



CBDC BANKING PARTNERSHIP PROPOSAL

TraceChain

Supply Chain Transparency – Using Digital Currency

TraceChain by Snapper Future Tech — an enterprise-grade blockchain platform integrating CBDC settlement directly into supply chain transactions. Real-time | Auditable | Automated.

TRC-TOKEN

CBDC Layer

CSR CBDC

Payouts

Compliance

SaaS

End to End

Provenance & Traceability

Built by Snapper Future Tech & Indian Blockchain Institute



Hybrid Architecture

Node.js + Angular + MongoDB + Hyperledger Fabric



Tamper-Proof Records

Every transaction recorded on-chain — immutable & auditable



CBDC Settlement

TRC-TOKEN auto-transfers on purchase receipt confirmation



NFT Certificates

Physical assets & compliance certs tokenised on Fabric

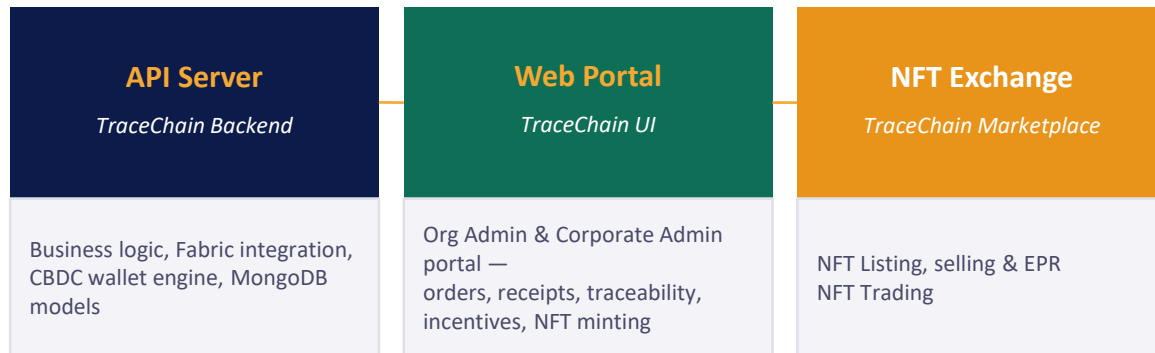


Multi-Industry

Agriculture, Pharma, Textiles, Distilleries, Recycling & more

Three Integrated Applications

A single cohesive product — API server, web application, and NFT marketplace



Problems It Solves



Opacity

No single source of truth



Fraud

Certificate & document fraud



Incentives

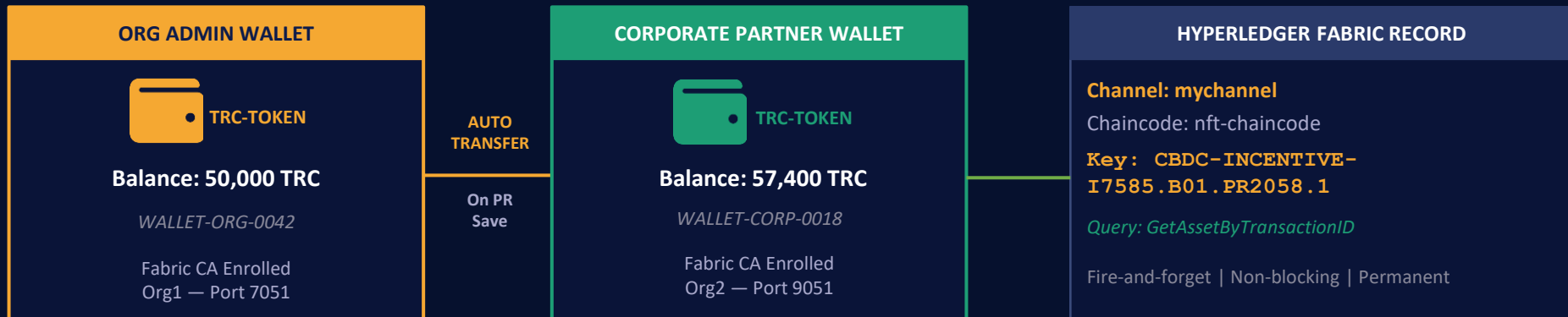
Manual incentive tracking



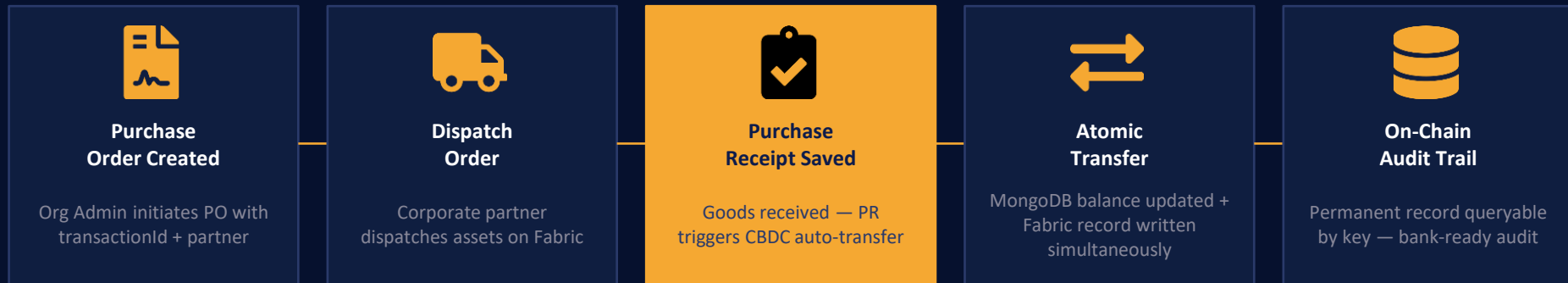
Compliance

EPR reporting gaps

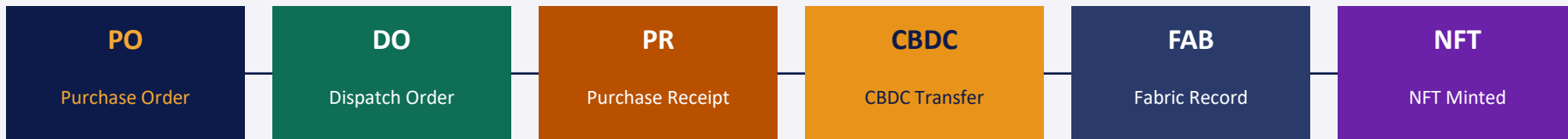
Dummy CBDC Implementation on Hyperledger Fabric



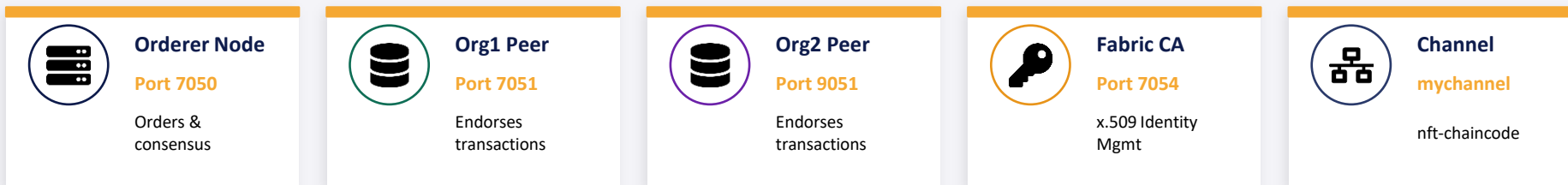
How TRC-TOKEN Works



Transaction Flow & On-Chain Infrastructure



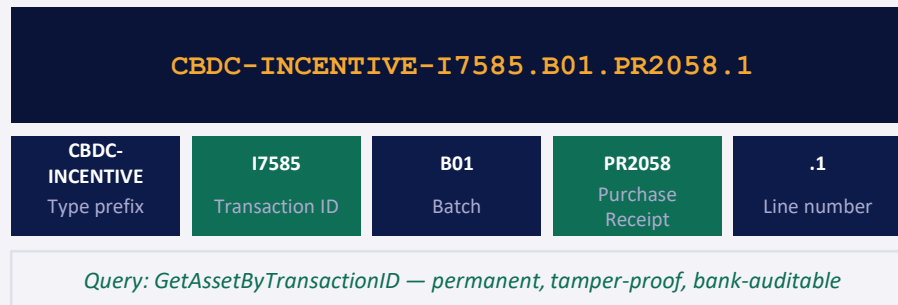
Hyperledger Fabric Network



CBDC Wallet Structure

Wallet ID	WALLET-ORG-0042
Organization	Org Admin / Corporate Partner
Balance (MongoDB)	50,000 TRC-TOKEN
Mirrored on	Hyperledger Fabric ledger
Transfer trigger	Purchase Receipt (PR) save event
Atomic operation	MongoDB update + Fabric record

Blockchain Record Key Schema



Tokenising Physical Assets on Hyperledger Fabric

NFT Lifecycle



Mint

CreateNFT chaincode — physical asset tokenised with provenance URL & hash



List

putOnSale chaincode — fixed-price listing on marketplace



Purchase

Buyer pays in TRC-TOKEN — ownership transferred on-chain



Audit

Full ownership history queryable — tamper-proof chain of custody



Burn/Revoke

Retire NFT when cert expires or goods consumed

EPR Certificate NFTs

Extended Producer Responsibility on Blockchain

- ✓ EPR certificates minted as NFTs keyed by certNumber
- ✓ Auditors query Hyperledger Fabric directly — no spreadsheets
- ✓ Revoke & re-mint on certificate update or expiry
- ✓ Marketplace trading of EPR credits between producers
- ✓ Tamper-proof — cannot be retroactively altered or double-counted

Chaincode Layer

Channel: **mychannel** Chaincode: **nft-chaincode** Query: **GetAssetByTransactionID**



Chaincode
Functions



Fabric
Orgs



Assets
Traceable

100%

On-Chain
Audit

10 Industries — CSR CBDC Payouts & Compliance SaaS ★ FEATURED



Agriculture & Food Safety

Farm → Mill → Bakery

Contamination traceability in seconds. EPR compliance.



Pharma & Healthcare

Cold-chain for vaccines

Geo-tagged transfers. Batch release NFT certs.



Distilleries & Ethanol

Molasses → Ethanol → By-products

Excise audit. CO2 & spent wash traceability.



Plastic Recycling & Circular

Waste → Granules → Manufacturer

EPR NFT marketplace. Tamper-proof recycling claims.



Government & Regulatory

EPR Compliance Reporting

Auditors query Fabric directly. Zero self-reported.

FEATURED



CSR CBDC Payouts

Corporate → Communities

Transparent CSR disbursement via TRC-TOKEN on Fabric.

FEATURED



Compliance SaaS Platform

Regulation → SaaS → Auditor

White-label compliance SaaS powered by TraceChain.



Textiles & Apparel

Cotton → Mill → Brand

Ethical sourcing NFTs. Consumer QR provenance.



Electronics & Manufacturing

Component traceability

Instant recall — all affected products identified.



Construction & Infrastructure

Quarry → Crusher → Site

Cement/steel batch tracking. Industrial EPR.



Transparent Corporate Social Responsibility via Blockchain-Verified CBDC Transfers



How CSR CBDC Payouts Work



TRC-TOKEN Disbursement
Corporations allocate CSR funds as TRC-TOKEN to designated program wallets on Hyperledger Fabric



Beneficiary Wallets
Communities, NGOs, and individuals hold on-chain wallets — all disbursements are traceable



Smart Contract Triggers
Payouts auto-execute when pre-defined conditions are met — no manual transfers or delays

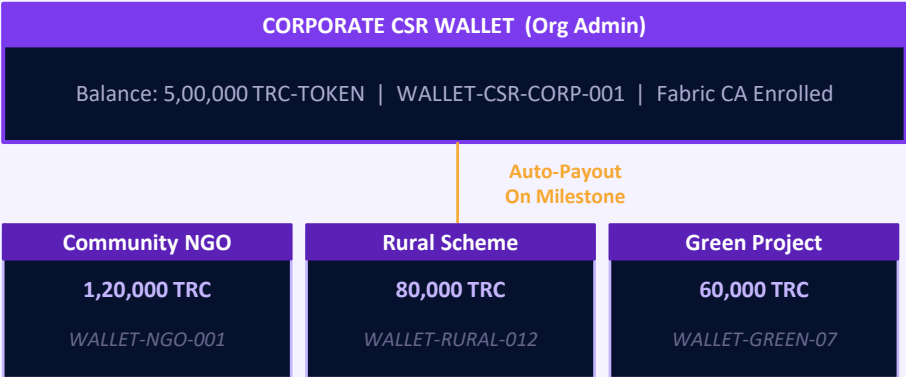


On-Chain Proof
Every transfer permanently recorded on Fabric — auditors and regulators can query directly



CSR NFT Certificates
NFTs represent verified CSR activities — tradeable & publicly queryable compliance proof

CBDC Flow — CSR Program



Why Banks & Corporates Benefit

- ★ 100% transparent fund trail
- ★ Auditor-ready Fabric records
- ★ Regulatory compliance built-in
- ★ Smart-contract auto-payouts
- ★ NFT proof of CSR activity
- ★ CBDC swap-ready infrastructure



White-Label Blockchain Compliance Reporting as a Service — Powered by TraceChain

Regulation
Input

TraceChain
SaaS Engine

On-Chain
Proof

Automated
Reports

Auditor
Dashboard

Compliance SaaS Modules



EPR Reporting Module

Automated EPR compliance reports generated from on-chain data — no manual data entry



Certificate SaaS

Organisations subscribe to issue, verify & trade compliance NFTs via white-label portal



Multi-Tenant Architecture

Each org gets isolated organisationId on shared Hyperledger Fabric — true SaaS model



Real-Time Audit Dashboard

Regulators & auditors get read-only Fabric access — live compliance status at all times



API-First Integration

Connect any ERP (SAP, Oracle) via REST API v1 — compliance data flows automatically

SaaS Architecture Layers

Client Tier WHITE-LABEL PORTAL

Branded compliance dashboard per client org — role-based access, reporting, NFT issuance

SaaS Engine Tier TRACECHAIN API v1

REST endpoints consume Fabric events, generate reports, trigger NFT minting & CBDC payouts

Blockchain Tier HYPERLEDGER FABRIC

On-chain proof — tamper-proof, permanent, auditor-queryable compliance records

Multi
Tenant

Isolated per Org

Real-Time
Reports

From On-Chain
Data

0 Spreadsheets

100% Blockchain

Plug-In
CBDC

Swap-Ready

Why This Matters for Banking Partners

- ★ Recurring SaaS revenue stream
- ★ Bank as trusted Fabric node
- ★ Compliance API for corporate clients
- ★ Audit trail reduces credit risk

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graph LR; A[Sugar Mill Molasses] --> B[Purchase Order]; B --> C[Ethanol Production]; C --> D[Purchase Receipt]; D --> E[NFT Cert + CBDC]; E --> F[By-product Trace];
```

Sugar Mill
Molasses

Purchase
Order

Ethanol
Production

Purchase
Receipt

NFT Cert
+ CBDC

By-product
Trace

TraceChain Features for Distilleries



Purchase Orders

Track molasses & chemical procurement from sugar mills



Dispatch Orders

Record raw material & finished ethanol movement



Purchase Receipts

Validate quantity & quality at each production stage



NFT Certificates

NFT of Provenance file and EPR compliance document



CBDC Incentives

Auto-distribute to farmers, mills & logistics on receipt

Traceable By-products

Spent Wash

Bio-compost

DDGS

CO₂ Recovery

Bio-energy Generation

Key Benefits

✓ End-to-end feedstock & ethanol batch traceability

✓ Excise & regulatory audit readiness

✓ Sustainability

✓ Transparent by-product utilisation tracking

✓ Prevention of certificate fraud

✓ Automated CBDC incentives across the chain

Plastic Waste → Recycler → Processor → Recycled Granules → Manufacturer

Waste
CollectionSort &
ProcessRecycler
ReceiptFlakes /
GranulesEPR NFT
MintedManufacturer
Verified

TraceChain Features for Recyclers



Waste Asset Registration

Batches from municipalities/aggregators registered as blockchain assets



Purchase Receipts

Recyclers confirm receipt — quantity, grade, source all on-chain



Asset Lineage Mapping

Recycled output linked back to original waste batch



EPR NFTs

Certificates minted & traded — prevents double-counting



CBDC Incentives

Rewards for collection centers & ecosystem participants

EPR NFT Marketplace

Minted on Hyperledger
Fabric

Marketplace Trading

Tamper-Proof Records

Revoke NFT

Offset Credit

Key Benefits

✓ Complete plastic waste traceability

✓ Tamper-proof EPR compliance on-chain

✓ Marketplace trading of EPR certificates

✓ Prevention of double-counting & fraud

✓ Improved transparency for regulators

✓ Supports circular economy

Why Partner with TraceChain?

TraceChain's TRC-TOKEN CBDC engine is architecturally designed to integrate with a real Central Bank Digital Currency. The wallet engine, transfer logic, and Fabric recording layer are plug-in ready.



CBDC Settlement Integration

Replace TRC-TOKEN with your regulated CBDC — wallet engine, transfer logic & Fabric recording layer ready for integration.



Trade Finance Automation

Immutable PO/PR records on Fabric serve as documentary evidence for automated letters of credit & invoice financing.



Consortium Network Expansion

Your bank operates as a trusted Hyperledger Fabric peer node — independent verification of CBDC transfers.



Incentive Audit Trail

A secure, chronological record of all actions related to Incentives verified from Hyperledger Fabric

Frontend Layer

**Angular**

SPA web portal
Org & Corporate Admin

Backend / API Layer

**Node.js / Express**

REST API v1
/api & /src namespaces

Blockchain Layer

**Hyperledger Fabric**

nft-chaincode
mychannel

Compliance Layer

**EPR Module**

Extended Producer
Responsibility Compliance
Documents

**JWT Auth**

x-api-token
x-cbdc-token sessions

**MongoDB**

Transactional data
CBDC wallet balances

**TRC-TOKEN CBDC**

Wallet engine
Atomic settlement

**Provenance &
Traceability**

Track and trace assets
using provenance file and
traceability with
blockchain

**Role-Based Access**

Per module, per user
per organisation

**AWS S3 / API GW**

Document storage
NFT image hosting

**NFT Chaincode**

CreateNFT
putOnSale / Burn

**Incentive Audit Trail**

Full CBDC incentive
transaction history