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Japan ST Public Blockchain Proof-of-Concept Report

July 2026

SBI SECURITIES Co. Ltd.
Daiwa Securities Co. Ltd.
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BOOSTRY BLOG

Executive Summary

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Japan ST, publishing PoC results on the use of public blockchain in anticipation of cross-border distribution
- Confirming the practical issues and effectiveness of using Ethereum / stablecoin in inter-dealer transactions -

■ Overall scheme:

Domestic consortium ⇆ public BC (Ethereum) ⇆ overseas securities, in a mirrored configuration achieving cross-border DvP

JPN assets to overseas	Preserve rights in securities	Global settlement infrastructure	Sell to Singapore investors	Hold JPN assets
Japan Issuer / Securities Firm	Consortium BC ibet for Fin	Public BC Ethereum	Singapore Securities / Custody	Overseas Investors (Professional Investor Segment)

Key Issues and Responses

a. "Absence of a regulatory addressee" problem
Consortium × Public BC mirrored configuration preserves rights

b. Node operation / gas fee burden
Node aggregation / ERC3009 for gas fee proxy payment

c. Legal / Tax
Japan/Singapore laws and tax

Main Systems / Features Implemented

①ST Bridge
Lock/Mint method

②ST Register
Preserve rights on the consortium

③DvP settlement
ST and USDC Atomic Swap

④Whitelist
KYC-completed accounts only transfer-enabled control

Challenges and Outlook

⚑ Key issues identified
Transfer restrictions on publicly offered corporate bonds (withholding-tax exemption scheme premised on custody at a domestic financial institution) vs. consistency with overseas custody

➤ Future direction
① Confirm legal interpretation / advocate for regulatory revision
② Expansion to other products
→toward overseas distribution of Japan's diverse assets (bonds / real estate / anime / content / sake)

1) Project Overview

Significance and Aims of this project

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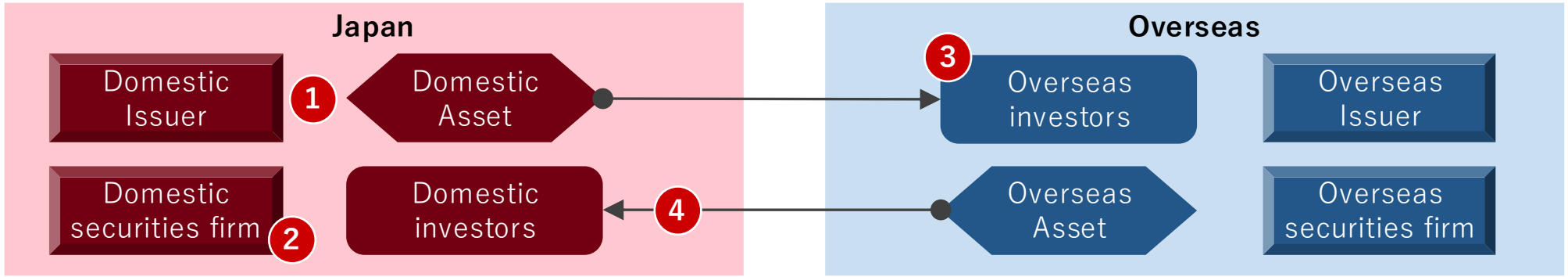
› **By selling diverse domestic assets to overseas investors, issuers broaden their funding base, securities firms gain business opportunities, and overseas investors diversify their portfolios, contributing to the expansion of global capital markets**

Digital securities (ST) global expansion / cross-border formation of a global capital market originating from Japan

1. [Issuer] Attractive and diverse domestic assets (bonds/real estate/anime/content/sake, etc.) sold overseas to broaden the funding base
2. [Securities firm] Expanding securities firms' customer base through overseas collaboration to grow business revenue
3. [Overseas investors] Diversifying portfolios by enabling access to Japan's diverse assets
4. [Domestic investors] Diversifying portfolios by enabling access to diverse overseas assets



This project builds the mechanisms to realize the above

	Current state	This project
1	Domestic platform is domestically self-contained (barriers from each country's regulations)	· Use of a public chain as settlement infrastructure · Collaboration with overseas securities firms for overseas support
2	FOP settlement	DvP settlement (SC: use of electronic payment instruments)

Basis for the public blockchain utilization plan

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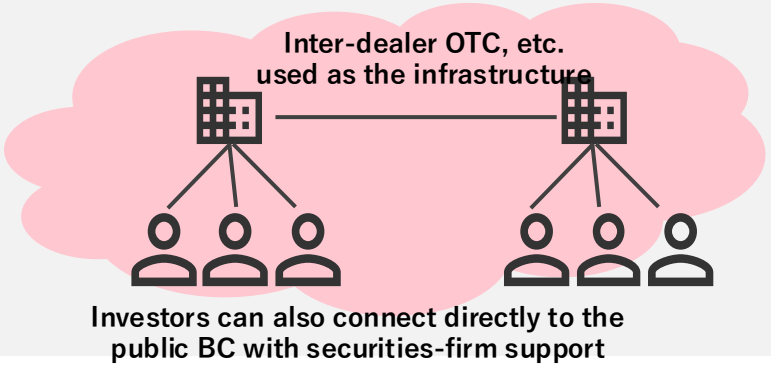
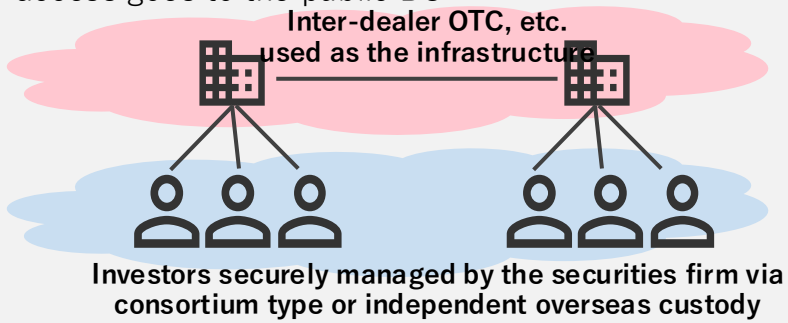
› **Direct investor access to the public BC may offer limited added value for general investors**

› **To start, we set the baseline as realistic use of the public BC in inter-dealer transactions**

Classification	Investor-access option	Broker-only access option (This PJ scope)
Configuration	Investors access the public BC directly  	Investors are securely managed within the consortium, while inter-dealer access goes to the public BC 
Why BC?	• Need to pursue the added value of investors' direct BC access e.g., SC efficiency via fund settlement and interest payments e.g., cost benefit from excluding securities-firm custody? e.g., Web3 unified asset management (for Web3 investors) e.g., ensuring transaction transparency, etc.	• Need to pursue the added value of efficient inter-dealer transactions • A solution to the lack of common global infrastructure e.g., more efficient inter-dealer ST settlement e.g., more efficient inter-dealer SC settlement
Risk handling	• High coordination difficulty because investors hold the keys • Handling the uncontrollability risk of the public BC	• Localize risk by managing investors in isolation within the consortium type • (at least for JPN operators) Addressing the uncontrollability risk of the public BC by using the public BC on a per-transaction basis (flow), not for asset preservation (stock)
This PJ	• Given the risk, the WhyBC rationale is weak, and since withholding-tax treatment for SC interest payments, etc. is difficult, deferral is assumed to be appropriate	• Balancing risk and Why BC, we will proceed with subsequent study under this option

List of stakeholders in this project

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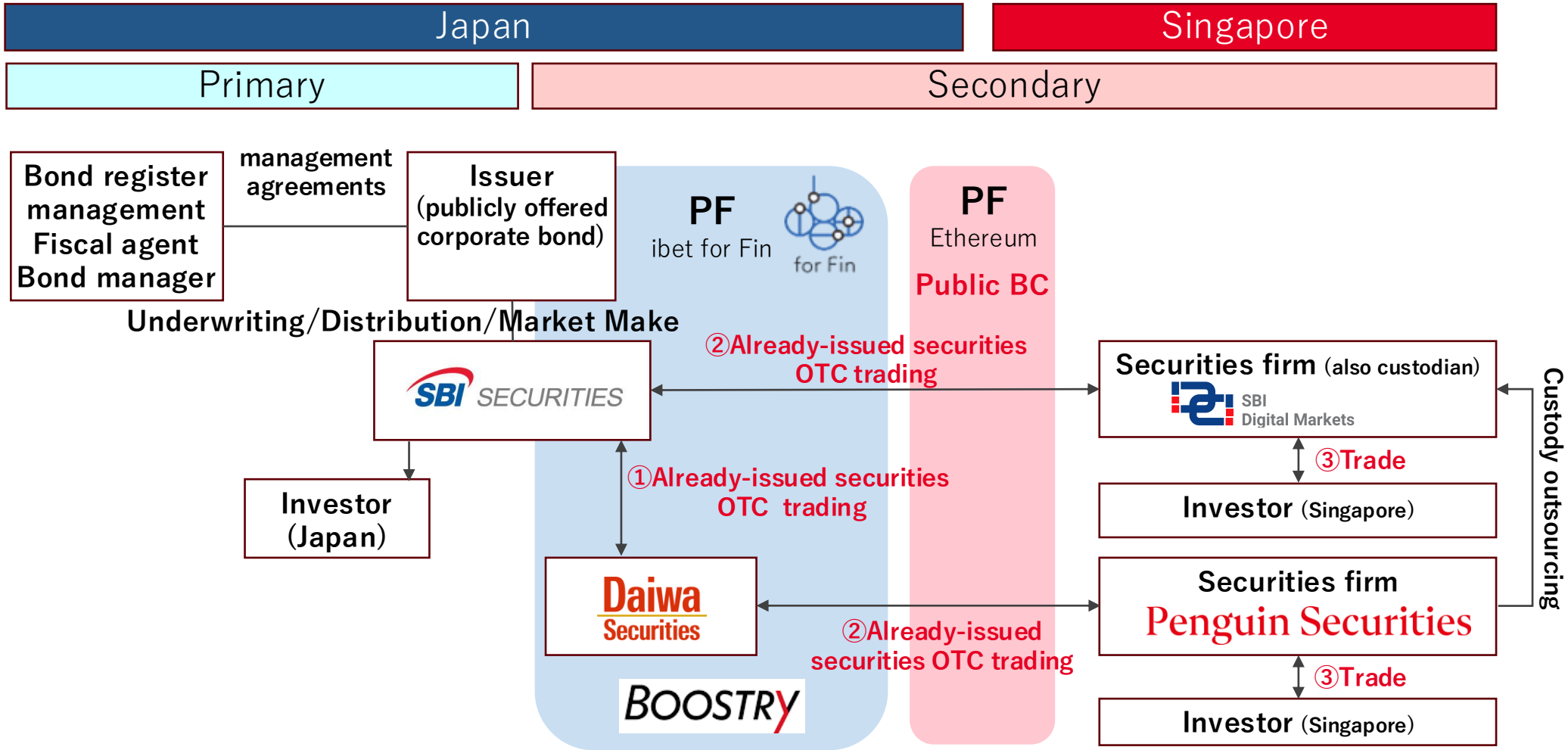
› **Projects were carried out with stakeholders across Japan and Singapore**

#	Category	Type	Company
1	Japan	Issuer	n/a (undisclosed)
2		Securities firm (underwriting/distribution/custody)	Daiwa Securities, SBISECURITIES
3		Issuing agent / register management	BOOSTRY
4		Fiscal agent	n/a (undisclosed)
5		Bond manager	n/a (undisclosed)
6		Electronic Payment Instruments Exchange Services	n/a (undisclosed)
7		Legal	Mori Hamada & Matsumoto
8		Regulators / self-regulatory organizations	Financial Services Agency (FSA), Japan Securities Dealers Association (JSDA), Japan STOAssociation (JSTOA)
9	Singapore	Securities firm (distribution)	SBI Digital Markets, Penguin Securities
10		Custodian	SBI Digital Markets
11		Legal	Allen & Gledhill
12		Regulator	Monetary Authority of Singapore (MAS) *No inquiry was made this time
13	Other	Platform	ibet for Fin+Ethereum

Assumed scheme diagram of this project

- Assumes a scheme where a publicly offered corporate bond issued domestically on ibet for Fin is traded with Singapore via secondary trading
- Based on a configuration that uses the public blockchain Ethereum for settlement



Main processing flow of the scheme

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- Domestic investors are managed on ibet for Fin, and the public BC is used only for inter-dealer transactions
- 1: Improved efficiency by using the public BC as cross-border settlement infrastructure
- 2: By using the BC, the SC already on the public chain enables DvP settlement, realizing more efficient transactions

【Main processing flow】

Standard primary flow of current STs

① ibet for Fin: issue tokens and transfer from the issuer to the securities firm's proprietary account

② Public offering and distribution to domestic investors; transfer tokens from the proprietary account to investors

New PJ implements a new OTC transaction

③ The domestic securities firm agrees price and quantity offline with the Singapore securities firm via OTC

④ The Japanese securities firm's proprietary holding: ibet for Fin lock, then Mint on Ethereum

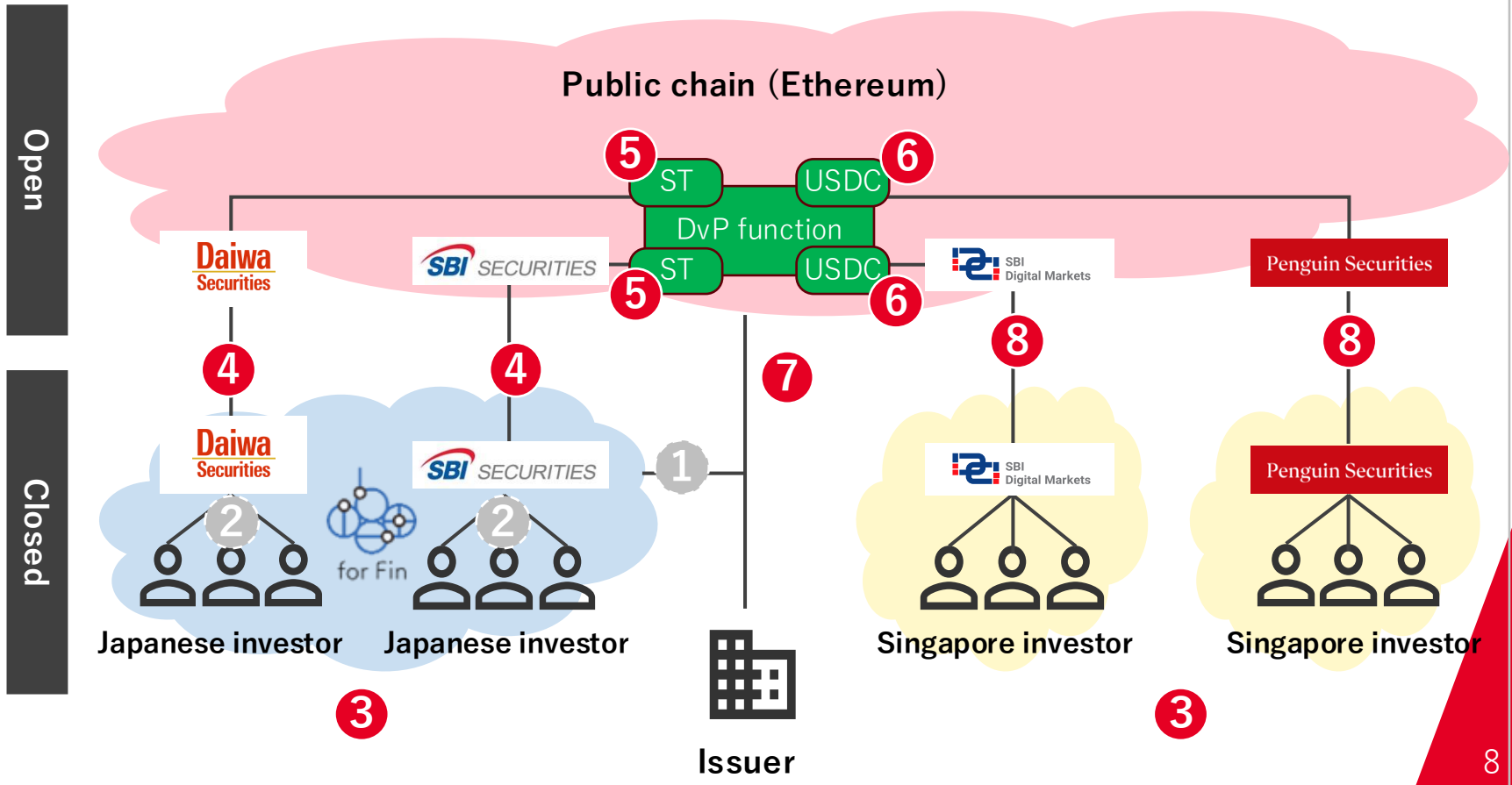
⑤ From the domestic firm's proprietary account to the overseas firm's proprietary account, transfer ST via DvP

⑥ From the overseas firm's proprietary account to the domestic firm's proprietary account, transfer USDC via DvP

⑦ The overseas firm's held ST is synced with the consortium chain to generate the register (the bond register records overseas custody; investors do not manage it)

⑧ The overseas securities firm sells tokens to professional investors under its home-country rules

【Conceptual diagram】



2) Key Discussion Points

Point a: Addressing the regulatory-addressee risk

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› **In finance, which requires advanced control, the "absence of a regulatory addressee" problem exists, where there is no regulatory entity on the public BC**

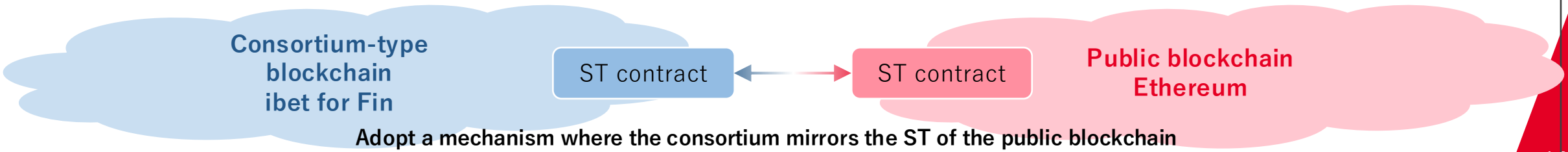
› **As one countermeasure, adopt a configuration in which the public BC and consortium BC mirror each other and coexist**

The regulatory-addressee problem:

- In the financial framework, financial institutions are structured to undergo supervision from regulatory authorities as the entities bearing management responsibility
- On the other hand, with **public blockchains that are jointly managed in a distributed ecosystem, the problem that no one is in a position to fulfill management responsibility (the regulatory addressee)** has long been pointed out

This project's approach:

- Mirror the ST of the consortium BC onto the public BC, adopting a configuration that lets the consortium always grasp the public blockchain's state
- This ensures that even if the public BC halts or disappears, rights can still be preserved on the consortium BC side
- In addition to the above, put in place the necessary security measures
  (vulnerability assessments, BCP drills, contingency-plan development, etc.)



Adopt a mechanism where the consortium mirrors the ST of the public blockchain and preserves the rights

Point b: Managing nodes and gas fees

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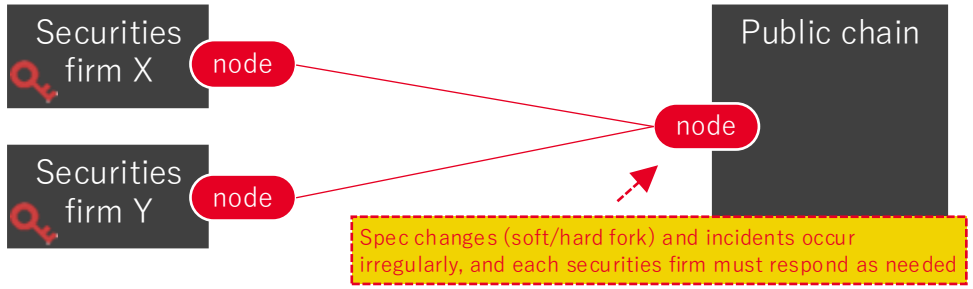
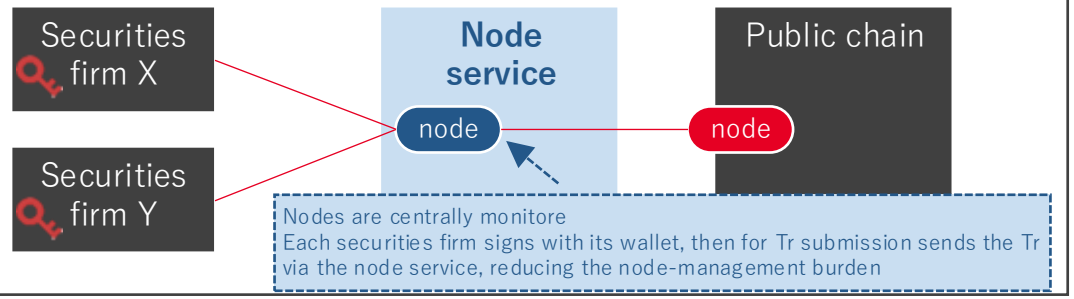
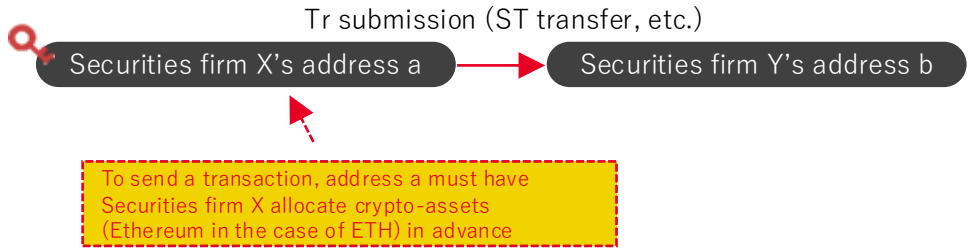
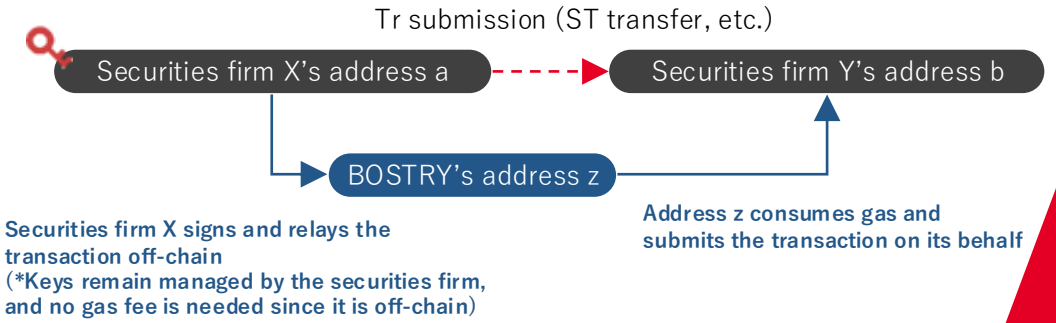
› **When financial institutions use a public BC, we identified that [A] node management and [B] gas-fee management become challenges**

› **As a solution, we consolidated nodes and used a protocol that proxies and tops up gas fees**

	Anticipated challenges	This project's approach
[A] Node	1) The base cost of operating nodes is incurred by each company 2) Updates and incidents on public blockchains must be continuously monitored, and appropriate actions must be taken as necessary. 	Adopts a configuration where it centrally manages the node service (separating the securities firm's key management from node management) 
[B] Gas fee	- Public BC transactions (Tr) require a gas fee to send - If the securities firm manages gas fees, financial coordination may become difficult e.g., holding crypto-assets as own assets and reflecting them in BS/PL, etc. e.g., capital management arising due to Basel rules, etc. 	Address Z adopts a meta-transaction in which address Z bears the gas fee. As the implementation method, we adopt ERC3009 "Transfer with Authorization" 

Point c: Organizing the legal and tax issues

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› **Organized the tax and legal issues arising in cross-border settlement using the public BC**

› **Conducted a comprehensive review on corporate bonds; no knock-out factors were found except one (described later)**

#	Type	Examples of issues examined
1	**Legal issues (Japanese law)**	• Legal analysis of managing overseas investors in the bond register • ST/SC settlement constitutes a regulated business under the Payment Services Act / FIEA • Legal analysis of ST key management and wallet types on the public blockchain • Analysis of whether SC key management on the public blockchain constitutes Electronic Payment Instruments Exchange Services • Analysis of whether the ST falls under electronically recorded transferable rights (security-token rights) • Analysis of whether the gasless service on the public blockchain constitutes a regulated business
2	**Legal issues (Singapore law)**	• Analysis of how an ST issued in Japan is characterized under Singapore law • Analysis of whether Japanese parties' actions breach Singapore securities/licensing regulations • Analysis of Singapore licensing requirements for selling STs to Singapore securities firms • Analysis of licensing requirements for Singapore securities firms distributing/intermediating STs to local investors • Analysis of settlement using stablecoins such as USDC under Singapore's payment-services regulation • Analysis of whether prior notification/explanation to MAS is required from Singapore securities firms • Analysis of custody requirements for STs under Singapore law
3	**Tax issues**	• Analysis of the division of roles for coupon payments and tax treatment of non-residents (held by custodian) • Analysis of the application of the Japan-Singapore tax treaty • Analysis of applying interest-tax exemption measures • Analysis of applying the withholding-tax exemption for financial institutions • Analysis of anticipated issues under the Act on Prevention of Transfer of Criminal Proceeds (APTCP) • Analysis of Singapore tax considerations (e.g., FTC applications)

3) System Architecture of the PoC

Systems used in this PoC

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› **Prepared the necessary systems with ST and SC settlement on the blockchain in mind**

#	Category	System	Overview
1	Blockchain	ibet for Fin (for Fin)	Japan's consortium-type blockchain
2		ST contract	ST contract on ibet for Fin
3		Ethereum	Public blockchain
4		ST contract (mirror)	ST contract mirroring the ST contract on ibet for Fin
5		USDC contract	Existing stablecoin
6	Japan	Core systems, etc.	Securities firm's core and accounting systems
7		E⚡Wallet	Wallet where the securities firm manages investors' private keys
8		E🚀Prime	Wallet where the ST issuer manages the issuer's private keys and register
9	Singapore	Custodian-managed Wallet	Wallet where the securities firm manages STs and SCs

1) ST bridge method

[Legend]
Solid line: transaction submission
Dotted line: accompanying transaction
: Securities firm's proprietary ST key
: Securities firm's proprietary SC key
: ST issuer key

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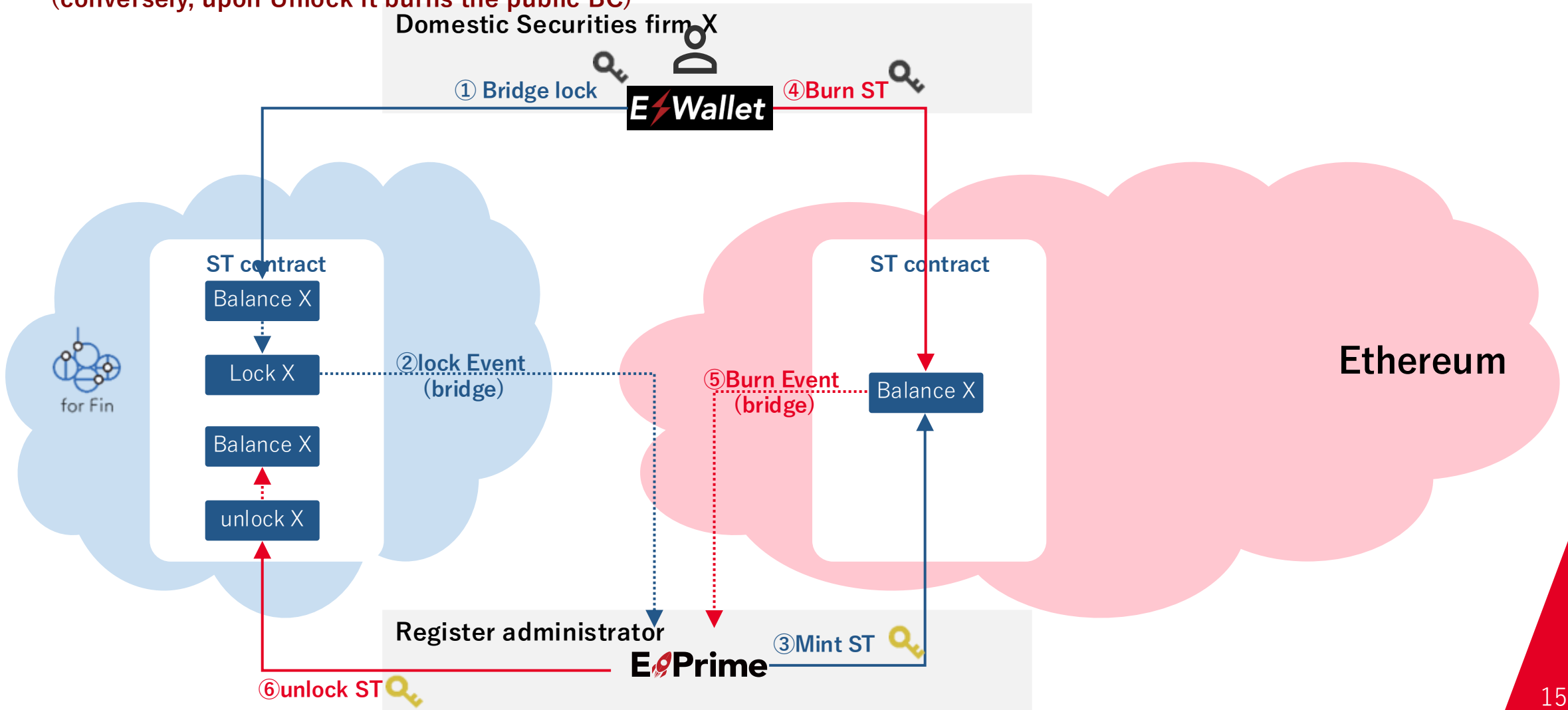
- For STs with a trusted issuer, an interoperable method synchronized with the consortium is considered preferable
- Adopts a method that detects the lock of the ST on the consortium side and Mints the ST on the public BC (conversely, upon Unlock it burns the public BC)



2) Register generation method

[Legend]
Solid line: transaction submission
Dotted line: accompanying transaction
: Securities firm's proprietary ST key
: Securities firm's proprietary SC key
: ST issuer key

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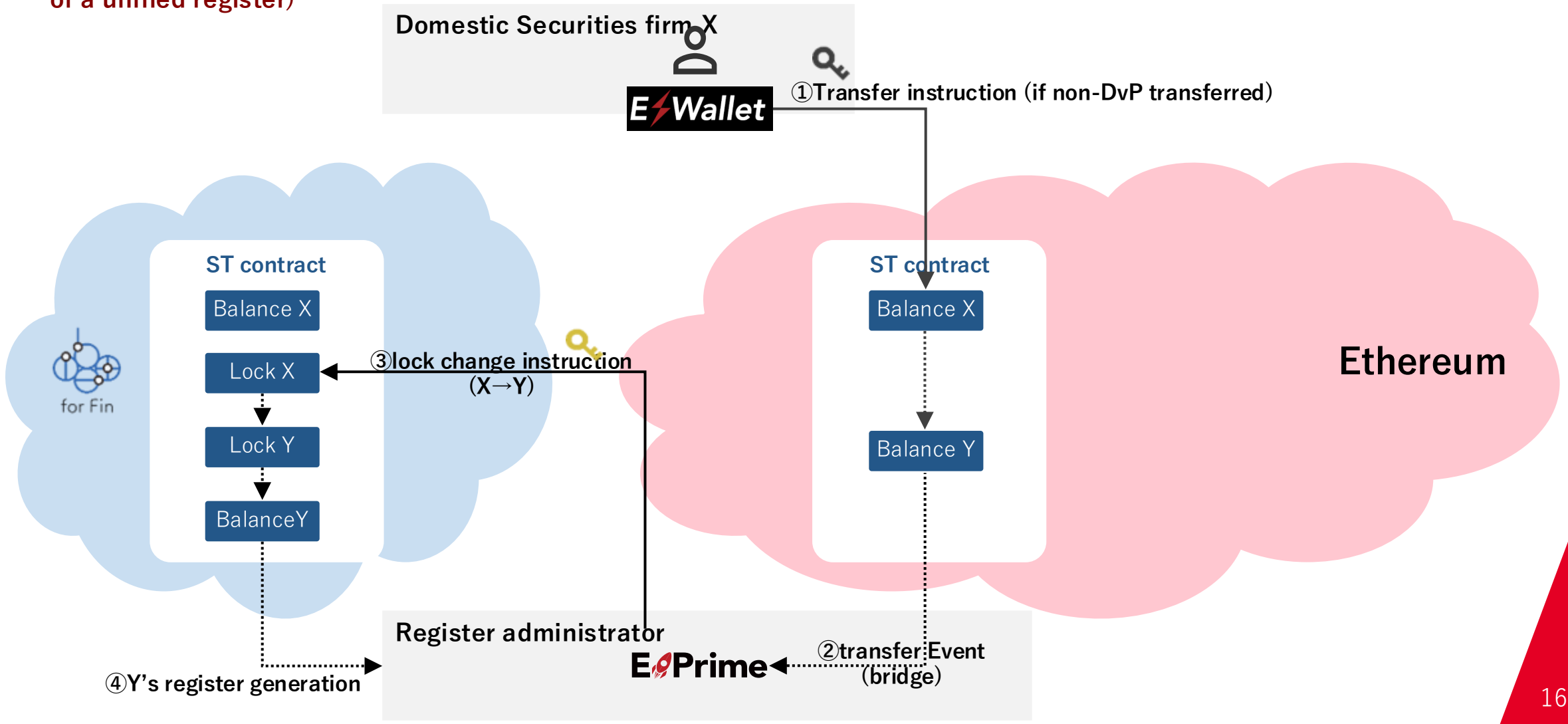
- Detects token-transfer events on the public BC and automatically reorganizes the lock on the consortium
- With this method, the rightful holder can always be identified by referencing the consortium chain alone (the benefit of a unified register)



3) DvP (Domestic → Overseas)

[Legend]
Solid line: transaction submission
Dotted line: accompanying transaction
: Securities firm's proprietary ST key
: Securities firm's proprietary SC key
: ST issuer key

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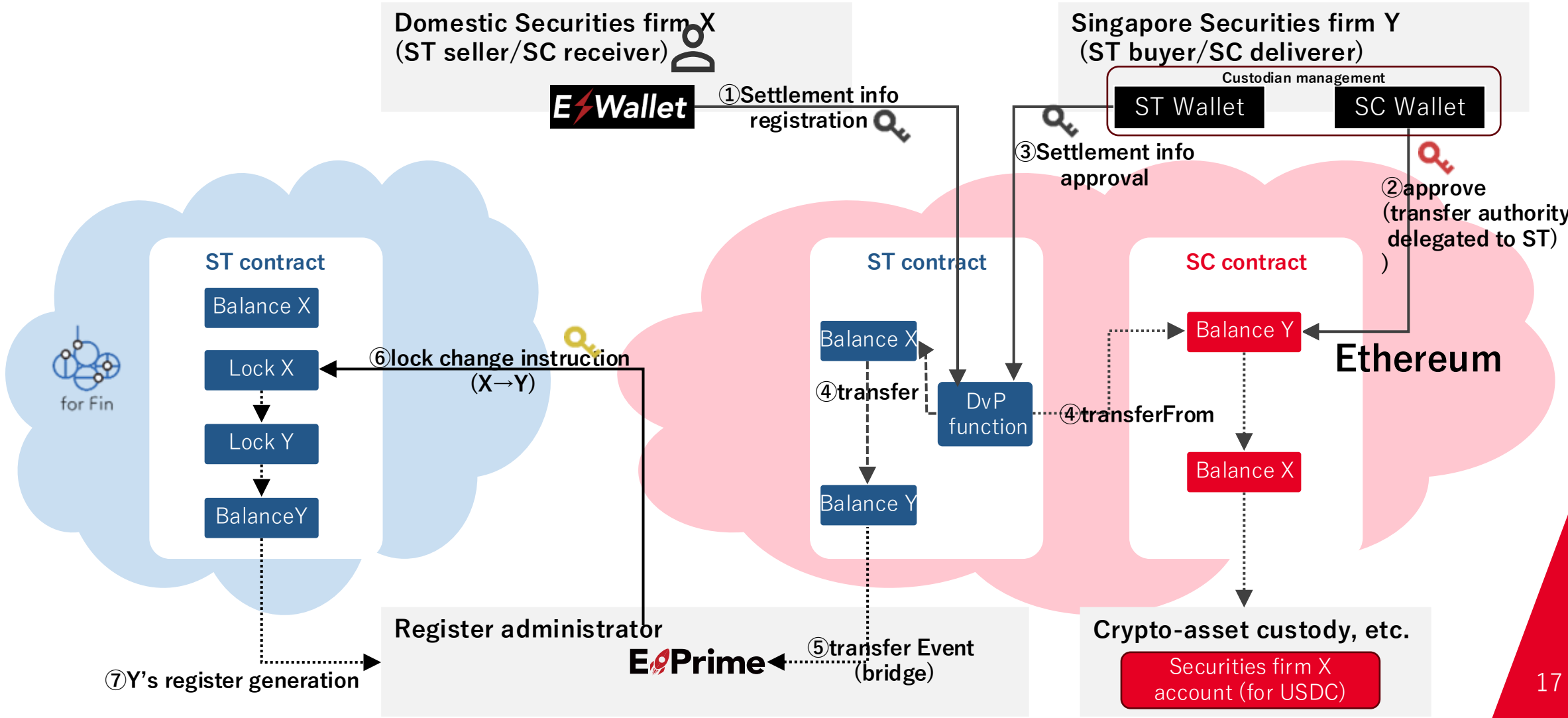
› ST seller registers the DvP settlement information, the ST buyer delegates the authority for the ST contract to move the SC (approve), then approves the DvP settlement information

› Both approvals trigger an atomic swap of ST and SC (both error if balance or authority is insufficient)



3) DvP (Overseas → Domestic)

[Legend]
Solid line: transaction submission
Dotted line: accompanying transaction
: Securities firm's proprietary ST key
: Securities firm's proprietary SC key
: ST issuer key

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› ST seller registers the DvP settlement information, the ST buyer delegates the authority for the ST contract to move the SC (approve), then approves the DvP settlement information

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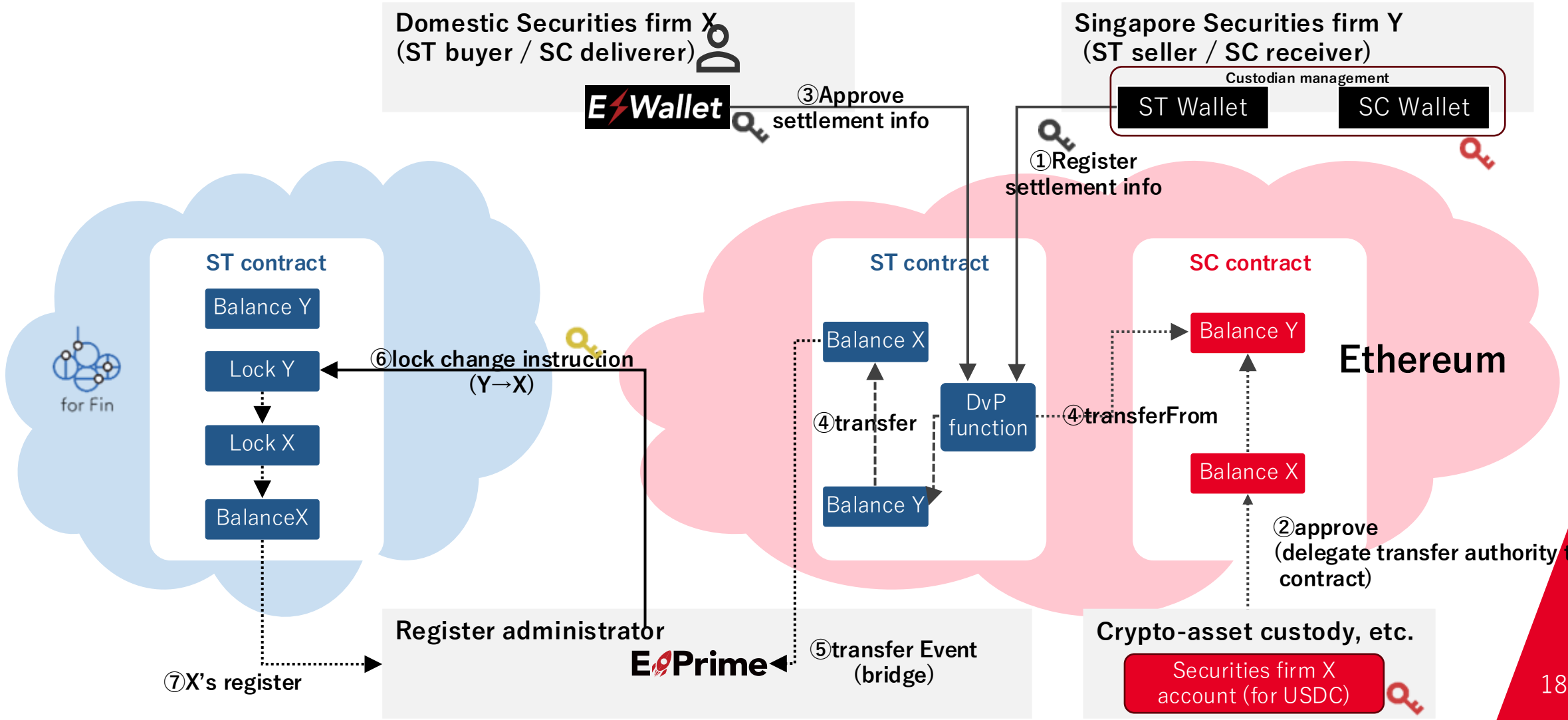

4) Whitelist method

[Legend]
Solid line: transaction submission
Dotted line: accompanying transaction
: Securities firm's proprietary ST key
: Securities firm's proprietary SC key
: ST issuer key

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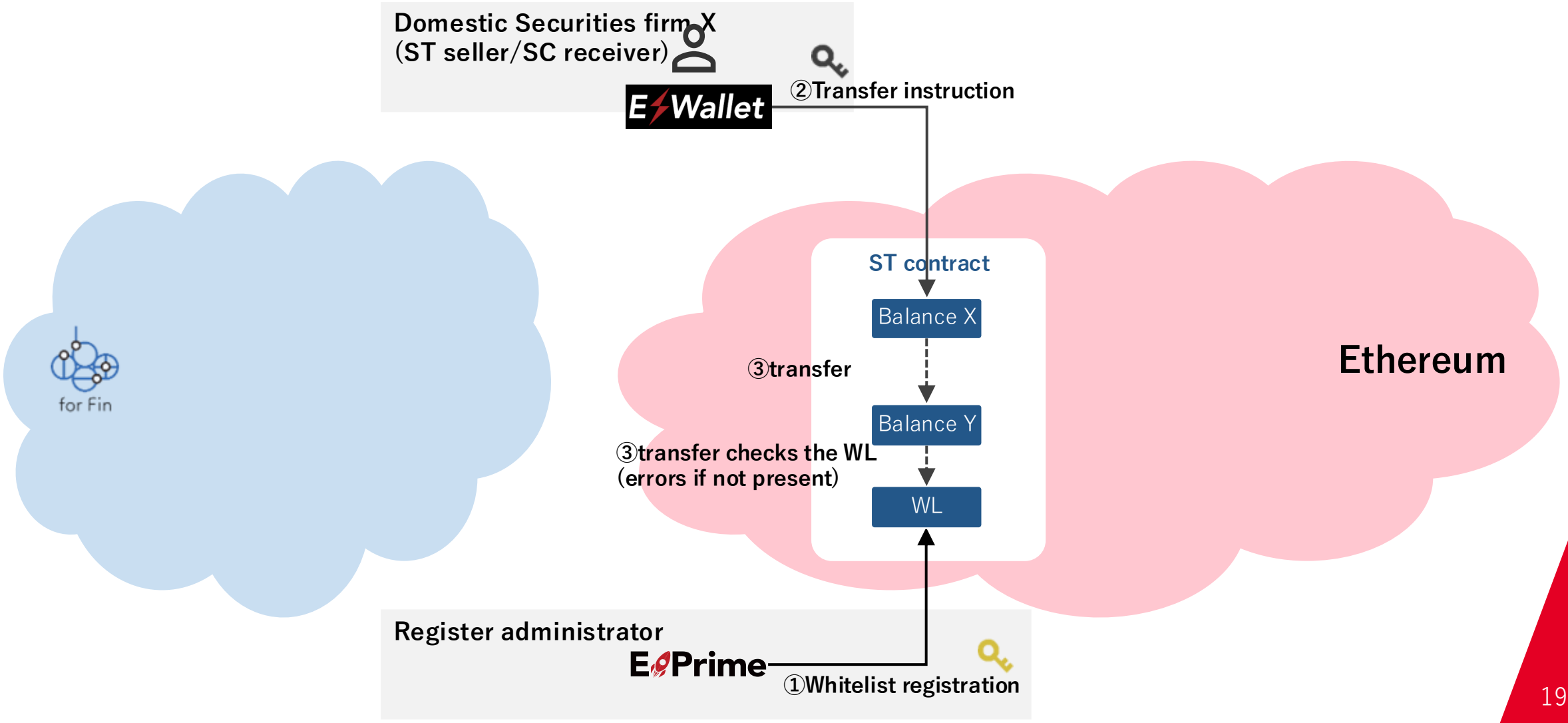
› The issuer (which by design may be delegated to the securities firm) registers ST-holdable addresses in the contract in advance
› Transfer events to addresses not registered in the list are controlled to error out



4) Challenges and Outlook

Challenges and outlook

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- **In this PoC, verification was carried out on the theme of corporate bonds, and a tax-system conflict was detected for publicly offered bonds**
- **In light of this challenge, it is hoped that multifaceted study will be advanced going forward**

Detected challenge	#	Direction of future response
In Japan, digital corporate bonds issued on a blockchain are commonly subject to transfer restrictions Specifically, **a restriction prevents the bond from being transferred unless it is deposited with a "domestic" financial institution** The transfer restriction is understood to be intended to apply the "scheme for non-application of withholding tax on interest income received by financial institutions," which took effect for digital corporate bonds in April 2024. Against this background, **this PoC—which assumes deposit by an overseas financial institution—detected that the transfer restriction above could become an issue**.	1	**Examine necessary measures after confirming the legal interpretation** Examine whether the tax scheme premised on domestic-institution deposit and this PoC premised on overseas-institution deposit can coexist If revisions to laws or self-regulatory rules prove necessary, advocate for them
	2	**Expansion to other products** The issue at left is a scheme applied to corporate bonds and does not arise for real-estate STs (specified beneficiary-certificate-issuing trusts), etc. With a view to distributing Japanese assets overseas, securitizing real estate, movables, content, etc. is expected to have meaningful value Accordingly, consider applying this scheme to beneficiary-certificate-issuing-trust-type STSTs (though trust-specific issues will need to be addressed)

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