Lattice Exchange
V1.5

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Introduction

Over the last decade, blockchain technology has made an emergence by improving digital systems and processes for nearly every industry and Fortune 500 company. Most notably an entire new industry has been created through the development of crypto currency assets, smart contracts, complex financial products and derivatives, and the new paradigm of Decentralized Finance (DeFi).

With decentralized and low barrier to entry tools like erc20-wallets, metamask, and swapping contracts, the new open source blockchain-finance ecosystem is growing at a tremendous pace. Within months, DeFi has captured more than $10B worth of market capitalization and more than $9B of staked tokenized value. However, transaction fees, cross-chain interoperability, network speed, data oracelization, and order matching algorithms and available liquidity are all bottlenecks for this growing blockchain-financial market to be on par with the $30T traditional securities markets.

With the growing ecosystem, user centric applications become paramount. Users demand low transaction fees, fast and secure swaps and cross-chain inter. The future of decentralized finance requires interoperability as a must-have feature of the near future. This evolution will include aggregating liquidity pools, smarter routing for trades, and access to multiple asset-specific automated market making (AMM) algorithms to secure the best price and profitability for users.

Current DeFi applications face challenges as base layer protocols of existing blockchain infrastructures have scaling limitations, are costly and slow to transact, and are not architecturally designed to process data like centralized data processing tools (including the oralization of data). Tools that already exist in traditional financial markets and the trading of securities. Additionally, there is an opportunity to aggregate liquidity pools to unlock more capital from multiple ecosystems and bridge fractionalized liquidity. These limitations ultimately provide barriers not only to regular users but to institutional investors from entering the cryptocurrency industry.

The Constellation Network, Hypergraph, is a groundbreaking new infrastructure protocol that is a graph based database (called a directed acyclic graph (DAG)), that leverages dynamic partitioning for efficient data distribution across a decentralized distributed network, and uses mathematical proofs, and concurrent consensuses, built into its Hypergraph Transfer Protocol (HGTP) to efficiently organize the network. Hypergraph and HGTP allow for fast and scalable throughput as well as easy cross-chain interoperability with other blockchain networks and existing data

management and cloud infrastructures. Constellation's microservice architecture allows for a new ecosystem of applications that communicate with blockchain and traditional systems and infrastructures. This enables the oracelization of data and the ability to integrate external data sources while ensuring resource efficient scalability.

Using the Constellation protocol, Lattice is a decentralized application, DeFi solution, built on the Constellation Hypergraph infrastructure with seed investors Alphabit and FBG Capital.

The Lattice platform offers the following advantages and features:

- AMM based liquidity pool that allows lenders to earn transaction fees on their deposits (farming).
- Smart routing algorithm for trade execution across different platforms.
- Advanced platform for pluggable institutional grade order matching algorithms that are asset specific (multiple AMMs).
- A governance token called "Lattice (LTX)" which gives holders certain rights in regards to economic parameters like transaction fees and inflation/deflation.

Lattice will be an evolution of existing DeFi solutions by providing better liquidity and more efficient asset-specific automated market making algorithms for traders and liquidity providers. The infrastructure enables a higher assurance in crypto asset trading and settlements. This solution will further advance the blockchain industry with improved financial instruments that are cost effective and have the speed, security, and scalability that traditional securities asset traders are accustomed to.

Constellation Protocol

Constellation's Hypergraph Transport Protocol (HGTP) is the only secure communications protocol that connects real world applications through seamless tokenized data. Constellation enables an ecosystem of applications to be built on the Hypergraph Network while using the HGTP to securely capture, connect and transport that data for an evolution of applications with data assurance and compliance. Hypergraph, is a resilient decentralized network that is built on a directed acyclic graph (DAG) and leverages dynamic partitioning and a reputation based consensus mechanism to be infinitely scalable, while providing fast throughput to handle high computational needs for instant data processing.

Every application produces, stores, and uses data to improve the customer experience and operations. The Constellation Network and Protocol is built to connect blockchains and real world applications by integrating easily with existing applications and data management stacks used for processing the world's data. Constellation's

technology is uniquely positioned to be compatible with data management solutions, like Cloudera and Splunk, and data processing tools (like Kafka, Storm, MongoDB, and Flink). The Hypergraph, a decentralized network, is the only network to provide leaderless authentication and provide cryptographic security to data pipelines at scale. Today, Constellation cryptographically secures simple numeric data structures, transactions and ledger balances, allowing the $DAG cryptocurrency to operate over the most scalable decentralized network.[1]

The world's leading equities and securities based hedge funds use algorithmic trading and require high computations to be competitive in analysis and trade execution. Additionally, they rely on third party data sources that are validated and trusted, to improve algorithmic trading decisions. Securities trades need to be consistent and efficient or else time and money is at stake. To date, there is no decentralized protocol that is on par with centralized solutions to support high computations used in trading. Constellation's infrastructure and protocol is the first and only infrastructure built to mirror, integrate, and communicate with centralized big data processing and data management solutions (like those used by quants and equities hedge funds) but provides the assurance, security, and immutable auditability of that data.[2]

The Lattice Exchange, powered by Constellation, will introduce a crypto asset trading product that propels crypto currency trading into the future.

The Ethereum Network and infrastructure is the main protocol on which many DeFi projects are being built on. The Ethereum Network is not cost effective (high gas/transaction fees) and is not built for speed, scalability, and securing data. Even with sharding capabilities on Ethereum, their synchronous chain still has scalability limitations which will dramatically impact the max throughput and speed of the network. Secondly, Ethereum's smart contracts and network are effective at creating an immutable audit trail around the movement of a digital asset, but not the actual features of that comprise the digital asset. Finally, there is no effective bridge of connecting real world data, third party data used to create advanced algorithmic trading, and data created on the Ethereum Network, thus limiting innovation and commercially viable algorithmic trading and financial trading tools and solutions from entering the crypto industry.

Constellation's infrastructure solves the limitations of Ethereum and provides a robust solution for the existing DeFi market. By leveraging Constellation's ecosystem and technology we can exponentially increase the market size and potential of the industry in the following ways:

1. **Speed:** Constellation is a directed acyclic graph (DAG) and a graph based distributed database that is infinitely scalable for faster transactions: the more

[1] Original Constellation Whitepaper - https://bit.ly/2Etsj87
[2] Constellation Business Whitepaper - https://bit.ly/31np6zI

nodes that join the network the faster it gets. Additionally, we leverage concurrent consensus mechanisms to run in parallel (thus not weighing down the network during times of high utility).

2. **Cost**: Constellation provides free transactions with the ability to add fees to ensure faster transaction throughput. This essentially serves as a freemium access to the network and a cost effective peer-to-peer payment system.
3. **Security:** Constellation's protocol can be appended at the source of data collection, making Constellation a solution for oraclizing data. Constellation's technology creates an immutable audit trail on the data collected and transferred (not just the asset as it is transferred). Additionally, if a transaction would make it through the double spend protection, it would need to pass through our concurrent consensus mechanism and topological ordering which is algorithmically executed and cannot be manipulated.

Furthermore, Constellation's technology is capable of executing through these key technology differentiators:

1. **Architecture**: DAG is a common data and distributed systems architecture for the leading centralized applications. Two main features are required to create a decentralized DAG and to organize the data and network (nodes) effectively: topological ordering and dynamic partitioning (an evolution of sharding asynchronously), and our consensus model is based on reputation (which allows us to organize the network through algorithms that leverage geo location, past participation in consensus.
2. **Network Optimization**: Constellation leverages topological ordering and concurrent consensus (using math to organize the data and the network) which allows us to organize the data so that AI and Machine Learning engineers can use data, with assurance, for high computational needs (algorithms). AI engineers (application layer) require data to be topologically ordered on a network for it to be used in applications. This allows for pre-processing of data and computations on the Hypergraph - Constellation's decentralized network.
3. **Consensus Mechanism - Proof of Reputable Observations**: We leverage a reputation based consensus mechanism which organizes the network based on multiple variables. This ensures additional security beyond double spend and network manipulation while seeing infinite scalability with no bottlenecks on throughput. Furthermore, we run concurrent consensus for improved security and network optimization: one for block consensus and one for global convergence.
4. **True Decentralization**: Unlike other leading decentralized protocols, Constellation is not just a master node with a few light nodes. Hypergraph is a truly decentralized Mainnet with 44 foundational nodes (100+ being

onboarded) and leverages rate limiting across our decentralized nodes to balance the network state.

5. **U.S. Government Validation:** Constellation is the only truly decentralized network that is working with the US government to provide a scalable distributed ledger technology to tokenize data, provide secure data access, and create Zero Trust. We have received multiple letters of support from the US government to create a new standard on how data is securely transported.

Constellation's capabilities and validation positions itself to provide the world's first scalable, secure, and cost effective DeFi solution.

Existing DeFi Solutions

Existing DeFi solutions are spearheaded by the likes of Uniswap/Sushiswap, Yearn, Balancer and Curve, and enable liquidity for exchange transactions between different tokens. Thereby liquidity is provided in the form of on-chain pools, equal in value for both ETH and a single ERC-20 token traded. Trades are executed against these on-chain pools, which use an automated market making strategy to enable order book and counterparty-free exchanges.

While liquidity is increasing in the ecosystem, single-platform liquidity pools are not enough to create low-slippage trading environments. First attempts at pooling liquidity are made with examples like 1inch.exchange however the fundamental necessity of thick and liquid order books has not been fully met.

The majority of the DeFi ecosystem relies on a simple AMM algorithm that fosters ease of use and it forces traders into market order trades. Combined with tentatively low liquidity the price movements on uniswap pools can therefore wildly fluctuate and make trading decisions less plannable.

The most widely used Uniswap AMM algorithm is not equally suitable for all currency pairs. Specifically stablecoin denominated pairs suffer inefficiencies that could be easily avoided with institutional grade algorithmic logic. Ideally, different pairs rely on more robust and individually tailored AMM algorithms. However, the EVM does not allow for an easy integration due to the limitations on the programming and network side.

Speed and trading fees (Gas) are the main weaknesses in current base protocol solutions. With the Ethereum network being at 80-100% capacity since 2017 with more and more peak loads of near 100% in recent months transaction fees to interact with any ethereum defi product calls for very high fees. Transaction fees of 5USD and

up to 50USD and more have become the norm. This poses serious barriers to entry not only for token holders with small and medium accounts but more so the high transaction fees are philosophically opposed to the entire promise of a self sovereign independent financial system on the blockchain with its instant and low-fee promise in comparison to legacy banking.

High transaction fees and slow transaction speeds hamper the growth of more advanced financial platforms. In high load times such as bonding curve sales, transactions are stuck in a pending state. One of the main problems occurs when pending transactions cannot be cancelled and causes a poor customer and user experience that will lead to fleeing usage.

Fair trade execution and participation in bonding curve sales and is furthermore hampered by frontrunning with high frequency tx bots and high fee payments. All three aspects form self reinforcing loops which increase the problem of network blocks and create user disadvantages.

The other major impediment of current solutions like, Uniswap, Curve, and Balancer, is impermanent loss. Impermanent loss occurs when the protocol allows for trade execution at a value under the value at which the pool is valued right after the trade concludes. Unless a trader takes a trade in the reverse direction, at the same amount, the liquidity provider realizes the impermanent loss into a realized relative loss. The final situation of impermanent loss is that impermanent loss is different for members in a liquidity pool as they have differentiated trade and entry points. Both mechanics make efficient fee calculations on the platform side as well as gains calculations for pool participants, a real challenge.

There are attempts to mitigate the impermanent loss by means of adjusting the trading fees. Uniswap uses fixed fees while Thorchain uses a flexible fee based on the slip of the price pool. Additionally, liquidity providers need to utilize third party tools to calculate the efficiency of their provisioning activities.

In summary, the DeFi ecosystem has made tremendous strides towards a truly decentralized financial system. At the same time the advantages of fluid liquidity management, borderless swaps and self-sufficient liquidity pools, have produced significant drawbacks for traders and liquidity providers alike.

Lattice aims to overcome the weaknesses of current DeFi applications with thicker liquidity, institutional-grade AMM algorithms and ultimately faster and cheaper settlement due to the use of the Constellation HGTP. Lattice will thereby bring institutional grade reliability and usability to the DeFi ecosystem.

A review of current available AMMs

We are still in the process of structuring our liquidity pools and how the governance of the liquidity pools will function. Our goal is to provide multiple AMM's that are optimized for specific token types like regular ERC-20 and stablecoins. There are a lot of well known approaches to AMM but they are rather simple as settlement needs to occur on Ethereum (and the EVM can only handle simple data structures). Our goal is to build a plethora of AMM's and eventually host more complex AMM's on Constellation's Hypergraph (after all, Constellation is being built to support complex data structures) and oracalize data on Constellation (using our state channel/micro-service framework) creating more robust trading solutions in the near future.

We know that the core of any AMM is it's algorithm or price curve, from which the price of the tokens involved can be determined. Generally the variables of the AMM are the reserve amount x_i of each token i.

General purpose swap

Now we start from the simplest formula

$$\sum x_i = k \qquad (1)$$

where k is a constant. Since price for any pair x_i and x_j is $-\partial x_i/\partial x_j = 1$, means you can always exchange x_j with the same amount of x_i. Then for a pair of token x and y, if we specify the formula to $x + Py = k$, then $-dx/dy = P$. We have got a fixed price AMM where you always need to use P amount of y token to get 1 x token. However we also notice that these two AMMs are almost useless for two reasons:

1. Price in the market is never anchored.
2. The AMM may end up being drained out of one token, thus losing all liquidity.

Despite these two issues, (1) is a fundamental formula and we will see its usage in the later part.

To keep price fluctuating and to preserve liquidity, there is Uniswap. The formula is generalized as

$$\prod x_i = k \qquad (2)$$

which means that the product of each token's reserve amount remains constant. For a two token pair X and Y, (2) becomes

$$xy = k \qquad (3)$$

Price $-dx/dy = x/y$ is changing corresponding to the reserve of both sides. if one token is under the condition of almost running out, its price will move to infinity. Therefore, there is always some liquidity, even in extreme conditions.

We have seen that (2)/(3) has solved all the issues raised by (1), and is actually the simplest working AMM.

A feature of (3) is that, when a user adds liquidity to the pool (adding to the token's reserves), the product needs to be kept constant. Therefore, a liquidity provider always has to add the same value of both tokens: a Uniswap pool can also be called a 50/50 pool. To overcome this limitation, a Balancer style AMM is introduced, whose curve is a particular N-dimensional surface:

$$\prod x_i^{w_i} = k \qquad (4)$$

where w_i is the normalized weight of x_i. When adding liquidity, the smaller the weight w_i, the fewer of the tokens will the liquidity provider need to deposit. The pool generator may specify say a 20/80 pool, involving the normalized weights of two involved tokens are respectively 20% and 80%

One main issue of (2) and (4) is impermanent loss. Because (2) and (4) do not have any external sources of the current market price, their way to maintain a market price

is to let arbitrageurs buy the cheaper token and to sell the more expensive token. Therefore, when the pool is deviated from the initial state value is captured by arbitrageurs from the liquidity providers. Let's take an example that the initial liquidity is 600 USDT and 2 ETH. The following table shows that ETH is falling, adding liquidity yields some loss compared to just holding original assets.

	Initial state	After arbitrage	Hodl
Market price	300 usdt/eth	208 usdt/eth	208 usdt/eth
usdt	600	500	600
eth	2	2.4	2
Total value	1200	1000	1016

For a raising eth price case, a similar conclusion.

	Initial state	After arbitrage	Hodl
Market price	300 usdt/eth	408.4 usdt/eth	408.4 usdt/eth
usdt	600	700	600
eth	2	1.714	2
Total value	1200	1400	1416.8

Inpermanent loss is due to liquidity providers needing to add tokens to both sides (Notice that Balancer also provides single sided liquidity provision, but it is through first buying other tokens in the pool.) while arbitrageurs keep rebalancing the pool. In order to overcome impermanent loss, DODO introduces an external price oracle and moves the AMM curve according to the price oracle. The DODO algorithm is a price

curve itself and is described by four parameters for a pool composed of a base token and a quote token:

B_0 : total number of base tokens deposited by liquidity providers

Q_0 : total number of quote tokens deposited by liquidity providers

B: number of base tokens currently in the pool

Q: number of quote tokens currently in the pool

The price curve is:

$$P_{margin} = iR$$

and is consist of two parts:

- $R = 1 - k + (B_0/B)^2 k$ when $B < B_0$
- $R = 1/\left(1 - k + (Q_0/Q)^2 k\right)$ when $Q < Q_0$

i is the market price provided by an oracle, and *k* is a parameter in the range (0, 1).

Since DODO separates the price curve of each token, liquidity providers may only deposit on one single side, avoiding impermanent loss.

Besides, near equilibrium DODO's price curve is closer to $P_{margin} = i$. Compared with Uniswap, the price is kept at the oracle price for a larger range, which is a desirable feature.

Stable coin swap

One extremely important subdivision of AMMs is stable coin swap. We may think of a stable coin swap as an AMM given the constraint that the price of each token involved is slightly fluctuating near 1. For example, 1 USDT is always worth approximately 1 DAI. And this kind of swap can be extended to any pool that consists of nearly equal valued tokens, say the family of cross-chain BTC: WBTC and RenBTC. Recall (1)

describe a formula that satisfied our current needs. In order to solve two issues (1) mentioned before, StableSwap uses a linear combination of (1) and (3)

$$\chi D^{n-1} \sum x_i + \prod x_i = \chi D^n + \left(\frac{D}{n}\right)^n \qquad (5)$$

where $D = \sum x_i$. The physical meaning is that, under a balanced condition, the AMM acts like (1) and yields a nearly 1:1 swap rate, while under an extremely unbalanced condition, the AMM acts like (3) where there is always some liquidity. For a condition in between, you may get say, 1 DAI = 1.03 USDT, which is exactly how a stable coin swap should behave.

(5) is already fairly good for a stable coin swap, but Blackholeswap has taken a further step. Since the price of stable coins is fairly constant , borrowing one stable coin in a lending protocol using another stable coin as collateral has no risk of default. This amplifies the reserve size of both sides. Applying Blackholeswap to Uniswap yields

$$(x + AS)(y + AS) = K \qquad (6)$$

where $S = x + y$ is virtual liquidity and A is the leverage multiple, which means the ratio that the pool can borrow from a lending protocol versus its all reservations. (6) can be reformed to

$$(x + ay)(y + ax) = k$$

which is equivalent to

$$\begin{bmatrix} u & v \end{bmatrix} = \begin{bmatrix} x & y \end{bmatrix} \begin{bmatrix} 1 & \alpha \\ \alpha & 1 \end{bmatrix}$$

This is actually a linear transformation to the original Uniswap, which has achieved two features:

1. Offering reasonable price under the extreme condition of Uniswap

2. Having curvature tending to infinity near equilibrium (means here it is close to (1))

Blackholeswap can also be applied to other AMMs like (4) and (5). A linear transformation to the corresponding target AMM enables similar improvement we have just mentioned.

Summary

Above are some of the more well known AMMs we are deploying, but there are more in the roadmap. Each AMM has its own strengths. Users may think Uniswap does not have any advantages, but because its formula is simple it saves gas on Ethereum. Cheaper gas fee attracts users which eventually attracts more liquidity providers. The Constellation Hypergraph makes routing through a near instant and zero fee network even more attractive to traders and liquidity providers, Lattice as the premier choice. The main issue with all DeFi solutions right now is the base layer infrastructure. We continue to see more applications built on top of a faulty ecosystem that isn't scalable (which is more or less a band-aid to the base layer protocol).

Lattice Approach: An Evolution to DeFi

With a multi-phase roll out, Lattice aims to be an end-to-end DeFi solution on the Constellation Hypergraph Network.

Roadmap Overview

Phase 1: Q4 2020 **Aggregate Liquidity**
Phase 2: Q1 2021 **Interoperability**
Phase 3: Q4 2021 **Robust Oraclization**

In the first phase, Lattice will first be developed on the Ethereum blockchain for transaction settlement. Liquidity from throughout the DeFi ecosystem will be aggregated and order matching will be improved. Lattice will aggregate the liquidity from various existing dexes to create better pricing and less slippage for traders. Additionally, users can supply liquidity to the exchange pools on the platform to earn trading fees. A cross chain bridge will connect the ERC-20 ecosystem with the Hypergraph ecosystem allowing for fluid interaction. This creates a meta-ecosystem

of interoperable feature-rich blockchain technologies that enhance each other in their value.

By leveraging Constellation's HGTP as the base layer protocol, Lattice will support more complex trading algorithms and deliver faster trades as their ecosystem supports microservices and complex data structures for high computation needs like real time trading.

The Constellation bridge will act as a pathway for cross-chain transactions and connect HGTP to Ethereum. It provides integration access from existing distributed ledger technologies to Constellation's Hypergraph, adding value such as horizontal scalability, increased speed, validating complex data structures, while reducing transaction costs and lost trade data.

Lattice will allow users to choose or to build their own AMM for creating liquidity pools based on the asset type. This could be achieved through developing multiple smart contract based swap protocols and aggregating the liquidity of different pools to make sure that users have access to the pools across the platform.

The Lattice liquidity pool

One of the biggest challenges for exchanges of any type is liquidity. Traders gravitate to where order books are most liquid. While centralized exchanges have a centralized orderbook with solid liquidity decentralized exchanges don't. That means liquidity is spread over different uniswap type environments which is unfavorable for traders.
To enable a higher liquidity and better prices Lattice exchange pools liquidity from several uniswap exchanges to allow for less slippage and higher trading amounts.

Different from the current AMM liquidity pools, Lattice will be supporting multiple AMM algorithms in the later buildout stage for users when they create a new trading pair on the exchange. The Constant Product AMM used by Uniswap is the most straightforward and easy to use[3]. For instance, in AMM it enables new settings: extending constant-utility cost functions. Othman and Sandholm proposed a new model that has limited bounded loss in addition to a bid/ask spread that gets arbitrarily small with trading volumes.

Furthermore, AMM is defined as algorithmic agents that provide liquidity in electronic markets. As Uniswap becomes the center of DeFi applications, AMM gains attention in the crypto industry, with protocols like Balancer, where there are more implementations in liquidity protocols. Uniswap uses constant product rule to design

[3] https://medium.com/@pintail/understanding-uniswap-returns-cc593f3499ef
https://cointelegraph.com/news/a-new-defi-exchange-says-it-has-solved-an-industry-wide-problem
https://insights.deribit.com/market-research/impermanence-loss-and-bancor-v2/#content

the market making process on the protocol. For instance, when users set up liquidity pools between ETH and USDC, there is an initial product value that is equal to ETH*USDC. As traders swap ETH for USDC, there is an increase in the amount of USDC and a decrease in the amount of ETH. In order to keep the product constant, the ETH price would decrease. This is also in line with the centralized order book system: the more an asset is being sold, the lower the asset price should become. Previous work in analysing the profitability of market making, on Uniswap, shows that for uncorrelated trading pairs the liquidity providers (LPs) on the protocols do not have a positive gain since it could generate permanent loss on the asset deposited. However, for pairs like stablecoins, there are no permanent loss risks for LP and would thus be more suitable for the constant product rule.

AMM on Ethereum vs Constellation

Ethereum smart contracts are limited to running on a shared, global computer network. This results in a longer execution time and increases gas fees, making it extremely difficult to implement complex algorithms. Execution happens as part of consensus.

An alternative to smart contracts, and a more developer friendly approach, is a microservice framework, leveraged by Constellation Network, giving the ability for systems, applications, and data to more seamlessly communicate. Micro-services can run in their own exclusive software infrastructure and can meet the demands and scale with project specific needs and developer support.

To address the problem of high costs (tx fees), slow transactions, and segregated liquidity of current decentralized liquidity solutions and Ethereum, Lattice introduces a new liquidity pool design leveraging the Hypergraph (a decentralized directed acyclic graph with concurrent consensus and a microservice framework). The Hypergraph will pool liquidity from DEX protocols to offer the best price for users and the swap protocol will facilitate faster, secure, and more reliant trades ultimately improving the integrity of trading. In this DeFi case, ETH gas fees (tx fees) are directly tied to logic processing in smart contracts. In Constellation's Hypergraph, that same processing could happen outside consensus as part of a data pipeline processing. This solution to processing would be feeless or nominal in some circumstances.

Roadmap Summary

Phase 1 Aggregate Liquidity: Liquidity aggregation through the Lattice liquidity pool. Additional liquidity provision and rewards for Lattice platform users. Optimized AMM algorithm for utility tokens and stablecoins creating higher returns for users.

Lattice will provide AMM and settlement on Ethereum, “on-chain” via smart-contract. Price will fluctuate according to constant price discovery.

Phase 2 Interoperability: Bridge to the Hypergraph ecosystem allowing for fluent value exchange between both ecosystems. Liquidity provision of Hypergraph $DAG tokens in the Lattice liquidity pool. Exploration and preparation of multiple plugable AMM algorithms that will allow users to choose or to build their own AMM for creating liquidity pools based on the asset type.

Phase 3 Robust Oraclization: Migration from Ethereum, to the Constellation Hypergraph. Lattice AMM will run on Constellation via micro-services. High-throughput institutional-grade trading experience. Multiple plugable specialized AMM algorithms for specific trading pairs allowing users to choose and develop their own AMM. Introduction of customizable data types on the Hypergraph to secure trade settlement and audit trail generation for assurance purposes. Secondary data assurance trading.

Token Economics

A native token, LTX, is introduced in the system as the governance token as well as to incentivize trading activities on the protocol. It will also implement a burn function for the transaction fees in the system to increase the demand of the token.

LTX Governance Committee
The protocol was developed by the Constellation team; it aims to become fully decentralized and governed by the token holders of the protocol and for the benefit of the platform users. Therefore, the LTX governance committee is established to process proposals and let the community vote on proposals.

Incentives for Liquidity Providers
As Lattice products are different from traditional order book based DEXes, instead of market makers, the liquidity provider mostly contributes to the platform through depositing in the pool and earning transaction fees in the respective pool. To kick start the platform liquidity, there are token rewards given to users who add assets into the protocol.

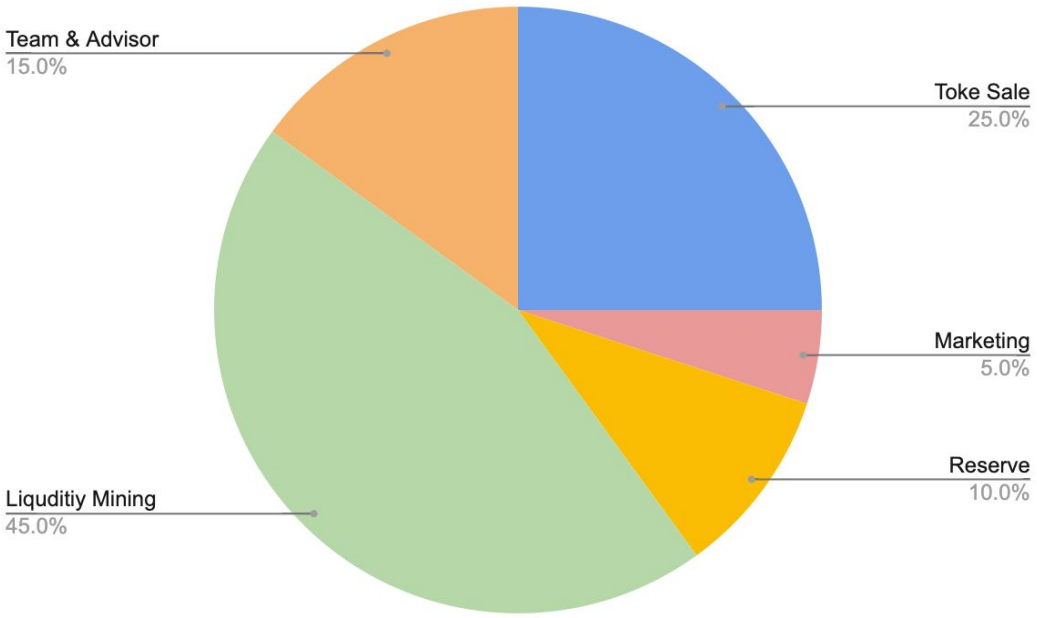
Transaction Fee Burn
For each transaction that happens on the platform, the transaction fee is set to be 0.03% initially and is subject to changes based on the decisions by the governance committee. Majority of the transaction fee will be rewarded to liquidity providers in

the respective pools and the remaining will be swapped to LTX tokens and burned to reduce the circulating supply of the tokens.

Token Distribution

There will be 100M LTX tokens minted in total, and the protocol has a fixed token supply.

- 25% of the tokens will be distributed through private and public sales;
    - 10% will be distributed in private round 1. ⅓ unlocked at launch; then ⅓ every 3 months for a total of 6 months.
    - 5% will be distributed in private round 2. ½ unlocked at launch; then ¼ after 3 months and ¼ after 6 months
    - 3% will be distributed in private round 3. ½ unlocked at launch; Remaining vest monthly in equal parts over the following 3 months.
    - 7% of the tokens will be distributed to users and token holders through a public sale. Any unsold tokens will be burned;
- 45% of the tokens will be used in liquidity mining. Tokens will be minted on a daily basis and distributed to users who participate in the platform;
- 15% of the tokens are reserved for team & advisors
- 5% of the tokens are used for marketing purposes
- 10% of the tokens are in the reserve and are unlocked over a period of 24months



Summary

Blockchain technology and cryptocurrencies have enabled a revolution of new applications and new financial models: immutability of transactions, decentralized governance, micro-payments, and an entirely new $300B asset class. While smart contracts, on Ethereum, introduced initial coin offerings (ICO's) and drove a cryptocraze that brought in institutional capital and retail investments, the network has now introduced a completely new financial platform and wave of innovation called Decentralized Finance: DeFi. It has long been known that the Ethereum Network presents scalability limitations due to the synchronous network architecture, consensus model, and high transaction fees, DeFi applications are elucidating Ethereum's limitations and limiting a potential huge market from taking off while truly commercializing blockchain technology.

Lattice will be an evolution of existing DeFi solutions by providing the best price and profitability for protocol users. It provides smart routing for trades and also the ability to incorporate multiple asset-specific automated market making (AMM) algorithms to increase profitability. This will not only capture market share but increase the overall market potential. Lattice, powered by Constellation's Hypergraph Network and HGTP, provides the protocol and infrastructure to improve and exponentially scale the DeFi industry and enable crypto asset trading tools with integrity and assurance. The aim of Lattice is to provide solutions that have more security, speed, and lower transaction fees which will be attractive to all crypto asset traders in the industry.