Auto-responders

- Auto-responder for Collateral Management (CMM and ETO) supporting both pledges and removals.

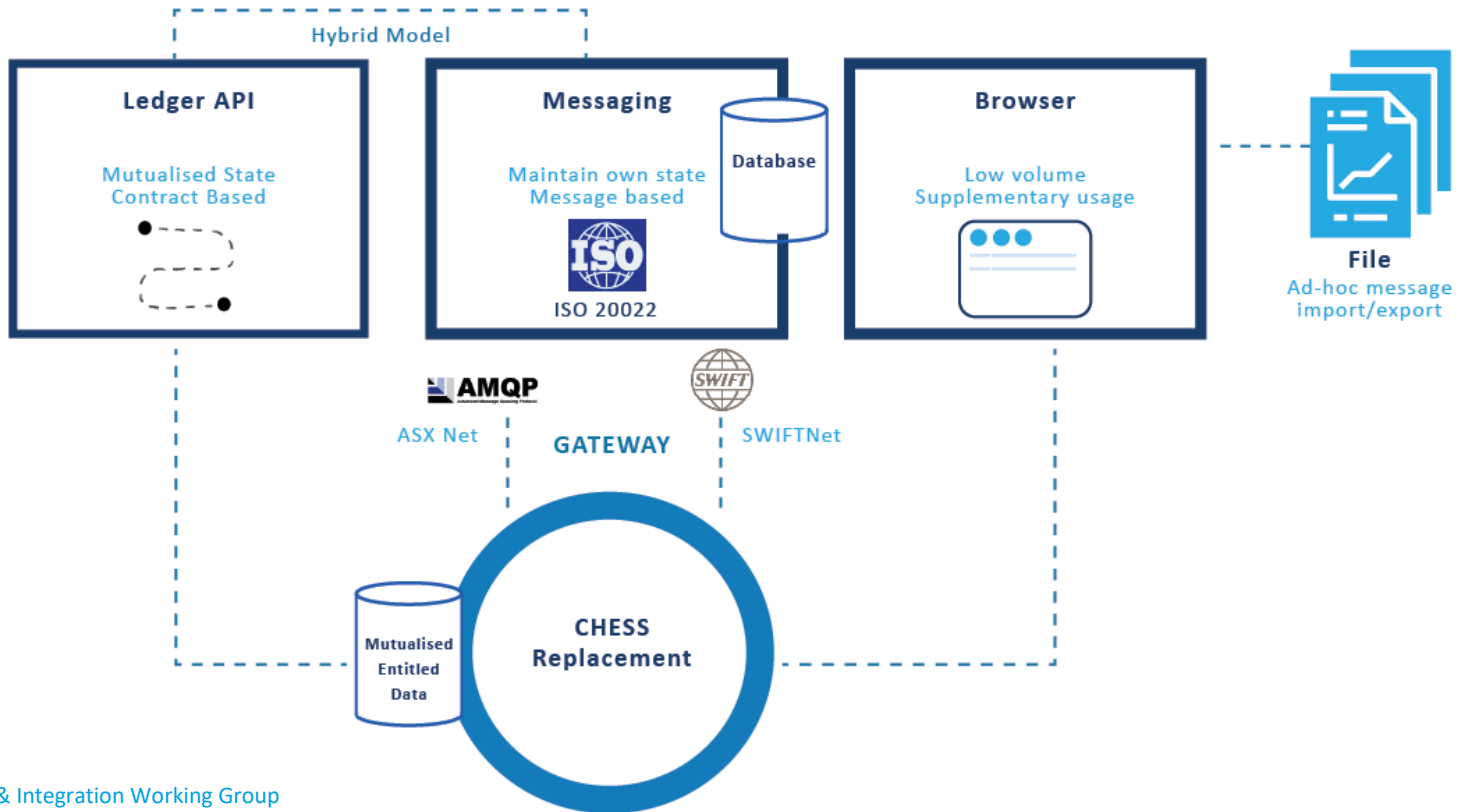
Self Serve tools

- Holding adjustments to support the generation of the hold_226 (subset of reason codes).
- Allows a settlement participant to generate holding adjustments if they have been initiated from a Share Registry
- Will use the same mechanism as trade inject using the same URL with a different service.

```
curl -iv --cacert ./cert_from_server.pem --key ./cde000.pk.key --cert ./cde000.pub.cer "https://cde-trade-  
ingest.asx.com.au:5000/xmlIngest/hold226" -H "accept: application/json" -H "Content-Type: multipart/form-data" -F  
"file=@test_hold216_1_repeat_regref_optional.csv"
```

Connectivity Updates

Connectivity Overview

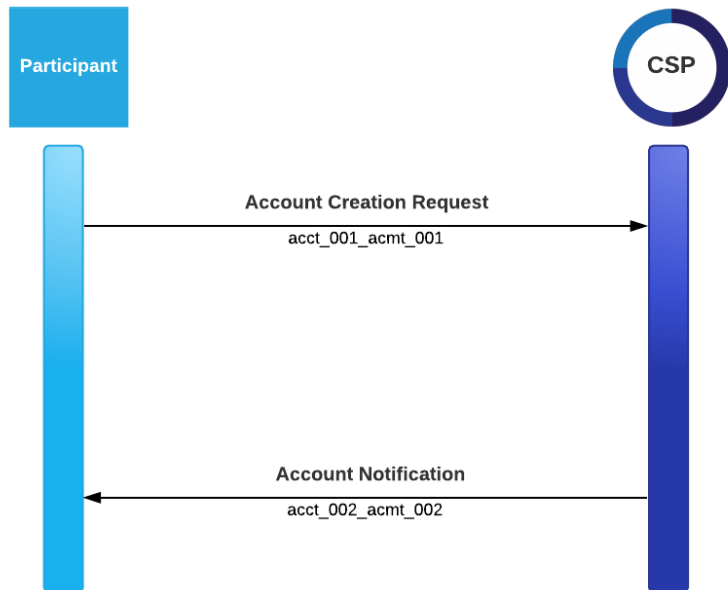


API Contracts

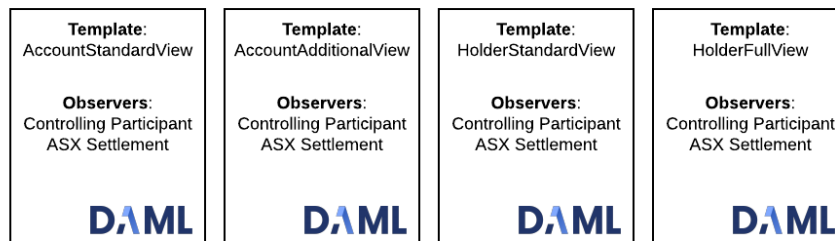
API Contracts: Overview

- The CSP stores data within a DAML Contract on the CHESSE Replacement distributed ledger, which are used to perform transactions and communicate between CHESSE Users
- A DAML Contract has the following attributes:
 - Permissions:
 - Signatory: ASX Settlement (Operator)
 - Observers: A party with the ability to view data on the DAML Contract
 - Choices: An action which can be performed on a DAML Contract. When a choice is exercised on a DAML Contract, the DAML Contract is progressed through the pre-defined workflow
- Unlike traditional databases, all data contained within a DAML Contract is able to be viewed by all Observers. Private data or data that cannot be shared between Observers must be stored as separate DAML Contract
- A DAML Contract is created as a result of an action performed by a CHESSE Users, ASX Operations or the CSP. The workflow for each DAML Contract is pre-determined
- Updating of attributes stored in a DAML Contract results in the contract being archived and a new DAML Contract being created with the updated values
- When a DAML Contract has completed its workflow, the contract is archived

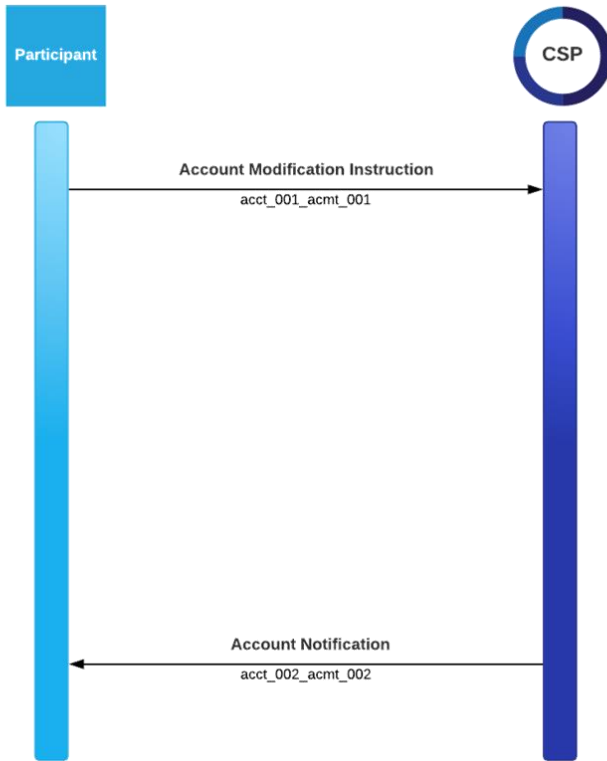
API Contracts: Example (Account and Holder Creation)



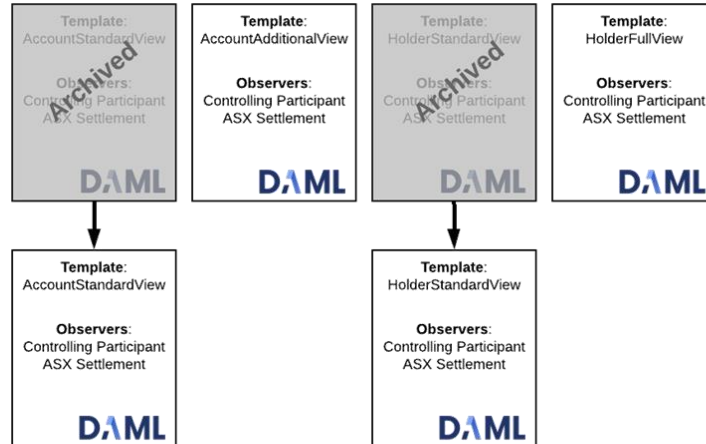
API Contracts



API Contracts: Example (Account and Holder Modification)



API Contracts



API Contracts: Technical Documentation

- The recent publication of technical documentation on 31st January 2020 included API Contracts for Accounts
- Additional column has been added to the Process pages for Account and Holder Creation, Modification and Locking/Unlocking and Change of Controlling Participant to identify the DAML Contracts that have either been created, updated or archived

Account and Holder Creation Process

| Step | Description | Party | Recipient / Observer | Message Reference | API Contract |
|-------------------|---|-------------|----------------------|--|---|
| 1 | The Participant populates the Account Creation Request with the following: <ol style="list-style-type: none"> Mandatory ISO 20022 elements defined in the Message Usage Guidelines; Optional ISO 20022 elements defined in the Message Usage Guidelines where applicable to the request; Related ASX business values and rules applicable to the request; The Participant sends the Account Creation Request to the CSP. | Participant | CSP | Account Creation Request (acct_001) | - |
| 2 | The CSP validates the request against the schema and business validation rules. If schema or business validation fails then refer to step 5: "On Fail". | CSP | - | - | - |
| On Success | | | | | |
| 3 | If the Account Creation Request is schema and business valid the CSP will generate a Holder Identifier, Account Identifier, Account Name and Mailing Addressee Line as well as create the Holder(s) and Account record within the CSP. | CSP | - | - | - |
| 4 | The CSP sends an Account Notification to the Participant. | CSP | Participant | Account Notification (acct_002) | DA.ASX.API.Account_DRAFT (AccountStandardView) (AccountAdditionalView) DA.ASX.API.Holder_DRAFT (HolderStandardView) (HolderFullView) |
| On Fail | | | | | |
| 5 | If the Account Creation Request fails schema or business validation, the CSP will send the Participant: <ul style="list-style-type: none"> An Invalid Transaction Notification with the relevant error code for schema failure. A Rejected Transaction for business validation failure. | CSP | Participant | Invalid Transaction Notification (comm_807) Rejected Transaction (comm_808) | - |

API Contracts: Technical Documentation

- The template for each API Contract can be found by clicking through to the Accounts API Contract page
 - Templates contain the following:
 - Signatory
 - Observers
 - Attributes (including Primary and Foreign Keys)
 - Data types (linked through to [Digital Asset's Data Dictionary](#))
- Where an attribute has subsequent elements, these are documented as data types and/or templates

template AccountStandardView

| *FieldTypeDescription | | |
|------------------------|--|--|
| operator | Party | The operator |
| observingParty | Party | The observing party |
| accountIdentifier | K | The platform-generated unique ID of the account (ASX: Account Identifier) |
| holderIdentifiers | [Text] | The unique ID(s) of the holders associated with the account (ASX: Holder Identifiers) |
| accountType | AccountType_DRAFT.T | The type of account (Sponsored, Direct, AccumulationEntrepot, SettlementEntrepot, or RegistrationIdentifier) (ASX: Account Type) |
| ownershipType | AccountOwnershipType_DRAFT.T | Account ownership type (Single or Joint) (ASX: Ownership Type) |
| accountName | Text | Name of the registered holder of the account (ASX: Account name) |
| mailingAddresseeLine | Text | The addressee line to be used for account statements (ASX: Mailing Addressee Line) |
| registeredAddress | Address_DRAFT.T | Address of registered holder of the account (ASX: Registered Address) |
| designation | Optional Text | Additional account information over and above the name of the registered holder (ASX: Designation) |
| controllingParticipant | Party | The controlling Participant of the account (ASX: Controlling Participant) |
| creationDate | Time | Creation time (ASX: Creation Date) |

- [Choice Archive](#)

Accessing API Contracts

Accessing API Contracts

API Contracts

API contracts are only accessible via the Ledger API

There are two key Ledger services to access API contracts;

- **Transaction Service** (which subscribes contracts that are created or archived)
- **Active Contract Service** (which utilises the active transaction service for active contracts only)

DAML Extractor

- A test tool within the DAML SDK that provides the ability to stream all API contracts into a postgres SQL database
- Recently upgraded to incorporate a plug-in to support other databases
- Extractor is open-sourced allowing developers to download the source code
- Strategic component of SDK that Digital Asset are continuing to develop and invest in

Any developer can build their own use cases independently of the DAML Extractor

Sample Account Messages (Joint account) – JSON format

AccountStandardView

```
{"accountIdentifier":"0000003883","accountName":"ALLAN BLOGS + JANE ANNE BLOGS PTY LTD","ownershipType":"Joint","designation":"No 1 @ Account","holderIdentifiers":["c4bc09bc015b4f80a35abc713ffce07a","571e5b35e28d40028564d8551852593f"],"operator":"00001","accountType":"Sponsored","creationDate":"2020-01-05T23:45:46.578Z","mailingAddresseeLine":"Allan BLOGS + JANE ANNE BLOGS PTY LTD","observingParty":"20076","controllingParticipant":"20076","registeredAddress":{"countrySubdivision":"NSW","addressLines":["UNIT1","201-203 BROADWAY AVE","BOND STREET"],"postalCode":"2564","townName":"Sydney","countryCode":"AU"}}
```

HolderStandardView

```
{"holderIdentifier":"c4bc09bc015b4f80a35abc713ffce07a","holderName":" ALLAN BLOGS","holderType":"Individual","operator":"00001","observingParty":"20076"}
```

```
{"holderIdentifier":"571e5b35e28d40028564d8551852593f","holderName":"JANE ANNE BLOGS PTY LTD","holderType":"Organisation","operator":"00001","observingParty":"20076"}
```

ISO 20022 XML Message Signing

CDE 6 Signatures

What is being validated in CDE 6

- ISO 20022 XML messages sent via AMQP channel only
- Validate signature created with public key in ISO message

What is not being validated in CDE 6

- Public key is authorized to sign a message on behalf of the UIC in ISO message
- Public key is an ISO signing key and not a TLS certificate

Egress message signatures

- ASX will be signing ISO 20022 XML messages sent to customers via AMQP
- Validation of ASX signatures is optional for CDE 6, but will need to be demonstrated for ITE

Ingress message signatures

- Customers wishing for ASX to validate customer message signature during CDE 6 should contact cts@asx.com.au and opt-in to signature validation
- ASX will validate customer ISO message signatures using public key provided in <KeyInfo>
- Customers can create ISO message signatures using their existing TLS certificate

ISO Signature Creation Challenges

Challenge

- ISO 20022 BAH Message Usage Guideline not prescriptive on how applications should implement signature creation and validation
- ISO 20022 XML messages consist of two parts, Business Application Header and Document wrapped by a Business Message Wrapper
- Adding a reference ID label for the Document element fails XML schema validation
- Standard cryptography libraries are not equipped to create a single signature composed of two documents

Resolution

- Since ISO BAH Message Usage Guideline is not prescriptive, ASX is providing guidance on how applications may implement signature creation and validation
- Utilize references to denote which specific section is being manipulated during signature creation and validation
- Leave an empty reference to denote that the Document element is being referenced
- Extend existing cryptography libraries to allow for signature creation and validation as per specification

ITE Order Forms

Industry Test Environment - Forms

Forms

- **Subscriber Technical Access agreement**
- **ITE Application including SWIFTNet Appendix**

Please return both these completed forms to:

CHESReplacement@asx.com.au

SWIFTNet Subscription

- **SWIFTNet closed user group (CUG) order**

The image shows two overlapping forms. The background form is the 'Clearing and Settlement Platform - Subscriber Technical Access Agreement'. The foreground form is the 'ASX Clearing and Settlement Platform (CSP) Industry Test Environment (ITE) Application Form'.

ASX Clearing and Settlement Platform (CSP)
Industry Test Environment (ITE) Application Form
February 2020 | Version 0.3

Please complete and return this form to CHESReplacement@asx.com.au. All fields require completion before returning.

| Subscriber | ASXO |
|------------|-------------------------------------|
| Name | ASX Operations Pty Ltd |
| ABN/ACN | 42 004 523 782 |
| Address | 20 Bridge Street Sydney NSW 2000 |

Note - ASX requires a separate application form for each legal/operating entity

Production CHES PID _____
or, System Vendor (If yes, complete the below section)

Internal use only - ITE UIC(s) _____

System Vendors (only) please identify the subscriber type you intend to use for both ITE & Production

| | |
|--------------------------|---|
| <input type="checkbox"/> | Trading, Clearing & Settlement Participant |
| <input type="checkbox"/> | Third Party Clearing & Settlement Participant |
| <input type="checkbox"/> | Non-Trading Settlement Participant |
| <input type="checkbox"/> | Account Participant |
| <input type="checkbox"/> | Trading & Account Participant |
| <input type="checkbox"/> | Product Issuer Settlement Participant |
| <input type="checkbox"/> | Share Registry |

Questions

Next Working Groups

2020

25 February 2020

- ISO 20022 Technical Committee

26 February 2020

- Implementation & Transition Webinar – Technical Accreditation

13 May 2020

- Connectivity & Integration – CDE 7

Thank you

Disclaimer

This document provides general information only and reflects matters put forward for discussion at a point in time. You should obtain independent advice before making any decisions. ASX Limited (ABN 98 008 624 691) and its related bodies corporate (“ASX”) makes no representation or warranty with respect to the accuracy, reliability or completeness of the information. To the extent permitted by law, ASX and its employees, officers and contractors shall not be liable for any loss or damage arising in any way (including by way of negligence) from or in connection with any information provided or omitted or from anyone acting or refraining to act in reliance on this information.

© Copyright 2020 ASX Operations Pty Limited ABN 42 004 523 782. All rights reserved.