Aboard Protocol

Overview

As blockchain technology rapidly emerges, more and more individuals and institutions can access the crypto market freely, equally, and anonymously. Rapid increases in user bases accelerate the development of decentralized finance (DeFi) projects like spot trading, lending, farming, or even crypto fund management. However, the development of DeFi derivative trading has not been as fast. According to Mehta and Sharma (2022), although crypto derivatives account for 57% of the monthly trading volume, most are perpetual futures in centralized exchanges. Also, the trading volume of crypto options is merely 2% of the spot trading volume, whereas, in the traditional U.S. equity market, this number is 35x. Such discrepancy in trading proportion indicates DeFi derivatives, or even crypto derivatives in general, are still in their nascent stage with tremendous potential. Existing DEXes face three major issues: lack of trading products, inefficient trading system, and absence of trading tools.

Aboard protocol includes an order-book decentralized derivatives exchange and an advisory protocol. We aim to further the development of the crypto derivatives market and related asset management business.

Aboard exchange seeks to solve current decentralized derivatives exchanges' defects by having more products, better efficiencies, and more trading tools. Aboard's advisory protocol will be a platform for fund managers to create trading strategies and investors to pick strategies in a transparent and immutable way. The later part of the paper presents the tokenomics of **Aboard's Token (ABE)**, the team behind the project, and the future roadmap. Readers interested in the mechanics of the products may check the implementation documents for more details.

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The Exchange

Introduction

Market Potentials of Aboard

1. The Derivative Market

Derivatives are instruments whose value is derived from underlying assets. They are often used as risk management tools or to create synthetic exposure of the underlying assets. Due to their natures, the derivatives trading market is one of the largest markets in the world. Some estimates the notional value size is over **$1 quadrillion.**

Derivatives account for **57%** of the monthly trading volume at around $3000 billion for the crypto market. In the future, both the percentage and the nominal amount will rise. Eurex's (2021) survey indicates that **90% of the TradFi institutional investors view crypto as a trading opportunity, and 33% believe futures and options are the most critical investment vehicles to the crypto market**. Following the TradFi history and the optimistic view of institutional investors, markets will see rapid growth of crypto derivatives volume.

2. Decentralized Exchanges

Decentralized exchange is a peer-to-peer system that removes third parties in the transaction process and provides service in a trustless way. In Q4 2021, Dex's monthly trading volume averages at around 11% of centralized exchanges'. However, the growth room for decentralized exchanges is enormous. According to a report by Coalition Greenwich (2022), **44% of front-desk professionals and 59% of the buy-side expect most trading volume to be on fully decentralized exchanges in the next two years.** Eurex points out that **67.75%** of professional investors are prevented from entering the market due to a lack of custody solutions for digital assets and security concerns regarding third-party custodians. Decentralized exchanges is the solution as they allow traders to keep the fund and trade in a trustless way.

Introduction

3. Problems of existing decentralized derivatives exchanges:

Current decentralized derivatives exchanges face three major issues: lack of trading products, inefficient trading system, and absence of trading tools. PWC annual crypto hedge fund report (2021) reveals that for hedge funds that are not investing digital assets:

- **71.4%** voted for lack of infrastructure.
- **68.2%** voted for lack of traditional synthetic products (e.g., ETFs, futures/options).
- **52.4%** voted for the size and liquidity of the digital asset market.

First, existing platforms usually provide one or two derivative products, which are not sufficient for professional traders to fully express opinions and achieve advanced risk controls . Investors often have to switch between different exchanges to purchase various derivatives. Second, most DeFi derivatives exchanges are built on AMM (automated market makers). Though effective in decentralization, AMM suffers slippage, impermanent loss, latency, and front-running trading issues. Subsequently, trading or even backtesting on AMM is infeasible for quantitative strategies due to excessive randomness during the trading process. Lastly, decentralized derivatives exchanges do not provide a diverse toolbox, which is essential for sophisticated derivative trading.

If the significant obstacles are removed, **18.2%** of the spectators claim to accelerate their involvement in the crypto market, and **45.5%** will potentially change the approach and become more involved.

Introduction

4. Aboard's solutions:

Aboard's team has solid experience in both TradFi derivative/asset management business and the crypto realm. Therefore, the group provides a potential solution by creating an order book decentralized exchange that will offer a wide range of products and professional trading functions.

Problems	Aboard's solutions	
Lack of trading products	Full-suite of products	Perpetuals futures
		Index/Index derivatives
		Options
		Lending & borrowing
		Etc.
Inefficient trading system	Order book system	
	Layer-2 solutions	
Absence of trading tools	Advanced order types	
	Professional functions	

The exchange is designed with serious crypto traders and TradFi investors in mind. The team refers to both centralized exchanges and TradFi derivative exchanges, hoping to find a sweet spot of the blockchain trilemma for derivatives exchange.

Key Features

1. Full Suite of products:

1.1 Perpetual Futures

Perpetuals futures currently dominates the decentralized derivatives exchanges. Based on Coingecko's data, daily trading volume typically ranges from $2 billion to $5 billion. As the name suggests, a perpetual future contract is a special future contract with no settlement date. It is designed to imitate a margin spot market, so the price of a perpetual future contract is similar to the underlying's index price, which is an average of spot price from various credible exchanges. Since there is no expiry date, a funding mechanism is required to prevent the contract's price from deviating too far from the spot price. As a derivative, perpetual future contracts allow hedging against the potential risk of the underlies. Additionally, perpetuals let speculative traders bet against underlies' performances in a leveraged position without holding the assets. Such a feature is practical for traders with limited capital or trading on different blockchains, i.e., gaining exposure to Bitcoin on Ethereum.

Aboard currently provides seven pairs of perpetual contracts for trade, namely AAVE-USDC, BTC-USDC, ETH-USDC, LCix-USDC, LINK-USDC, SUSHI-USDC, UNI-USDC. Users can choose up to 25X leverage and utilize a cross-margin trading system to maximize capital efficiency. Every 8 hours, the funding fee makes sure the contract price stays around the corresponding index price. All perpetual contracts have insurance funds, limiting the probability of counterparty liquidation. Aboard Exchange will initially inject capital into the funds; After the initial stage, contract trading fees will become the primary source of the insurance funds.

By Q4 2022, Aboard will have 40 perpetual contracts available.

Check guide documents for implementation details.

Key Features

1.2 Index & Index Futures

In traditional finance, indices and index futures are critical components and criteria in most investment strategies. Instead of holding a basket of spots, investors can expose to a specific industry by buying index spots or futures. They can speculate on the direction of the index with only one contract or extract market alpha by purchasing strong tokens and hedging with shorts on the index future.

All major traditional markets have index future products, such as E-mini S&P 500 and E-mini Nasdaq-100 in the United States, Hang Seng index futures in Hong Kong, and CSI 300 index futures in China.

Surprisingly, the decentralized cryptosystem does not have such products. **Aboard launched the LCix-USDC index perpetual futures to fill the gap in Jan 2022.** The LCix index is a capitalization-weighted index that tracks the performance of Bitcoin, Ether, and Binance Coin. LC stands for large-cap, and ix means index. BTC, ETH, BNB are the top 3 tokens ranked by capital.

The mechanism and features of perpetual index futures are similar to that of all perpetual futures contracts. The only difference is that now traders are betting on the combined direction of the three assets.

By Q4 2022, Aboard will have five indices/matching derivatives available. Upcoming indices are **Metaverse Index, Web3 Index, Defi Index, NFT index, Infrastructure Index.**

Check guide documents for implementation details.

Key Features

1.3 Options

Options are specific opportunities unique to option holders that allow the owner the right, but not the obligation, to either buy or sell in the future. Similar to futures, options are great hedging tools. Also, it allows spectators to bet on market directions with limited downside risk and low cost. For more sophisticated traders, options enable them to create diverse trading strategies, such as betting on volatility. Options are among the most traded financial derivatives in the traditional financial market. Research by CBOE Global markets states that options have more average daily notional trading volume than stocks since 2020, with an annual daily average of over $400 billion. With similar characteristics, DeFi markets will see an increasing need for options soon.

Aboard's option system will employ a traditional T-shape display, and the contract sequence is automatically generated according to the current price of the underlies. Aboard will introduce market makers and adopt external implied volatility to rationally price options and smooth out the trading experience. Additionally, the exchange maximizes capital efficiency for each asset by charging a portfolio option margin aligned to the greek risk dimensions.

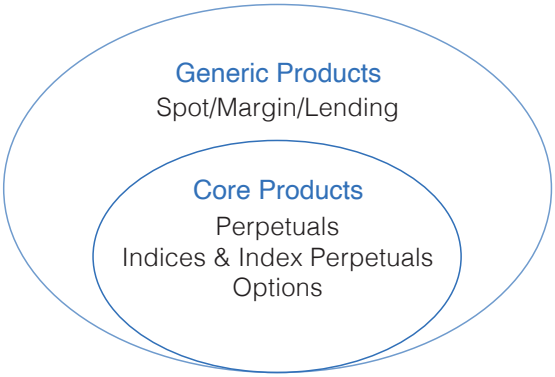
Aboard supports automatic settlements. Upon expiry, the exchange will carry out cash settlement for open positions according to the underlying price.

By Q4 2022, Aboard will offer various traditional options with fixed maturity. In the future, depending on the user's need, we will launch perpetual option contracts.

Key Features

1.4 Other Products

In addition to previously mentioned products, Aboard exchange also plans to launch other products, including lending & borrowing, margins, and spots. Margins and Spots trading will be available by Q4 2022. Lending and borrowing products will be available by 2023. With such a wide selection of products, traders can choose the best-fit products according to their risk preference and portfolio needs.



2. Efficiency:

2.1 Order Book System

An order book is a system to list all open buy and sell orders. Almost all exchanges use it due to its transparency and efficiency. An order book is the better choice for decentralized derivatives exchanges since it can bootstrap most market trading volume and requires less capital to achieve the same level of liquidity as AMM's.

Quantitive strategies run by crypto funds account for most of the trading volume in crypto derivatives markets.AMM is not compatible

with such a strategy due to its flaws, such as impermanent loss, slippage, and low transaction speed. As a result, trading or even backtesting on AMM is infeasible. Also, market makers and professional investors who are used to centralized exchanges will find it easier to transfer to a decentralized order book exchange. More market makers mean better liquidity and tighter spreads, which bring a better trading experience. Lastly, some of the most traded crypto assets are traded via the order book system.

Thus, an order book system can create a positive feedback loop: more trading volume can provide better trading experiences, and better trading experiences can attract more trading volumes.

Order Attributes	AMM	Aboard (Order book)
Transaction per second	Low	High
Slippage	High	Low
Trading cost	Gas Fee	No Gas Fee
Impermanent loss	Yes	N/A

2.2 Layer-2 Solutions

Aboard is currently deployed on Arbitrum Mainnet. Arbitrum is an Ethereum Layer-2 solution that utilizes optimistic rollup technology. For more details, Harry, Steven, and Ed (2018) discuss the mechanism of the Arbitrum network in their white paper. Aboard chooses Arbitrum One based on two main reasons:

Key Features

1. Better Ecosystem:

Arbitrum is fully EVM compatible, so code for Ethereum will also work on Arbitrum. This allows popular Ethereum projects to adapt to L2 solutions quickly. **According to Defi Llama, compared with all L2 solutions, Arbitrum has the most TVL at $1.94 billion.** A prosperous ecosystem can bring considerable liquidity, one of the core factors for trading experience.

2. Lower transaction costs:

Ethereum is currently the most popular public Mainnet for blockchain projects. More than 3,000 decentralized applications are running on the Ethereum blockchain. Such popularity leads to a considerable increase in the Ethereum gas fee and its volatility. The average daily gas price went from 58 Gwei in August 2015 to 158 Gwei in January 2022. Consequently, High transactions costs make trading on layer-1 almost infeasible to serious traders.

As a layer 2 solution, optimistic rollups can significantly reduce the trading cost. Arbitrum reduces the trading cost by more than 50x for most works loads and even more with the upcoming Nitro upgrades.

Key Features

3. Professional Functions:

3.1 Advanced Order Types

Basic order types may not fulfill the trade execution needs of professional investors. **Advanced order types allow traders to trade with precision, control risks, and capture market opportunities**. For example, a derivative trader using correlation strategies could use a delta hedge order to remove directional risk. Therefore, in addition to basic order types, including market, limit, post-only, and stop orders, Aboard will offer a variety of advanced order types by Q3 2022:

Order Type		Description
Batch		Batch order allows users to place a set of orders at one time.
Conditional		An order will automatically be submitted or canceled only if the predetermined criteria are met.
Hedge	Beta Hedge Order	A hedge against an index.
	Delta Hedge Order	An option order that hedges against the volatility.
	Pair Trade	A hedge against different contracts.
Iceberg		Iceberg order allows the trader to publicly disclose only a portion of the order at a time.
Peg	Pegged to Market	The order price is pegged on the best offer of sell and bid.
	Pegged to Midpoint	The order price is pegged to the midpoint of the bid and offer.
	Pegged to Underlies	The order price of an option is pegged relative to the underlies.
	Pegged to Benchmark	The order price pegged to a customized benchmark.
Snap	Snap to Market	The order price is determined by the Bid/Ask's market price plus or minus an offset amount.
	Snap to Midpoint	The order price is determined by the midpoint of the Bid/Ask price plus or minus an offset amount.
Trailing stop	Trailing Stop Market	Trailing stop sell order allows the price to rise with the market price on a one-to-one ratio but holds constant when the price falls—Vice versa for trailing stop buy orders.
	Trailing Stop Limit	Trailing stop limit orders is a dynamic limit order.

Key Features

Order Attributes	Description
AON	An All-or-None order will only execute when the entire quantity is available.
OCA	One-Cancels-All is a set of orders that if one order gets executed, the rest of the orders will be canceled.
OCO	One-Cancels-Other is a pair of orders that if one order gets executed, the other order will be canceled.
Block	Block is a large volume order that consists of many orders.

Time in Force	Description
Day	A Day order is canceled if it fails to execute by the end of the trading day.
GTC	A Good-Til-Canceled order is effective until the trade is canceled or executed.
GTD	A Good-Til-Date order will expire at a pre-selected date.
FOK	A Fill-or-Kill order must be entirely executed, or it is canceled.
GAT	A Good-After-Time order will be sent to the exchange at a pre-selected date.

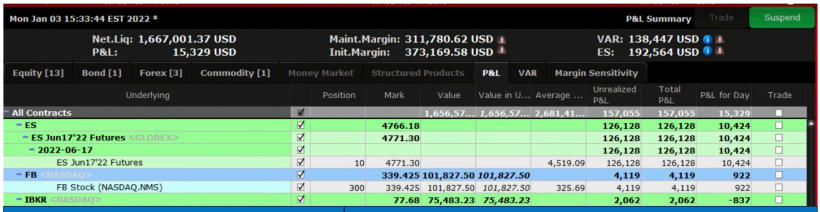
3.2 Advanced Trading Functions:

The cryptocurrency market is one of the most volatile markets. It is not uncommon the see fluctuations over 50%. According to PortfoliosLab, as of Jan 2022, the corresponding volatility of Bitcoin, Ether, and BNB is 57.41%, 83.84%, and 84.37%. As a benchmark, the volatility of the S&P 500 is 13.26%. High volatility is a double-edged sword in that investors can potentially gain considerable returns, but they are also exposed to tremendous risks. As a result, serious traders who have risk control in mind need sophisticated risk management tools and portfolio monitors. Further, since technical analysis is the dominant way of analyzing the crypto market, traders will find tools such as chart traders helpful.

Aboard's trading toolbox is designed with professional investors in mind. Referring to centralized and traditional exchanges, Aboard's current trading toolbox includes **book traders** and **a trading API.**

Key Features

Book traders are identical to those that investors use in the centralized and TradFi exchanges. The trading API enables quants to implement algorithms or quantitative trading strategies. By Q2, aboard will roll out a series of once "CEX-exclusive" tools that include but are not limited to risk controller, portfolio monitor, and chart trader.



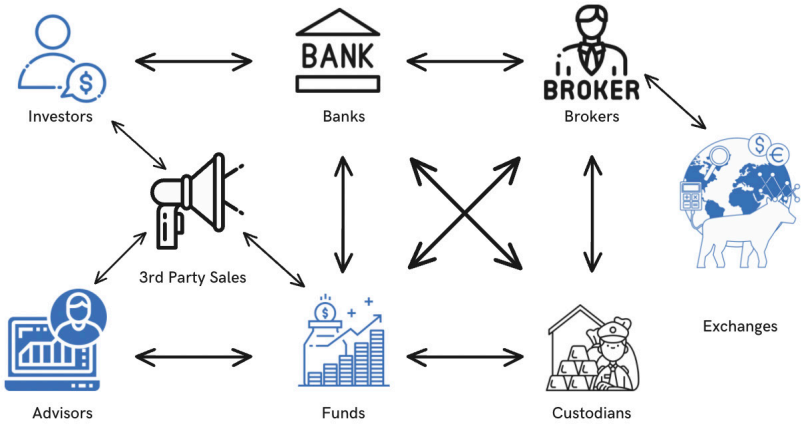
Risk Controller's Functions		Description
Net Liquidation		The total net liquidation value for the account.
Portfolio Value	P&L	The total P&L for the entire portfolio.
	Portfolio Relative P&L Graph	The portfolio relative P&L graph shows how the total value of the entire portfolio will be affected by proportional changes of the underlies.
Maintenance Margin		The total maintenance margin for the entire portfolio.
Initial Margin		The total initial margin requirement for the entire portfolio.
VAR		Value at Risk for the entire portfolio. Value at Risk quantifies the potential losses for the portfolio via different formulas and confidence intervals.
Average VAR (Expected Shortfall)		The expected return of the portfolio in the worst case.
Average Beta		The sum of the underlying beta across the portfolio divided by the number of the positions.
Portfolio Beta		The sum of the weighted beta for all positions.

Advisory Protocol

Advisory Protocol

How funds work in TradFi:

In traditional finance, regulators structure funds with numerous parties and strict barriers to prevent moral hazards and other risks. A hedge fund usually includes a portfolio manager, investors, banks, prime broker, executing broker, 3rd party sales, and custodians. Though effective in reducing risks, the system dramatically increases fund managers' and investors' time and financial costs. Here is what a traditional fund structure would look like:

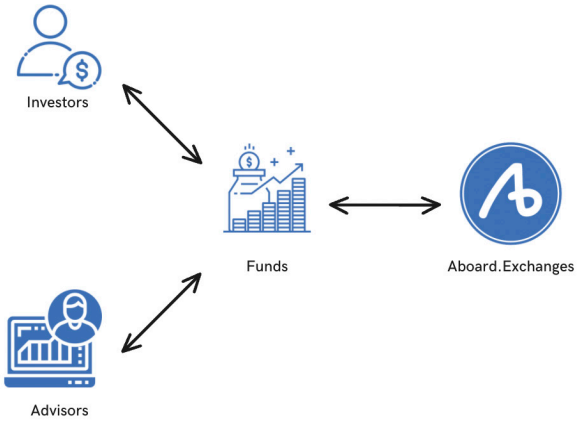


Each link requires legal contracts, fees, and qualification processes. A trust fund often takes over two months to set up the structure and terms. For the fund management team, such a system is burdensome as the team has to devote human power to handle the documents and the process; For investors, most of them do not have the expertise needed to comprehend a legal contract fully. Thus, they still have to trust the fund management team, which potentially has agency problems and may harm the interest of the investors.

Advisory Protocol

How funds work in Aboard Advisory Protocol:

Following the idea "Code is Law", Aboard will launch an advisory protocol that uses smart contracts to connect crypto investors with DeFi fund managers directly. **The protocol provides a platform for fund managers to create trading strategies and investors to pick strategies in a transparent and immutable way.** The connections are established via smart contracts, which record investment agreements and terms. Here is our proposed structure:



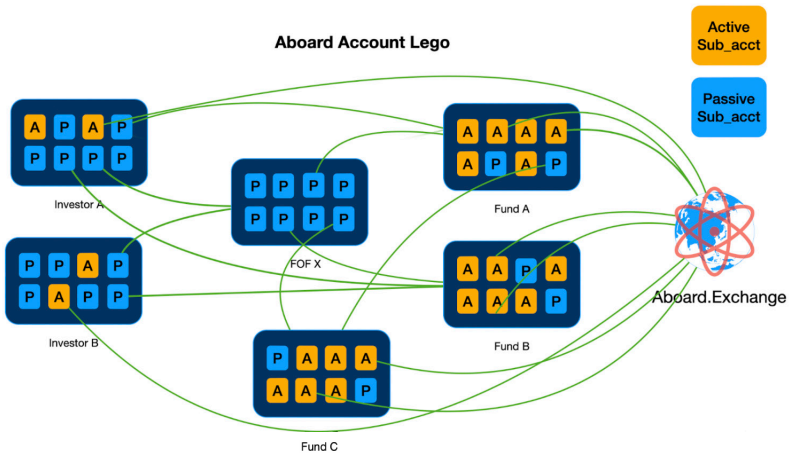
Investors and fund managers can establish ties by e-signing an investment management agreement without third parties or paying a custody fee. Rather than dealing with multiple parties, the management team can now dedicate more time to developing and monitoring investment strategies. On the other hand, since all terms are transparent and immutable, fund investors no longer need to worry about delusive legal terms or managers constantly updating the words to their favor. Such a system will significantly improve efficiencies in the asset management business.

Advisory Protocol

Sub-account Functions:

To further modulize the portfolio management system, Aboard proposes the Sub-account functions. The sub-account function allows traders to isolate capitals for different needs and construct well-organized portfolios. Active sub-accounts are for direct trade with Aboard exchange, and Passive sub-accounts are for fund investments.

Institution and individual investors will own master accounts upon connection to the exchange. Traders can further set up sub-accounts for different purposes. Participants can set up as many sub-accounts as needed. For example, an individual trader can have an active account for perpetual tradings and a passive account for crypto ETFs. And a FOF manager can set up three different passive accounts for different strategies: one for enhanced index fund (EIF), one for quantitative trading funds, and one for hedging strategies. With Sub-account functions, fund structures are clear and transparent to all investors so that the system can avoid multi-layering issues such as "FOF of FOF."



Project Development

Tokenomics

ABE Token:

ABE is Aboard's native protocol token issued by the Aboard DAO. The ABE token serves two primary functions. First, ABE is used to bootstrap liquidity and expand network effects. Second, ABE serves as a utility and governance token to facilitate and incentivize Aboard's decentralized governance.

ABE Token Utility:

Functionalities of ABE include:

- Trading fee offset: Participants can stake ABE tokens to get a trading fee offset that is proportional to holdings.
- Voting: ABE token holders have proportional voting rights to their holding.
- Trade mining: Holders can stake their tokens in staking pools to receive rewards in return. ABE also works as an incentive to users who provide trading liquidity or trade on Aboard.
- Advisory protocol and fees: Participants can stake ABE tokens to access the Advisory protocol function. ABE can be used as an asset management fee.
- Access to professional functions: Participants can stake ABE to access risk controller and portfolio management functions.

*Note that the proposed functions are subject to changes and addition.

Team

Aboard's Team:

The Aboard is an enthusiastic team with diverse professional backgrounds.

Aboard's trading system engineer team includes a tech executive from SunGard with over 20 years of industry experience 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.

Aboard's blockchain engineers team has been working in the industry since 2016 and is involved in multiple Defi projects. Our engineers have extensive knowledge and expertise in front-end & smart contract development, especially in contract security.

Aboard's trading team is led by a chief strategist of a billion-dollar hedge fund. The team has over 20 years of collective experience in the industry. Their extensive knowledge of the asset management business is essential to providing a complete user experience.

Our marketing and operations team has experience in popular public blockchains, DeFi projects, and 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

- Trading core implementation
- Bitcoin & Ethereum perpetual contracts launch
- White paper release

Q1 2022

- Arbitrum Mainnet launch
- V1.0 live for public trading
- Indices and index futures
- Expand to 10 perpetual contracts

Q2 2022

- Chart trader
- Introduce synthetic products
- Performance optimization
- DeFi Index, Metaverse Index, Web3 Index Launch

Roadmap

Q3 2022

- Expand to 20 perpetual contracts
- Advanced order types
- Multi-collateral trading

Q4 2022

- Expand to 40 perpetual contracts
- Non-linear products
- Risk/Portfolio Monitor
- Advisory Protocol Launch

2023

- Launch on more public networks
- More trading tools
- More trading products

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