FLETA
BUSINESS
WHITE
PAPER

FLETA

ENG

FLETA.io

FLETA
BUSINESS
WHITE
PAPER

Table of Contents

APPENDICES:
FLETA
TECH
PAPER

Abstract

FLETA goes beyond just building a new platform. It focuses on extensive technological innovation and diverse fields of application. FLETA's blockchain network has been designed to actualize the real 'decentralization' and contribute to the advancement of the blockchain ecosystem, by enhancing the independence and scalability of DApps. As an unprecedented type of blockchain, FLETA allows more freedom and efficiency in developing and providing services.

With the goal of maximizing the potential of blockchain technology, FLETA came up with a breakthrough. It all starts from our unique and original blockchain structure, which distributes subchains in a layered chain for each DApp. Through the Block Redesign technology, verification speed becomes faster and data volume is reduced. In addition, block generation speed has been reduced, with more transactions processed per block.

FLETA provides the function to create a customized subchain for each DApp, where the transaction of its token and assets can be made. Run through its own network, each DApp can update independently based on its own governance, frontend and backend development environment.

Additionally, high-speed block transaction is made possible through parallel processing and instant confirmation of observer node. High GAS price and functional degradation of DApps have also been resolved. Other innovative technologies such as a multichain structure, parallel sharding, and a new consensus model (Proof-of-Formulation; PoF), contributed to resolving problems which the current blockchain ecosystem is facing.

FLETA's innovative technology and platform will play a leading role in the spread of diverse DApps throughout the industry and in advancing the blockchain ecosystem.

Project Background

This year marks the tenth anniversary of Bitcoin, which is a first-generation cryptocurrency using blockchain technology. Market capitalization of Bitcoin reached 112 billion dollars and that of the overall cryptocurrency market is more than twice that figure.[1]

For the first 8 months in 2018, a total of 18.7 billion dollars was made from ICOs, which is three times that of same period from last year. In 2016, there were 43 ICO cases and that number surged to 770 in the first 8 months of 2018.[2] By the end of 2018, there was over 20 times the growth compared to two years earlier.

Ethereum, which emerged in 2014, adopted turing-complete languages for smart contract, actualizing the various potentials of blockchain. Subsequently, blockchain app platform emerged, giving way to the idea of the blockchain ecosystem. The utilization of blockchain went beyond cryptocurrency and started to be utilized in various industries including finance and public organizations. Despite this fact, blockchain-based DApps are still hard to find. The reality is that the DApps, which actually provide services are in their initial stages.

Blockchain is arousing interest in decentralization and is also is being discussed as an alternative to resolve data monopolization, along with startups who are coming up with innovations. It is global giants, however, who are investing the most and the Big 3 Bitcoin Mining Pool comprises 60%, as the mining of cryptocurrency already became another field for corporations.[3] In theory, the attack of the 51% became feasible.

Blockchain is still undervalued as a field only for engineers. In terms of technology, the utilization and development of decentralization is inconspicuous except for the voting process. Various consensus mechanisms or voting systems are being introduced. In order for the blockchain technology to contribute to the real 'decentralization', the advancement of the blockchain ecosystem must precede. FLETA believes that such an environment starts from DApps being able to function independently without going through a centralized mining group and being a decision-maker. Based on this belief, FLETA has started its journey to realize true decentralization by forging a complete and independent DApp ecosystem.

References

1) http://www.coinmarketcap.com
2) https://www.coinschedule.com/stats.html?year=2016
3) https://bitcoinchain.com/pools

Project Background

FLETA is the blockchain service platform which aims to provide the technology and business support services to DApp developers who build their projects in the FLETA ecosystem. The blockchain ecosystem consists of users, DApp developers and miners (blockchain node operators). FLETA, as a blockchain platform, provides a service model to DApp developers to include FLETA's chain technology, token generation, and an environment for developing smart-contracts and developer portals. When the service model becomes more active, the number of DApps will increase and the ecosystem will expand.
As the ecosystem expands, there will be more nodes that maintain the blockchain network, which is designed to be mining nodes that create blocks and receive rewards due to the characteristics of the blockchain.

FLETA designed the mining node to be operated on the cloud network and charge the monthly maintenance fee of the mining node to miners. This becomes FLETA's revenue. To put it simply, FLETA's business model is to provide the mining nodes like IaaS or SaaS and receive the maintenance fee.

To create the mining node, a person has to hold a certain amount [subject to change; 200,000 FLETA tokens as of 8 Feb 2019y] of FLETA tokens. The monthly maintenance fee of mining node can be paid by Korean Won, US Dollar, BTC, ETH and FLETA tokens. When it is paid by FLETA tokens, the discount rate [subject to change; 20% discount as of 8 Feb 2019y] is applied so that we can promote people to use FLETA token as a method of payment. Also, FLETA tokens can be used as a payment method to use FLETA's own DApp. FLETA is launching its own game DApp along with the beta testnet. The DApp game will be a free service.

FLETA is also planning to collaborate with certain DApp partners that use the FLETA platform, so that FLETA tokens can be used. The mining nodes can receive DApp's tokens that FLETA strategically partnered with as an airdrop. However, all this cooperation and these collaborations are conducted subject to FLETA's compliance with all the laws and regulations of Singapore. Thus, if DApps wish to use the FLETA technology as a base, they are restricted from carrying out any regulated activities and/or offering products that are regulated under the Securities and Futures Act of Singapore.

This white paper will give you an idea on our thought process to support an independent DApp ecosystem and to raise applicability of blockchain technology in industries so that the technology can go beyond being just hype. Our profound ideas and their results are described in this paper.

Vision

FLETA project aims to provide a service platform like Google Android or Apple iOS in blockchain, supporting the efficient development and operation of DApps for constructing a blockchain based app ecosystem, along with continuous technological innovations. This includes resolving the issues in developing and operating DApps through Ethereum or EOS and providing a perfect decentralized economy through DApp independence and scalability.

It starts from simply lightening the burden of GAS or STAKE and increasing transaction speeds. Ultimately, the goal is to construct a sustainable ecosystem with the users by achieving, combining, and expanding the objectives of all projects.

FLETA team has already come up with original and innovative technology, upgrading the core of the blockchain technology. We proudly introduce our newly advanced platform, which realizes our vision through technological innovations.

Projects of FLETA

FLETA is a blockchain service platform with enhanced efficiency and independence of DApp development and operation, along with infinite scalability.
It provides a groundbreaking, unprecedented blockchain structure, allowing DApps within platforms to operate independently and freely.

First, we maximized the function of blockchain technology. This was possible due to increased transaction speeds, high freedom and low development costs, which in turn enhances the efficiency of DApp development and operation.

Secondly, we provide a distinguished token economy, which guarantees the independence of DApps.

Last but not least, FLETA's advanced blockchain technology and DApp independence open the door to infinite scalability.

1. Maximizing Functions of Blockchain Technology

FLETA came up with a new consensus model. Instead of the existing model, PoW (Proof-of-Work, verify calculating process) or PoS (Proof-of-Stake, verify stake), FLETA developed a new consensus model to prevent unnecessary fork. This new model is called PoF (Proof-of-Formulation) in which consensus is made on block mining procedure and blocks are generated in a designated order. This allows block's dissemination range to be reduced, resulting in faster block generation and dissemination. Moreover, observer node enables instant confirmation and prevents fork. In turn, network becomes stable and transaction speed is increased.

When new tokens are generated in FLETA, their own transaction chains are created, and blocks are processed through PoF consensus model and token economy. Thus, the mainchain and each subchain of DApps are not mutually influenced, operating independently in a parallel structure. (For further detailed information on FLETA's Token Chain and Token Issue **see Appendix A**)

Also, on the FLETA ecosystem, by applying Interchain System, the mainchain and a DApp's subchain can be connected. Additionally, DApps can share their information by synchronization through Interchain System, as they wish, so they can be connected together with token economy through the token sale system.

The Interchain System allows synchronization between the mainchain and the subchain. The Observer node in the subchain periodically submits the chain header to the mainchain's Observer node to provide the interchain function. If the mainchain's Observer node checks and signs the subchain and notifies the chain, the other subchain receives the interchain action of the corresponding subchain up to header listed so far and reflects it when generating the block. Through this process, all subchains synchronize to the mainchain.

Also, FLETA supports token issuance and sales capabilities for each of FLETA's DApps through our own Token sale system. A DApp can open a subchain token account in the token mainchain to sell them with FLETA Coin. When a buyer deposits FLETA Coins, FLETA provides the ability to deposit the token into the buyer's account in the subchain. If a DApp is developed on the FLETA platform, the token can be easily created and sold through FLETA, subject to such token complying with any regulatory requirements in relation to such a sale of the DApp tokens.

FLETA's sharding model is novel model of sharding, operating in complete independence so that data is not mutually shared. This system enables each and every chain that is generated to operate as a mainchain. Additionally, the independent chains work under the same address system, which in the eyes of users, could seem as if one address is being processed with one wallet. In fact, however, many shards operate independently to promptly process the transaction. Cross transactions among shards are not used but instead, wallet separates the shards itself so that users are lightened of the burden of choosing which shard they should transmit the transaction. Execution fee is decided regardless of the number of shards used in a transaction, making the user not recognize the shard in the transaction process.

2. Distinguished Token Economy

FLETA, as a blockchain platform, provides a service model to DApp developers such as chain technology, token generation, and an environment for developing smart-contracts and developer portals. DApp tokens in FLETA are mined under certain token economy system of DApps depending on their own parameter value. Additionally, the mining reward and execution fee can be customized based on the preference of each DApp. This function is made possible after the initial generation of token through the Smart Contract, which is called Token. Update on the rewarding system is made through the update in Smart Contract using DApp governance, which concurrently means that update can be done without fork, swap, wallet update or any pauses.

In the case of Smart Contracts, FLETA supports not only Solidity, but also Java Script and Go language. The token economy of the DApp will proceed with the PoF's token economy algorithm, but depending on the decision of the DApp developer, the mining part can be removed, or the setting part of the mining amount or progress can be changed. It also provides the option to borrow PoF's and PoS's algorithms to set up similar mechanisms for activation, although they are not directly connected to block generation.

3. Scalability Achieved through Multichain Structure

FLETA consists of a mainchain and many subchains that operate on top, making a multichain platform altogether. The mainchain notarizes the subchain's header to interchain with subchain. Notarized subchain's header include the interchain command, which allows the other subchains to process interchain commands issued by other chains, only after synchronizing the mainchain. Not only the blockchain, but the data chain is expanded when DApps are added. Building on it is the separation of data, through which infinite scalability is attained. Maintaining and managing subchains are the responsibilities of Formulator of each DApp and subchains can be accessed through seed node as listed in the main chain. Thus, synchronizing the Formulator group resolves maintaining and accessing issues of other multichain structures.

Each subchain is allocated exclusively to the pertinent DApp, which signifies that DApp manager is given free rein to carry out functions like update and data migration. To clarify, a new subchain is created when a new DApp is created. In addition, execution fee can be paid with each DApp's token and if the DApp manager insists, there might be no execution fees at all. Through such features, a multichain that guarantees DApp independence in every way; from function, data and token mining, has been developed. Thus, FLETA's multichain system overcomes the shortcomings of the existing chain systems.

Innovations of FLETA

The four technological innovations and three platform innovations in which blockchain functions are maximized, token economy is distinguished, and scalability is expanded, are as follows:

4 Technological Innovations	**3** Platform Innovations
New Block & LEVEL Tree Verification	Ultra-High Speed TPS
New Consensus Model: PoF (Proof-of-Formulation)	Infinite DApp Scalability
Independent Multichain Structure	Token Economy
Parallel Sharding	

1. Four Technological Innovations of FLETA

1.1. New Block & LEVEL Tree Verification Method

FLETA newly designed and upgraded the block structure, which is the core of the blockchain technology. Blocks that were 560 bytes in one transaction have been reduced to under 360 bytes, leading to faster transaction speeds. This is the most fundamental approach to enhance the transaction speed without making changes in protocol or design such as to the consensus algorithm and sharding model.

Additionally, FLTEA adopted LEVEL Tree verification method, replacing the existing Merkle Tree verification method. This, also, is a technological breakthrough that enhances the real transaction speed itself. The replacement results in more than 5 times faster verification speeds. With the new block structure and LEVEL Tree verification method, FLETA actualized more than an eightfold transaction speed increase compared to the prior blockchains.

Moreover, FLETA employs a Hybrid method, combining UTXO and Account. UTXO, which can be used right away without creating an account. And Account, which can be used with less execution fee and data. They both coexist in harmony to enhance both usability and efficiency. Additionally, DApps are able to provide new types of data and service in a chain level, not a smart contract level, through a plug-in system of Account type and Transaction type.

1.1.1. Block Structure Redesign

U.S.P(United States Patent) Application Number: 62717703

The block structure is the basis of blockchain technology, directly leading to the processing speed and storage volume. FLETA redesigned the block structure to reduce blocksize, increase processing speed and reducing index volume needed for operation. Blocks consist of a block header and a transaction list, the latter taking up most of the volume. Thus, reducing each transaction size concurrently leads to

Four Technological Innovations of FLETA

reduced blocksize, volume, network traffic and block processing time.

Vin and signature take up the biggest volume, which indicates the coins to be used. In Bitcoin, vin is indicated with Transaction Hash and the used TxId and N. Additionally, many possessors can put coins in the vin of one transaction, meaning that the number of signatures required is equivalent to the number of vin. 32 Bytes of TxId, 4 Bytes of N and 65 Bytes of signature results in a total of 101 Bytes per coins.
In FLETA, TxId is indicated with block height and transaction location within the block, reducing the TxId to 6 Bytes and N to 2 Bytes. Moreover, only coins of one possessor can be used in one transaction to reduce the required number of signatures. Statistics show that the average transaction size is 560 Bytes, including approximately 3 vin and 3 vouts. By changing it to FLETA's new block structure the size reduces by 43%, resulting in 320 Bytes.

Making use of the block height and transaction location within blocks give various advantages in operation as well. The existing verification method utilizes Transaction Hash, thereby requiring Index DB to find the original transaction. Thus, in Bitcoin, 50 GB Index is required to process 100 GB data. However, in FLETA, a large Index is unnecessary as the TxId indicates the coordinates of the transaction and addition Index DB is not used in the process.

1.1.2. LEVEL Tree Verification

In the traditional Merkle Tree data structure, data is transmitted through P2P (peer-to-peer) or use din verification process of data exchange in a database like Cassandra. This is mainly used when relatively big volume over 1 MB has to be processed by the node. Also, when only a proportion is recognized, not the whole Merkle Tree, clear verification is hard to be make. Thus, in order for clear and correct verification to take place, the presence of the entire Merkle Tree is a prerequisite and entails a whole lot of calculation. Even if Merkle Tree guarantees the verification in a practical level, a lot of memory and calculation is required for SPV (Simple Payment Verification).

FLETA employs LEVEL Tree method, clustering 16 blocks as one unit to hash and hash that unit into 16 parts. This is a much more efficient system, making a tree where the hash process of the transaction is simplified, and each level has 16 subunits. Using this tree system makes 1 route, 16 level 1s, 256 level 2s, 4,096 level 3s and total transaction list of 65,545 (In the serialization process, 2 Bytes is used to limit the maximum number; transaction variable can be 0-65,535). Considerably less memory and calculation resources are utilized, guaranteeing verification of transaction with less resource and network communication in mobile devices in which tree is saved.

1.1.3. Light Node

LEVEL Tree, not the entire tree is saved in light node and it requests information in need to the full node. If LEVEL 3 Tree data is saved, only 16 Hash and 1 Transaction is sufficient to search specific transaction or verify the validity. Therefore, even if there is low memory, it can be used, with very fast verification process. (For further detailed information on FLETA's Block Redesign and LEVEL Tree Verification **see Appendix B**)

Innovations of FLETA

Four Technological Innovations of FLETA

1.2. New Consensus Model: PoF (Proof-of-Formulation)

FLETA came up with a new consensus model, replacing the existing models like PoW (Proof-of-Work; verify calculation process) or PoS (Proof-of-Stake; verify stake) and preventing unnecessary Fork. The new consensus model is PoF (Proof-of-Formulation) and blocks are generated in a designated order, agreeing on the block mining order. This allows the block generation and dissemination to be faster, as the dissemination range of blocks are reduced. In addition, instant confirmation is made possible through the observer node. The incentives are the block rewards when Formulator node generates blocks. Incentives consist of block rewards and transaction fee.

1.2.1. Consensus Algorithm: PoF (Proof of Formation)

U.S.P(United States Patent) Application Number: 62717695

Consensus algorithm is one of the most fundamental parts of the blockchain network. This verifies the validity of the generated blocks and guarantees the authenticity within the network. PoW (Proof-of-Work), PoS (Proof-of-Stake) and DPoS (Delegated Proof-of-Stake) are the mostly commonly known algorithms.

PoW algorithm raises the level of difficulty through mining competition, resolving the issue of civil attack or double spending attacks. PoS algorithm resolves the issue of high-power consumption of PoW as the mining reward is allocated proportionate to the amount of coins. In DPoS algorithm, the token possessor uses the block generator or the witness system to carry out mining and verification, resolving the transaction speed issue. That is, in a general blockchain network, blocks can be generated simultaneously from networks all over the world. Thus, it uses a method in which block generation time is adjusted through level of difficulty in order to prevent Fork, resulting in a serious reduced speed of the blockchain.

FLETA resolves the issue with an innovational design as the Formulator group reaches a consensus on the block mining order. The Formulator group consists of all the nodes that generate blocks and maintain them and all the groups of mining nodes that participated in block generation are the Formulator group. The block generation process of FLETA consists of a block generator and a synchronization group. The Formulator group shares and confirms the block generation sequence in the network and carries on the block generation following the shared and synchronized sequences. The highest rank Formulator generates the blocks, and the next blocks are generated by the runner up, continuing this well-organized circulatory process. Ultra-high-speed transaction mechanism is provided, and a stableblock generation is executed.

FLETA came one step closer to decentralization through the PoF consensus model and complemented the setbacks of the existing algorithms by actualizing an ultra-high speed transaction speed.

1.2.2. Block Generation through Formulator Group Verification

The block generation order of PoF (Proof-of-Formulation) follows the score rank of the Formulator group. The highest node is allocated with the role of block generator and 2nd-10th ranks are given the role as the synchronization group.
The block generator generates blocks, signs and then sends them to the next observer

Four Technological Innovations of FLETA

node. Observer nodes are the groups that perform confirmation, and the synchronization group is a device to spread the latest block faster between Formulators. Formulators that are waiting to generate blocks take that role. Next, the observer node uses the public key of the next highest ranked block generator to confirm blocks and signatures. Observer node confirms at least 3 of the 5 blocks through signatures. The next synchronization group receives the blocks and confirms the entire transaction record and observer node's signature, adding blocks to the blockchain and sending the synchronized result to all the connected nodes. After the 1st node who generated blocks goes out of the group, the 11th node comes in and the sequence begins again. The order is all determined by block height so it cannot be changed randomly and also cannot be forged as every node verifies the same result. Like this, the synchronization group disseminates blocks, lightening the traffic burden of observer nodes and block generator and disseminating the generated blocks swiftly. When the generated blocks are added to the blockchain, the prior 1st node automatically moves down the rank and the runner up becomes the 1st rank, generating the next blocks.

All the nodes which receive blocks confirm the blocks and signatures. As a result, blocks with false transactions are denied and are not added into the chain. Likewise, the block generation process of PoF (Proof-of-Formulation) reduces the time of block generation and verification, uses synchronized sequence to generate blocks, and prevents Fork, as observer nodes verify the process real-time. In addition, as the block generation and synchronization are subdivided, each group can focus their energy on a certain task, lightening the burden of the network.

The synchronization group and observer node all focus on the designated role, so overload of the network is avoided. For the most efficient block generation process, the highest rank node can generate blocks continuously. Limitations in block generation are initially set as default but can be amended through governance.

In order to participate in the Formulator group, FLETA tokens must be held. Observer Nodes will be operated by FLETA first, then will be operated by delegators later (for example the DApps themselves). In the case of reward, FLETA coins will be given to the Formulators participating in FLETA chain and DApp tokens will be given to Formulators that hold that DApp's token. These are the basic concepts but the DApp developers are offered the option of setting up their own compensation plan for its own Formulators.

All of the Formulators that generate blocks have a Formulator Account. All of these Formulator Accounts will be imported and ordered using their most recently created block information as well as information when participating in the Block Generation Round. This order sheet utilizes the information in the block and is generated by the block, so all nodes have the same order sheet. At the beginning of the block generation round, the Observer nodes submit and agree to a top Formulator list, which enables Formulators to connect online, since there is no guarantee that all Formulators are online. The agreed top Formulator will be sent a block generation message, reviewed via Round State, and then collect the Observer Signature once the block is verified. In this process, when a majority get together, they recognize

and propagate the block.

Synchronization groups and seed node groups have no additional rewards associated with Formulator compensation as the Formulators continue to be rotated into each group in turn during the process. The Observer node is a watchdog node operated by FLETA or delegators that performs only block verification and notification, with no separate participation rewards.

1.2.3. Fork Prevention

As a result of such an efficient and innovative system, Fork is prevented. When two blocks of the same height go into the observer node, Fork is detected as 3 out of 5 nodes required signature. Fork, therefore, is prevented as the observer node detects the collision in signature. If observer node deviates from the normal protocol due to security threats, the chain is put to a stop and assets are protected via Panic Protocol. If the Formulator group deviates from the normal protocol, that Formulator is put to a stop via Formulator Ban Protocol. (For further detailed information on FLETA's Proof-of-Formulation Consensus Model **see Appendix C**)

1.3. Independent Multichain Structure

In the existing blockchain platforms, the mainchain included many DApps and the mining group had to operate the mainchain and all other subchains. This easily led to the overload of the mining group. On the other hand, FLETA employs a structure in which each subchain independently operates its own chain, resolving the aforementioned issue. Thus, FLETA separates function and data field so that DApps are not influenced by one another, providing infinite scalability to DApps. DApps are designed to organize the Formulators by their token holders. Synchronization groups and seed nodes are rotated according to the process when the Formulator is configured. So, they're a dependent concept for the Formulators. The Observer node can be set up with a variety of options in order to enable the DApp developer to either entrust FLETA to operate, or to operate directly.

1.3.1. Multichain Protocol

Most of existing coins consist of a single mainchain, maintain mainnet. In this case, all transactions are mutually referenced, which requires all the data in order to verify the validity of each transaction. FLETA's multichain structure, however, allows each DApp to have its own independent chain, with separated observer node and Formulator to operate the chain independently. Also, that DApp's token is used instead of FLETA Coin in creating Formulator, which concurrently signifies full independence.

1.3.2. Independent Chain

The existing multichain and independent chain network had a lot of setbacks. To start with, it is hard to determine who has to operate both the mainchain and independent chain. Also, it is hard to determine the order of the miners when the blocks are continuously generated. Lastly, the problem lies in storing data. The problem of determining data possessor or the problem in volume may cause a loss in connection in synchronization among networks in multichain network.

In FLETA, seed node and observer node operate in a server accessible from outside (Public IP), synchronizing with the network and maintain the chain procedures. Additionally, without depending on the Formulator of the mainchain, each subchain

constitutes a Formulator, thereby operating independently even when the mainchain stops to operate.

1.4. Parallel Sharding

Parallel processing of transaction is a pivotal technology, actualizing high-speed transaction speed. In FLETA, transaction is allocated to certain shard according to a pre-determined rule and transaction result is processed independently in each shard. That is, each shard operates independently without being included or mutually connected with other shards, meaning each shard has its own chain. One account can access all the shards with the same key and address.

Keys and addresses are basic tools to prove data change authority in blockchain, so users must own the keys and addresses before they can be accessed. This applies not only to shards but also to the mainchain. However, anyone can view the contents of a block or transaction regardless of whether they own a key or address.

In FLETA's new sharding model, each shard operates independently as if it is a single mainchain to actualize the real sharding technology. The mainchain consists of and maintains various shard chains and each chain operates independently in a parallel structure, which means that double spending is not feasible in this design. This, in turn, provides an unmatched transaction speed, making all token and coin transactions fast and efficient.

1.4.1. Multichain Based on Transaction Sharding

Unlike single chain structure, each shard of FLETA has an independent chain. Thus, each shard is not mutually influenced and processes in a parallel structure within an independent blockchain. Shard System basically does not share data and therefore, double spending is not possible in this design. Independent chains of shards actualize complete parallel structure, increasing the processing speed. (For further detailed information on FLETA's Parallel Sharding Model **see Appendix D**)

2. Three Platform Innovations of FLETA

2.1. Actualization of Ultra High Speed TPS

The TPS that is feasible in the FLETA platform is ultimately traced back to the network speed and signature verification speed. Our original platform network, Geolocational Balanced Peer Selection Algorithm enables blocks to be distributed swiftly and evenly. This network algorithm is designed to connect peers with geolocational balance. The distance is determined by ping, and the lopsidedness of the network can be avoided, receiving nodes by group which is generated through distance. The network distance creates as much distance as possible in order to make it as even as possible to avoid lopsidedness to a certain direction.

If many signatures are required in FLETA transaction, it can be made possible through creating a multiple signature account and putting in various addresses as authenticator when creating it. To use that account, all the signatures of the multiple addresses are required.

Innovations of FLETA

Three Platform Innovations of FLETA

This clear design reduces the complexity of multiple signatures and simplifies the verification procedure.

The secp256k1 based ECDSA signature algorithm can carry out a maximum of 23,000 verifications per second in a parallel processing of 8 core CPU. This requires 1.4 MB/s network speed in order for such transaction to be transmitted. Thus, FLETA aims to reach 20,000 TPS through our original block design.

TxId of FLETA uses bock height and transaction location within the block instead of transaction hash. Concurrently, the need for a big index diminishes, alleviating the burden when searching for transaction. Verification is made via signature, so itsvalidity is secured even without using transaction hash. This, instant transaction searching,reduces index and data volume.

Through our own original parallel sharding algorithm, each shard can operate independently without double spending. FLETA strives to actualize a realistic number of shards in order to make an optimal DApp centered platform. If 500 shards can be operated without causing problems, 500Shard x 20,000TPS, 10,000,000TPS can be achieved. FLETA's innovation on speed and receptivity will continue to take place over and over.

2.2. Infinite DApp Scalability

FLETA employs a multichain structure, with independent subchains operated through each DApp. Mainnet overload is avoided, even when DApps in the platform and the number of subchains increase infinitely. FLETA is the one and only platform where an enormous DApp ecosystem can be sustained with no limitations, thereby implying FLETA and FLETA's DApps' value to rise constantly.
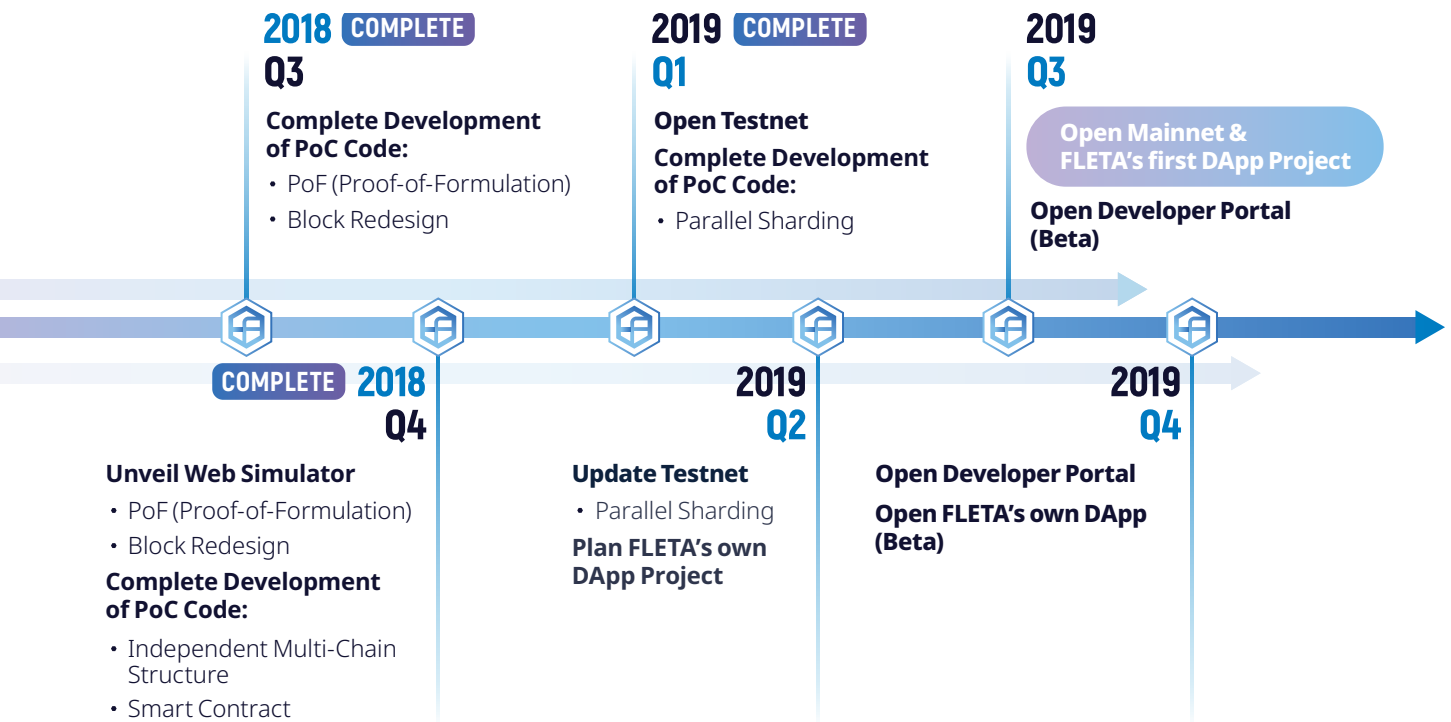
2.3. Token Economy

DApps with token issued in the FLETA platform are operated in their own independent chain, not in the mainchain. That is, token economy is actualized through various consensus mode selected by each and every DApp developer. Each DApp's token can be rewarded independently through a preferred consensus model (PoW, PoS or voting process is included, but not limited to these). Token economy is a driving force of FLETA and its DApps, providing motivation for various utility tokens to get on board with FLETA.
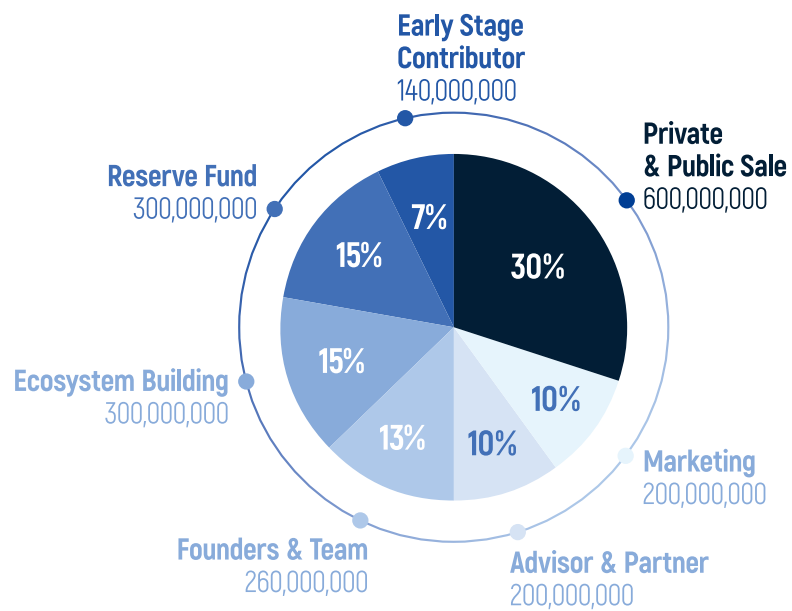
FLETA's Potential

FLETA opened its first alpha testnet in October of 2018 and its beta testnet in March of 2019. Official opening of the mainnet is scheduled to be made in Q2 of 2019. FLETA's technology will flourish with our global blockchain users. Currently, we are discussing technological cooperation with several blockchain-related companies including ENTERSOFT, Caledo and Buddy and also are networking with major global crypto funds and IT companies. Already, diverse DApps are making use of FLETA's platform is in the process of development.

FLETA will strive to overcome all the setbacks and shortcomings of the existing platforms, continuously upgrading protocols and boosting long-term growth by meeting the visions of various business models. It is hard to foresee how the blockchain technology will eventually unfold, but it is without a doubt a great tide of innovation, which could bring a better life if we get on board. FLETA hopes to play a pivotal role in that tide. Please support FLETA's blockchain innovation.

Project Roadmap

2018 COMPLETE
Q3

Complete Development of PoC Code:
- PoF (Proof-of-Formulation)
- Block Redesign

2019 COMPLETE
Q1

Open Testnet
Complete Development of PoC Code:
- Parallel Sharding

2019
Q3

Open Mainnet & FLETA's first DApp Project

Open Developer Portal (Beta)

COMPLETE **2018**
Q4

Unveil Web Simulator
- PoF (Proof-of-Formulation)
- Block Redesign
Complete Development of PoC Code:
- Independent Multi-Chain Structure
- Smart Contract

2019
Q2

Update Testnet
- Parallel Sharding
Plan FLETA's own DApp Project

2019
Q4

Open Developer Portal
Open FLETA's own DApp (Beta)

Token Metrics

Pie chart:
- Private & Public Sale — 30% — 600,000,000
- Marketing — 10% — 200,000,000
- Advisor & Partner — 10% — 200,000,000
- Founders & Team — 13% — 260,000,000
- Ecosystem Building — 15% — 300,000,000
- Reserve Fund — 15% — 300,000,000
- Early Stage Contributor — 7% — 140,000,000

Category	Token Amount	Percentage	Lock-up Period
Private & Public Sale	600,000,000	30%	Bonus tokens only; up to 1 year
Marketing	200,000,000	10%	-
Advisor & Partner	200,000,000	10%	Up to 1 year
Founders & Team	260,000,000	13%	Up to 3.5 years
Ecosystem Building	300,000,000	15%	Up to 3 years
Reserve Fund	300,000,000	15%	Up to 3 years
Early Stage Contributor	140,000,000	7%	Bonus tokens only; up to 1 year
Total Amount of Issue ✴✴	2,000,000,000	100%	-

   ✴✴Inflation of FLETA tokens may occur as the activated Formulators(mining nodes)
generates new blocks(tokens) every year. The total number of generated tokens will
not exceed 400,000,000(20% of total amount issued tokens in the beginning of FLETA);
the generated tokens would be used as rewards to holders of activated Formulators
who have participated in the PoF process.

Token Metrics

• The Use of the Ecosystem Building

The funds for ecosystem building will be used to develop and support the FLETA ecosystem which is necessary for DApps to take full advantage of FLETA including:

- Swapping DApp tokens by changing a blockchain platform to FLETA
- Supporting FLETA-based DApps
  (20 percent of total reserve amount will be used for token swap with our strategic partners (DApps or other projects), subject to the assessment by FLETA that the DApp and FLETA will, in conducting such swaps, be in compliance with any applicable laws that may apply to the issuance/offer of such tokens. Another 20 percent of total reserve amount will be used for attracting DApps and investing in DApps. FLETA is a platform project, so setting up a close network with as many exchanges as possible is important. 40 percent of the total reserve amount will be used for consultation with exchanges and listing fees. Another 20 percent is planned to be used in order to expand the Formulator ecosystem.)
- Conducting airdrop events for the FLETA project
  (Airdrop consists of tokens from the token-swap with strategic partners and DApps' tokens. Basic plan for airdrop is for operator of Formulator, but it also can be given if DApps or partners want to expand the numbers of their holders or for promotion purposes.) Such airdrops shall be subject to the DApp's and Fleta's compliance with the applicable laws in relation to the issuance/offer of such tokens should they be considered to be regulated products and/or enable the provision/access of regulated services under the laws of Singapore.

• The Use of the Reserve Fund

- The reserve fund will be used to protect and enhance the value of FLETA platform including: Business development aspects of FLETA
- R&D activities of technology development
- Miscellaneous such as responding to risks and issues related to the value of FLETA coins and paying token listing fees

FLETA
TECH
PAPER

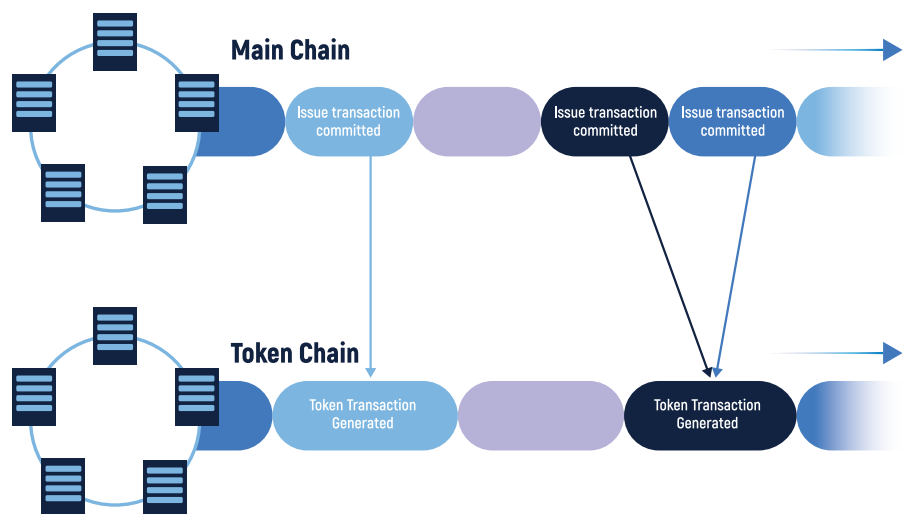# Token Chain and
Token Issue

Token Chain and Token Issue excerpt from FLETA Tech Paper

Token Chain

FLETA's DApp has to issue each token, which enables an independent Token Chain. By setting the Genesis information, such as total quantity of token, account composition, observer node public key, seed node, IP, Lockup, selling of token, and performing TokenCreation Transaction, the Token Account is created. Such information can be used to designate Token Chain node, comprising a network. Until this point is the early stages of the composition and following this, that chain separates itself from the mainchain, with its blocks operating. Smart Contract of DApp operates in each of the Token Chain, resolving the execution fee or overload problems in the prior mechanisms where different DApps overlapped. Token Chain takes the block from mainchain in order to issue the token and also for the sake of interchain function. During this process, TokenIssueTransaction that needs to be done in Token Chain is processed, recording the point processed in block header and issuing tokens.

Token Issue

TokenIssueTransaction can be used when token sale information is in the initial value of the created token. When the user deposits token in Token Account through TokenIssueTransaction, it is verified and authenticated via that sale information. Token Chain processes the information that needs to be processed within the Token Chain, out of all the mainchain transactions. This is the point when real tokens are issued.

In summary, the mechanism by which FLETA exchanges token, is the token goes into the token administrator's address, concurrently leading to the issuing of TokenIssueTranscation. Token Chain verifies the Issue Transaction and provides the amount in the address to which deposit is made, by creating designated tokens.

Interchain Communication

Basically, DApps of FLETA are operated as independent blockchains. Thus, in order to support interchain communication among DApps, interchain technology is required. Interchain technology is operated in the process by which each DApp chain regularly reports its block header to the mainchain, leading to the inscription of that information. This allows tokens to be transferred from one DApp to another. The transferred token is completely deleted in the chain that sent it, and the chain that receives the token takes the newest block header information from the mainchain. It also approaches the chain with Light Node, receiving tokens and finalizing the process to create tokens. This means that a chain could be in possession of different types of token and that Smart Contract can be operated via such different types of tokens. Only tokens that are authenticated can be transferred to DApps that authenticate the act of receiving tokens from other DApps. Then, the execution fee and token to be paid, is set. Such authentication is done by the founder of Token Account, as the founder issues TokenAllowanceTransaction in the very TokenAccount.

Appendix B.
Block Redesign and
LEVEL Tree Validation

Block Redesign and LEVEL Tree Validation excerpts from FLETA Tech Paper

Block Redesign

A block consists of a block header, a transaction and a signature. In the traditional header, transactions of the previous block and the Merkle Tree root hash using TxId are included. Merkle Tree, however, has an inefficient computational structure, making it difficult to verify and exchange Light Node data with a simple transaction list. Therefore, we at FLETA, replaced the Merkle Tree validation with Level Tree validation. Merkle Tree is often used in P2P network systems to detect changes when sending data, but it requires the entire tree to function. In reality, the block is received from a single node and the Merkel Tree's size is almost equivalent. It is thereby difficult to use it for partial verification using P2P data transmission, which is the same as simply performing additional SHA 256 from a different angle.

Appendix B.
Block Redesign and
LEVEL Tree Validation

Block Redesign

FLETA's block consists of a block header and a transaction list, using a Level structure to support Light Node and parallel processing. The basic block structure is:

Block: {BlockHeader, TransactionSignature[], Transaction[], BlockSignature}
BlockHeader: {Version, HashPrevBlock, HashLevelRoot, Timestamp, Timeout, FormulationAddress}

The Level Tree is a hexadecimal tree structure binding 16 transaction hashes and using the hash of that bind once again. In other words, the Level Tree is a structure in which the maximum number of inscribable transactions per block is 65535, and each level designed to have 16 offspring. Thus, there are levels 1, 2, and 3 (Lv1, Lv2, Lv3). In the block header, HashLevelRoot using 16 Lv1s is inscribed; Lv1 is a Hash value using 16 Lv2s; and Lv3 uses a hashed value occurring from 16 concatenated Hashes. When forming the hash, HashFunction (Hash1 + 8bits + Hash2 + 8bits ... + 8bits + Hash16)—a function that hashes the values concatenated by inserting a designated pattern of 8bits padding between hash values—is used so as to improve speed and reduce the possibility of falsification and tampering.
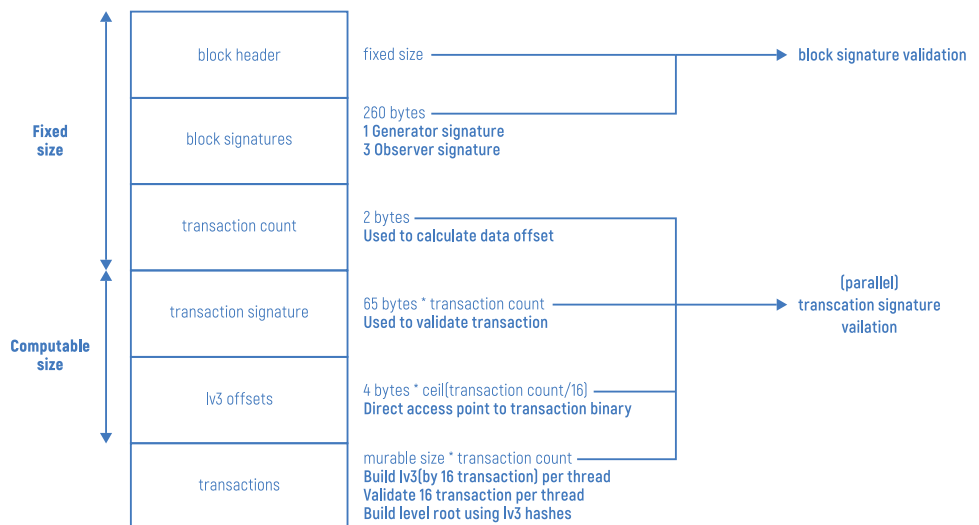
Serialization of the next block is designed to expedite verification of blocks in parallel, with the following structure:

BlockSerialization: {BlockHeader, BlockSignature, TransactionCount, Level3Indexes, TransactionSignatures, Transactions}
**BlockSignature : {CreatorSignature, Signatures[9]}**

First off, the BlockHeader and the TransactionCount here are of fixed sizes; Level3Indexes and TransactionSignature are of fixed sizes proportional to the TransactionCount. This allows for immediate checks of binary positions of Transactions, and using Leve3Indexes allows for a quick parallel verification of binary data since hexadecimal-bound transactions can be located immediately. BlockSignature — a signature using hash value for BlockHeader—

Appendix B.
Block Redesign and
LEVEL Tree Validation

Block Redesign

consists of the signature of the generator, the block generator group, and the observer node. Block generation is performed by the block generator, reward order performed by the generator and the block generator group, and the content is confirmed by the observer node. Here, the blocks with observer node signatures (those that have completed verification) are also transmitted with the TransactionSignatures input; the individual node also verifies both the transaction and the signature, preventing erroneous transactions by design.

LEVEL Tree Validation
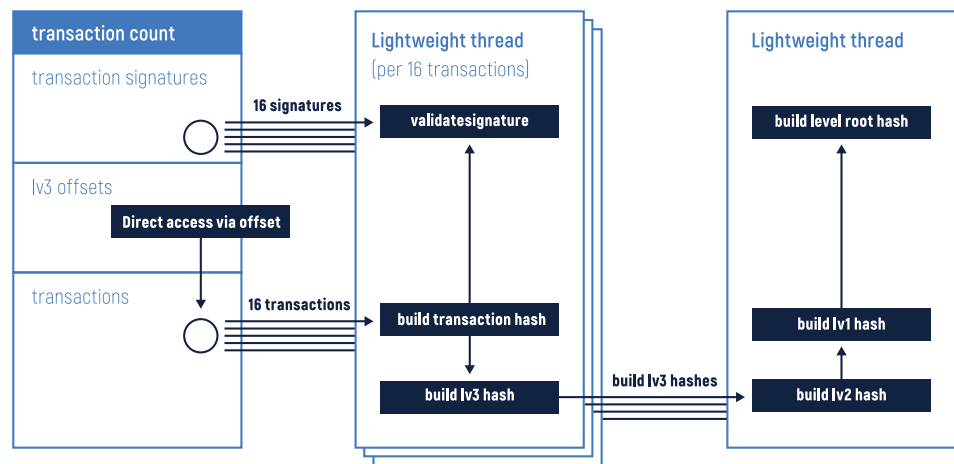
Overall consistency of a transaction can be verified by constructing a level with a transaction's hash and comparing it to the HashLevelRoot. The validation of the signature can be verified by comparing the signature, transaction, and level in parallel by dividing the TransactionSignatures in 16s and dividing the transaction in threads of 16 using Level3indexes. Since all such functions are read operations, they can be carried out simultaneously. Upon receiving a block, verifying transactions by 16 and composing Lv3 from the hash from verification and verifying by Level Tree throughout.

The level structure is also advantageous for the verification of the Light Node. The Light Node has 512 Bytes per Level 1 and 8192 Bytes per Level 2, so the Light Node can contain 8880 Bytes of validation data per block including the block header. If it is necessary to have data on a particular transaction, the Height will be displayed in the TxId, so the block can be immediately known, and since the position is displayed on the Index, knowing which Level Tree node contains a particular transaction is immediately possible. By importing 16 transactions that correspond to a tree in Level3 (512 bytes and 3600 Bytes respectively) the contents can be verified through the tree structure. Therefore, a lightweight node can perform high level transaction verifications with low data reception.

Appendix B.
Block Redesign and
LEVEL Tree Validation

LEVEL Tree Validation
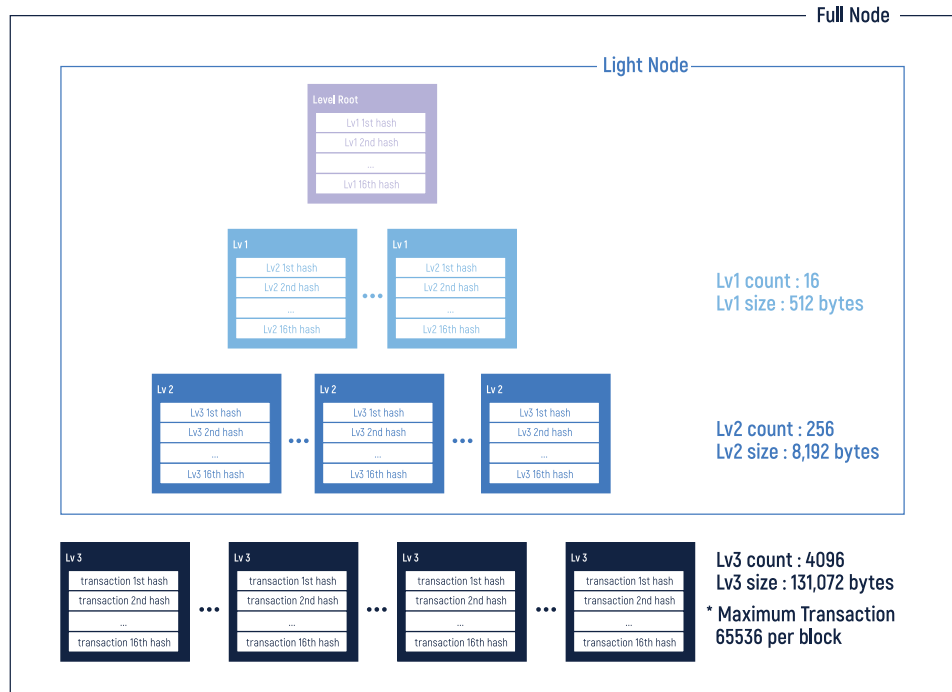
Appendix C.
Proof-of-Formulation

Proof of Formulation excerpt from FLETA Tech Paper

Consensus refers to a common understanding on block generation, in particular it signifies who generates the next block or who chooses the blocks out of the generated blocks in the chain process. The prior consensus used a method that disseminated blocks throughout the network for the arbitrary users to mine. However, this requires high recovery of confirmation or block time, as miners are able to generate subsequent blocks only when the new blocks are disseminated throughout the whole network. As a way to deal with this problem, only a select number of miners were picked in order to achieve lower block time.

FLETA has come up with a PoF (Proof-of-Formulator), allowing fast generation and dissemination of blocks by using Formulator reward sequence to designate the mining target and narrow down the dissemination range. Additionally, the existence of observer node allows immediate authentication and prevents fork of blocks. Anyone can make the formulator, so the door is open to all. Low block time can be achieved as the mining sequence of the formulator is fixed, making the dissemination range of new blocks very small.

Rank Table

RankTable calculates the score on all FormulationAccount and ranks the scores. All node has a RankTable and because the score is calculated through transaction and chain height, the list is the same. The authority to generate new blocks is given to the Formulator with the highest rank. When the block is generated and thus included in the score, the sequence changes and the authority can go to another.

Score of RankTable consists of Phase and Hash. Phase is a value related to time, showing how many times the RankTable has turned. The new formulator always participates in the RankTable with a LargestPhase+1 value. After the generation of blocks, the formulator's phase is increased so that reasonable sequence is secured. The details are as follows:

Score : uint64(Phase) << 32 + uint64(binary.LittenEndian.Uint32(hash[:4]))

This signifies that every Formulator is guaranteed with one mining opportunity in every phase and different formulator sequence is provided in different phrases, in order to prevent potential attack or collusion of and against Formulators.

Connectivity

In order to prepare for DDoS attack, every formulator accesses the observer node, therefore hiding the IP of Formulators and maintaining systematic sequence and process. Thus, observer node assumes the responsibility of all costs of protecting DDoS and security, Observer node is able to provide protection with high efficiency and with less cost, as it consists of relatively smaller amount. This, in turn, enables observer node to receive real-time information about the Formulator's activity. The observer node can increase transparency by revealing node status and structure information to formulators and users. If the turn comes for the unconnected node, TimeoutCount can play its role to continue the mining process by excluding such unconnected nodes. Formulators whose turn is skipped, are aware of such, making users able to monitor with ease.

Block Generation

The block generation is performed according to the agreed generation order among the formulators, and the block reward goes to the formulator that generated it. The block generation order is synchronized using the aforementioned formulator synchronization. Within a balanced network the algorithm is managed and directly (or via multiple peers)

Block Generation

assesses connections to make agreements of block generation order correspond across the network. Block generation is only possible by the first ranked node here and since a signature is required, only the first ranked node can create forked blocks. This means that with the observer nodes confirming in real time, forks will never occur.
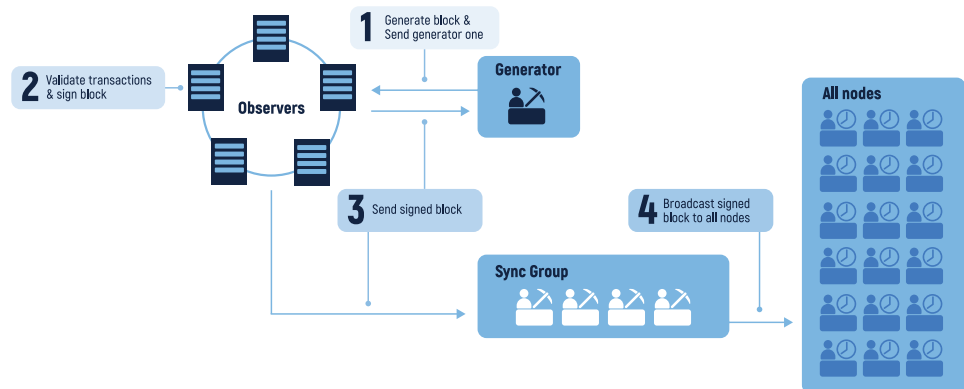
The mining group consists of A) the 1st place generator group, B) a synchronization group consisted of 2nd to the 5th place. The synchronization group agrees on the compensation order, and the observer node performs the content verifications. In other words, the block generator generates a block, sends the generated block to the synchronization group and the observer node, and the synchronization node confirms the generator sequence and header, and proceeds to sign it, and sends it to the observer node.

The observer node receives 6 signatures from the synchronization group and reviews all transaction signatures in the block and exchanges signatures between observer nodes. If three signatures from the five observer nodes are collected, the block is complete and the observer node sends the completed signature part to the synchronization group. The synchronization group creates a completed block by attaching the signature to the previously received block and sends it to the standby group, which then distributes the block to the network. The block generator in this fashion can quickly generate a block, and since 3/5 of the observer nodes signed it, a fork is not possible as at least one observer node will detect the fork before it forms. And since synchronization group proceeds to sign the sequence for verification purposes, a biased observer node signature is prevented. And the role division of synchronization and standby group divides the transmission traffic while ensuring that the block propagates as fast as possible throughout the network.

To expedite mining, the 1st rank node can send both the 2nd rank and the observer nodes the generated block so that the 2nd rank can be prepared in advance. Of course, if the block sent by the first rank has a problem or fails to sign, the recipient node will discard the flawed block and prepare for a new one. This acts as a catalyst for expedited signing if the generated block is without problems. If the first rank node fails to generate a normal block within 1 second, the second order node generates a new block on its own to be safe. If afterwards the first rank node still fails to create a regular node for over 3 seconds, the 2nd rank immediately propagates its created block and continues with block generation. The observer node confirms that the first rank did not create for more than 3 seconds and
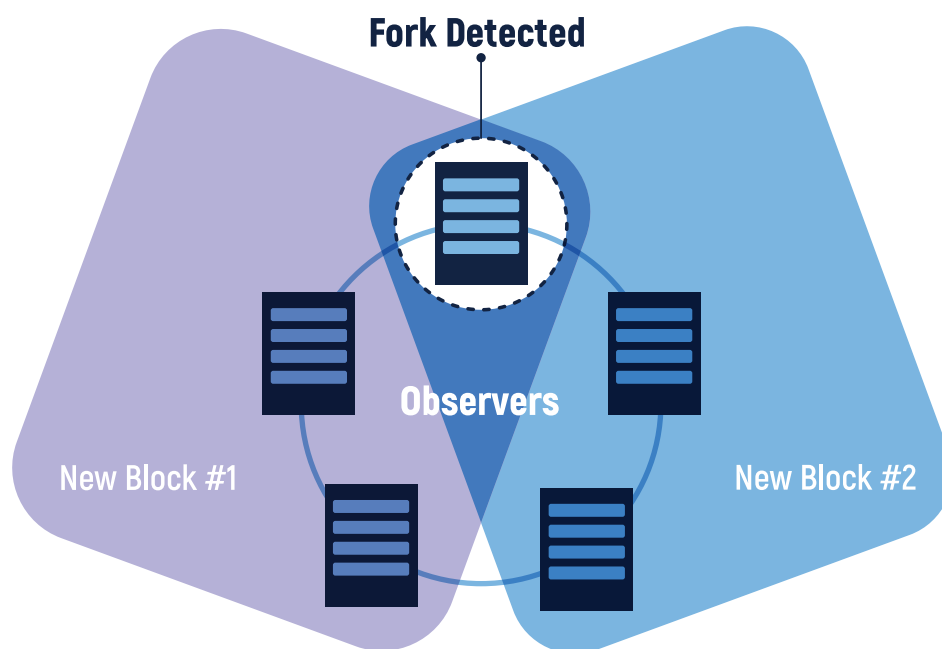
Block Generation

proceeds with the signing process.

Fork Prevention

When the highest rank formulator generates a block and receives the signatures of the observer nodes, the observer nodes sign and store the block. When the signature is signed by the synchronization group, it receives the block and the blockchain progresses so that if a fork block occurs, it cannot go past the observer node, preventing a fork from happening by design. The concept is that when the formulator order is correctly configured, the 1st rank node only has the right to generate and sign the block, at which phase making two or more blocks to fork the blockchain will be stopped by the observer nodes. Therefore, if the formulator rank order is synchronized, it is possible to only receive blocks that are not forked, simply by verifying the block generator and observer node signatures. The generated block therefore is decisive, and all transactions approved by the observer node are immediately confirmed.

Fork Detected

Observers

New Block #1   New Block #2

## 3/5 sign prevent chain from forking

Through the implementation of observer nodes, the attacker cannot create fork blocks to induce double payments. Furthermore, since the subject of block generation is a formulator, blockchain maintenance is also done by individuals who created the formulators, and since the observer nodes requires no compensation, the reward is solely given to the individuals in possession of the formulators.

Appendix D.
Parallel Sharding

Parallel Sharding excerpt from FLETA Tech Paper

The sharding described below refers to processing a transaction in parallel by using multiple nodes as shards.
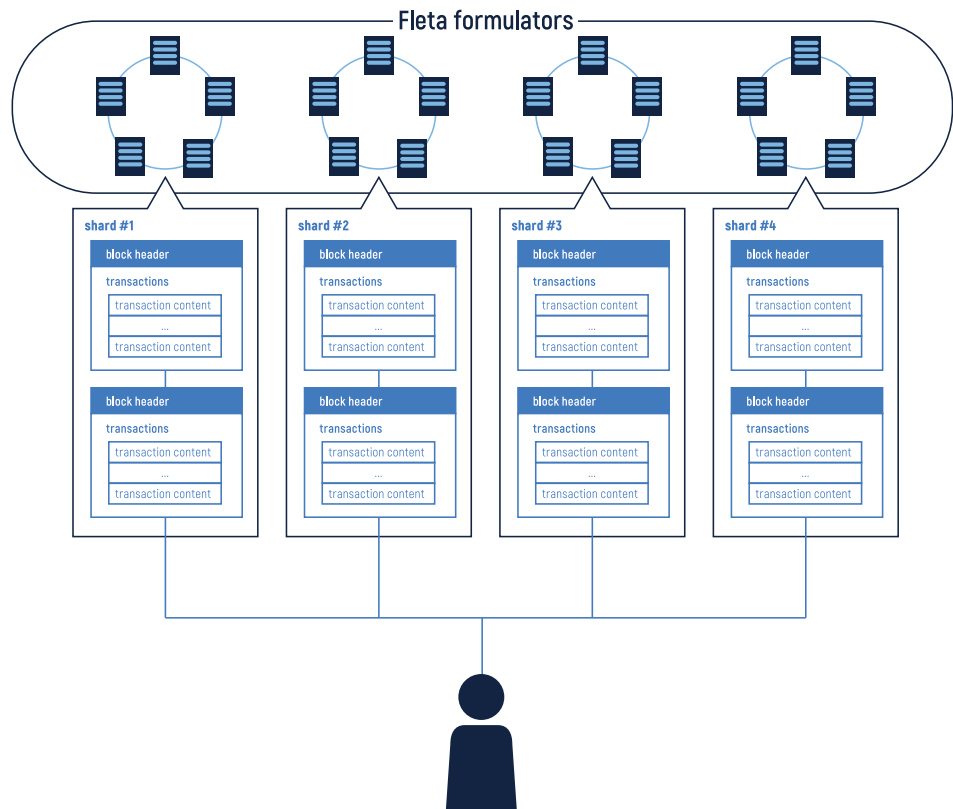
Multiple shard chain with one address

FLETA regards each shard as an independent blockchain, operating in a fully parallel fashion. However, a user's public and private keys can be viewed and used as if they were processed as a single entity, using the same value regardless of the shard. Using this method, we at FLETA came up with a complete parallel shard mechanism that from the beginning, has no chance of double spending.

Disclaimer

Please read this entire section carefully. If you are in any doubt as to the action you should take, please consult your legal, financial, tax or other professional advisor(s).

1.1 Legal Statement

(a) This Whitepaper ("**Whitepaper**"), in its current form, is circulated for general information purposes only in relation to the platform and applications described in the Whitepaper ("**Platform**") as presently conceived and is subject to review and revision. Please note that this Whitepaper is a work in progress and the information in this Whitepaper is current only as of the date on the cover hereof. Thereafter, the information, including information concerning Fleta Pte Ltd (the "**Company**") business operations and financial condition may have changed. We reserve the right to change, modify, add or delete parts of this Whitepaper or its associated website without notice for any reason or at any time.

(b) No person is bound to enter into any contract or binding legal commitment in relation to the sale and purchase of the tokens native to the Platform ("**FLETA Token**" or "**Token**") (as defined below) and no payment is to be accepted on the basis of this Whitepaper. Any sale and purchase of the Token will be governed by a legally binding agreement, the details of which will be made available separately from this Whitepaper. In the event of any inconsistencies between the abovementioned agreement and this Whitepaper, the former shall prevail.

(C) This Whitepaper does not constitute or form part of any opinion on any advice to sell, or any solicitation of any offer by the issuer/distributor/vendor of the Token to purchase any Token nor shall it or any part of it nor the fact of its presentation form the basis of, or be relied upon in connection with, any contract or investment decision.

(d) The Tokens are not intended to constitute capital market products, including, in particular, securities, debentures, units in a business trust, or units in a collective investment scheme, each as defined under the Securities and Futures Act (Cap. 289) of Singapore, or its equivalent in any other jurisdiction. Accordingly, this Whitepaper therefore, does not, and is not intended to, constitute a prospectus, profile statement, or offer document of any sort, and should not be construed as an offer of capital market products, securities of any form, units in a business trust, units in a collective investment scheme or any other form of investment, or a solicitation for any form of investment in any jurisdiction.

(e) No Token should be construed, interpreted, classified or treated as enabling, or according any opportunity to, purchasers to participate in or receive profits, income, or other payments or returns arising from or in connection with the Platform, the Token, or products, or to receive sums paid out of such profits, income, or other payments or returns.

(f) This Whitepaper or any part hereof may not be reproduced, distributed or otherwise disseminated in any jurisdiction where offering coins/tokens in the manner set out this Whitepaper is regulated or prohibited.

(g)   No regulatory authority has reviewed, examined or approved of any of the information set out in this Whitepaper. No such action has been or will be taken in any jurisdiction.

(h)   Where you wish to purchase any Token, the Tokens are not to be construed, interpreted, classified or treated as: **(a)** any kind of currency other than cryptocurrency; **(b)** debentures, stocks or shares issued by any entity; **(c)** rights, options or derivatives in respect of such debentures, stocks or shares; **(d)** rights under a contract for differences or under any other contract with the purpose or pretended purpose to secure a profit or avoid a loss; or **(e)** units or derivatives in a collective investment scheme or business trust, or any other type of securities or capital market products.

1.2 Restrictions on Distribution and Dissemination

(a)   The distribution or dissemination of this Whitepaper or any part thereof may be prohibited or restricted by the laws or regulatory requirements of any jurisdiction. In the case where any restriction applies, you are to inform yourself about, to obtain legal and other relevant advice on, and to observe, any restrictions which are applicable to your possession of this Whitepaper or such part thereof (as the case may be) at your own expense and without liability to the Company or its representatives, agents, and related companies ("**Affiliates**").

(b)   Persons to whom a copy of this Whitepaper has been distributed or disseminated, provided access to or who otherwise have the Whitepaper in their possession shall not circulate it to any other persons, reproduce or otherwise distribute this Whitepaper or any information contained herein for any purpose whatsoever nor permit or cause the same to occur.

1.3 Disclaimer of Liability

(a)   The Token, the Platform and related services provided by the Company and its Affiliates are provided on an "**as is**" and "**as available**" basis. The Company and its Affiliates do not grant any warranties or make any representation, express or implied or otherwise, as to the accessibility, quality, suitability, accuracy, adequacy, or completeness of the Token, the Platform or any related services provided by the Company and its Affiliates, and expressly disclaim any liability for errors, delays, or omissions in, or for any action taken in reliance on, the Token, the Platform and related services provided by the Company and its Affiliates.

(b)   The Company, its Affiliates and its directors, officials and employees do not make or purport to make, and hereby disclaim any representation, warranty or undertaking in any form whatsoever to any entity or person, including any representation, warranty or undertaking in relation to the truth, accuracy and completeness of any of the information set out in this Whitepaper.

(c)   To the maximum extent permitted by the applicable laws and regulations, the Company and its Affiliates shall not be liable for any indirect, special, incidental, consequential or other losses of any kind, in tort, contract or otherwise (including but not limited to loss of revenue, income or profits, and loss of use or data), arising out of or in connection

with any acceptance of or reliance on this Whitepaper or any part thereof by you.

1.4 Cautionary Note on Forward-Looking Statements

(a)   Certain information set forth in this Whitepaper includes forward-looking statements regarding the future of the project, future events, achievements, and projections. These statements are not statements of historical fact and may be identified by but not limited to words and phrases such as "**will**", "**estimate**", "**believe**", "**expect**", "**project**", "**anticipate**", or words of similar meaning. Such forward-looking statements are also included in other publicly available materials such as presentations, interviews, videos etc.. Information contained in this Whitepaper constitutes forward-looking statements including but not limited to future results, performance, or achievements of the Company or its Affiliates.

(b)   The forward-looking statements involve a variety of risks and uncertainties. These statements are not guarantees of future performance and no undue reliance should be placed on them. Should any of these risks or uncertainties materialize, the actual performance and progress of the Company or its Affiliates might differ from expectations set by the forward-looking statements. The Company or its Affiliates undertake no obligation to update forward-looking statements should there be any change in circumstances. By acting upon forward-looking information received from this Whitepaper, the Company or its Affiliates' website and other materials produced by the Company or its Affiliates, you personally bear full responsibility in the event where the forward-looking statements do not materialize.

1.5 Potential Risks

By purchasing, holding and using the Tokens, you expressly acknowledge and assume the risks set out in this section. If any of these risks and uncertainties develops into actual events, the business, financial condition, results of operations and prospects of the Company or its Affiliates may be materially and adversely affected. In such cases, you may lose all or part of the value of the Token. Such risks include but are not limited to the following:

Risks Relating to the Tokens

(a)   There may not be a public or secondary market available for the Tokens.

I.   The Tokens are intended to be native Tokens to be used on the Platform, and the Company and its Affiliates have not and may not actively facilitate any secondary trading or external trading of Tokens. In addition, there is and has been no public market for the Tokens and the Tokens are not traded, whether on any cryptocurrency exchange or otherwise. In the event that the Tokens are traded on a cryptocurrency exchange, there is no assurance that an active or liquid trading market for the Tokens will develop or if developed, be sustained. There is also no assurance that the market price of the Tokens will not decline below the purchase amount paid for the Tokens, which is not indicative of such market price.

II.   A FLETA Token is not a currency issued by any central bank or national, supra-national or quasi-national organisation, nor is it backed by any hard

assets or other credit. The Company and its Affiliates are not responsible for nor do they pursue the circulation and trading of the Tokens on the market. Trading of the Tokens merely depends on the consensus on its value between the relevant market participants, and no one is obliged to acquire any Token from any holder of the Token, including the purchasers of the Tokens, nor does anyone guarantee the liquidity or market price of the Tokens to any extent at any time. Accordingly, the Company and its Affiliates cannot ensure that there will be any demand or market for the Tokens, or that the price uponwhich the Tokens were purchased is indicative of the market price of the Tokens if they are made available for trading on a cryptocurrency exchange.

Risks Relating to the Company, its Affiliates and the Platform

(a)   **Limited availability of sufficient information.**

The Platform is still at an early developmental phase as of the date of this Whitepaper. Its governance structure, purpose, consensus mechanism, algorithm, code, infrastructure design and other technical specifications and parameters may be updated and changed frequently without notice. While this Whitepaper contains the key information currently available in relation to the Platform, it is subject to adjustments and updates from time to time, as announced on the Company's website. Purchasers will not have full access to all the information relevant to the Tokens and/or the Platform. Nevertheless, it is anticipated that significant milestones and progress reports will be announced on the Company's website.

(b)   **The digital assets raised in the sale of the Tokens are exposed to the risks of theft.**

Whilst the Company and its Affiliates will make every effort to ensure that any cryptocurrencies received from the sale of Tokens are securely held through the implementation of security measures, there is no assurance that there will be no theft of the cryptocurrencies as a result of hacks, mining attacks, sophisticated cyber-attacks, distributed denials of service or errors, vulnerabilities or defects on such blockchain addresses, or any other blockchain, or otherwise. Such events may include, for example, flaws in programming or source code leading to exploitation or abuse thereof. In such event, even if the sale of Tokens is completed, the Company and its Affiliates may not be able to receive the cryptocurrencies raised and the Company and its Affiliates may not be able to utilize such funds for the development of the Platform, and the launch of the Platform might be temporarily or permanently curtailed. As such, the distributed Tokens may hold little worth or value. The Tokens are uninsured, unless you specifically obtain private insurance to insure them. In the event of any loss or loss of value of the Tokens, you may have no recourse.

(c)   **The blockchain address(es) may be compromised and the digital assets may not be able to be retrieved.**

The blockchain address(es) are designed to be secured. However, in the event that the blockchain address(es) for the receipt of purchase amounts or

Disclaimer

otherwise are, for any reason, compromised (including but not limited to scenarios of the loss of keys to such blockchain address(es), the funds held at such blockchain address(es) may not be able to be retrieved and disbursed, and may be permanently unrecoverable. In such event, even if the sale of the Tokens is successful, the Company and its Affiliates will not be able to receive the funds raised and the Company and its Affiliates will not be able to utilize such funds for the development of the Platform, and the implementation of the Platform might be temporarily or permanently curtailed. As such, distributed Tokens may hold little worth or value.

(d) **There is no assurance of any success of the Platform and the Company and its Affiliates may cease the development, launch and operation of the Platform.**

I. The value of, and demand for, the Tokens hinges heavily on the performance of the Platform. There is no assurance that the Platform will gain traction after its launch and achieve any commercial success. The Platform has not been fully developed, finalized and integrated and is subject to further changes, updates and adjustments prior to its launch. Such changes may result in unexpected and unforeseen effects on its projected appeal to users, and hence impact its success. There are no guarantees that the process for creating the Tokens will be uninterrupted or error-free.

II. While the Company has made every effort to provide a realistic estimate, there is also no assurance that the cryptocurrencies raised in the sale of Tokens will be sufficient for the development and integration of the Platform. For the foregoing or any other reason, the development and integration of the Platform may not be completed and there is no assurance that its systems, protocols or products will be launched at all. As such, distributed Tokens may hold little or no worth or value.

III. Additional reasons which may result in the termination of the development, launch or operation of the Platform includes, but is not limited to, **(aa)** an unfavorable fluctuation in the value of cryptographic and fiat currencies, **(bb)** the inability of the Company and its Affiliates to establish the Platform or the Tokens' utility or to resolve technical problems and issues faced in relation to the development or operation of the Platform or the Token, the failure of commercial relationships, **(cc)** intellectual property disputes during development or operation, and **(dd)** changes in the future capital needs of the Company or its Affiliates and the availability of financing and capital to fund such needs. For the aforesaid and other reasons, the Platform may no longer be a viable project and may be dissolved or not launched, negatively impacting the Platform and the potential utility and value of distributed FLETA Tokens.

(e) **There may be lack of demand for the Platform and the services provided, which would impact the value of the Tokens.**

I. There is a risk that upon launching of the Platform, there is a lack of interest from consumers, merchants, advertisers, and other key participants for the Platform and the services, and that there may be limited interest and

therefore use of the Platform and the Tokens. Such a lack of interest could impact the operation of the Platform and the uses or potential value of the Tokens.

II. There is a risk of competition from alternative platforms that may have been established, or even from existing businesses which would target any segment of the potential users of the Platform fulfilling similar demands. Therefore, in the event that the competition results in a lack of interest and demand for the Platform, the services and the Tokens, the operation of the Platform and Token value may be negatively impacted.

(f) **The Company and its Affiliates may experience system failures, unplanned interruptions in its network or services, hardware or software defects, security breaches or other causes that could adversely affect the Company or its Affiliates' infrastructure network, or the Platform.**

I. The Company and its Affiliates are unable to anticipate or detect when there would be occurrences of hacks, cyber-attacks, mining attacks (including but not limited to double-spend attacks, majority mining power attacks and "**selfish-mining**" attacks), distributed denials of service or errors, vulnerabilities or defects in the Platform, the Tokens, or any technology (including but not limited to smart contract technology) on which the Company, its Affiliates, the Platform, the Tokens, rely on or any other blockchain. Such events may include, for example, flaws in programming or source code leading to exploitation or abuse thereof. The Company and its Affiliates may not be able to detect such issues in a timely manner, and may not have sufficient resources to efficiently cope with multiple service incidents happening simultaneously or in rapid succession.

II. Although the Company and its Affiliates will be taking steps against malicious attacks on its appliances or its infrastructure, which are critical for the maintenance of the Platform and its other services, there can be no assurance that cyber-attacks, such as distributed denials of service, will not be attempted in the future, and that any of such security measures will be effective. Any significant breach of security measures or other disruptions resulting in a compromise of the usability, stability and security of the Companyand its Affiliates' network or services, including the Platform.

Risks Relating to the Participation in the Sale of Tokens

(a) **You may not be able to recover the purchase amount paid for the Tokens.**

Except as provided under any applicable terms of sale or prescribed by applicable laws and regulations, the Company is not obliged to provide you with a refund of the purchase amount. No promises of future performance or price are or will be made in respect to the Tokens, including promises of inherent value or continuing payments, and there is no guarantee that the Tokens will hold any particular value. Therefore, the recovery of the purchase amount may be impossible or may be subject to applicable laws and regulations.

Disclaimer

(b) **You may be subject to adverse legal and/or tax implications as a result of the purchase, distribution and use of the Tokens.**

    I.   The legal character of cryptocurrency and cryptographic assets remain uncertain. There is a risk that the Tokens may be considered securities in certain jurisdictions, or may be considered to be securities in certain jurisdictions in the future. The Company and its Affiliates does not provide any warranty or guarantee as to how the Tokens will be classified, and each purchaser will bear all consequences of the Tokens being considered securities in their respective jurisdictions, and bear the responsibility of the legality, use and transfer of the Tokens in the relevant jurisdictions.

    II.   Further, the tax treatment of the acquisition or disposal of such cryptocurrency or cryptographic assets might depend on whether they are classified as securities, assets, currency or otherwise. As the tax characterization of the Tokens remains indeterminate, you must seek your own tax advice in connection with the purchase, acquisition or disposal of the Tokens, which may result in adverse tax consequences or tax reporting requirements for you.

(c) **The loss or compromise of information relating to the purchaser wallet and your method of accessing the Platform may affect your access to and possession of the Tokens.**

There is a risk that you may lose access to and possession of the Tokens permanently due to loss of unique personal ID created on the Platform, and other identification information, loss of requisite private key(s) associated with the purchaser wallet or vault storing the Tokens or any other kind of custodial or purchaser errors.

(d) **Blockchains may face congestion and transactions may be delayed or lost.**

Most blockchains used for cryptocurrency transactions are prone to periodic congestion during which transactions can be delayed or lost. Individuals may also intentionally spam the network in an attempt to gain an advantage in purchasing cryptographic tokens. This may result in a situation where block producers may not include your purchase of the Tokens when you intend to transact, or your transaction may not be included at all.

Privacy and data retention issues.

As part of the Token sales, the verification processes and the subsequent operation of the Platform, the Company may collect personal information from you. The collection of such information is subject to applicable laws and regulations. All information collected will be used for purposes of the Token sales and operations of the Platform, thus it may be transferred to contractors, service providers and consultants worldwide as appointed by the Company. Apart from external compromises, the Company and its appointed entities may also suffer from internal security breaches whereby their employees may misappropriate, misplace or lose personal information of purchasers. The Company may be required to expend significant financial resources to alleviate problems caused by any breaches or losses, settle fines and resolve

inquiries from regulatory or government authorities. Any information breaches or losses will also damage the Company's reputations, thereby harming its long-term prospects.

Macro Risks

(a) **General global market and economic conditions may have an adverse impact on the Company and its Affiliates' operations and the use of the Platform.**

I. The Company and its Affiliates could be affected by general global economic and market conditions. Challenging economic conditions worldwide have from time to time, contributed, and may continue to contribute, to slowdowns in the information technology industry at large. Weakness in the economy may have a negative effect on the Company and its Affiliates' business strategies, results of operations and prospects.

II. Suppliers on which the Platform relies for servers, bandwidth, location and other services could also be negatively impacted by economic conditions that, in turn, could have a negative impact on the Company and its Affiliates' operations or expenses.

III. There can be no assurance, therefore, that current economic conditions or worsening economic conditions or a prolonged or recurring recession will not have a significant adverse impact on the Company and its Affiliates' business strategies, results of operations and prospects and hence the Platform, which may in turn impact the value of the Tokens.

(b) **The regulatory regimes governing blockchain technologies, cryptocurrencies, Tokens, offering of Tokens, and the Platform remain uncertain, and any changes, regulations or policies may materially adversely affect the development of the Platform and the utility of the Tokens.**

I. Regulation of the Tokens, the offer and sale of Tokens, cryptocurrencies, blockchain technologies, and cryptocurrency exchanges is currently undeveloped or underdeveloped and likely to rapidly evolve. Such regulation also varies significantly among different jurisdictions, and is hence subject to significant uncertainty. The various legislative and executive bodies in different jurisdictions may in the future adopt laws, regulations, guidance, or other actions, which may severely impact the development and growth of the Platform, the adoption and utility of the Tokens or the issue, offer, and sale of the Tokens by the Company. Failure by the Company and its Affiliates or users of the Platform to comply with any laws, rules and regulations, some of which may not exist yet or are subject to interpretation and may be subject to change, could result in a variety of adverse consequences against the Company and its Affiliates, including civil penalties and fines.

II. Blockchain networks also face an uncertain regulatory landscape in many foreign jurisdictions. Various jurisdictions may, in the near future, adopt laws, regulations or directives that affect the Platform, and therefore, the value of

the Tokens. Such laws, regulations or directives may directly and negatively impact the operations of the Company and its Affiliates. The effect of any future regulatory change is impossible to predict, but such change could be substantial and materially adverse to the development and growth of the Platform and the adoption and utility of the Tokens.

III. To the extent that the Company and its Affiliates may be required to obtain licenses, permits and/or approvals (collectively, the "**Regulatory Approvals**") to carry out its business, including that of the creation of the Tokens and the development and operation of the Platform, but are unable to obtain such Regulatory Approvals or if such Regulatory Approvals are not renewed or revoked for whatever reason by the relevant authorities, the business of the Company and its Affiliates may be adversely affected.

IV. There is no assurance that more stringent requirements will not be imposed upon the Company and its Affiliates by the relevant authorities in the future, or that the Company and its Affiliates will be able to adapt in a timely manner to changing regulatory requirements. These additional or more stringent regulations may restrict the Company and its Affiliates' ability to operate its business and the Company and its Affiliates may face actions for non-compliance if it fails to comply with any of such requirements.

V. Further, should the costs (financial or otherwise) of complying with such newly implemented regulations exceed a certain threshold, maintaining the Platform may no longer be commercially viable and the Company and its Affiliates may opt to discontinue the Platform and/or the Tokens. Further, it is difficult to predict how or whether governments or regulatory authorities may implement any changes to laws and regulations affecting distributed ledger technology and its applications, including the Platform and the Tokens. The Company and its Affiliates may also have to cease operations in a jurisdiction that makes it illegal to operate in such jurisdiction, or make it commercially unviable or undesirable to obtain the necessary Regulatory Approval(s) to operate in such jurisdiction. In scenarios such as the foregoing, the distributed Tokens may hold little or no worth or value.

(c) **There may be risks relating to acts of God, natural disasters, wars, terrorist attacks, riots, civil commotions widespread communicable diseases and other events beyond the control of the Company and its Affiliates.**

The sale of the Tokens and the performance of the Company, its Affiliates and/or the Platform's activities may be interrupted, suspended or delayed due to acts of God, natural disasters, wars, terrorist attacks, riots, civil commotions, widespread communicable diseases and other events beyond the control of the Company and its Affiliates. Such events could also lead to uncertainty in the economic outlook of global markets and there is no assurance that such markets will not be affected, or that recovery from the global financial crisis would continue. In such events, the Company and its Affiliates' business strategies, results of operations and outlook may be materially and adversely affected, and the demand for and use of the Tokens and the Platform may be materially affected. Further, if an outbreak of such infectious or communicable

diseases occurs in any of the countries in which the Company, its Affiliates, and the participants of the Platform have operations in the future, market sentiment could be adversely affected and this may have a negative impact on the Platform and its community.

(d) **Blockchain and cryptocurrencies, including the Tokens are a relatively new and dynamic technology. In addition to the risks highlighted herein, there are other risks associated with your purchase of, holding and use of the Tokens, including those that we cannot anticipate. Such risks may further materialize as unanticipated variations or combinations of the risks discussed herein.**

1.6 No Further Information or Update

No person has been or is authorized to give any information or representation not contained in this Whitepaper in connection with the Tokens, the Platform, the Company or its Affiliates and their respective businesses and operations, and, if given, such information or representation must not be relied upon as having been authorized by or on behalf of the Company or its Affiliates.

1.7 Language

This Whitepaper may be translated into other languages. If any disagreement should arise due to different language translations, the version in English will prevail.

1.8 Advice

No information in this Whitepaper should be considered to be business, legal, financial or tax advice regarding the Token, the Platform, the Company or its Affiliates. You should consult your own legal, financial, tax or other professional advisor(s) regarding the Token, the Company or its Affiliates and their respective businesses and operations. You should be aware that you may be required to bear the financial risk of any purchase of the Tokens for an indefinite period of time.

THANK
YOU!

FLETA.io