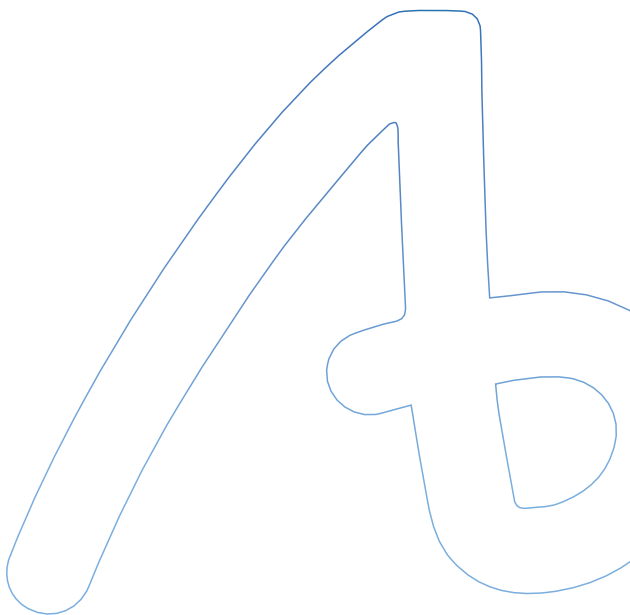




Aboard.Exchange

Derivatives & DeFi





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Background

As blockchain technology rapidly emerges, more and more individuals and institutions can access the crypto market freely, equally, and anonymously. In the DeFi world, anybody can access comprehensive financial services like lending, farming, speculation, investing, arbitraging, buying crypto hedge funds, or even being a financial advisor. However, the development of decentralized derivative products has not been as fast, yet offers significant advantages over existing centralized systems.

Let's see the numbers which show the driving factors at hand in crypto derivatives trading.

| Daily trading of derivatives volume | Date from | Volume (\$ billion) | Current vol. (\$ billion) | Duration* (years) | Growth (%) |
|-------------------------------------|------------|---------------------|---------------------------|-------------------|------------|
| Binance | 24/10/2020 | 6.05 | 108.80 | 1 | 1800 |
| FTX | 24/10/2020 | 0.83 | 19.91 | 1 | 2400 |
| dYdX | 13/4/2021 | 0.12 | 6.09 | 0.5 | 5075 |
| Deribit | 24/10/2020 | 0.31 | 2.10 | 1 | 677 |

**Current volume data as of 22/10/2021*

Data source: <https://www.coingecko.com/en/exchanges/derivatives>

The data shows the exceeding growth of crypto derivatives trading volume in 2021, along with the booming crypto market. However, this is just the starting point of the coming 5 to 10 years. Considering the nascent stage of decentralized exchanges (DEXes), we are only at the very beginning for derivative products.

Welcome Aboard!

Introduction

Aboard.Exchange will be the first decentralized derivatives exchange that offers a full suite of products serving both individual and professional traders. We provide users with a silky-smooth trading and portfolio management platform with high efficiency, low costs, and full security.

Traditional derivative products are awash with barriers and fees. Crypto exchanges have brought these barriers down for spot trading, but there is still no platform that offers comprehensive decentralized derivative products. Aboard will provide a full suite of derivative products on one platform and open up opportunities for users to be a fund manager or find managers to invest in funds. With no institutional barriers or fees, Aboard truly opens up the benefits of crypto derivatives trading through decentralized blockchain technology.

Aboard Protocol is a set of rules and procedures which govern the Aboard ecosystem. It is made of on-chain smart contracts to ensure the anonymous, non-custodial, and trustless features of DeFi that are open-source and audited by top security firms. On-chain data like trade settlements, account balance, and trade history are transparent and publicly immutable.

Aboard.Exchange is designed to reduce the complexity of on-chain processes and keep core activity data concerning fund security and verifiability on-chain. Since the nature of blockchain is to keep redundancy and maintain verifiability and immutability, the execution speed and trading cost of AMM (automated market makers) cannot compete with traditional order book systems.

Introduction

We introduce our off-chain IBOHS (integrated bookkeeping and order handling system) as a low-latency order routing and matching engine. IBOHS's powerful trading core replaces heavy calculations with lightning-fast speeds and zero gas costs. This eliminates considerable slippage, impermanent loss, latency, and front-running trading with on-chain AMM.

In addition to blockchain and trading system engineering, the other core competency of Aboard is an excellent understanding of asset management. To help professional derivative fund managers seamlessly shift from TradFi to DeFi, Aboard is focusing on the development of the following aspects:

1. Broader Products

Aboard's full line of products, including an advisory protocol, perpetuals, indices, options, futures, lending, and spot, enable traders to maximize their performance with diversity and position hedging.

2. Advisory Protocol & Sub-account Functions

Aboard uses blockchain smart contract technology to break the cumbersome traditional fund industry mold, opening up funds by bringing down barriers such as minimum investment amounts.

Investors and fund managers can establish ties by e-signing an investment management agreement without a third party or paying a custody fee. The agreement is an on-chain smart contract that is completely transparent and immutable.

Introduction

Aboard's design also means that prospective first-time investment managers can have a go at starting their own fund. Users do not need to build and maintain relationships with third-party agencies and pay fees; they will receive everything they earn. Without such fees, attention can be focused on creating a successful fund.

3. Portfolio Monitor & Risk Controller

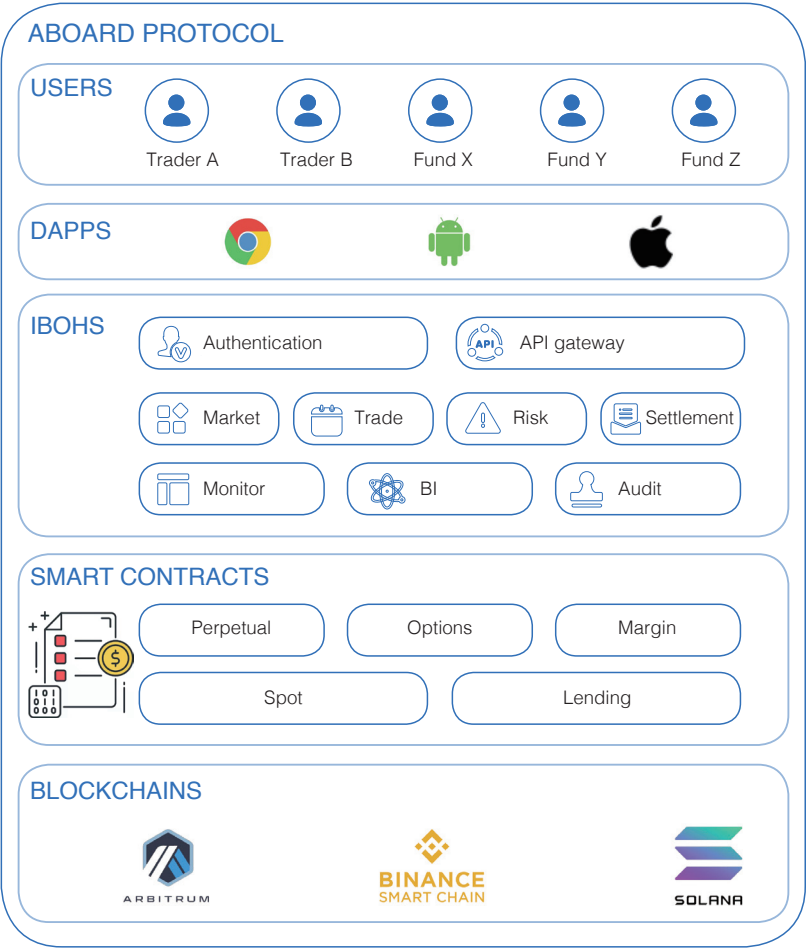
Fund managers can view the real-time net worth and Greek exposure of positions. The liquidation triggers can be preset upon the terms of the agreement mentioned above. The risk controller will liquidate all positions when specified conditions are triggered to minimize losses.

4. Advanced Trading Tools and Order Types

Tools like charts and options traders can be convenient for traders. Based on their technical analysis, they can place orders by clicking on the desired position on charts. Order types like trailing stop, conditional order, OCA, OCO, GTC, GTD, FOK, iceberg, etc., will help traders trade in an efficient and timely manner.

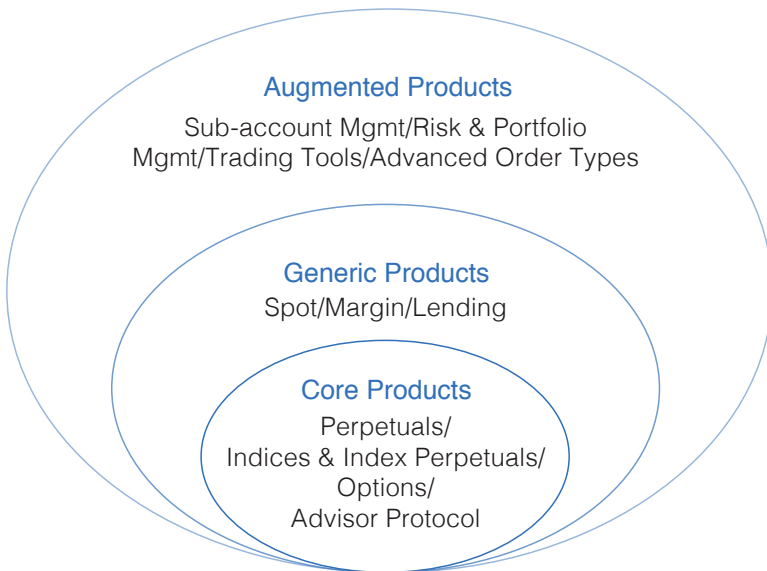
Architecture

1. Technical Architecture



Architecture

2. Products Overview



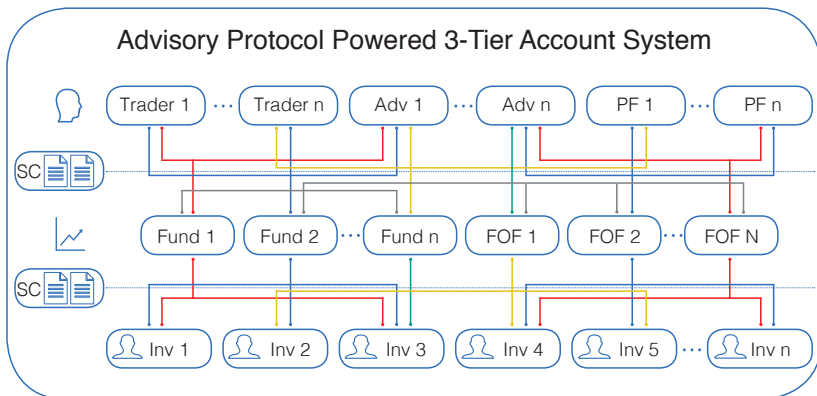
3. Functional Layout

As professional traders from hedge funds, family offices, corporations, FOFs, and MOMs are getting involved in the crypto market, DEXes face more sophisticated and specialized requirements like asset allocation, portfolio and risk management, multi-account management, etc. Aboard is deploying the following modules to fulfill these requirements:

Architecture



4. Account Structure



FOF = Fund of funds

Inv = Investor

Adv = Advisor

PF = Passive fund (e.g. ETFs)

SC = Smart contract

Key Products/Features

1. Multi-chain

Currently, Aboard is deploying smart contracts on Arbitrum, Optimism, and Binance Smart Chain (BSC) networks. Other mainstream networks like Solana, Near, Polygon, ZKsync, Starkware, etc., will be supported later. Users can initiate trades or transfer their assets between different networks. This can provide a great convenience to users and significantly increase market liquidity and efficiency.

2. Broad Product Range

Aboard offers financial products, including spots, margin, futures, options, indices, index futures, lending, and loans. This gives flexibility and diversity for fund managers to build their portfolios.

3. Multi-platform

Aboard supports Windows, Linux, Android, and iOS.

4. Indices & Index Futures

Indices and their futures are critical for both investors and traders. Indices can measure the performance of a particular sector of the market, e.g. the large-cap/small-cap sector, DeFi/DEX sector, NFT/Metaverse sector. Investors can long a specific industry by buying the index perpetual instead of holding a basket of spots. Meanwhile, traders can extract alpha from buying strong tokens from a sector

Key Products/Features

and hedge their long position by shorting the index future. Aboard. Exchange will launch Crypto50, Crypto300, DeFi50, NFT50 indices by Q4 2021.

5. Cost & Performance

By applying our state-of-the-art IBOHS and layer 2 rollup solutions, trading costs and latency are minimized. Aboard takes care of the gas fee; traders only need to pay the trading fee, which is significantly below the market average.

6. Advisory Protocol

This on-chain protocol enables connections between fund managers and investors in a trustless manner. Smart contracts are taking the place of the role of the custodian in the traditional asset management industry. All terms and conditions, such as fees, duration, risk level, etc., are specified in the smart contract. By e-signing the contract, anybody can buy shares of any crypto fund listed on the market. It also gives institutions and managers great convenience in fundraising.

In addition to giving managers great convenience in fundraising, all functions, including transactions, clearing, and settlement, are automatically executed on the platform according to contract terms. Moreover, the performance of funds is also comprehensively displayed, and sub-accounts can be opened for advanced investment portfolios.

Key Products/Features

7. Fast Withdrawals

Users trading with Aboard do not need to wait up to seven days to withdraw their funds. With third-party cross-chain and cross-layer solutions, they can instantly withdraw and transfer their tokens across Ethereum, Arbitrum, Optimism, BSC, and Polygon with low cost and latency.

8. Advanced Order Types

In addition to basic order types, including market, limit, post-only, and stop orders, Aboard offers the following advanced order types for professional traders:

Types: trailing stop market/limit, iceberg, pegged, snap, conditional, combo, hedge, batch

Attributes: AON, OCA, OCO, block

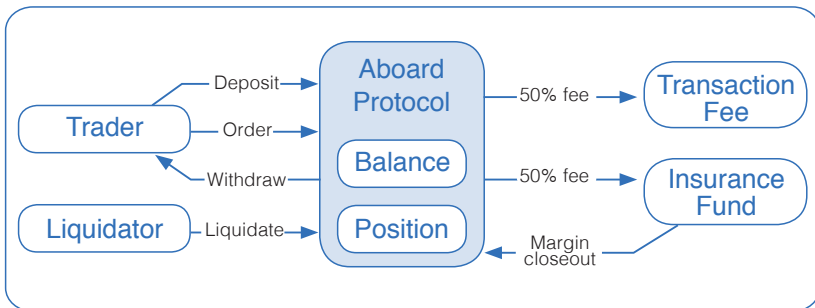
Time in force: day, GTC, GTD, FOK, GAT

9. Trading Tools

The trading API enables quants to implement their algorithm or quantitative trading strategies. With a portfolio monitor, fund managers can comprehensively view all assets under their management. The risk controller shows real-time exposure of positions, and managers can click on their predefined rebalancing strategy to control risks.

Implementation

The following figure shows Aboard's margin trading process. Aboard Protocol's set of Ethereum smart contracts ensures transparency of transactions, including deposits, withdrawals, trades, liquidations, etc., 50% of trading fees collected from traders will go to an isolated insurance fund vault. In the case of extreme market conditions like volatility surges, liquidated accounts could have a negative balance, and the insurance fund will take on the losses.



1. Margin Calculation

$$\text{Initial margin} \quad IM = ABS(S * P * i)$$

$$\text{Maintenance margin} \quad MM = ABS(S * P * m)$$

S: Position (negative for shorts)

P: Oracle price

i: Initial margin rate

m: Maintenance margin rate

$$\text{Total initial margin} \quad TIM = \sum ABS(S_i \times P_i \times i_i)$$

$$\text{Total initial margin} \quad TMM = \sum ABS(S_i \times P_i \times m_i)$$

Implementation

2. Liquidation

Liquidation happens when the real-time margin rate goes below the maintenance margin rate.

$$RTM \text{ (real-time margin rate)} \leq m$$

$$\begin{aligned} RTM &= Bal / Abs(S * P) \\ &= (Bi + UPNL) / Abs(S * P) \\ &= (Bi + S * (P - Pi)) / (dir * S * P) \end{aligned}$$

For a single position, the liquidation price is:

$$P = (S * Pi - Bi) / S * (1 - dir * M)$$

Bi: Initial balance

Pi: Position opening price

dir: +1 for a long position or -1 for a short position

UPNL: Unrealized profit and loss

For multiple positions, the liquidation price of token x is:

$$\begin{aligned} Px &= (S * Pxi - Bi + otTMM - otUPNL) / S * (1 - dir * Mx) \\ otTMM &= \sum abs(Sn * Pn * Mn) - abs(Sx * Px * Mx) \\ otUPNL &= \sum (S * (Pn - Pni)) - (Sx * (Px - Pxi)) \end{aligned}$$

Implementation

3. Funding Rate

otTMM: Sum of the other position's maintenance margin

otUPNL: Sum of other position's unrealized profit and loss

$$F = (-1) * R * (T / 8 \text{ hours}) * B * X$$

F: Fund received or paid

R: 8-hour rate

B: Net position

X: Oracle price

$$\text{Premium} = (\text{Max}(0, \text{Impact bid price} - \text{Index price}) - \text{Max}(0, \text{Index price} - \text{Impact ask price})) / \text{Index price}$$

Index price: Weighted average price from major exchanges

Impact bid price: Average execution price for a market sell of the notional impact value

Impact ask price: Average execution price for a market buy of the notional impact value

$$R = \text{Premium} + \text{clamp}(\text{interest rate} - \text{Premium}, -D, D)$$
$$\text{clamp}(x, y, z) = \min(\max(x, y), z)$$

D: Adjustment factor

Governance

ABE is Aboard's native protocol token issued by the Aboard DAO. The ABE token is primarily a utility and governance token to facilitate and incentivize Aboard's decentralized governance. ABE token holders accrue voting rights proportional to their holdings. Holders can also stake their tokens in staking pools, which they can receive rewards from in return. Advisory protocol users must stake ABE tokens to get authority to use this function. ABE also works as an incentive to users who trade on Aboard or provide trading liquidity.

Team

The Aboard is an enthusiastic team with diverse professional backgrounds. The core tech team includes a tech executive from SunGard with over 20 years of industry experience, a chief strategist of a billion-dollar hedge fund, and a chief architect of a major commodity exchange.

Academic backgrounds in the core tech team include master's and PhDs in applied mathematics, financial engineering, and computer science from King's College London, York University, and Indiana University Bloomington.

Our current blockchain and trading system engineers have over 15 years of collective experience in the industry, with solid experience as system architects developing platforms with order matching and handling, low latency, and risk control.

As for traders, this part of our team has been managing portfolios for several institutions in traditional financial markets worldwide for more than 20 years. Their extensive knowledge of the asset management business is essential to providing a complete user experience.

Our marketing and operations team has experience in leading public blockchains, popular DeFi projects, and leading centralized exchanges. Academic backgrounds include master's in economics and finance from Johns Hopkins University, IE Business School, and the University of California, Davis.

Roadmap



Q4 2021

- IBOHS implementation
- Arbitrum & BSC MainNet launch
- Bitcoin & Ethereum perpetual contracts launch
- White paper release



Q1 2022

- Optimism, Solana MainNet launch
- Indices and index futures
- Expand to 30 perpetual contracts
- v1.0 launch
- Security audit
- ABE token release
- ABE airdrop and reward programs



Q2 2022

- Advisory protocol
- Sub-accounts
- Chart trader
- Spot and margin
- Risk/portfolio monitor
- Advanced order types

Roadmap



Q3 2022

- Performance optimization
- Options protocol
- Options trader
- Lending
- v2.0 launch



Q4 2022

- Enhanced IBOHS
- Launch all top 10 chains, including Avalanche, Terra,
- Fantom, HECO, TRON, etc.



2023

- Increasing stability & efficiency
- Comprehensive advisory protocol
- More trading tools
- Introducing synthetic products from traditional markets
- v3.0 launch