

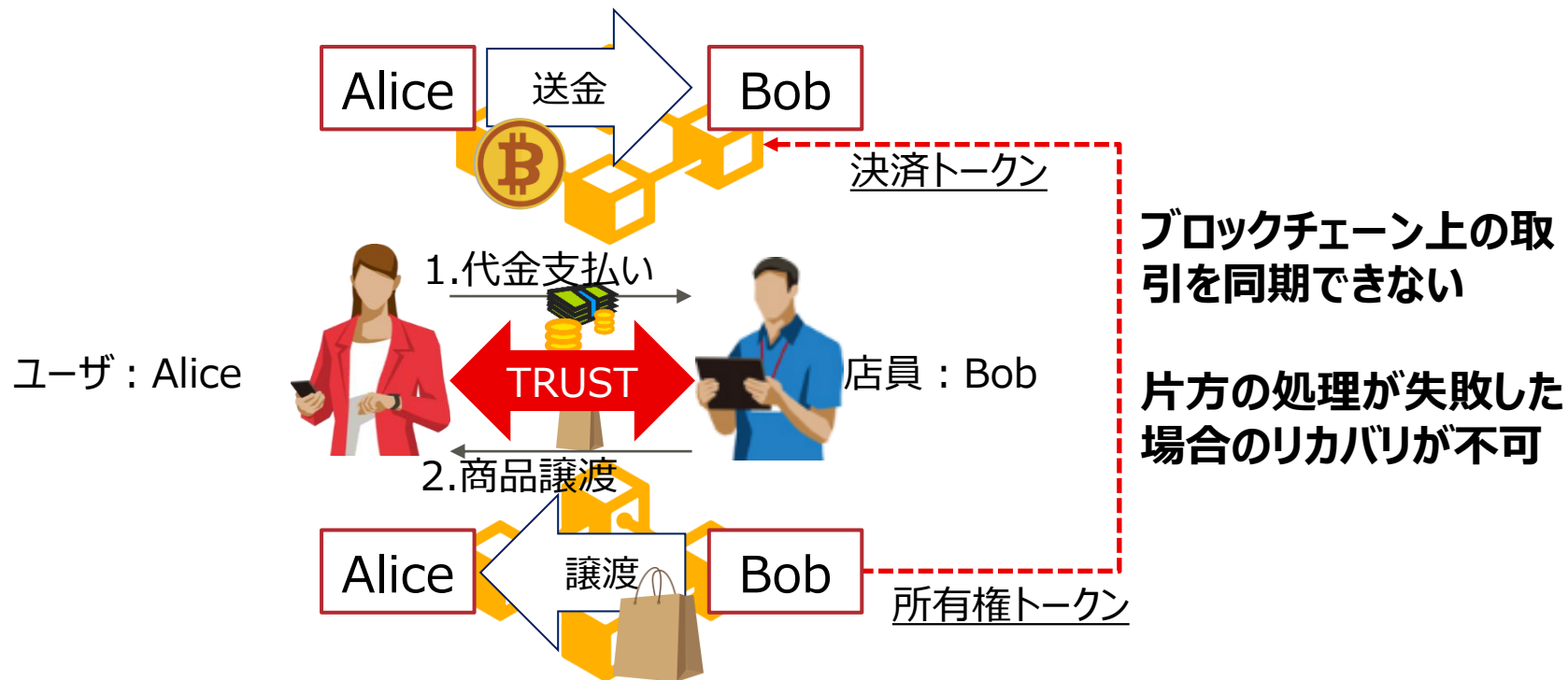
異なるブロックチェーン同士を 安全に連携させるセキュリティ技術 ConnectionChain:

富士通株式会社

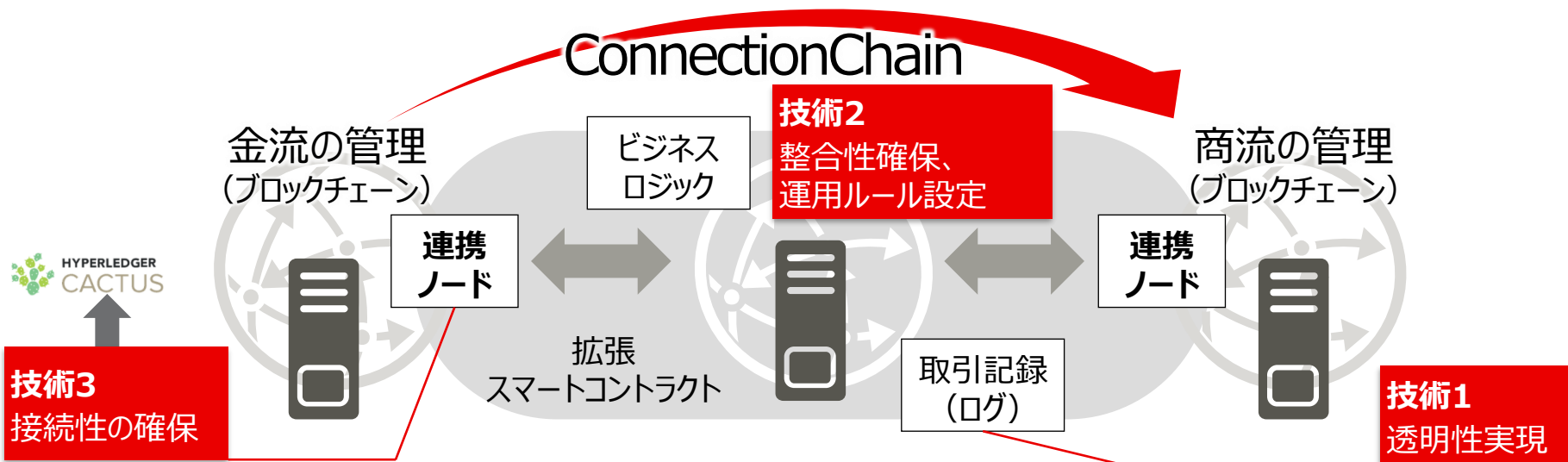
研究本部

データ&セキュリティ研究所

課題：異なるブロックチェーンが関わる取引



複数のDLTを対象にした高度な状況判断と、エラーリカバリ機能が必要



- 【技術1 : 拡張スマートコントラクト】システムを跨ぐ取引を証拠性を担保したまま台帳管理し、透明性を実現
- 【技術2 : マルチシナリオ機能】運用ルールをスクリプトで設定可能とすることで、他社サービスを自社向けにカスタマイズする等、自在な運用ルール設定が可能。複数サービス間での処理の整合性も確保
- 【技術3 : BC操作抽象化】ブロックチェーン操作の抽象化で接続機能を部品化。様々なBC基盤と接続が可能

OSS活動: Hyperledger CACTUS



Hyperledger Landscape
<https://landscape.hyperledger.org/projects>

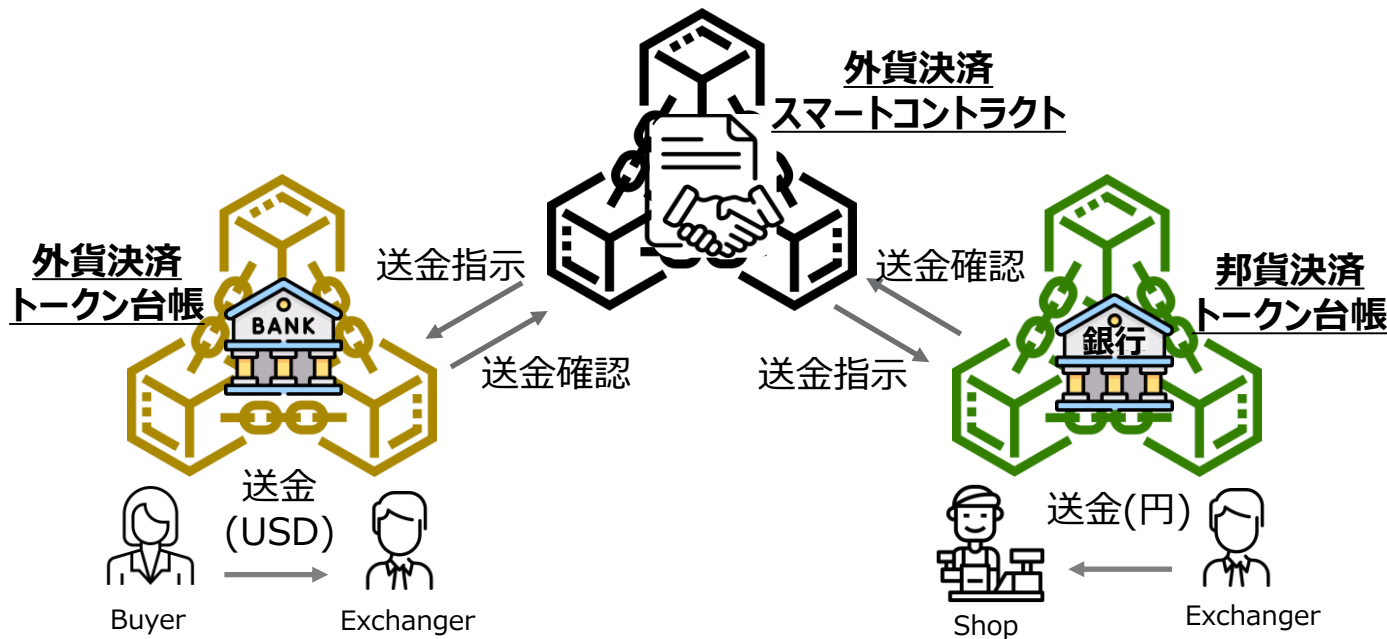
➔ 2022.3にV1.0をリリース

富士通はCACTUSの設立に関わり、アーキ設計、開発コードの量でOSSコミュニティに貢献しています

CACTUS supports

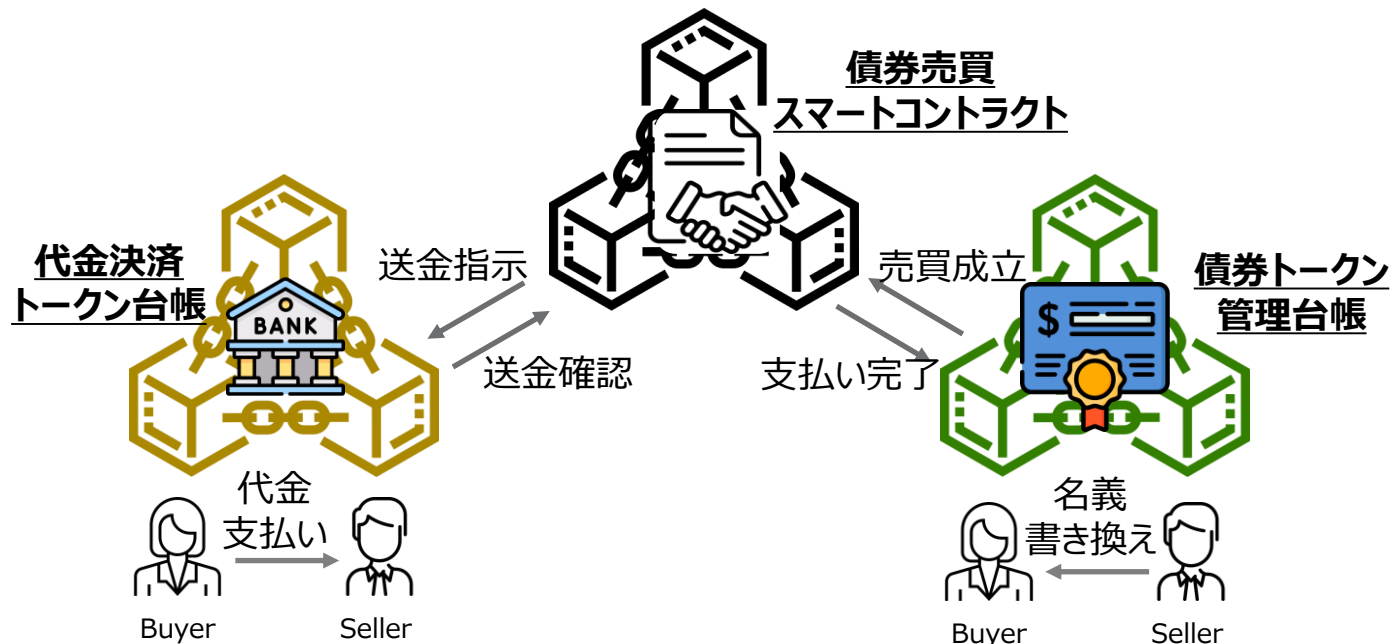


実証実験①：外国人旅行者向け決済



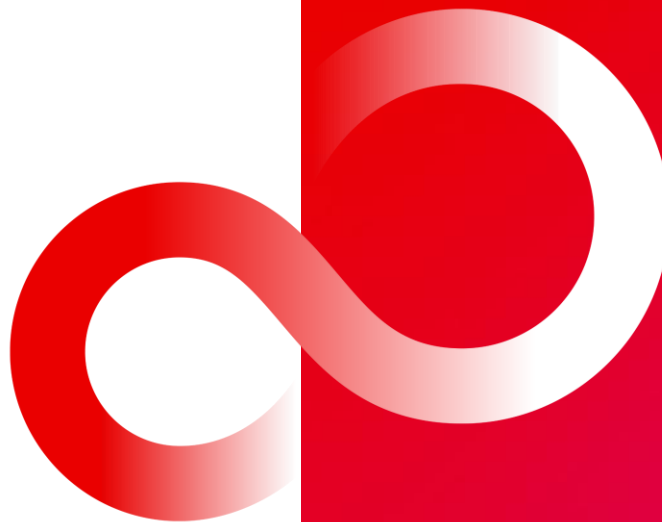
仲介者(Exchanger)が居れば同じブロックチェーンに参加する必要はない

実証実験②：デジタル債券の売買



代金の支払いと名義書き換えを統一された処理ロジックで自動実行

Thank you



Extended Smart-contract example

Business logic of smart contract

Business logic scenario

- (1) Create a transfer transaction crossing multiple ledgers
- (2) Request to transfer from account of **Person F's regional Currency A** to escrow account
- (3) Notify block data
- (4) Validate block data then, pickup target Tx and apply conversion rule(Rate/Fee) on it
- (5) Query about **Bookshop X's** account status
- (6) Determine if payment can be settled (if **OK**, then to (7))
- (7) Request to transfer money from pool account to **Bookshop X's** account
- (8) Notify block data
- (9) Validate block data, and start settlement of the payment
- (10) Request to settle payment from escrow acct. to **Settlement acct.**
- (11) Notify block data
- (12) Validate block data then, pickup target TX and confirm completion of the payment

Parameters for smart contract

Runtime parameters

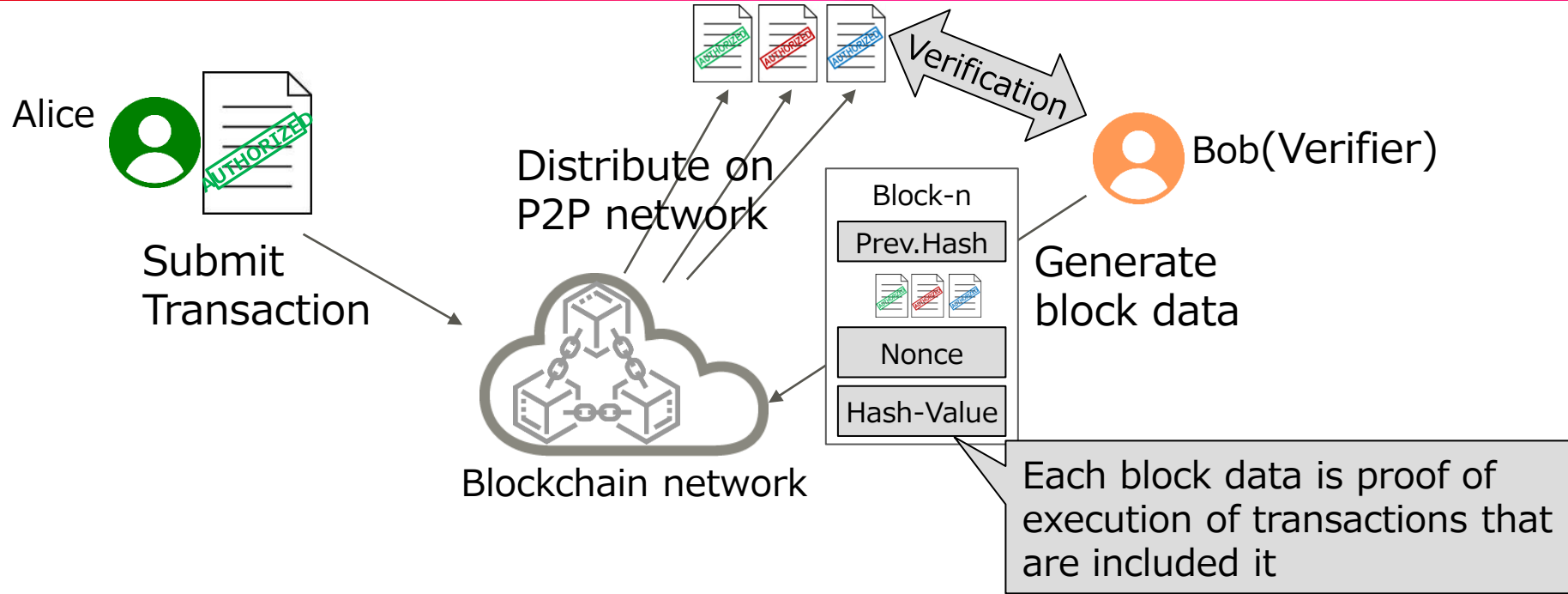
| Parameter | Description |
|---------------|---|
| Transfer TxID | ID for series of transactions |
| Requester ID | UserID on ConnectionChain system |
| FromChain | Person F's account of regional Currency A |
| ToChain | Bookshop X account of regional Currency B |
| Asset | Currency amount to transfer |
| RuleID | Rule (Rate/Fee) to be applied on the transfer |

Parameters for conversion rule

Configurable parameters

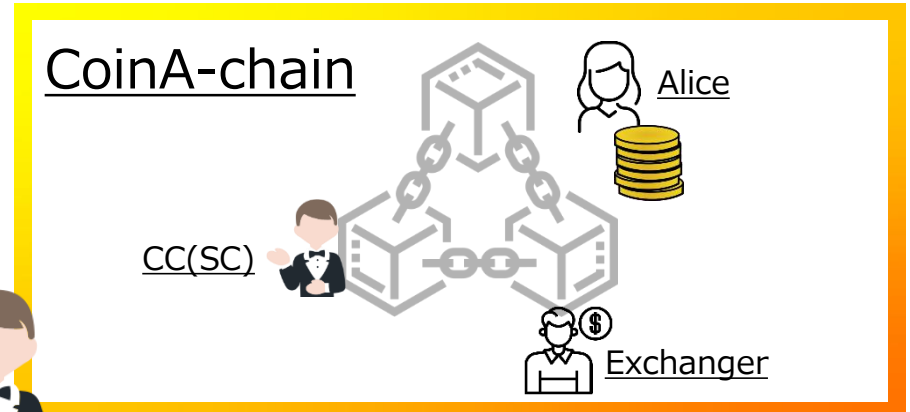
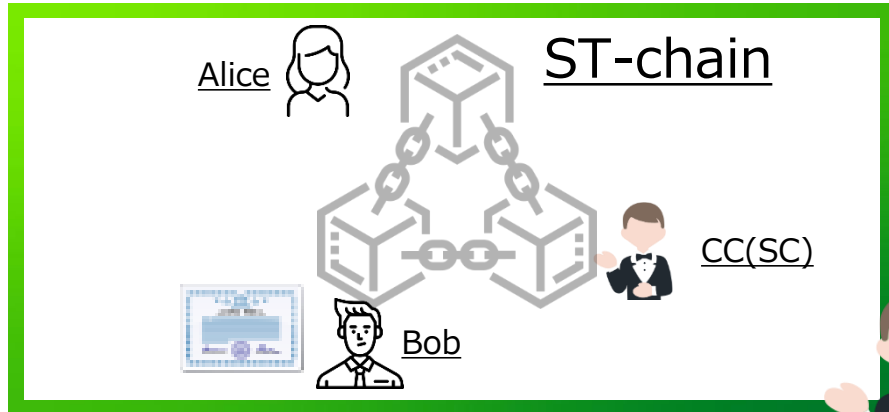
| Parameter | Description |
|------------------|---|
| Rule ID | ID to referee from |
| From Chain | ID of transfer origin block chain |
| To Chain | ID of transfer destination block chain |
| Rate | Conversion rate applied on the transfer |
| Fee | Handling fee on the transfer |
| Settlement acct. | Settlement account of regional Currency A |
| Pool acct. | Pool account of regional Currency B |

Proof of transactions in blockchain



Blockchain is a robust distributed ledger system that can reliably process transactions due to its immutability.

ConnectionChain DvP flow (proposed)



CC(Business Logic)

ConnectionChain will integrate transactions which across multiple ledgers

