



The Abacas Protocol

“Any Asset, Anywhere, Anytime”

Liquidity through “Universality” and
Price Discovery using “Gateway Assets”
with Smart Tokens

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Abstract

- There is a continuum of new block chain service providers being announced and funded through the formation of new crypto-currencies as a method of payment for the services and infrastructure provided.
- The creation of the ERC20 & Mosaic Token Standards provides a means for any asset owner to register and tokenize their assets, and record the balance and transfer of any portion of that asset through a distributed public ledger on the blockchain.
- Highly liquid digital currencies including BTC and ETH are gaining acceptance as a method of payment in lieu of fiat currencies.

These three events create a need and opportunity for a new kind of digital asset exchange, the AbacasXchange.

The **AbacasXchange** is a new system for the registry and peer-to-peer exchange of tokens, mosaics and less liquid cryptocurrencies through highly liquid cryptocurrencies and asset tokens known as Gateway Assets (BTC, ETH, XEM, etc.)

Using **Gateway Assets**, the AbacasXchange forms liquidity chains between three or more assets to connect and form a price between two assets that may not exist otherwise.

The **Liquidity Chains** that are formed provide greater opportunities for buyers and sellers to connect on disparate assets, but this can only exist on an exchange that insures the integrity of the process and assets of the exchange.

The AbacasXchange enforces the integrity of assets traded through a set of rules and procedures known as the **Abacas Protocol**. The Abacas Protocol provides for user identity; asset proof of existence, proof of provenance and proof of authenticity; custody and trust of the underlying asset of a digital token; low latency price discovery; low friction order entry; smart order linkage for cross-asset liquidity; integrated block chain services for open and distributed workflow processing and value transfer over multiple distributed ledgers.



The Double Coincidence of Wants

"The first difficulty in barter is to find two persons whose disposable possessions mutually suit each other's wants. There may be many people wanting, and many possessing those things wanted; but to allow of an actual act of barter there must be a double coincidence, which will rarely happen."

Jevons (1875)

The Infinite Coincidence of Supply - Abacas 2017

The age-old dilemma of trading disparate wants [e.g. 3 sheep for 1.2 cows] remains a challenge in modern times for a number of reasons - 1. price discovery and establishing relative value 2. ensuring sufficient market liquidity 3. transaction slippage 4. risk of default or non-delivery 5. fungibility 6. provenance and proof of existence 7. infrastructure burden and 8. divisibility. The Abacas Protocol seeks to remedy these challenges by creating the "infinite coincidence of supply", which simply means that any asset which follows the protocol can be traded. The AbacasXchange will seek liquidity through any Gateway Asset anywhere in the world and make trading available any time 24/7 365 days of the year.

Abacas (2017)

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The Internet of Financial Things

The Internet of Things (IoT) is a recent phenomenon from the Smart Home with connected devices to digital assistants such as Siri and Alexa to the watch you wear that is monitoring your health, planning your day and of course telling you literally the time.

What has enabled the IoT is wireless WIFI in your home and Broadband WIFI while you are traveling. With all devices now able to connect to the internet, integration and availability is unprecedented and bounded only by the imagination of those creating new connected devices.

Just as ubiquitous access to WIFI enabled the Internet of Things, distributed blockchain technology and in particular, distributed blockchain ledger technology (DLT) is creating the Internet of Financial Things (IoFT).

A distributed blockchain ledger is a publicly available record of a registered asset, current balance and the transaction history recording all balance transfers.

The information is immutable, publicly available and protected from fraudulent manipulation through cryptographic keys integrated with the transaction history that is recorded and distributed to all nodes of the blockchain network.

Asset Exchange through Blockchain Integration

The problems plaguing mass acceptance of the blockchain and distributed ledger technologies as an alternative to traditional practices of asset trading, settlement and accounting stem from the deep infrastructure that has been built over a half century to both regulate and process the exchange of these assets.

Traditionally, exchanges have been centralized and the asset supply chain is a black box. Assets servicing is complicated, and the logic necessary to process an end to end transaction exposes the purveyor to execution risk, credit risk and delivery risk.

While blockchain technology has the potential to disrupt many aspects of asset exchange and servicing, it is clear that blockchain services will be introduced incrementally to the existing infrastructure and practices.

The opportunity then, is to integrate new blockchain technologies and systems within the industry while advancing the adoption of blockchain technologies.

Where applicable, the AbacasXchange utilizes traditional practices of custody and asset processing. However the use of digital asset tokens [i.e. tokenized assets or tokens] enables liquidity and monetization for any asset, anywhere, and anytime.

The AbacasXchange

- With each blockchain service that is founded, a new cryptocurrency is frequently issued for both initial funding and as the currency (gas) used to pay for the services provided. In order for the blockchain service to gain traction, there needs to be a programmatic method to automatically purchase small amounts of the blockchains' cryptocurrency for payment of the services of the blockchain.

The AbacasXchange provides APIs (Application Programme Interfaces) whereby **micro-transactions** of gateway assets may be exchanged for other less liquid crypto-currencies of a blockchain service provider. This automatic exchange and payment processing will enable cross-chain applications without the need to hold reserve crypto-currencies for every blockchain that may be utilized.

- As distributed blockchain ledgers become an accepted registry of asset ownership and digitized value transfer, there must be a method of exposing these tokenized assets for trade and exchanging one asset for another. As a result, exchanging tokenized assets requires a set of rules and procedures to insure the integrity of the counterparty, the assets and the transaction, in order to protect the rights of ownership to the underlying asset.

The AbacasXchange provides for the trading of all assets including asset tokens created using standards such as the ERC20 & NEM Mosaics. Beyond trading digital tokens, the AbacasXchange provides for assets that are "Fulfilled by Abacas".

A Fulfilled by Abacas asset is one that is held in safe-keeping [custody] and one in which the asset's existence, authenticity and provenance are assured.

The AbacasXchange enforces the integrity of Fulfilled by Abacas assets through a set of rules and procedures known as the **Abacas Protocol**.

- Tokenized assets may be transferred for payment, or exchanged for the purposes of investment and speculation. These **macro-transactions** require a highly visible order book with a view into the open orders and depth of market prices.

The AbacasXchange provides a matched order book for the placement of market and limit orders across all assets on the exchange. Where liquidity cannot be discovered directly, the AbacasXchange will attempt to link orders through "Gateway Assets" to form a liquid price on the token pair to be traded.

Case Studies:

Example #1: Blockchain Database Provider

A new company, Database On-the-Chain (OTCdb) is founded with the intent of providing a distributed database service using blockchain technology. Using the block chain as the fundamental record keeper of database transactions, OTCdb has built programmer APIs in a multitude of programming languages including Java, C++, C#, Python and Node.js.

The programmer APIs provide for the activities of a SQL database including creation of a table, definition of table relationships and the ability to add, update and delete records in a table, and finally a series of APIs to query the database for both current and historical records.

OTCdb plans to use a Proof of Stake consensus for their services, and they have successfully completed a fund raiser of EUR 25 Million through an ICO of their cryptocurrency “DBTS”

When the service is up and running, OTCdb will charge for their services using DBTS, and users will be micro charged for activity as little as .000001 DBTS.

Companies wishing to utilize OTCdb’s service will need to purchase DBTS in small amounts and the supply will come from the initial ICO that funded the company. As the services are more heavily utilized, the value of the DBTS will increase, thus creating a liquid market for the cryptocurrency.

Using the AbacasXchange, DBTS owners can register and deposit their DBTS for trading on the AbacasXchange.

There will be two types of buyers of DBTS:

The first is application developers wishing to utilize the OTCdb service and they will need to pay small amounts of DBTS programmatically as their systems utilize OTCdb’s services.

The second is investors wishing to trade DBTS speculatively. There are the original investors in OTCdb that may wish to sell some of their cryptocurrency for another token, and there are investors looking to purchase DBTS as an investment in the company and its service.

The AbacasXchange provides programmatic APIs for applications wishing to purchase micro amounts of DBTS in exchange for another token (BTC for example) that is on account with the exchange.

The AbacasXchange also provides for the deposit of DBTS into the custody of the exchange and the deposit of Fulfilled by Abacas DBTS coins @DBTS which can be exchanged for other tokens on the exchange including Fulfilled by Abacas tokenized securities, cryptocurrencies, fiat currencies and other tokens outside of the Abacas Protocol.

Example #2: Blockchain Medical Records

A new initiative to make medical records publicly available to health care providers globally is underway using a blockchain database for record storage and retrieval. The organization is called Doctor's Exchange whereby medical records are uploaded and made available to all relevant health care providers on a permissioned basis by the patient.

Doctor's Exchange has implemented their new system using OTCdb's distributed blockchain database services.

The Doctor's Exchange charges for their blockchain services using an ERC20 Token "DOCX" which is registered on the Ethereum blockchain.

In order to utilize OTCdb's services in an automated manner, the Doctor's Exchange must convert from their digital currency "DOCX" to the OTCdb's digital currency "DBTS".

Because the Doctor's Exchange is utilizing the services of the AbacasXchange, they have programmatic APIs that automatically sell DOCX for DBTS on an as needed basis.

Without the real-time availability to exchange one digital currency for another, the Doctor's Exchange would need to establish an account with OTCdb, sell DOCX on the market and buy DBTS and then manage a monthly billing process for services utilized. This overhead is friction in leveraging the DOCX digital token for payment and acquiring the DBTS for payment that is eliminated by the use of the AbacasXchange.

Example #3: Blockchain Asset Trading

A speculative fund manager is identified on the AbacasXchange as “TradezDigital” and has fiat currency assets under management that are to be aggressively invested in blockchain technology companies.

TradezDigital has a large Bitcoin (BTC) account on the AbacasXchange and they are always looking for opportunity to invest in fast growing blockchain companies.

Based on investment information, TradezDigital has decided to purchase a block of 50,000 DOCX for BTC. Using the AbacasXchange, TradezDigital is able to view the open order book (thus depth of order book) as well as two-way pricing for BTC vs DOCX.

Two-way pricing shows BTC-DOCX as 10/10.5 which means that someone is willing to buy 1 BTC for 10 DOCX, and someone is willing to sell 1 BTC for 10.5 DOCX. The bid/offer spread is thus .5 DOCX.

When TradezDigital places a limit order to buy 50,000 DOCX for BTC, their order is filled at 10, thus TradezDigital will pay 5,000 BTC and receive 50,000 DOCX.

The TradezDigital order was filled both directly and indirectly as follows:

- A) TradezDigital places a Limit Order to Buy 50K DOCX for BTC with a limit price of 10 BTC-DOCX
- B) An investor, “DXInvestor1” has placed a limit order to sell 25,000 DOCX for BTC with a limit price of 10 BTC-DOCX.
- C) A trader, “DXTrader1” has placed a limit order to sell 50,000 DBTS for BTC with a limit price of 20 BTC-DBTS
- D) A trader, “DXTrader2” has placed a limit order to buy 50,000 DBTS for DOCX with a limit price of 2 DOCX-DBTS.

The AbacasXchange is able to identify both a direct and indirect path to fulfilling the TradezDigital order:

- 1) TradezDigital is matched with DXInvestor1 for 25,000 DOCX in exchange for 2,500 BTC
 - a. TradezDigital buys 25,000 DOCX and sells 2,500 BTC
 - b. DXInvestor1 buys 2,500 BTC and sells 25,000 DOCX
- 2) TradezDigital, DXTrader1 and DXTrader2 are all matched as follows:
 - a. TradezDigital buys 25,000 DOCX and sells 2,500 BTC
 - b. DXTrader1 buys 2,500 BTC and sells 50,000 DBTS
 - c. DXTrader2 buys 50,000 DBTS and sells 25,000 DOCX

The capability of the AbacasXchange to indirectly fulfil orders through Gateway Assets such as BTC creates liquidity prices that would not otherwise exist. **This is the Infinite Coincidence Supply!**

Any Asset, Anywhere, Anytime

Any Asset

Imagine a world in which each asset is committed to a distributed/decentralized ledger (DLT) by the purveyor. For example, Apple Computer commits AAPL common stock ownership to the Apple equity blockchain ledger. Every change of ownership is recorded within the distributed ledger and committed to an immutable blockchain. In this new world, the exchange of assets does not require the overhead of brokers, settlements or clearing and change of ownership can be instantaneous (subject to latency of the blockchain to which the asset is linked).

While Apple may not be ready to commit their common shares to a blockchain, the AbacasXchange is capable of doing so today. Assets such as stocks can be converted into Fulfilled by Abacas tokens whereby the Apple shares are held in custody and converted into tokens. The tokens are traded in the exchange based on the underlying asset value and any change of ownership is conveyed on a blockchain ledger. A Fulfilled by Abacas token can be redeemed at any time for the underlying asset.

Since the AbacasXchange is unopinionated, assets that may not adhere to all elements of the Abacas Protocol may still be traded on the exchange. These assets are **not** “Fulfilled by Abacas” but are “Fulfilled by ClientName”, which simply means that custody and proof of asset are managed outside of the Fulfilled by Abacas process.

A similar feature exists when items are purchased from Amazon. If Amazon has the item in their warehouse, then the purchase is fulfilled and guaranteed by Amazon. If the item is fulfilled directly by the merchant that is advertising on Amazon, then the buyer knows that delivery and return policies of Amazon may not apply.

Within the AbacasXchange, any token that is traded and only partially fulfils the Abacas Protocol does not receive a Fulfilled by Abacas seal of approval. These tokens may still may be purchased or traded on the exchange.

Any asset can be traded on the AbacasXchange if it can be represented by an asset token and value conveyed on a distributed blockchain ledger.

Anywhere Anytime

The AbacasXchange is a cloud-based exchange system that is distributed globally and is operational 24x7 365 days of the year. If the token is available for trading, it can be exchanged at anytime and anywhere globally.

Introducing the Abacas Protocol

The Abacas Protocol is an encoded open workflow that enforces a rigid set of policies on cryptographic assets to insure the proof of identity, proof of asset, price discovery, order entry and fulfilment, matched transaction processing, asset servicing, life-cycle management and value transfer to/from each party of the trade.

The Design Features of the Abacas Protocol

- Asset Identity and Metadata
 - Each asset added to the AbacasXchange is registered with an asset code and metadata that categorizes the asset and establishes information about the asset including how the asset's proof of existence, proof of authenticity and proof of provenance are certified.
- User Identity and Metadata
 - Each exchange user is identified uniquely and verified through Know-Your-Client verification. Additionally, metadata is stored on each user to classify them in terms of nationality, geographic location, etc.
- Asset Pair Exchange Rates through Price Discovery
- Order Book Management with the ability to do multi-party matching across 3 or more assets.
- Asset specific workflows that engage pipelines of services into which service providers may connect and provide part of the processing fabric of the AbacasXchange.
 - Each 3rd party service provider must register with the AbacasXchange and will be certified as a provider to the Fulfilled by Abacas Protocol.
- Web Socket and HTTPs APIs for price discovery, order entry, order history and token balances.
- Integration APIs supporting the services of the pipeline including blockchain based services as well as traditional non-blockchain services. These services are typically connected via Web Sockets and HTTPs using JSON formatted data.
- A distributed exchange ledger recorded on a blockchain for safekeeping of tokenized asset ownership and balances.

Abacas Tokenized Assets

The AbacasXchange allows for the trading of any asset that can be represented as an Abacas tokenized asset.

An Abacas token represents the meta-data that defines all the relevant characteristics of the asset: asset type, proof of asset, provenance and history.

A token is either “Fulfilled by Abacas” or “Fulfilled by ClientName”.

Fulfilled by Abacas

Tokenized assets that adhere to all aspects of the Abacas Protocol are designated as “Fulfilled by Abacas”. A Fulfilled by Abacas token is prefixed with the “@” symbol, which assures the buyer that all aspects of the Abacas Protocol are applied and validated.

An “Fulfilled by Abacas” @token implies the following:

- User identify is authenticated
- Asset identity, provenance and authenticity are verified
- Assets are held in custody
 - Trusted 3rd party custody
 - AbacasXchange cryptocurrency custodial wallet
- Assets are processed and cleared for AML/KYC checks
- Asset servicing of Corporate Actions
- Independent reconciliation of tokenized to underlying asset balance held securely in custody
- A secure transaction life-cycle
- A public record on a public blockchain ledger of all activity on each asset in custody and each tokenized asset.

Fulfilled by ClientName

The AbacasXchange provides for the trading of asset tokens that are not fully verified by the Abacas Protocol. These asset tokens may have a provision for self-custody, or different requirements for transaction processing that do not strictly match the requirements of the Abacas Protocol.

Just as Amazon provides items fulfilled by Amazon, and other items provided directly by the merchant advertising no Amazon; the AbacasXchange provides digital asset tokens that are fulfilled by the AbacasXchange (Fulfilled by Abacas) and other assets where the fulfilment is with the party selling the asset on the exchange (Fulfilled by ClientName).

Abacas Liquidity

Trading on the AbacasXchange is performed by the direct peer-to-peer exchange of asset pairs. Liquidity and thus price discovery are determined by both direct asset pair trading, and indirectly through the chaining of asset pair orders to form a liquidity link through gateway assets.

Direct Liquidity

The AbacasXchange manages all tokenized asset pair orders in discrete asset pair order books, segregating buy orders from sell orders, and matching bids versus offers when an order crosses the bid/offer spread.

As orders are discrete asset pairs, the liquidity of any one asset is distributed across the range of assets offered in the AbacasXchange versus a traditional exchange where all trading of an asset is through a single fiat currency.

The AbacasXchange addresses this liquidity challenge by introducing the concept of “Gateway Assets” as an alternative to fiat currency.

Indirect Liquidity through Gateway Assets

The AbacasXchange Liquidity service is a process that oversees all asset pair order books. Using a proprietary combination of graph theory and neural networks, the liquidity engine identifies Gateway Assets that serve as alternatives to fiat currency. These Gateway Assets serve the same purposes as fiat currencies and form a liquidity core upon which the exchange then determines asset pair price discovery.

While some assets such as BTC and ETH are obvious candidates for Gateway Assets, there are infinite assets such as gold that can form a liquidity link between assets outside the core.

Illustration: Liquidity Link

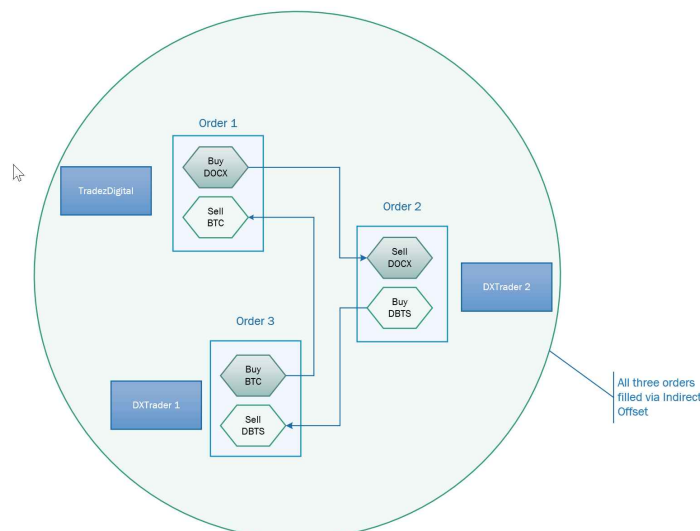
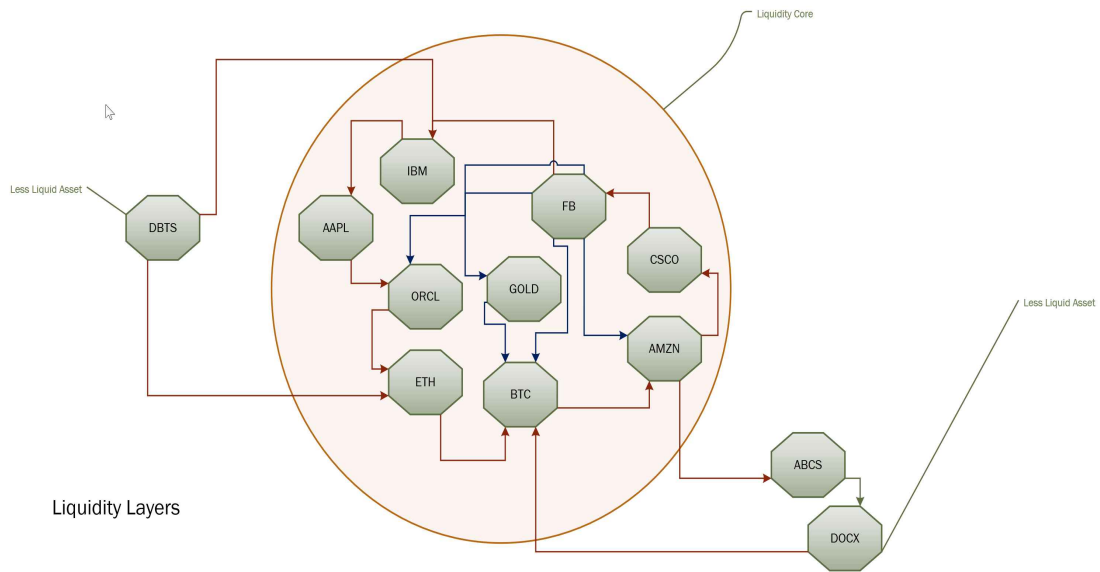


Illustration: Liquidity Core through Gateway Assets



Custody

A key component of the Abacas Protocol and “Fulfilled by Abacas” tokens is the need for custody of the asset by a trusted third party.

There are two types of Fulfilled by Abacas Custody.

Trusted 3rd Party Custodial Service Provider

Traditional custodial services where a trusted 3rd party provides custody and asset servicing is the most prevalent form of AbacasXchange Custody.

AbacasXchange Digital Custody

Cryptocurrencies do not adhere to the traditional approaches of custody; thus, the AbacasXchange does provide custodial services (Exchange Wallets) for cryptocurrencies that are deposited to the exchange.

Unlike other exchanges, the underlying cryptocurrency is converted into a token, and thus the cryptocurrency is held within the custody of the exchange while the asset token is traded within the exchange.

Abacas Technology

The AbacasXchange utilizes four primary technology tiers.

- 1) Web Client
- 2) Service Engines
- 3) Workflow Orchestration
- 4) Database

Abacas Web Client

The AbacasXchange Web client is based on HTML 5 web pages utilizing the Angular 4 framework and Typescript 2 (which transpiles into JavaScript). Web pages communicate with server-side services via Web sockets and HTTPs with a preference for web sockets and HTTPs as a fall back.

Data communication from client to server is secured and packaged into JSON formatted data.

Abacas Services

Abacas Services are comprised of several core processing engines including the following:

- Rate Engine
- Order Management Engine
- Indirect Liquidity Engine
- Executed Orders and Asset Balances
- Data Publishing Engine

Workflow Engine

The Abacas Workflow tier is a highly configurable sequencing and routing engine that takes exchange activity including client onboarding, asset definition and registration, order entry and execution and filled order transaction life-cycle management through an orchestrated series of processing actions that are either performed within the exchange, or via pipelines to external service providers.

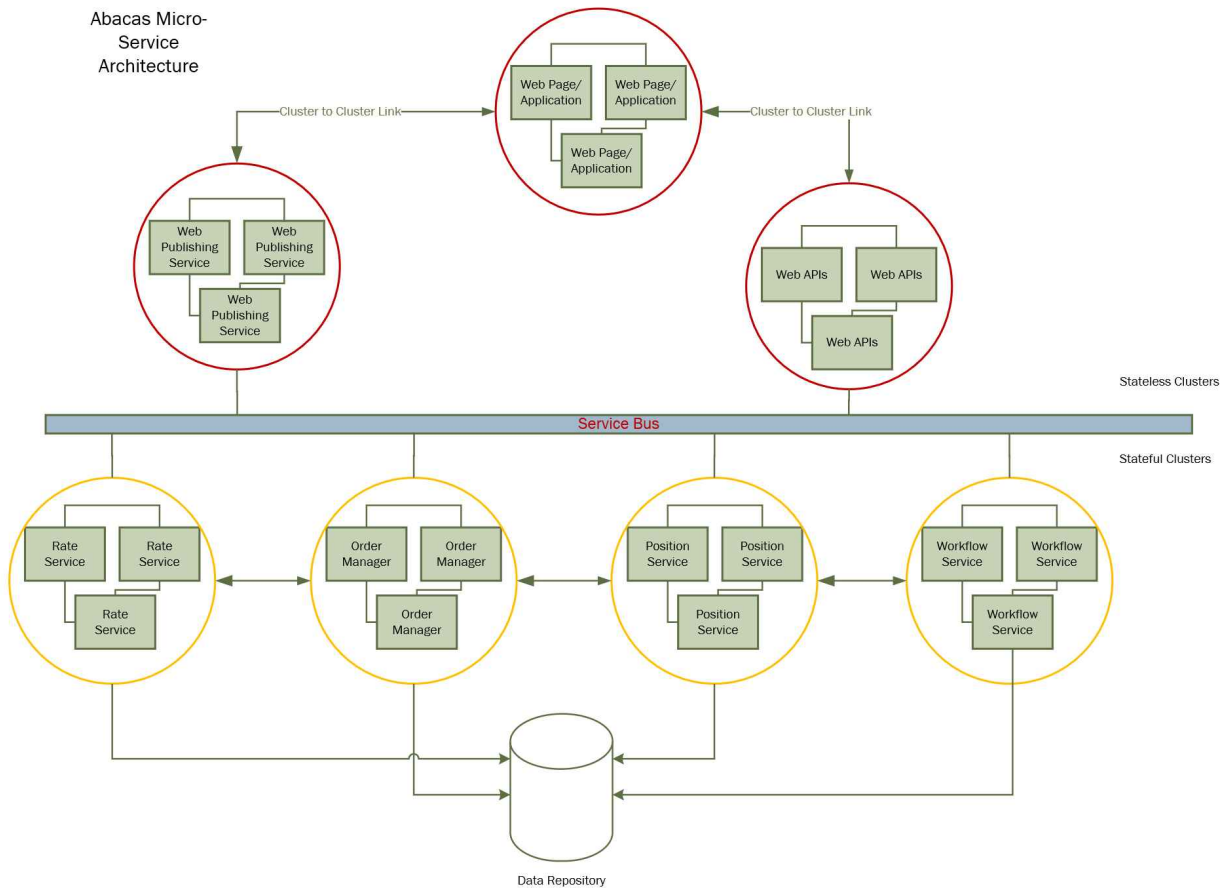
Database Services

The Abacas Enterprise Database is a cloud based relational database using SQL commands and queries.

Application Service Fabric

The AbacasXchange web and service tiers are deployed into a Microsoft Azure Service Fabric. All services within the fabric are micro-services in that they are part of a cluster and automatically managed.

Stateless services like the Data Publishing Service are configured into a load balanced cluster with each client being sticky to a particular instance. Stateful services are configured into a cluster of service copies with each instance managing a subset of the entire exchange portfolio (partitions) and each service instance is registered with a service registry that routes traffic to the correct instance based on the data that is partitioned (typically client or asset identity).



Regulatory & Compliance Management

User Authentication

User Authentication will be conducted through the identity services of the exchange in conjunction with external blockchain service providers that may provide background (AML/KYC) checking and additional identity and background checks on the user/organization.

Asset Authentication

The Asset Authentication pipeline of services is formulated based on the meta-data of each asset. Each asset in custody must be verified for identity, authenticity and provenance. Examples of blockchain service providers that provide asset authentication services include Chronicle, Maecenas and Civic.

Regulatory & Compliance Goals

The AbacasXchange will integrate Regulatory and Compliance requirements into the Abacas Protocol and workflow services through the use of blockchain service providers that assist in the reporting and reconciliation of User and Asset identity along with exchange activity for pricing, order fulfilment and transaction life-cycle processing.

Regulatory & compliance standards include MiFID, MAR and Reg NMS [NBBO]

Evolving Compliance Requirements

Traditional Compliance

The use of a repository structure for physical assets and dematerialized assets held in custody allows Abacas and accredited users to be compliant with prevailing regulation immediately, while promoting the values of regulatory agencies for fair markets, oversight and reporting (AML/KYC). It further allows Abacas to address the nuances of physical vs a dematerialized asset storage and to evolve as assets evolve, as custody evolves and as asset servicing evolves, thereby mirroring the transition from non chain assets to tokenized assets on the chain.

Virtual Compliance

The use of a virtual compliance protocols such as Self-key allows the Abacas ecosystem to mitigate the behaviour of bad actors by directly leveraging the accessibility of the blockchain 24/7. It opens the door to transaction by transaction dynamic compliance and may in turn be a stepping stone to a fully-integrated cross asset class global compliance system.

Abacas Cryptocurrency (ABCS)

The AbacasXchange utilizes the “ABCS” token as the fuel upon which the exchange services are charged. To facilitate micro-transaction charges in the exchange, an ABCS can be fractionalized to an Abbit (10^{-9} ABCS).

The AbacasXchange provides a framework and workflow pipelines upon which blockchain (and traditional) service providers can integrate and provide verification and processing services to the exchange.

Examples of blockchain services include user identity and know-your-client checking, asset authentication, anti-money laundering checks, and, of course, value transfer to external blockchains.

The AbacasXchange attaches a charge in ABCS to each asset token that is traded and compensates pipeline service providers in Abbitts.

Pipeline service providers may in turn request that the exchange automatically convert Abbitts to any other token on the exchange including the service provider’s cryptocurrency, thus forming a community around the AbacasXchange sharing resources that are funded through ABCS.

The Abacas Protocol Foundation

The Abacas Protocol Foundation is a nonprofit foundation whose core objective is the establishment of the Abacas Protocol as a global standard for intrinsically tradable tokenized assets and cryptocurrencies. When one contributes to the foundation, subscribers will receive ABCS (& abbitts), the price and convertibility of which will be determined algorithmically via the ERC20 token after the token sale. The ABCS is the initial smart token to be deployed using the Abacas protocol, establishing the AbacasXchange network.

Mining and validation in **any connected blockchain** spawns exchange-tradable credits. All participants are compensated for their contributions and no valued contribution is dismissed.

ABCS are tradable with:

- asset purveyors who wish to commit assets to the exchange
- investors who wish to purchase tokenized assets
- traders and resellers who wish to leverage the liquidity in the exchange
- investors who wish to hold ABCS
- any service looking to leverage the AbacasXchange as a third party vendor

The foundation will collaborate with different contractors to achieve its goals. The foundation will reach out to governments, businesses, academia and NGOs who are committed to enhancing the monetization, security, and portability of assets globally.

ABCS Token Sale Objectives

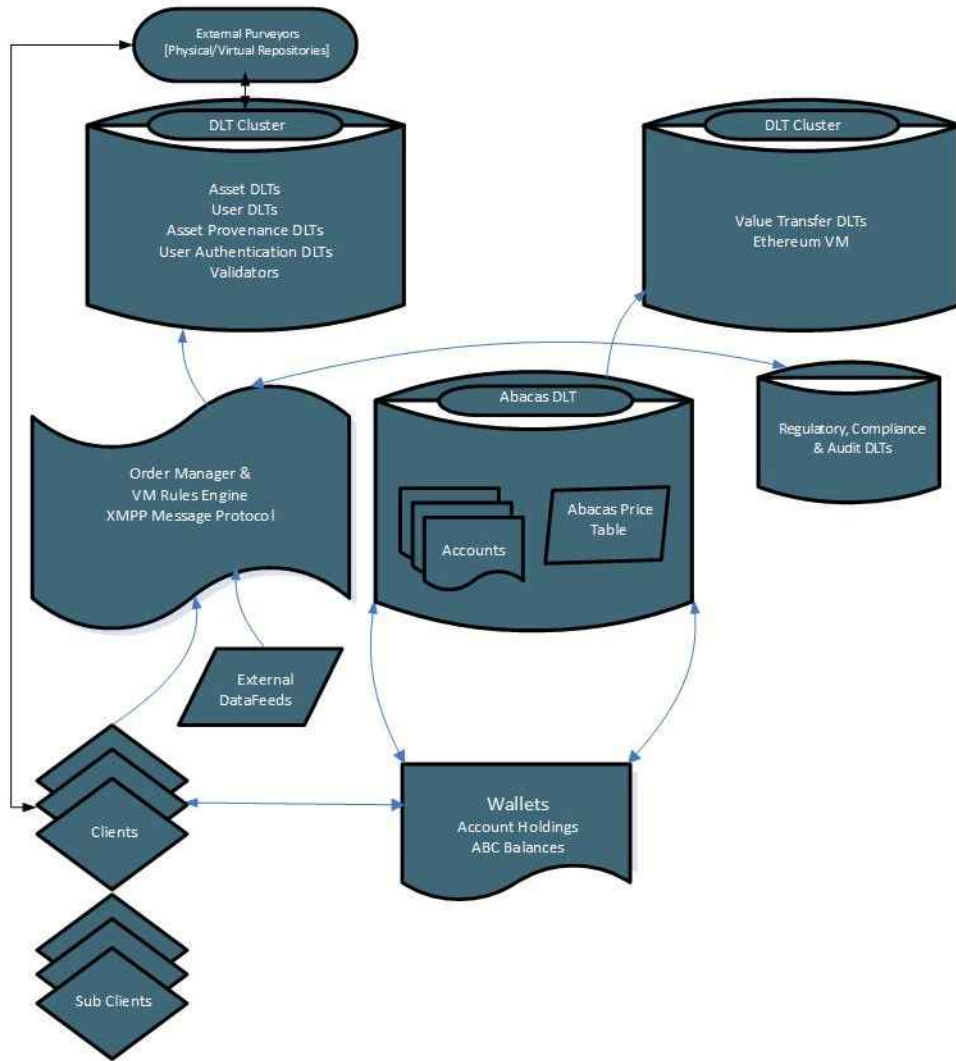
An allotment will be used as the XEM/ETH reserve for early stage ABCS transactions to promote development in DLT support networks.

An allotment will be used to develop, promote and support related applications, general Abacas protocol implementations, community initiatives, and related technologies such as user-friendly blockchain explorers, web services, wallets, new industry specific smart token logic, and crowdfund solutions.

An allotment will be used to seed, set-up and advance the first tranche of early adopters and asset contributors. Join the 4A Club.

An allotment will be used to participate in and support strategic and innovative smart token crowdfunding.

Appendix A: High Level Architecture



Terminology and Related Information

Definitions

1. Double coincidence of wants - Jevons 1875 https://en.wikipedia.org/wiki/Coincidence_of_wants
2. Infinite coincidence of supply - Abacas 2017 https://en.wikipedia.org/wiki/Say%27s_law
3. Universality and the Law of Inclusion - Abacas 2017 Interoperable DLTs promise a future of unrestricted access resulting in supply & demand that are restricted only by pure interest.
4. Asynchronous order book <http://www.investopedia.com/terms/o/order-book.asp>
5. Graph Theory https://en.wikipedia.org/wiki/Graph_theory
6. Set Theory https://en.wikipedia.org/wiki/Set_theory
7. Proof of Work Consensus PoW <https://keepingstock.net/explaining-blockchain-how-proof-of-work-enables-trustless-consensus-2abed27f0845> ; https://en.wikipedia.org/wiki/Proof-of-work_system
8. Proof of Stake Consensus PoS <https://en.wikipedia.org/wiki/Proof-of-stake>
9. Proof of Resource (Stake) Consensus https://safenetwork.wiki/en/Proof_of_resource
10. Differences in Consensus <https://ethereum.stackexchange.com/questions/118/whats-the-difference-between-proof-of-stake-and-proof-of-work>
11. Distributed Ledger Technology DLT https://en.wikipedia.org/wiki/Distributed_ledger
12. Price Discovery https://en.wikipedia.org/wiki/Price_discovery
13. Real Time Data Feeds RTDF https://en.wikipedia.org/wiki/Data_feed
14. Indicative Pricing http://www.investorwords.com/15471/indicative_price.html
15. Execution Pricing <http://www.investopedia.com/terms/e/execution.asp>
16. Relative Pricing https://en.wikipedia.org/wiki/Relative_price
17. Expressions of Interest EOI <https://www.divestopedia.com/definition/899/expression-of-interest-eoi>
18. Liquidity <http://www.investopedia.com/terms/l/liquidity.asp>
19. Real Time Gross Settlement System RTGS https://en.wikipedia.org/wiki/Real-time_gross_settlement
20. Net Settlement System NSS https://en.wikipedia.org/wiki/Net_settlement
21. Real Time Net Settlement System - A multilateral netting system in real time <https://www.kantox.com/en/glossary/multilateral-netting-system/>
22. Monetization <https://en.wikipedia.org/wiki/Monetization>
23. Corporate Actions and Asset Servicing - to service asset ownership through distributions[cash, capital adjustments or securities] and by facilitating ownership rights [eg. voting]
24. Digital Asset https://en.wikipedia.org/wiki/Digital_asset
25. Market Maker <http://www.investopedia.com/terms/m/marketmaker.asp>
26. Maker-Taker System <http://www.marketswiki.com/wiki/Maker-taker>
27. Standing Order System [https://en.wikipedia.org/wiki/Standing_order_\(banking\)](https://en.wikipedia.org/wiki/Standing_order_(banking))
28. “Double Spend” <https://en.wikipedia.org/wiki/Double-spending>
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