Digital assets

Swift

Update for SMPG
Oslo – April 2023
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PREVIOUSLY

Experimentation on tokenized assets: completed in July 202

Context

Between January and July 2022, together with **Northern Trust, Clearstream, Citi** and technology partner **SETL** we initiated a set of experiments to explore the **feasibility and benefits of SWIFT acting as an interconnector and 'combined access point,' linking up multiple tokenisation platforms and various cash leg payment types** (gpi, RTGS and CBDC), with participants interacting with tokenised assets via SWIFT – similar to the way they do today with traditional securities assets.

Scope

We aimed to simulate **primary token issuance and secondary market transfers of both tokenised bonds and equities and** using different cash settlement environments/methods (**RTGS, gpi and CBDCs**)

Objectives & results

1. Demonstrated the technical capabilities of enabling the use of the SWIFT infrastructure to enable the c**reation, transfer, and redemption of tokens and update balances between multiple client wallets**.
2. Showed how interoperability between the "traditional" and "new" worlds or between different tokenization platforms can be achieved
3. Provided evidence to support some of the claimed benefits of tokenised asset securities when it comes to atomic settlement, fractionalization, programmability, transparency and removal of reconciliation friction/cost.

Use cases

The experiment **comprised seven (7) different use cases**: tokenization, detokenization and five (5) DVP settlement variations.

Conclusion

Promising – current messages largely cover the requirements, a few data need to be put in narrative though.

Complexity of implementing orchestrations of some flows, such as detokenisation

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1. Why

Going forward - What is the burning problem?

As a financial institution,

I want to provide:

- Issuance services on a platform of my choice for each type of assets
- Digital assets management for my investors on any platform
- Improved experience and reduced cost for highly inefficient asset class
- Offer expanded assets and liquidity pools including private markets
- Regulatory reporting on assets under my custody and where I am a master book keeper

But today, I face:

- A large variety of DLT platforms
- A large variety of technology players to run this digital custody business
- Regulatory uncertainty in certain asset classes
- A rather long hybrid phase with on and off chain worlds co-existing
- Opportunities to change processes but obligation to keep legacy systems in place

I want to leverage technology to:

- Get access to new asset classes (private markets) and source of growth
- Improve settlement speed including cash leg for some dedicated assets
- Reduce reconciliation cost and improve transparency through public chain access
- Reduce issuance cost by cutting down manual and paper steps

I need a solution to:

- Minimise the complexity to reach any asset pools wherever they are independently of the selected ledger
- Have maximum interoperability with existing systems where-ever possible
- Get some flexibility on the flow orchestration needed (what sort of cash leg is required, actors needed, type of chain)
- Benefit from joint orchestration of cash and securities independently of where they sit

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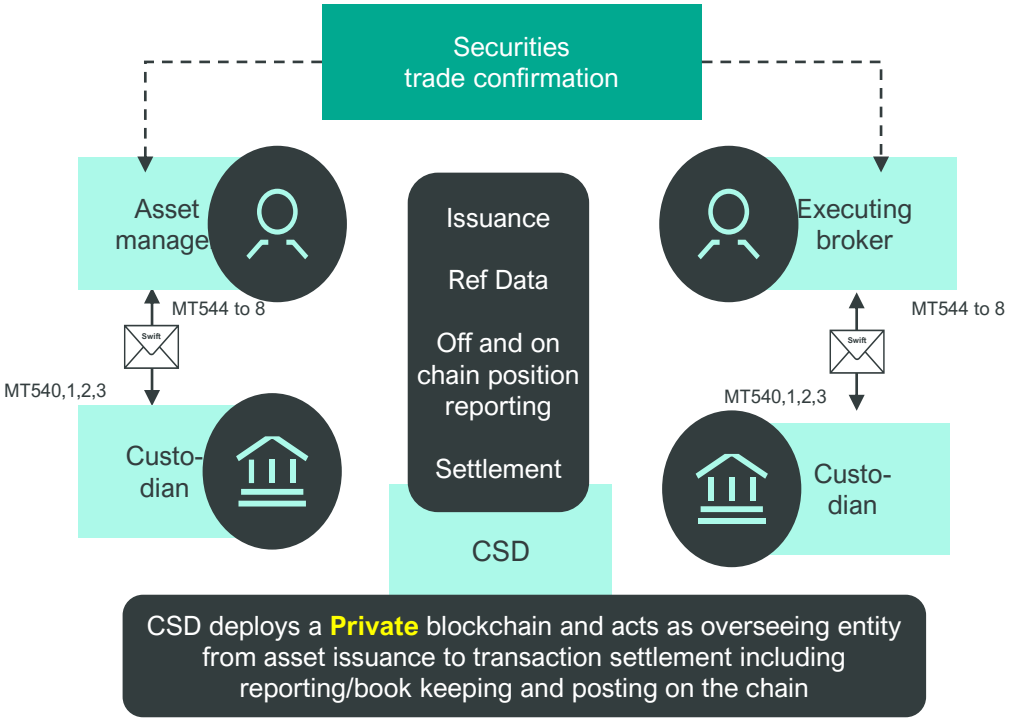
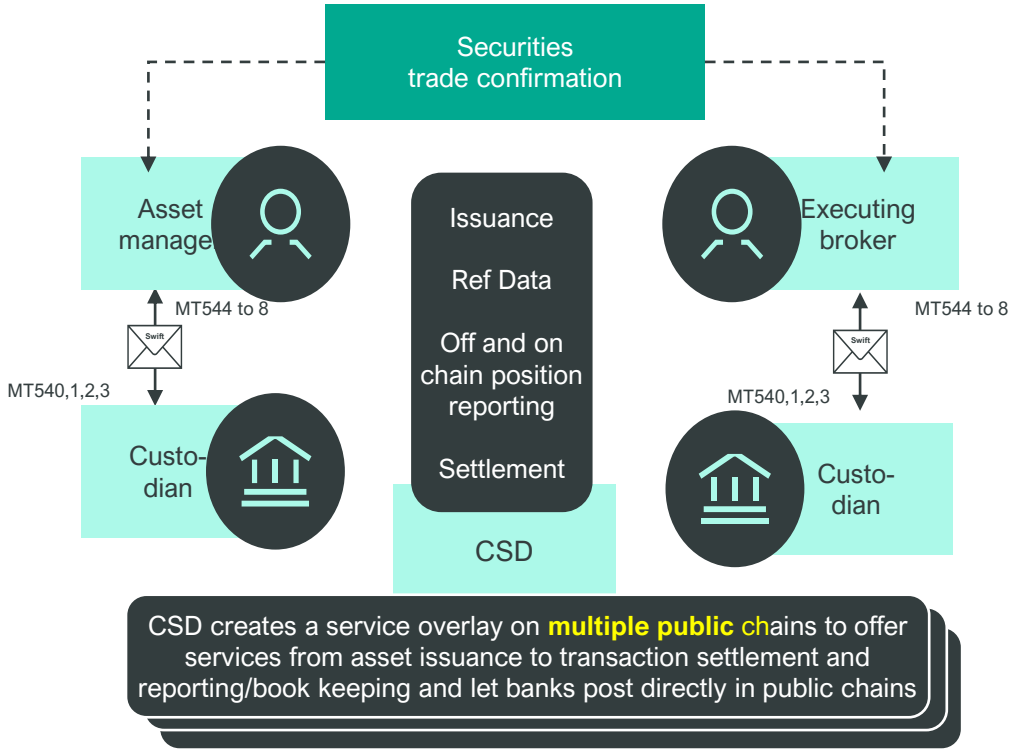
Market situation

Emerging set-ups

1a Similar to existing flows on a single chain ~ Closed Digital FMI model



1b Similar to existing flows on multiple chains ~ open Digital FMI

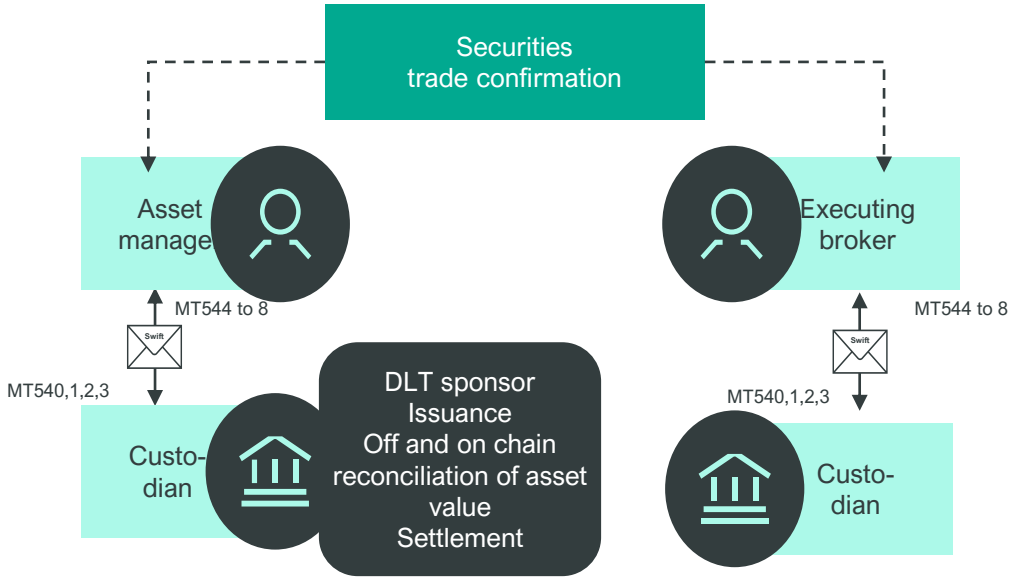


1. Why

Market situation

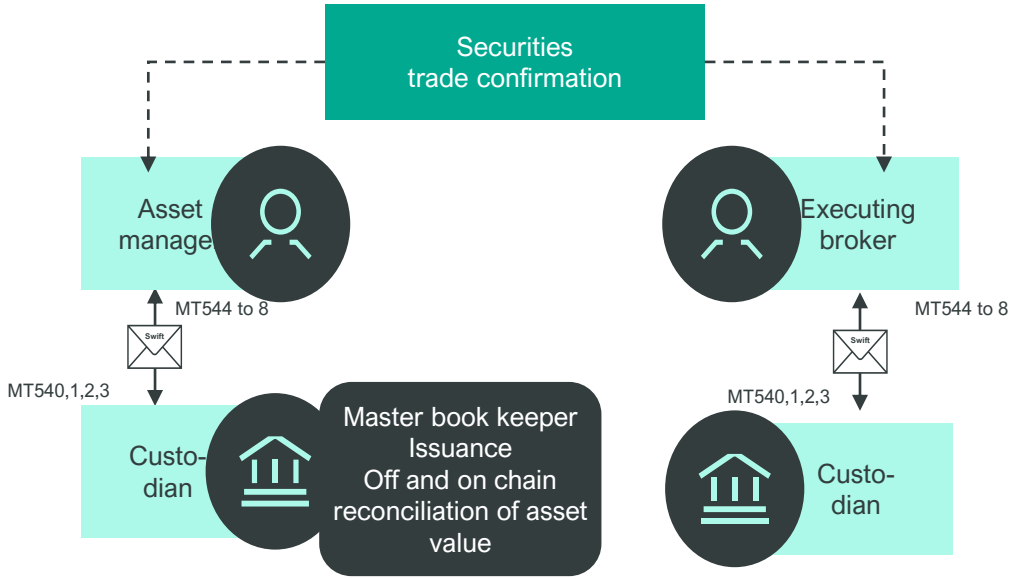
Emerging set-ups

2a Direct custody solution, no CSD involved, custodian acting as guardian on single chain ~ Master book keeper



A Custodian becomes the DLT sponsor of a digitally issued asset backed or not by a real life one. The custodian acts as guardian of value and total supply of the asset. The asset is tokenised on its own distributed ledger.

2b Direct custody solution, no CSD involved, custodian acting as guardian on multiple chains ~ Master book keeper



A Custodian becomes the DLT sponsor of a digitally issued asset backed or not by a real life one. The custodian acts as guardian of value and total supply of the asset. The asset is tokenised on one or many public chains that can be accessed directly by others.

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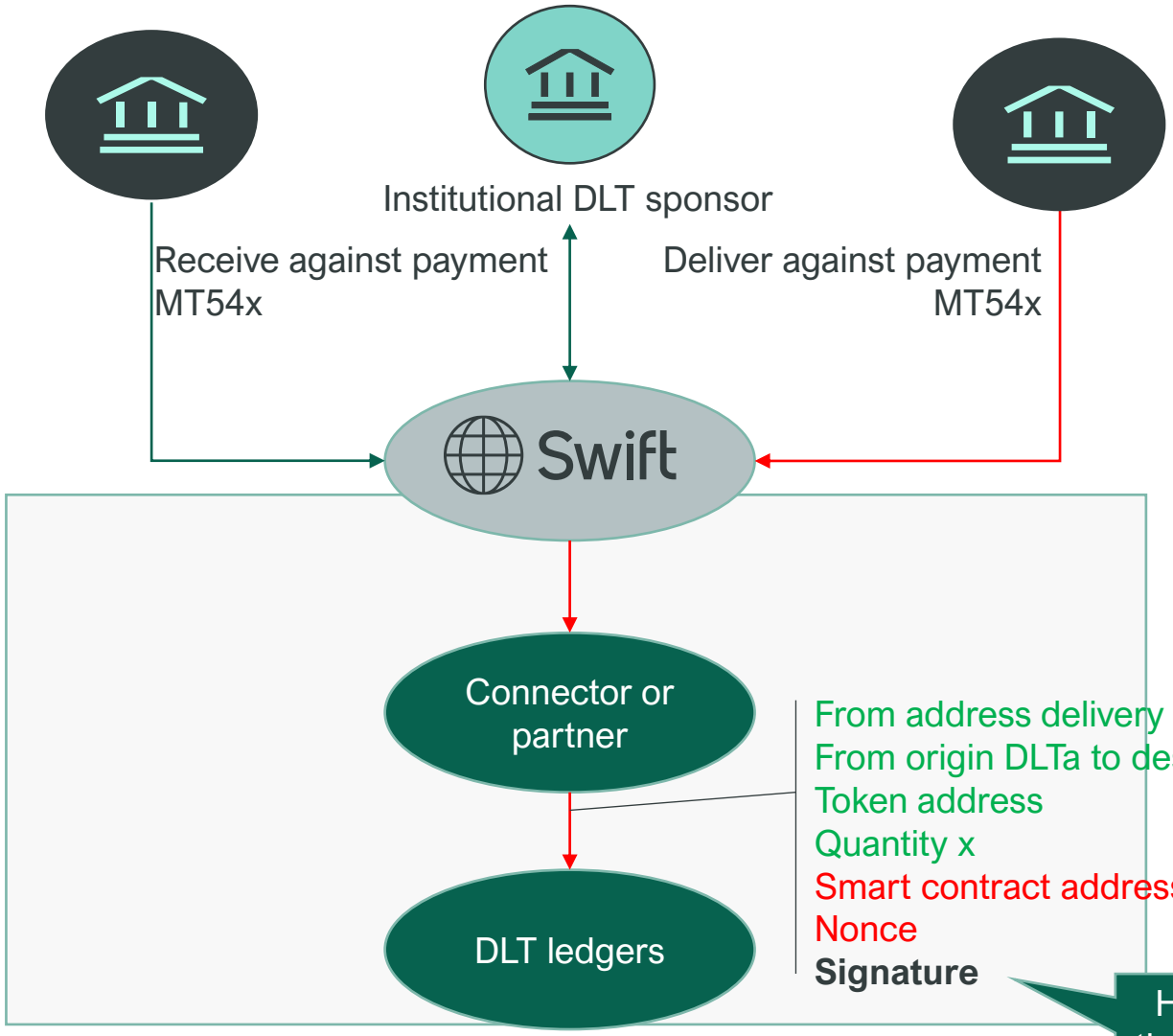
2. What

March 2023

The key components and process - challenges identified

Matching 2 legs into a single DLT instruction including a signature covering targeted partners/DLT chain specific fields



Posting on the ledger requires a set of addresses some of which might not be known to the sending bank

However the signature needs to be created using the Private Key stored in the digital custody solution of the bank

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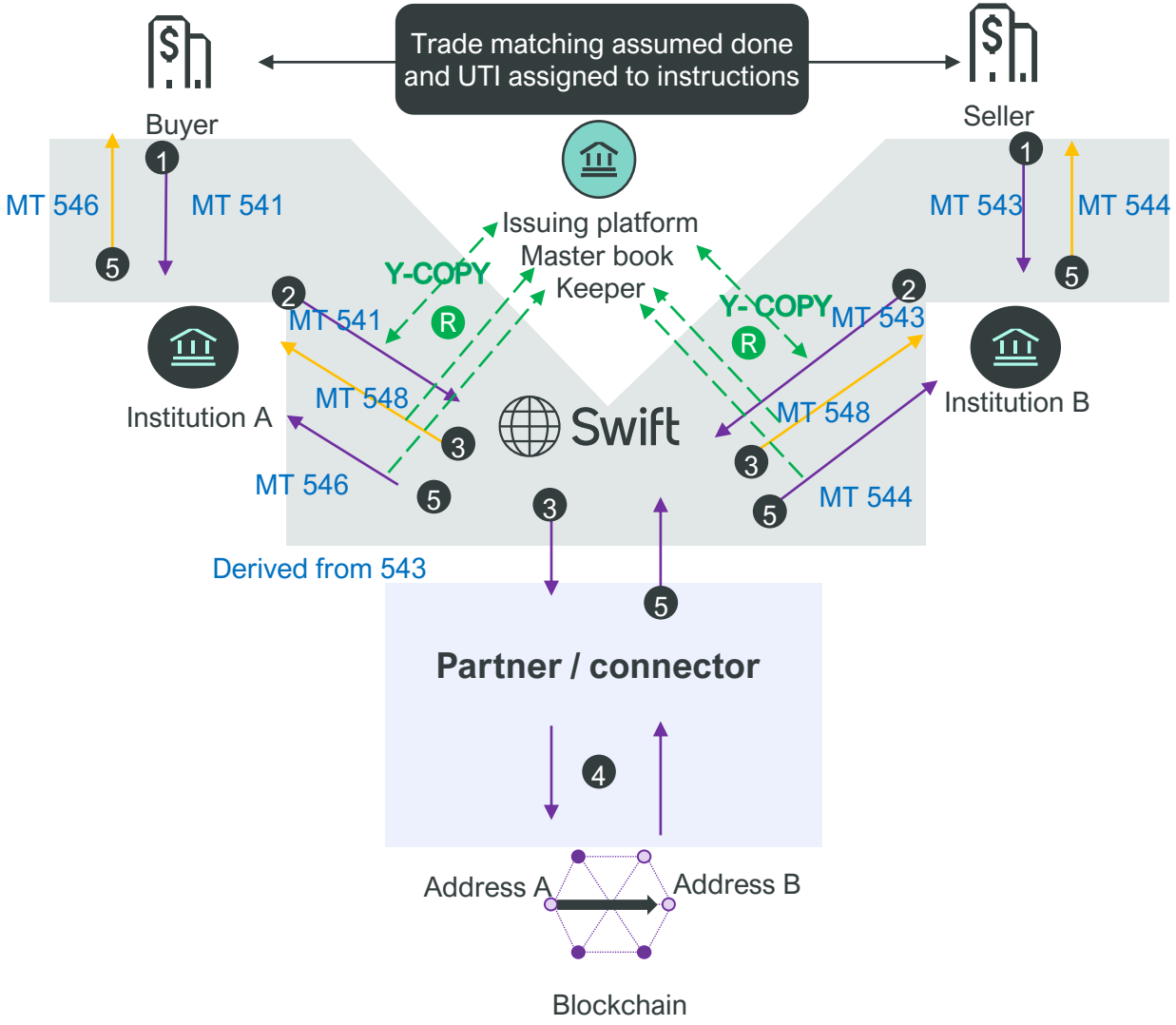
2. What

Routing 1 - Overview of the asset flow (no cash leg)



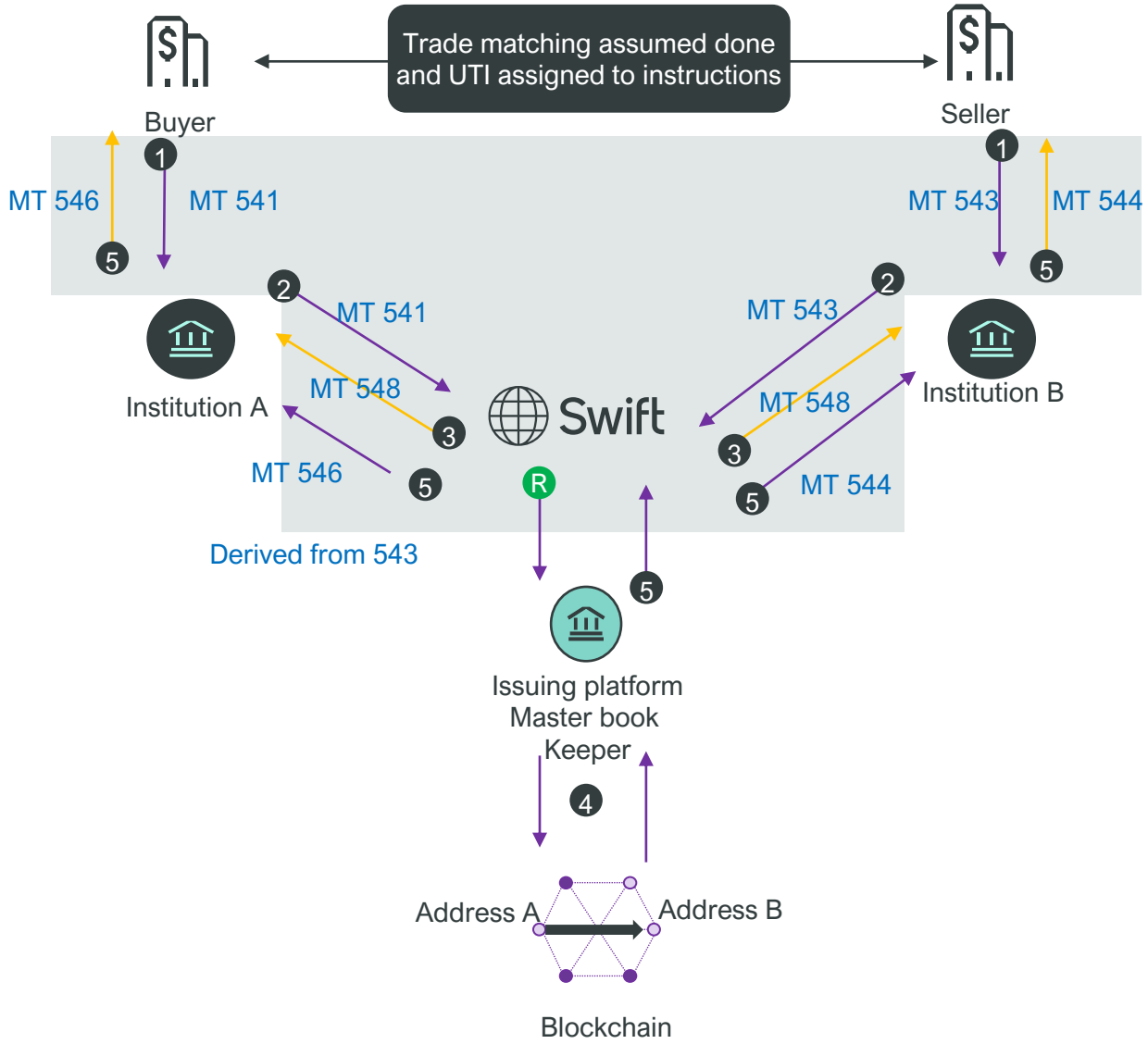
Proposed high-level instruction Flow

1. Buyer/seller instruct over Swift using ISO standards and messages with UTI from trade matching
2. Custodians instruct settlement over Swift using Swift standards and messages with UTI from trade matching
R. Swift issues a request to master book keeper to inform of movement and proceed with posting
3. Swift performs conversion of received message payload into the format expected by the DLT integrator and provide status back to Custodians in the original format
4. Asset movement is performed on a single or multiple chain (public, public to public, private to public)
5. Asset movement is confirmed back to Swift and Swift confirms it back to custodians using ISO standards and messages

Swift

2. What

Routing 2 - Overview of the asset flow (no cash leg)



Proposed high-level instruction Flow

1. Buyer/seller instruct over Swift using ISO standards and messages with UTI from trade matching
2. Custodians instruct settlement over Swift using Swift standards and messages with UTI from trade matching
3. R Swift issues a request to master book keeper to inform of movement and confirm orchestration
4. Swift provides status back to Custodians on confirmation from master book keeper
5. Asset movement is performed on a single or multiple chain (public, public to public, private to public)
6. Asset movement is confirmed back to Swift and Swift confirms it back to custodians using ISO standards and messages

Swift

2. What

February 2023
Tokenised Assets platform link Strawman

Looking at standards to bridge on and off chain

Standards details required and potential requirements for smartcontracts

The following elements are needed to post on the ledger(s)

- Place of settlement = target blockchain(s)
- Token name & address
- Token Quantity = high precision number
- Delivery safekeeping account = address of the sender
- Receiving safekeeping account = address of the receiver
- Processing routing = address of the externally exposed Smartcontract to post on the chain (might the one of a partner)
- Chain spec 1 = Nonce for public chain
- Signature = signature generated using the private key associated to the sender address on the chain will probably be captured inside processing instructions field

The following elements are needed to bridge on and off chain tracking

- UTI = unique transaction reference issued at trade/instruction level
- Place of settlement = Blockchain operating company (could be the Master book keeper) as Bic or text
- (TBD) Master Book keeper = Master book keeper BIC
- Asset identifier = ISIN, DTI, or other
- Receiving Agent= Custodian BIC
- Delivering Agent= Custodian BIC
- Buyer = Client BIC
- Seller = Client BIC
- Delivery Safekeeping account = account number at custodian *FYI Message can currently handle address OR account as proxy, not both*
- Receiving Safekeeping account = account number at custodian *FYI Message can currently handle address OR account as proxy, not both*
- Settlement Date

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Potential SR 2024 elements

Potential upcoming changes are to be discussed with the market. Note that these can go live in November 2024 at the earliest, if they are voted on and accepted:

- Extra parties' identifications which do not exist in traditional securities processing, such as:
- Master Bookkeeper
- Automated Market Maker
- Oracle ("place of price")
- Place of tokenisation when different from PSET

Other, granular information related to digital assets that cannot be well mapped to current fields in the messages, such as potentially the following concepts:

•The asset's ID as a blockchain address (since the DTI is a business level reference)

- Technical protocol details, to be discussed if important for business actors; for example:
- Block size
- Hash
- Nonce
- Potential forking details
- A signature of fields required for blockchain operations

•If a wrapper is used, the underlying digital asset's ID

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