Altoros Hyperledger Demo

Distributed Clearing Platform for Derivatives
Introducing Hyperledger

A **collaborative** effort created to **advance blockchain** technology by identifying and addressing important features for a **cross-industry open standard** for distributed ledgers that can transform the way **business transactions** are conducted globally.
Introducing Altoros

Altoros is a 250+ people consultancy helping banks and insurance companies digitize revenue streams. For blockchain applications we integrate solutions offered by the Hyperledger ecosystem.
Hyperledger provides distributed ledger and smart contract technology

Synswap is building a Distributed Clearing Platform

Altoros is making it happen
# Hyperledger Technology

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<th>Smart Contracts</th>
<th>Ledger</th>
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<td>Code executed by members of a peer-to-peer network implements workflows of a Clearing House.</td>
<td>Immutable ledger of financial agreements is maintained by all members.</td>
<td>Financial agreements recorded on the blockchain are open only to the parties involved.</td>
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OTC Derivative swap

Bilateral agreement to exchange cash flows at specified intervals (payment dates) during the agreed life of the transactions (maturity)

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OTC Derivative swap

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A credit default swap is a credit derivative contract in which one party (*protection buyer*) pays a periodic fee to another party (*protection seller*) in return for compensation for default (or similar *credit event*) by a *reference entity*.
Risk Management

In order to mitigate counterparty risk when trading a CDS, important post trade workflows are executed:

Netting of cash flows

Margining (collateral management)

Compression (netting of offsetting trades)

Default Management

However, “some firms and infrastructures still rely on fax for some of their business communication and instruction”.

These risk management workflows are typically run by a Clearing House, but...
Clearing House

Central Clearing House:
● Expensive
Clearing House

Central Clearing House:
- Expensive
- Counterparty Risk
Clearing House

Central Clearing House:
- Expensive
- Counterparty Risk
- Concentration Risk
Post Trade by Smart Contracts

Smart contracts run by trading members on a peer-to-peer network can fully automate post trade workflows.

- Trade
  - Matching
    - Settlement
      - Collateral
      - Coupon
      - Compression
      - Default
Clearing House: Distributed

Workflows of a Clearing House are run by all members in a peer-to-peer network.
Trades are Smart Contracts

Financial agreements between counterparties are represented by smart contracts. They are isolated ledgers and executable code.
Counterparties are Members

Counterparties enroll in a network as equal members, supporting and executing workflows.
Trades are Confidential

Financial agreements can be decrypted and executed only by its counterparties.

Other members support order and persistence but cannot see confidential data.
Payment by Adapters

Smart contracts *orchestrate* payments by issuing instructions to the payment system outside of the platform.
Payment by Adapters

Payment system notifies the platform of successful transfers.

Smart contracts *react* to these events by steps in their workflows.
Credit Events by Oracles

Smart contracts react to events delivered to the platform by trusted oracles.
Pricing by Consensus

Prices for collateral management are calculated by a smart contract run by each member.

Members reach consensus on the CDS price.
Collateral Management

Based on results of Pricing margin accounts are adjusted daily. Payment instructions are issued and confirmed.
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Payment instructions are issued and confirmed.
Collateral Management

When a payment confirmation is not received the payer is in default.
When a member defaults, a smart contract calls to auction out the defaulted member’s portfolio among remaining members.
A smart contract determines the winners of the auction process.

Members who win the trades of the defaulted member become new counterparties of the trades.
Member Default

Smart contract unwinds trades of the defaulted member...
Member Default

... and redistributes them among the winners of the auction.
Member Default

New trades are created automatically.
Member Default

Members collectively covered for the defaulted member.
Each member submits his portfolio anonymously to a smart contract.
Trade Compression

No member nor the smart contract can see trade details...
Trade Compression

… or deduce parties to trade.
Trade Compression

The smart contract runs a compression algorithm on anonymized inputs.
Trade Compression

Number of trades is reduced and so are the risk and capital requirements.
Decentralized Clearing on Hyperledger

Hyperledger technology provides confidentiality of financial agreements committed to a common ledger.

Smart contracts run by trading parties on Hyperledger blockchain allow to collectively execute post trade workflows in a more secure and less expensive decentralized model.