



ZeroCore Presentation

Digital asset exchange platform

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Crypto market overview

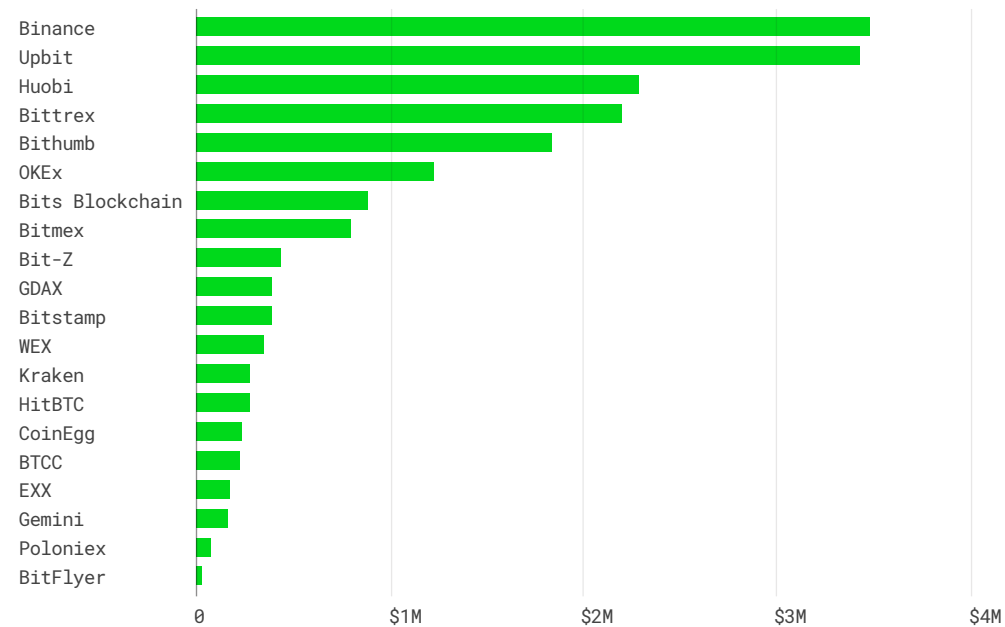
Hype / FUD / Transformation



2017 / Growth and extreme hype

Bloomberg

Crypto exchanges are raking in billions of dollars



Trading fee based on daily revenue estimated with 24Hr volume from CoinMarketCap

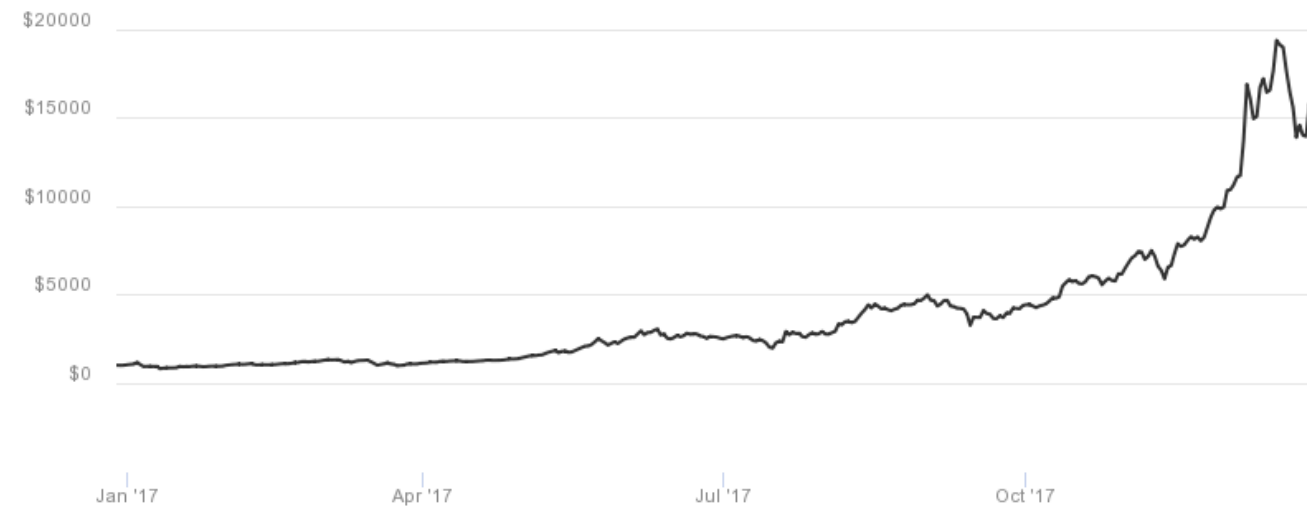
+20%

Exchange volume growth per month in 2017

+5%

Exchange Userbase growth per month in 2017

Bitcoin price



2018 / Crypto reality check

Markets dropping while exchanges keep earning



Binance, is still profitable despite last year's market meltdown.

Source: [Binance CFO to CNBC](#)



Huobi exchange earned ~ \$500m despite industry downturn in 2018

Source: [8btc.com](#)

Binance earned \$446 million in profits in 2018 becomes NASDAQ's rival with only 4% of staff

Cryptocurrency exchange platform
Binance made almost as much profit as Nasdaq in Q1 2018.

Source: [bitcoinist.com](#)

2018Q1	Binance	Nasdaq
Profit	\$200M	\$209M
Employee	200	4500
Age	8 months	47 years

Exchanges investing in expanding and launching new products

They are now reinvesting this money in new products, acquiring companies and fostering the ecosystem on their way to **become today's mainstream incumbents**.

2019 / Crypto industry transformation

Indicators signal the bearish-to-bullish trend reversal

Source: [CoinDesk](#)

Transition from speculation to usage

Solving problems for real users, deploying scalable and robust infrastructure, improving user experiences and driving sustainable businesses.

Creating real products that deliver real value.

The Emergence of Stablecoins

Bridging that gap to mass adoption.

Getting people comfortable with digital assets, and the tools to move them around.

Gambling industry eyeing cryptocurrencies

Gambling industry problems urge transition to accepting digital assets, crypto processing is in demand

"Investing into an exchange platform is one of the safest and easiest ways of making money from digital assets, with much more opportunities to come"

Exchanges expanding

Huobi expands regional coverage of exchange services

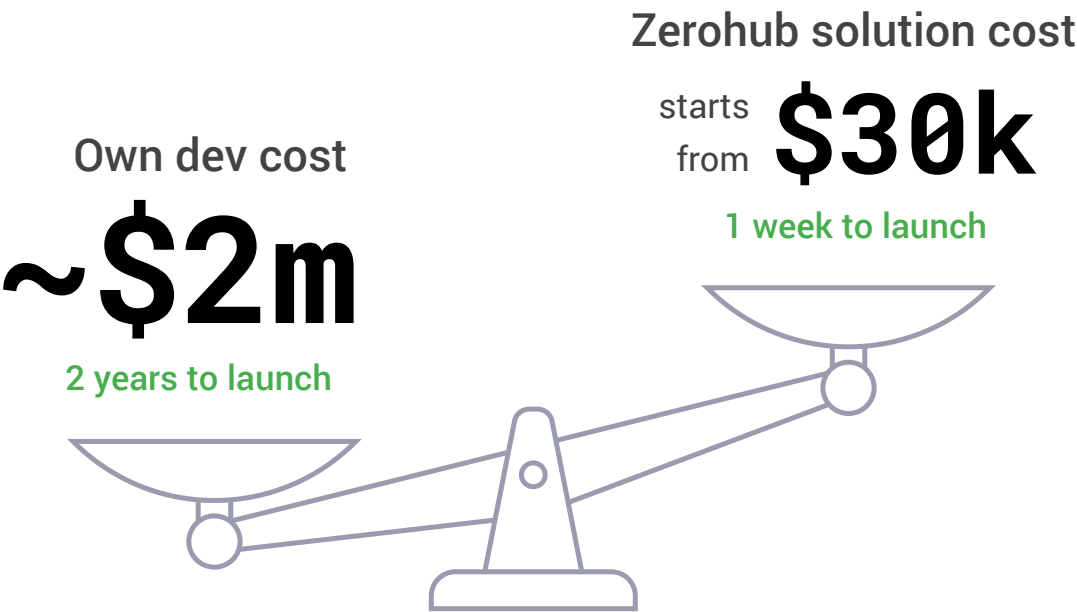
Country	Launch date	Nasdaq	Crypto
Uganda	October 2018	UGX	Bitcoin, Ethereum
Jersey	January 2019	GPB, EUR	Bitcoin, Ethereum
Singapore	Planned for 2019	SGD	Bitcoin, Ethereum
Malta	Planned for 2019	EUR	Bitcoin, Ethereum
South Korea	Intended	KRW	Bitcoin, Ethereum
Liechtenstein	Intended	CHF	Bitcoin, Ethereum
Argentina	Intended	ARS	Bitcoin, Ethereum
Russia	Intended	RUB	Bitcoin, Ethereum
Turkey	Intended	TRY	Bitcoin, Ethereum
Bermuda	Being considered	BMD	Bitcoin, Ethereum

OTC traders and market makers also make money by providing liquidity to exchanges, institutions and whales

Nasdaq and Fidelity investing to launch a regulated cryptocurrency exchange ErisX

Exchange startup costs

How much time and money would it take to launch an exchange on your own?



Requires additional liquidity and operation capital funds

Development costs before launch

Solving problems for real users, deploying scalable and robust infrastructure, crafting great user experiences and driving sustainable businesses. Creating real products delivering real value.

\$50 – 100k	2-3 months	analytics, requirements, recruiting
\$1.5 – 2m	1-2 years	IT development
TOTAL: ~ \$1.8m		

Estimated expenses at launch

\$50 – 100k	entity registration, legal support, payment gates, banks (+ min. \$500K for license)
\$100k – 300k	marketing
TOTAL: ~ \$250k (without license)	

Operational expenses per month

\$50 – 70k	technical support, development, new features, bug fixing, maintenance
\$30 – 50k	operational management (Board, CFO, Legal, CCO, user support, marketing)
\$10 – 20k	Production / development environments
\$100 – 150k	marketing
TOTAL: ~ \$230k/mo	

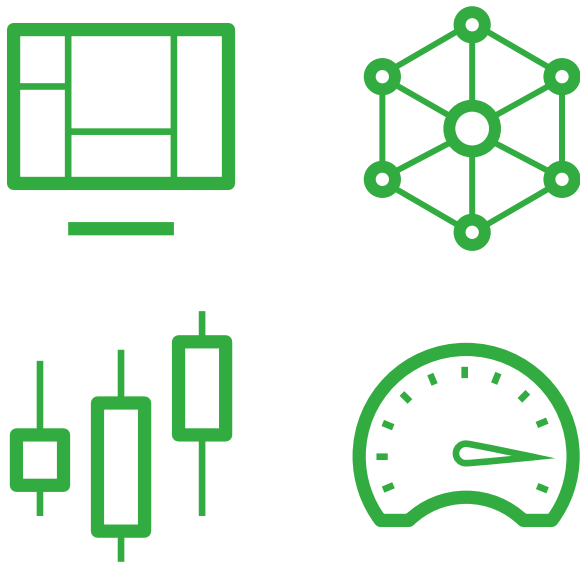
Our solution

Reliability / Scalability / Security

ZeroCore platform



ZeroCore: Exchange platform



An ultra-low latency solution with superior functionality

- / ZeroCore, the flagship product of Zerohub Limited was built as an extensible trading platform with the ability to expand and change rapidly to fit any trends and match high volatility of the crypto industry.
- / The matching engine can be configured to work with assets of any type.
- / Built on rule-based, distributed, fault tolerant technology, making it highly reliable, scalable, and flexible.
- / Can be deployed quickly, resulting in a shorter time to market.
- / Allows fast and straightforward changes in business logic, by changing business rules, decreasing support costs.
- / Easy to understand and operate, saves time on extensive training and administration.

ZeroCore: A custom built exchange

**A exchange platform is the
CORE of every digital business**

A multifunctional exchange and trading platform supporting all popular crypto assets and enabling a complete ecosystem for various business models.

Matcher

Processes orders and makes matches

Queue manager

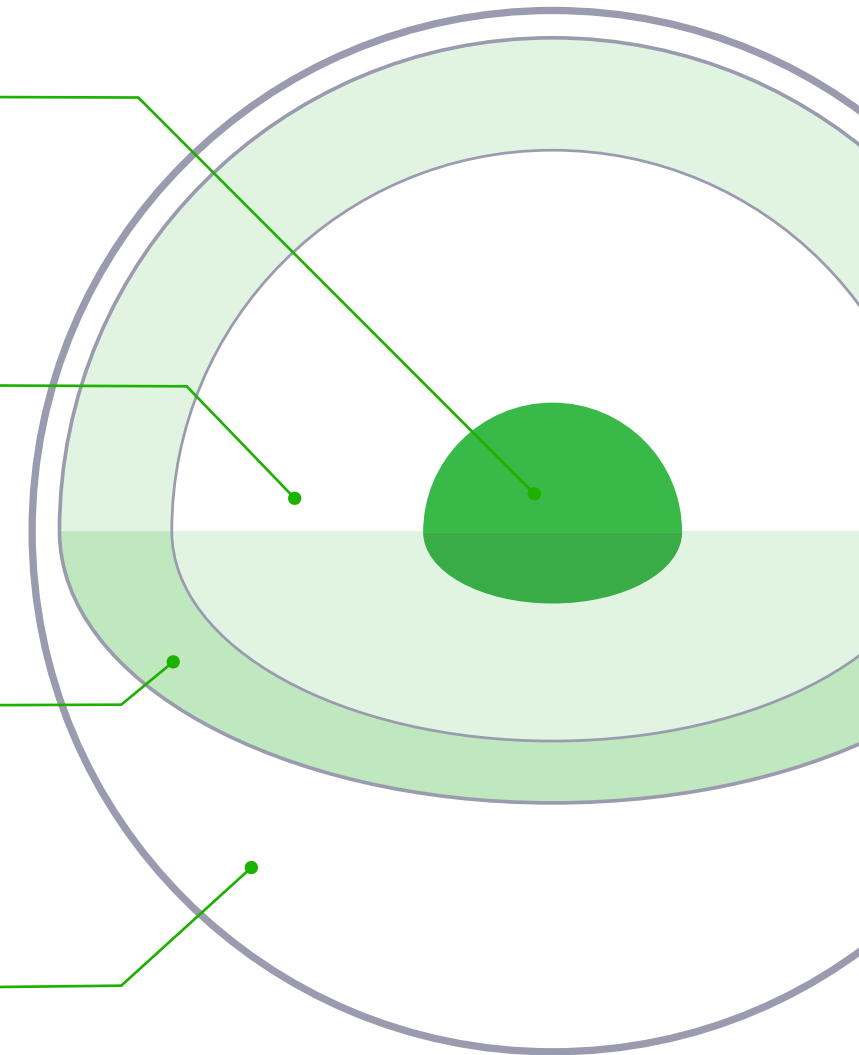
Organizes order queue

Business logics

Custom rules and policies

External layer

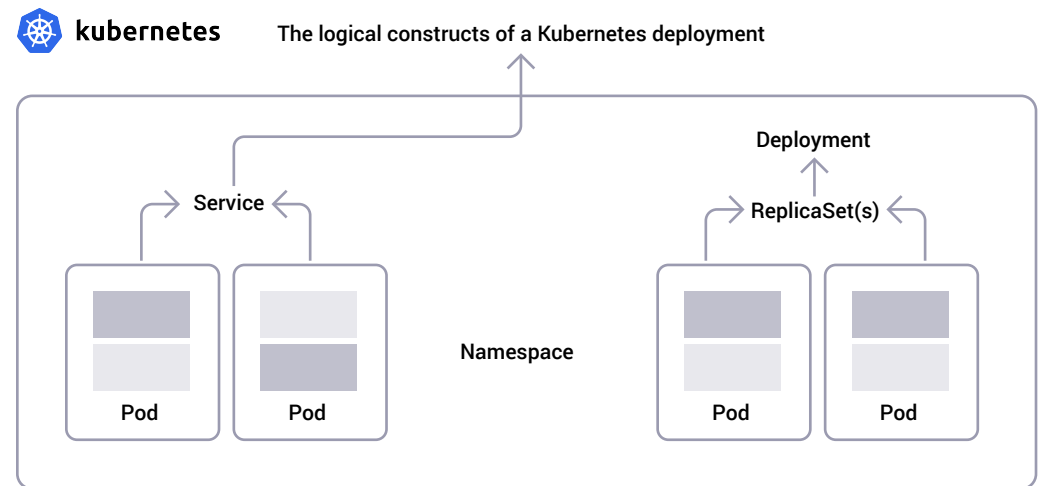
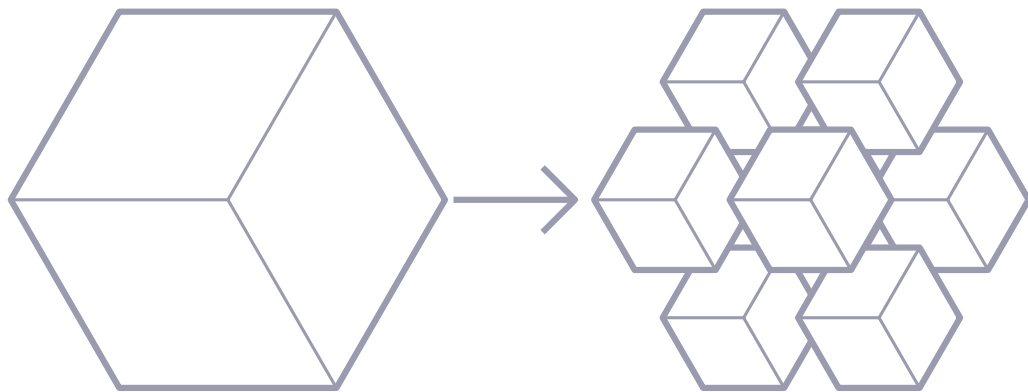
User interaction



Exchange technology

Microservice-based architecture, all services are isolated and independent from each other.

- / Provides high level performance as well as scalability
- / gRPC (binary format protobuf over http/2 connection)
- / Services are described in protofiles using pseudocode, which is used to generate actual code (java, Golang, python, etc).
- / Any service can be easily re-written and documented.



We use Google's kubernetes as our infrastructure management tool

Exchange technology

PostgreSQL database — allows to read and write high loads of information

Kafka — High availability messaging and queue system

Google Cloud SQL — 10-15% can be migrated into other cloud services, like bare metal

All services operate through consul, and are monitored

SLA

Uptime 99,99%

"Infrastructure as code" principle adherence,
Continuous integration using TeamCity and Terraform



Main components

Matcher

- / Reliable matching engine with unmatched performance
- / Well-honed business logic, up to the smallest detail
- / Updated monitoring services and control mechanisms to manage all aspects of the exchange and market
- / Supporting up to 3m TPS with system throughput: up to 100k orders per second (including database locks, balance confirmation, balance locks)

Fiat payment gateways

- / Universal business logic to integrate any payment service provider

Websocket service

- / Realtime account events, tickers, etc.

Public API

- / Connects to private API
- / Open source (can be re-written in any language)

Private API

- / Implements business logics
- / Fee settings, limits, etc.

Notification service

A separate service with its own database, API as well as rules and logic

Logs and monitoring

- / Stackdriver based logs and monitoring. Includes tracing and profiling in production.

Authorisation service

- / A separate service for user data storage as well as compliance with recent data storage regulations (GDPR).
- / All other modules use depersonalised IDs
- / Supports 2-factor authorisation (uses notification module)

KYC Service

- / Connects via Public API
- / Own KYC solution or use a 3rd party solution (currently — Jumio)

Market data services

- / Storing and processing of market data (OHLCV, Volume, etc.)

Important business functions

- / User account switch with separate controls for trading and deposit/withdrawal functions
- / User account API requests limiting and whitelisting
- / Full account information export for internal use as well as for regulator compliance
- / User session control with browser fingerprint binding + ability to end session
- / User account partial/full history export in multiple supported formats + available using API request
- / KYC ability to find duplicates, auto scan KYC requests to identify fraud
- / Fiat currency section
 - Currency accounting and reporting, including separate fiat accounting
 - A variety of payment service providers integration
 - Internal asset transfer protocol (including personalized vouchers) with ability to set beneficiary
- / Helpdesk integration
- / Referral program
- / Bug bounty



Send a request to

info@0hub.com

to receive a full list
of features

End-user facing modules



Advanced charting tools



Customisable interface



Convenient analytical tools



Smart notifications



Portfolio management



Widgets and tickers



Instant transactions

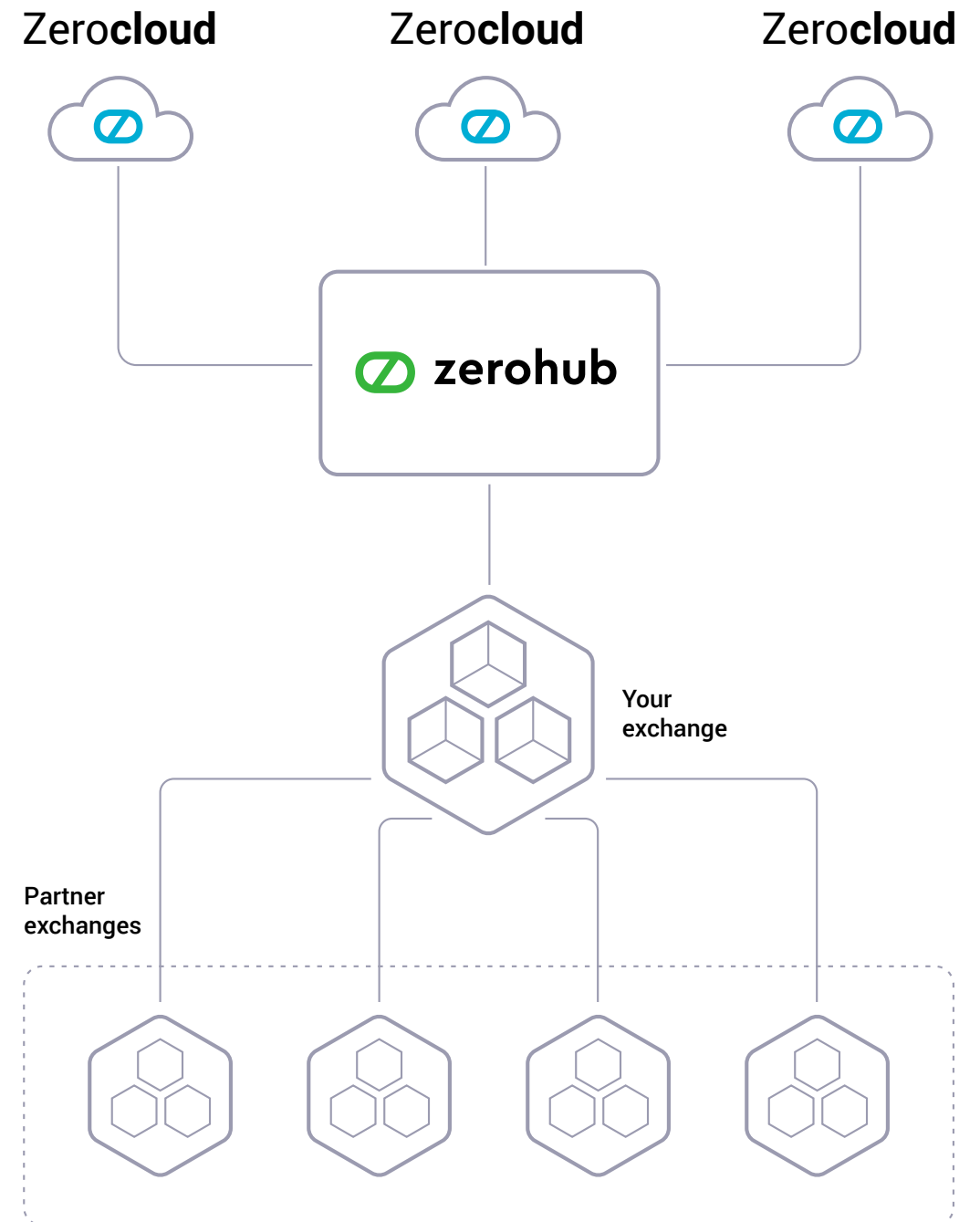


Aggregated liquidity

Deployable cloud solution for partner exchanges

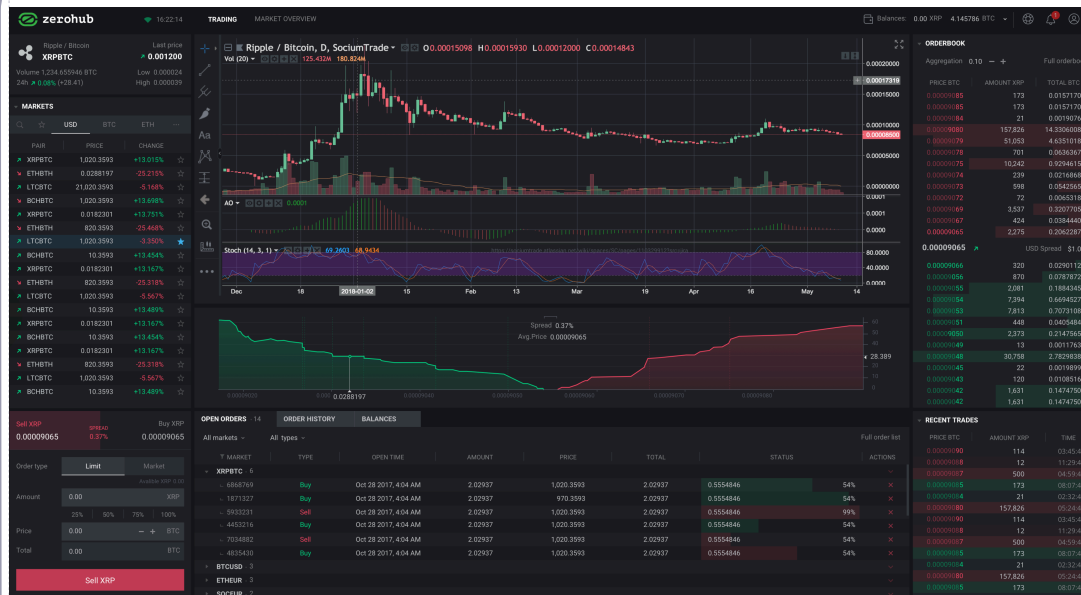
Allows to license exchange white-labels to increase customer coverage in various regions.

- / With a cloud solution you can create multiple exchange entities, increase liquidity and have a separate income flow from partners
- / Use different payment providers for different entities to resolve regulatory burden while staying fully compliant

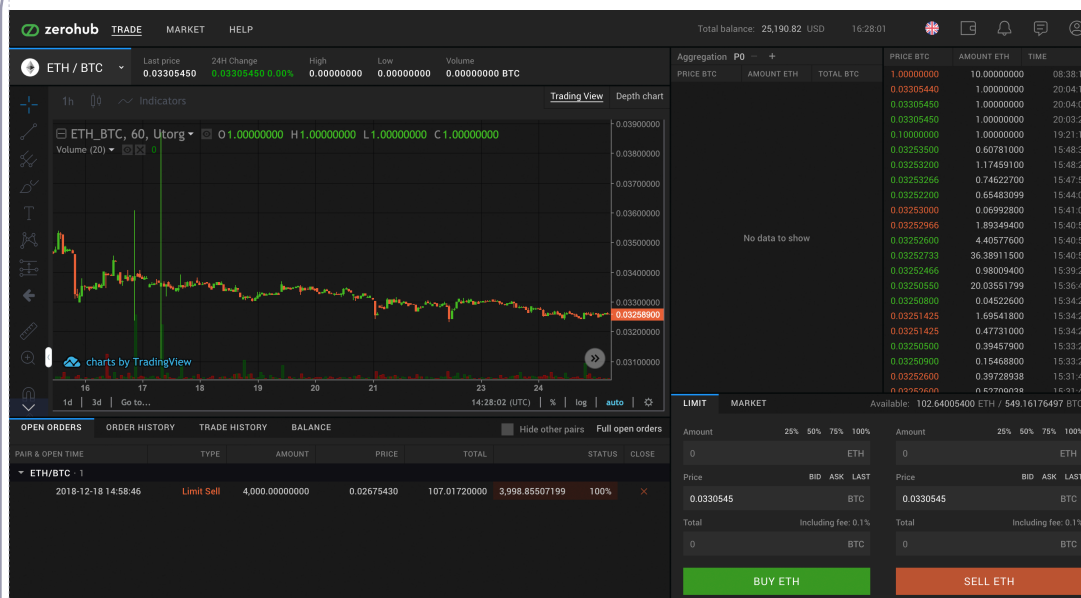




Modern trading terminal with
well thought UX/UI



Full customizability
to fit any business objectives



Gain full control with a powerful back office

ZHJeff S1.2.053076CF

DEVOWNER

Statistics dashboard

Finance

Trading

Balance Checksums

Wallet Operations

Control panel

Users

Back office admin

Liquidity office

Other settings

My settings

Logout

Wallet Operations

All timeFilters (0)Columns

Account ID	User ID	Currency	Amount	Fee	Wallet ID	Order ID	Withdrawal ID	Type	Timestamp
104		ETH	0.833333	0	416	482635	0	ORDER CANCELED	26 February 2019, 12:4
104		ETH	-8.13703	0	416	0	0	ORDER RESERVED	26 February 2019, 12:4
104		BTC	-0.00321086	0	415	0	0	ORDER RESERVED	26 February 2019, 12:4
104		BTC	-0.04197643	0	415	0	0	ORDER RESERVED	26 February 2019, 12:4
104		BTC	-0.29709911	0	415	0	0	ORDER RESERVED	26 February 2019, 12:4
104		BTC	-0.0050987	0	415	0	0	ORDER RESERVED	26 February 2019, 12:4
104		BTC	-0.01479616	0	415	0	0	ORDER RESERVED	26 February 2019, 12:4
104		BTC	-0.17485816	0	415	0	0	ORDER RESERVED	26 February 2019, 12:4
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104		BTC	-0.76083645	0	415	0	0	ORDER RESERVED	26 February 2019, 12:4

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Killer features

Inter-account asset transfer (vouchers)

- / Allows instant asset transfer between exchange accounts

Improved accounting system

- / Includes double-entry system and arbitrary balance checks

Well thought backoffice

- / Puts you in control of all processes without the need to change any code

Cryptocurrency processing for merchants

- / Compliment exchange liquidity with an additional flow of transactions and income flow

Own KYC & AML Service

- / Saves time and money, while assuring banking partners of clear and compliant customer verification process
- / Allows to monitor all transactions without compromising speed and delays for end-user
- / Includes ScoreChain integration for maximum due diligence

Zerohub sub-license

- / Allows to issue e-money digital assets, coins and tokens
- / Enables payment processing

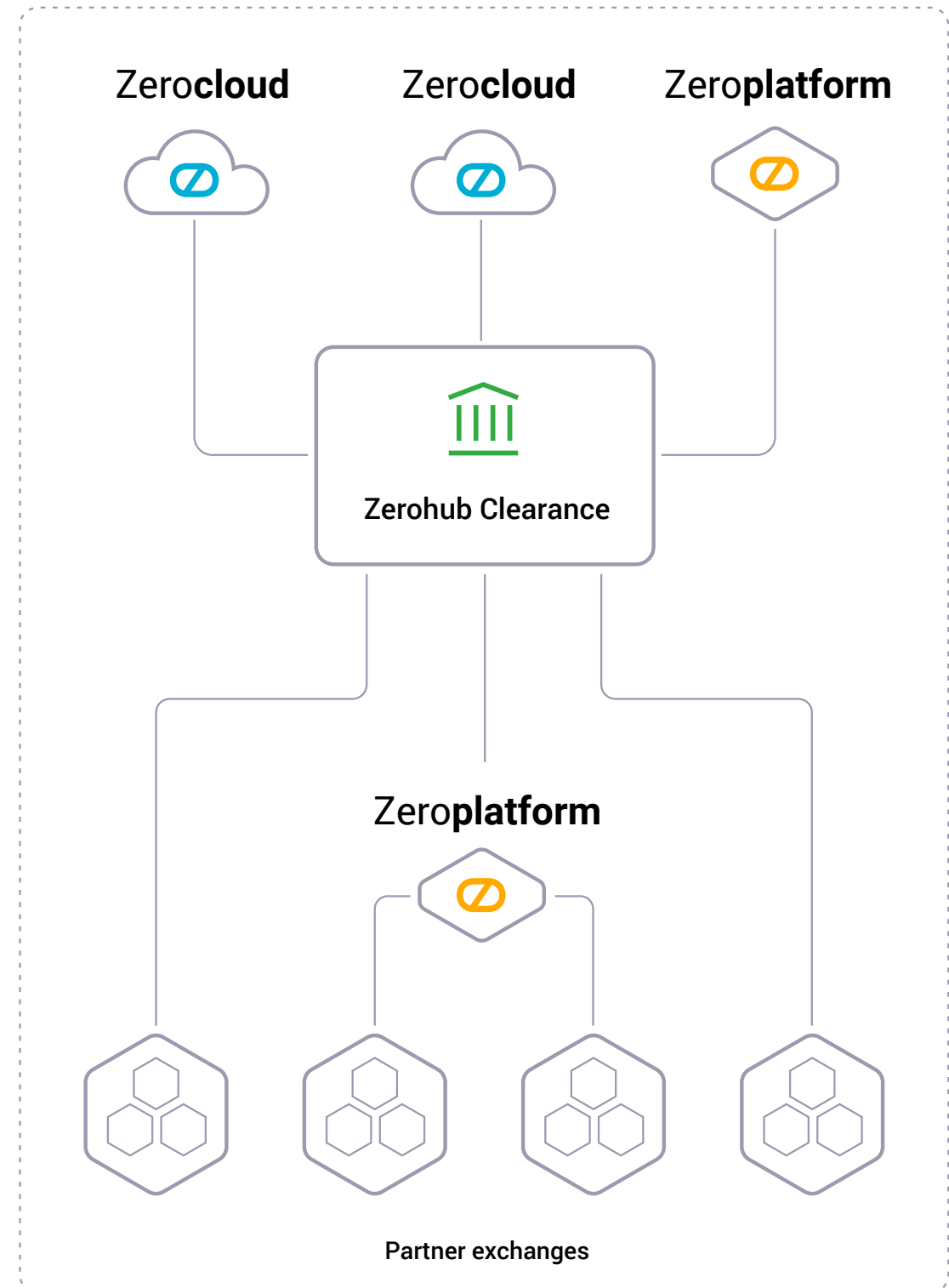
Cloud solution opportunities

- / Introduces a flexible way of running a business with constant expansion

Clearing house

Seamless non-crypto transactions

- A clearing house stands between multiple exchanges and facilitates the exchange of payments, securities, or derivatives transactions. Its purpose is to reduce the risk of an exchange failing to honour its trade settlement obligations.
- Receive liquidity, comply with regulations, resolve all fiat-currency-related problems with Zerohub's clearing house and a fully compliant sub-license.



ZeroCore distribution



ZeroCloud

A white-label solution, with limited frontend customization (logo and branding), backend functions provided as is, with paid upgrades and updates. Digital asset listing limited to available hashing algorithms or per agreement with vendor. Liquidity provided by vendor. Subscription includes a regular monthly payment and one-time setup fee.



ZeroPlatform

A standalone solution with one-time setup payment, lifetime core updates. The core as well as the main components have binary distribution with open API, allowing the client to update and upgrade services to fit their business needs. The solution is deployed to client's server infrastructure and includes training for the client's staff. Product support and maintenance can be provided for an additional monthly fee. Paid further upgrades, liquidity can be provided by vendor or client.



ZeroPartner

A joint venture partnership, where shares are distributed per initial agreement 5-30%. All further development is provided by the vendor. The client is requested to pay a one-time setup fee and covering all operational costs, while the vendor is responsible for the platform technology as well as provides consultation on all questions regarding bank accounts, licenses, and other issues. Vendor makes every effort to launch as early as possible.



ZeroSource

Sale of shares in Zerohub Limited company is considered in exceptional cases, which includes ZeroCore source code with documentation and Intellectual Property Rights. The offer is available to experienced investors with a track history of successful platform launch. The code is sold only with the company shares to make sure that other Zerohub customers will not be affected by the sale. Everything is negotiated on an individual basis. Smart money only.

About us and our operation principles

Experience. Agility. Flexibility



The Team

A dream team of enterprise level professionals

It took us several years to establish a team, consisting of the industry's top performing professionals:

- / Traders
- / Investors
- / Enterprise developers
- / Thought leaders and visionaries

United by a desire to build products which make our life better

Complemented by expertise in multiple fields

- / Crypto fund asset management
- / Mining pool operation
- / Mainstream OTC trading providers

Combined experience from development of top crypto exchanges

- / Bitfinex
- / Exmo
- / CEX.IO

ZeroCore business agility

Modern business practices require agility and product flexibility:

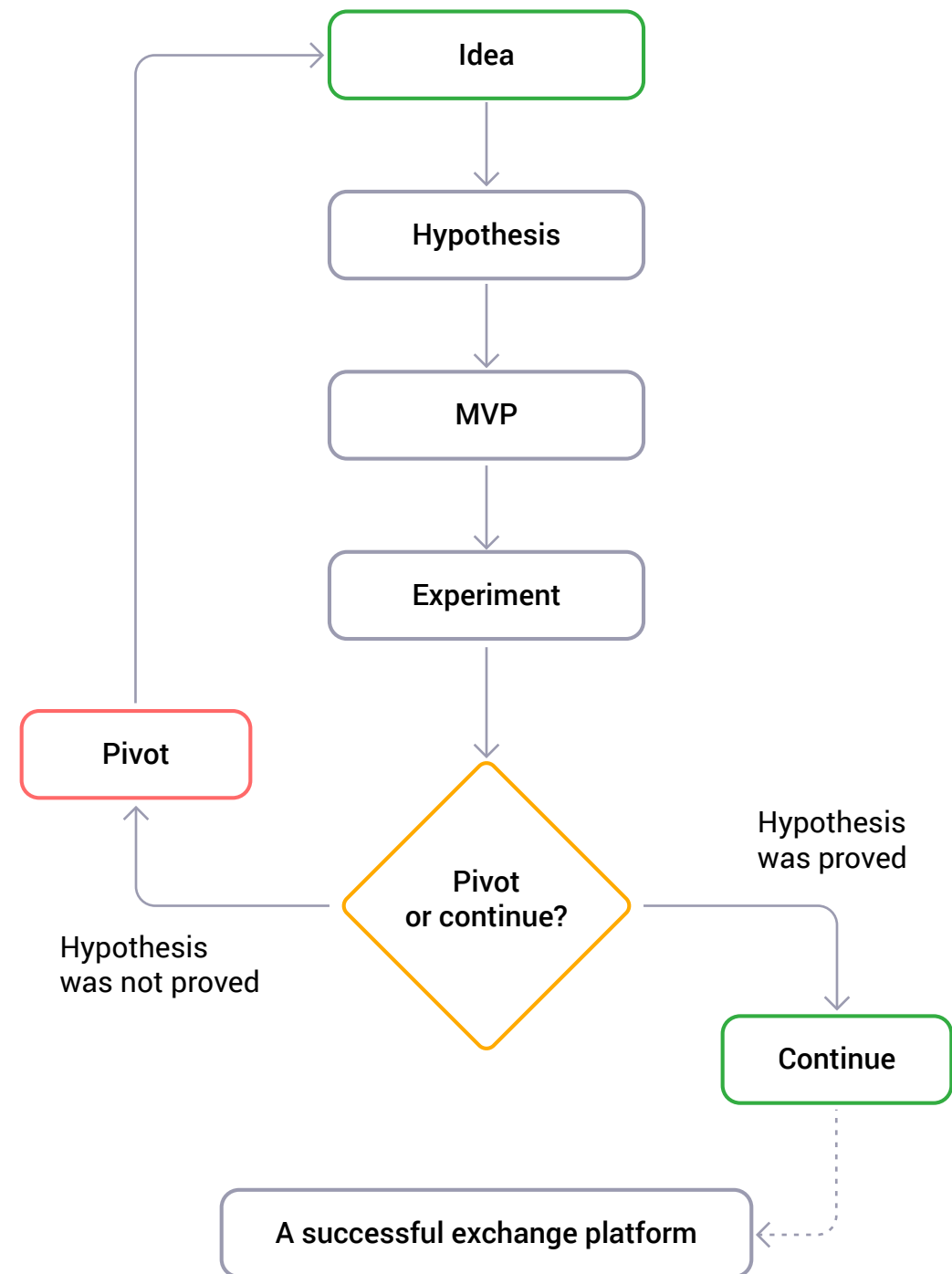
1. The exchange platform can be customized and refitted for all business idea involving digital asset transactions
2. We help find an optimal solution for each specific business case
3. We share our experience and make sure mistakes are avoided
4. We are used to cooperating and coming to an agreement
5. We provide the best terms for creating a profitable future-proof business
6. We guarantee timely delivery after an agreement has been signed
7. Thanks to microservices based architecture, our product is highly flexible and upgradeable
8. We are following a clear product development path

Our Principles.

From conception to market

Our product development process is always tested for viability and demand. The steps include:

1. Idea generation
2. Concept development and testing
3. Marketing strategy development
4. Business analysis
5. Product development
6. Test marketing
7. Commercialisation



Time to market

Save time, cut costs, launch now!



How to start

A fully working and production-tested solution is just 1 step away

Avoid wasting time and money, concentrate on important business operations.

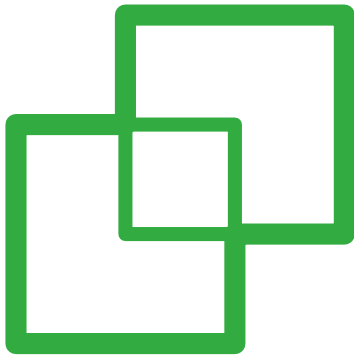
- Send a request to info@0hub.com
- Sign an NDA to freely discuss exchange operations (1-2 days)
- Share your vision and business objectives + view product demo (1 day)
- We construct a personalized offer according to your objectives (3 days)
- We discuss cooperation agreement, establish milestones (~3 days)
- We deploy the technical solution and setup pre-launch configurations (5 days)
- Platform customization per your requirements (TBD)
- Product launch (Includes multiple fiat payment integrations, bank partnerships, quality consultants, and much more)

Join the most promising exchange project

Demo is available upon request: info@0hub.com

Technical Specifications

Matching Engine



Supporting up to 3m TPS with system throughput: up to 100k orders per second

Market statistics show top exchanges do not exceed 2000 orders per second at peak trading times.

Written in java using kafka as destructor

- High performance
- Scalability (vertical and horizontal)

Interaction with private API, public API, balance locks, cancel request management, clearing procedures

Trade engine architecture allows switching to alternative order book data feeds, enabling implementation of a decentralized exchange

Trade engine module is also responsible of market statistics, OHLCV aggregation and calculation which is fetched by Nginx or public API and liquidity aggregator

Hack-resistant architecture

Proprietary wallet signature system with hardware and software binding

- Keys are created and bind to a specific admin's public key even a stolen private key will not allow to withdraw funds with existing multiple layers of audit and integrity checks
- All keys are stored in an encrypted form in the security enclave of server processor, and decrypted only in memory at the time of signing
- All transaction types have their own storages, which brings chances of an error to a bare minimum

Quality guarantee

All components are penetration tested

Zerohub's safety precautions will make you feel much safer than any other crypto exchange owner.

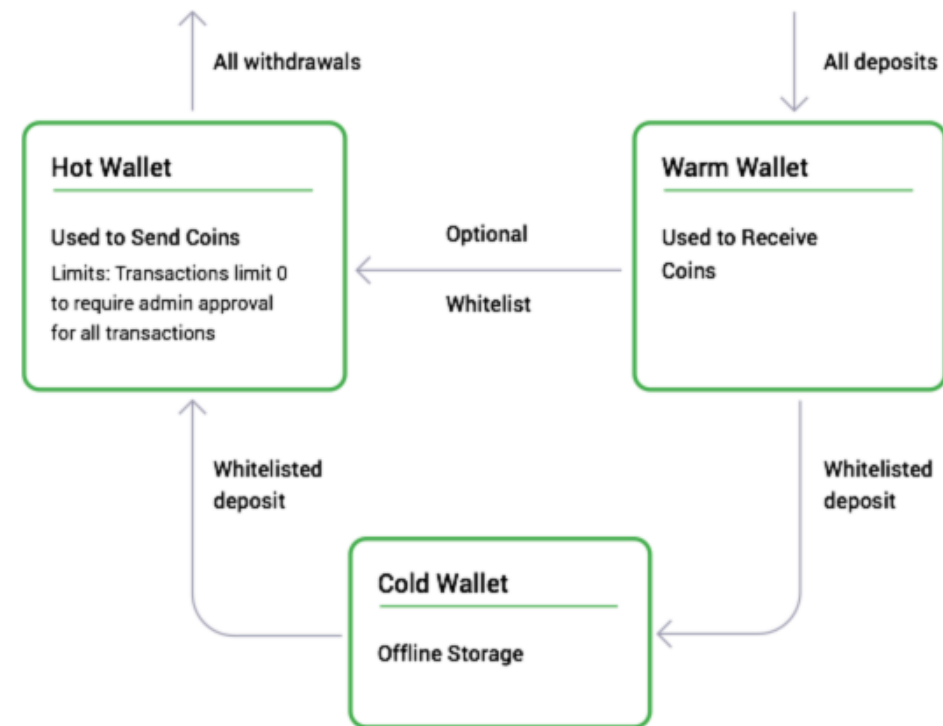
Wallet service

Hot Wallet

- Used for withdrawals
- Coins can be withdrawn to any address
- User requested withdrawals are automatically signed by the system if withdrawal transaction volume has not reached limit
- If transaction volume is higher than configured limit, withdrawal should be signed by an additional signature held by the merchant
- You can use any number “n” of “m” signatures

Warm Wallet

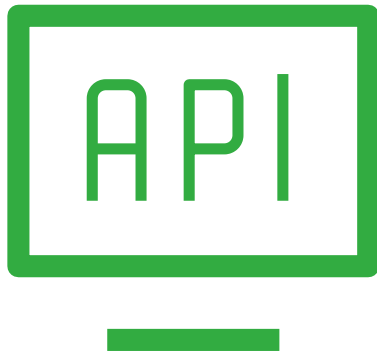
- Used for deposits
- Generates deposit addresses for users
- Can only send funds to whitelisted addresses: cold wallet and hot wallet
- Automated rebalancing system transfers coins between hot and cold wallets



Cold Wallet

- Used to store major part of coins
- Not directly connected to the internet
- 2 of 2 manual signatures are used to release funds
- Both of keys are held by merchant admins and stored on separate secured storages like Trezor or Ledger

Connectivity



Support of the most popular protocols:

- REST API
- Websockets - WebSocket server, with real-time data delivery (order execution notification, balance adjustment, etc.)
- FIX (future development)

Logging and queue management

High availability system-wide messaging service for durability, handles every transaction in microseconds

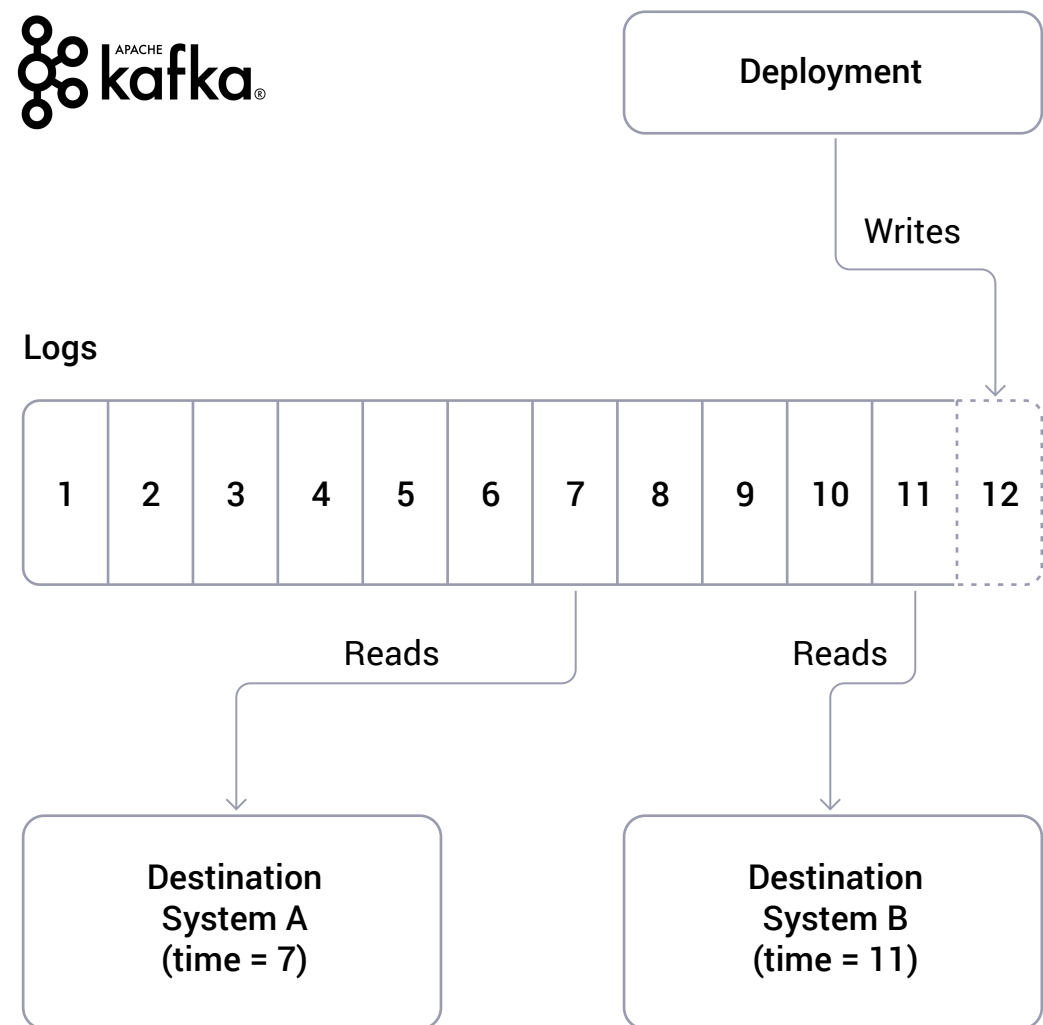
Messages types:

- Orders
- Balance adjustments
- Account status
- KYC status

Is also used as logging & audit system

- admin backoffice actions
- all user balance adjustments
- all wallet balance adjustments

Has only read and write permissions, data cannot be deleted

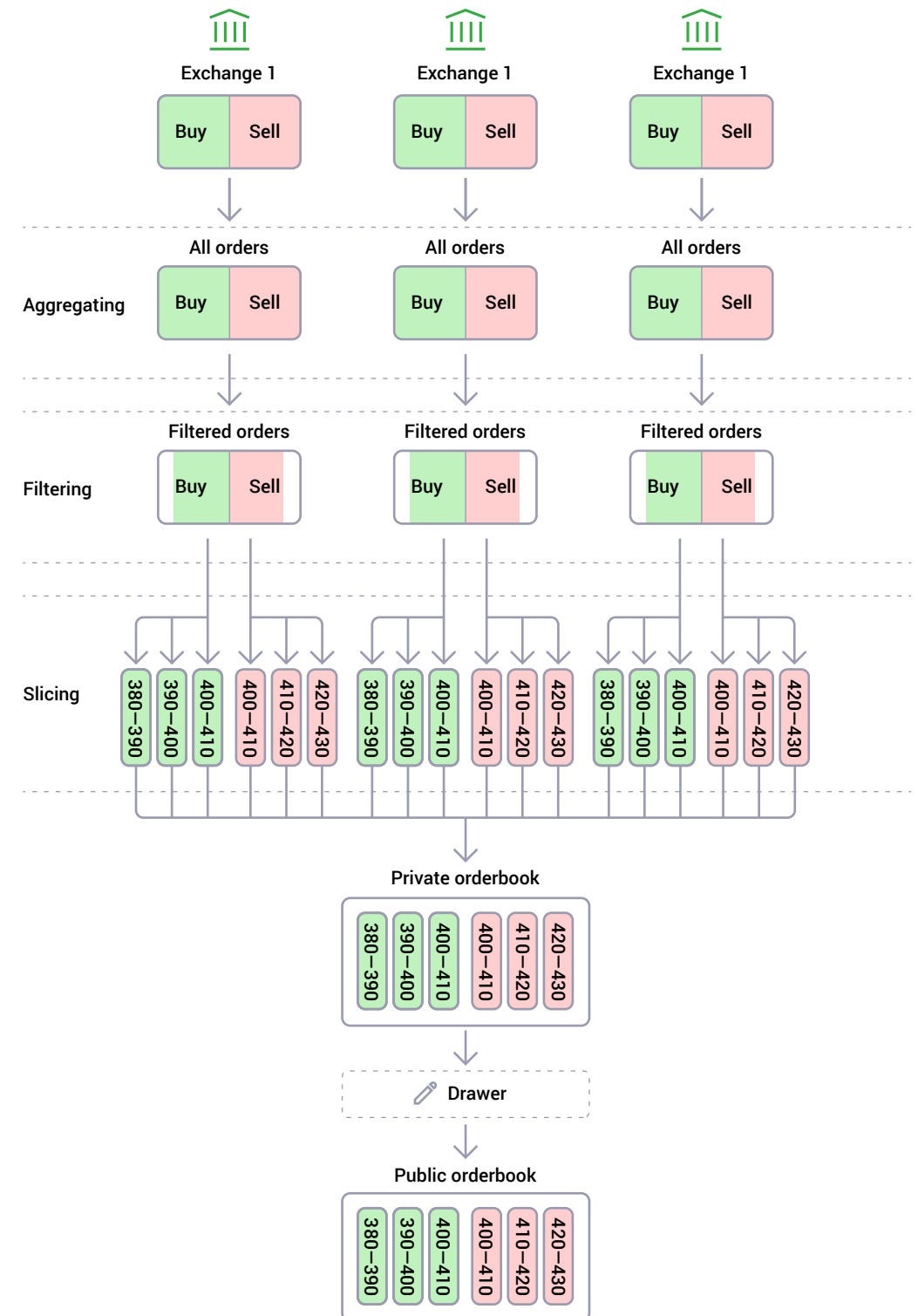


Liquidity aggregator

Works with multiple exchanges.

Functions:

- Fetch and filter out relevant orders
- Slicing and sorting
- Send to drawer (dasher) - ML powered monitoring and analytics system, reactive spread adjustment, tracks order book changes, market changes
- Efficient market making algorithm minimises rebalancing operations, as external exchanges have proven to be unreliable
- Clearing engine is adjusted within a set time period in equivalence to the set spread in the dasher



Appendix 1

Legend

HTTP/WS →

gRPC →

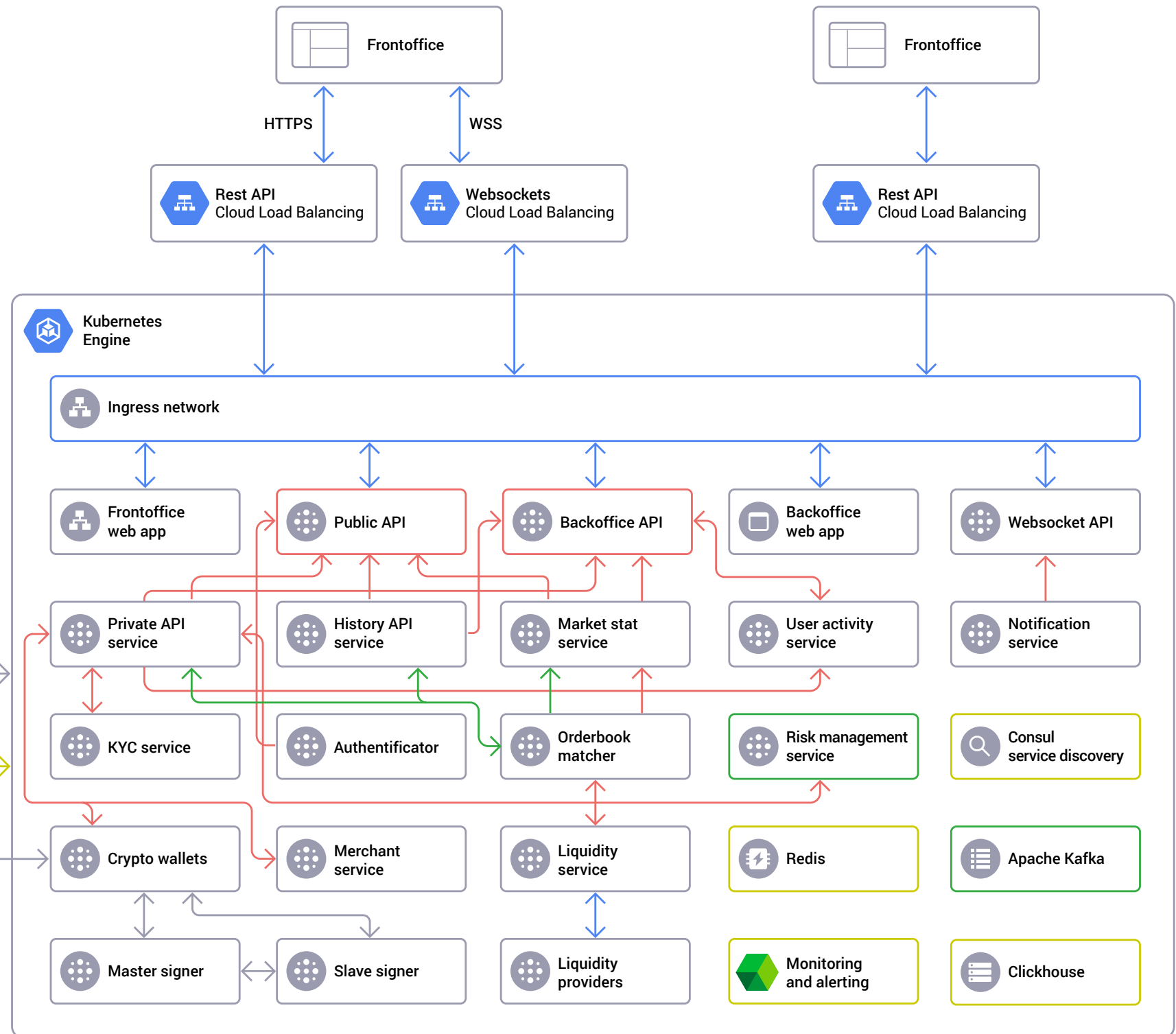
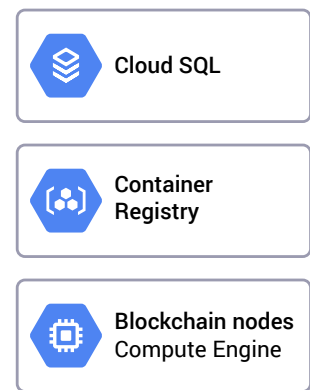
Kafka →

TCP/UDP →

High kafka usage

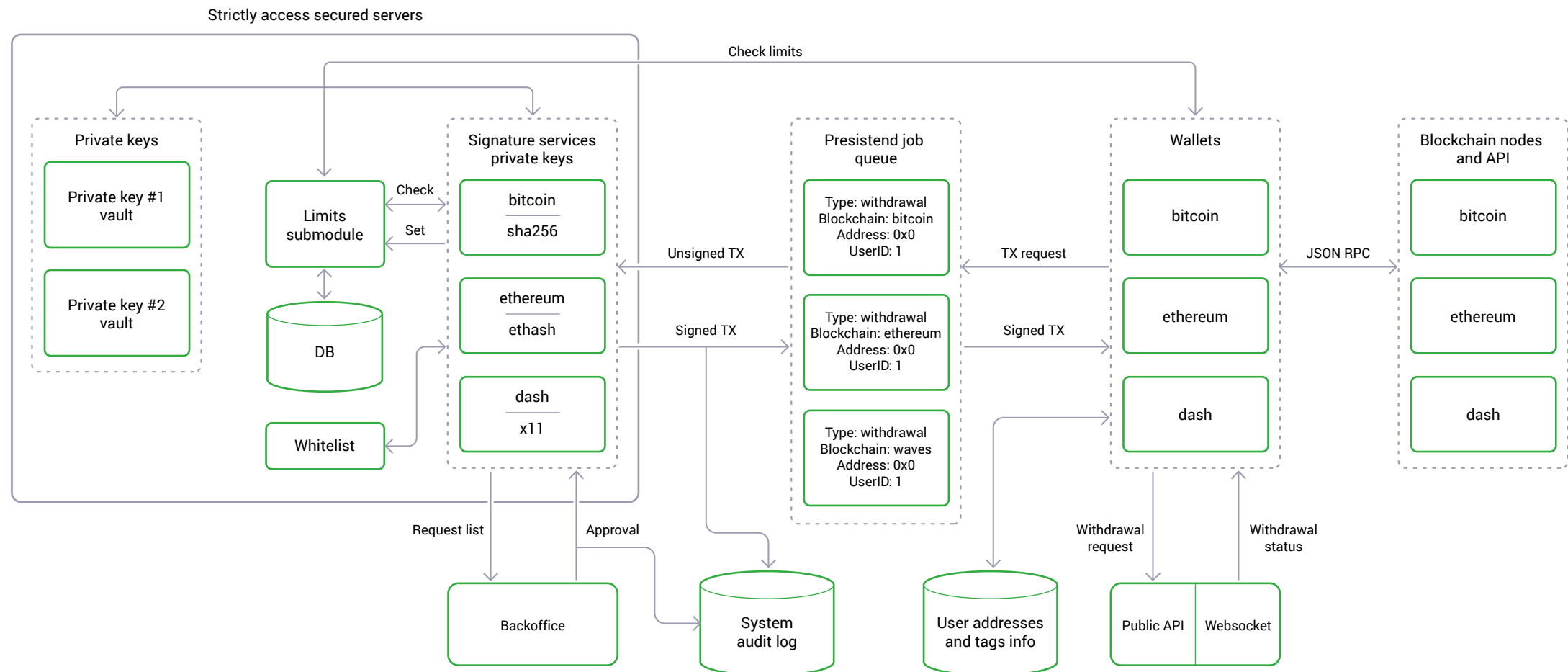
gRPC consumer

Infrastructure



Appendix 2.

Signature service



Appendix 3. Signature service

Warm Wallet (deposit)

- Is used to generate HD wallets using BIP32
- Wallet service does not hold private keys

Flow:

1. User makes deposit transaction
2. User wallet generates the transaction
3. Transaction is sent to persistent job queue
4. Sent to signature service
5. Checks limits and whitelists
6. If all is ok – signature service signs the transaction
7. Is sent to persistent job queue
8. Is sent to the wallets
9. Transaction is propagated to the blockchain

All transactions are locked in separate audited storage and signed with admin's private keys, validated against signed public key

Hot Wallet (withdrawal)

Requires 2 of 2 private signatures

1. Withdrawal request initiated by user, sent to persistent job queue
2. Job queue sends request to signature service
3. Only at this stage signature service generates the transaction (to avoid malicious transactions with fake metadata being generated) checks for limits and whitelists
4. If all is ok – signature service signs the transaction with 1 private key, sends back to job queue, which sends the transaction to signature service 2
5. Both signature services are separated, making sure 1 entity does not have access to both private keys
6. Is sent to persistent job queue
7. Is sent to the wallets
8. Transaction is propagated to the blockchain

In case the limits are exceeded – the transaction is sent for approval to financial monitoring back office, where an officer can either approve or reject the transaction. All actions are logged in a separate audit database.