

White Paper

April 2019



Advancing Performance with
Layered Multi-Blockchain
Architecture for Enhanced
Smart Contracting

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SINGAPORE
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The MOACPlatform:

Advancing Performance with Layered Multi-Blockchain Architecture for Enhanced Smart Contracting

MOAC FOUNDATION LTD.

April 1, 2019

Version 3

ABSTRACT

The MOAC foundation (MOAC) has released a next generation blockchain platform in 2018. With a pioneering Multi-Blockchain architecture, MOAC not only addresses the performance and cost issues with existing blockchain systems, including Bitcoin and Ethereum, but also introduces new features that minimize the barrier to entry for developers, users, businesses, and the entirety of the blockchain ecosystem. The new platform achieves this by using a layered Multi-Blockchain architecture, blockchain sharding, MicroChain, Smart Contracts, and Cross-Chain capabilities.

The underlying architecture of the MOAC Platform is a Multi-Blockchain consisting of a global primary blockchain, MotherChain, and additional MicroChains. Using blockchain sharding technology, a MicroChain functions as a child blockchain within the platform that operates above the global MotherChain, and is responsible for Smart Contracts management. MicroChains also enable high volume transactions using a variety of consensus systems. Consensus system is an agreement system that provides accountability and verification of transactions.

The platform's advanced layered Multi-blockchain architecture increases overall transaction processing speeds by up to 100x faster than existing blockchain platforms. Meanwhile, MicroChains enhance token concurrency rates by up to 10,000 times, for a truly scalable solution.

MicroChains significantly reduce the cost of smart contract operations and allow developers to rapidly test different application and service ideas. MOAC's MicroChains are able to interconnect with other non- MOAC blockchains using Cross-Chain capabilities. This allows both users and their decentralized applications (DApps) to migrate easily to the MOAC Platform, with no prior blockchain knowledge. It also provides a decentralized file storage solution which is currently missing from other major blockchains.

MOAC incentivizes mining as well as rewards for the entire ecosystem. The MotherChain uses a proven Proof of Work (PoW) model, similar to Ethereum, so that miners and mining pools have opportunities to participate in mining the MotherChain. The MOAC Platform provides additional MicroChain mining and validation and provides mechanisms for mining from mobile devices, including smart phones.

By lowering the barrier to entry for both mobile users and server farms, the MOAC Platform offers a truly scalable ecosystem for developers and their Smart Contracts, enabling developers to create innovative DApps with lower operating costs, enhanced capabilities, and improved performance without a reduction in security.

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INTRODUCTION

Blockchain technology, cryptocurrencies, and Smart Contracts have the potential to alter the way developers build decentralized applications (DApps) and are already changing the way the world conducts business.

Since the introduction of Bitcoin in 2008, blockchain technology as a cryptocurrency has established itself as a decentralized ledger of record for digital financial transactions and as a store of value. Bitcoin functions by using a single decentralized consensus model to provide transaction verification and security without a centralized monetary authority.

See <https://bitcoin.org/bitcoin.pdf> to read more.

In 2015, platforms like Ethereum made the concept of Smart Contracts and DApps popular. A Smart Contract is a computer program that directly controls the transfer of digital currencies or value based assets between parties under certain party or developer defined programmatic conditions.

Read more at <https://github.com/ethereum/wiki/wiki/White-Paper>.

A “DApp” is a decentralized application that does not rely on a central server to function. Instead, it relies on peer-to-peer (P2P) networks similar to BitTorrent, Napster, and Kazaa to interconnect. P2P networks preserve optimal data transfer from multiple sources. Smart Contracts and DApps use blockchains for processing and storing data, as well as providing additional computing functionality. This is unlike Bitcoin, a first generation blockchain, which is purely transactional.

Since the creation of Bitcoin, blockchain technology (i.e., platforms and cryptocurrencies) has evolved in the hope of expanding function, performance, security, and scalability. By solving these system challenges, user adoption will rise, satisfying innumerable business use cases.

This paper outlines the groundbreaking solutions that combine existing blockchain best practices with new scalable Multi-Blockchain technologies that significantly advance Smart Contracting. This is not a theoretical paper and all of the intellectual property in this paper has been in development, undergone testing, and will soon be in production.

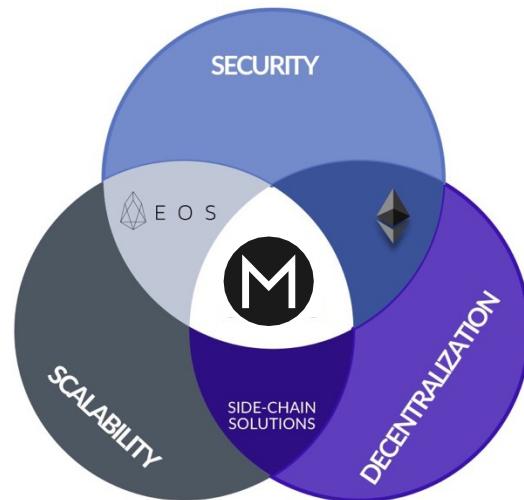


PROBLEM STATEMENT

Existing technologies and blockchain platforms suffer from steep learning curves, unnecessary complexity, and high usage fees - all of which impact adoption and scalability. Existing platforms have low performance transactions-per-second (TPS), fixed consensus models, and are not able to quickly adapt to the ever growing needs of developers. Currently, mining in the blockchain community is highly centralized and doesn't properly incentivize new users and interested consumers due to complexity and the cost of required hardware.

These blockchain platforms are also alienated from each other and unable to communicate effectively with other cryptocurrencies, Smart Contracts, and blockchain systems. This has created a highly segregated blockchain marketplace, separating platforms, technology, user-base, and industry.

It is currently extremely challenging even for experienced technical developers to build new blockchains. To make matters even more complicated, most blockchains are difficult to upgrade, and split participation inefficiently between users.





A MULTI-BLOCKCHAIN SOLUTION: THE MOAC PLATFORM

MOAC foundation (MOAC), has addressed the primary inefficiencies of existing blockchain platforms by developing a Multi-Blockchain platform. The MOAC Platform uses an advanced layered architecture that lowers DApp developer costs, provides for scalability, and reduces development complexity while increasing transaction speed and volume using sharding. MOAC leverages Multi-Blockchain within its platform, including MotherChain (a Proof of Work based blockchain) and MicroChains for Smart Contracts supporting multiple consensus models. The MOAC Platform also has Cross-Chain capabilities to interconnect MicroChains within the system and to interconnect with 3rd party non-MOAC blockchain and cryptocurrencies.

THE MOAC PLATFORM

By separating balance transfer and Smart Contracts, the platform's advanced layered Multi-blockchain architecture increases the overall transaction processing speeds up to 100x faster than Ethereum. Below is an overview of the MOAC architecture, consisting of MotherChain, an event handling system, Smart Contracts as MicroChains , blockchain sharding, Cross-Chain capabilities, security, and an API.



MOTHERCHAIN : THE PROOF OF WORK BLOCKCHAIN

MotherChain - not to be confused with MOAC – is described as an intersystem Proof of Work(PoW) blockchain that handles data storage and computesprocessing for Smart Contracts and DApps.

A Proof of Work (PoW) algorithm is an economic measure to deter and ultimately prohibit third-party interference, including denial of service attacks and other service and network abuse such as spam. By requiring some work from the service requester, usually equating to committed processing time by a computer for completing specific processing tasks, erroneous system threats are eliminated.

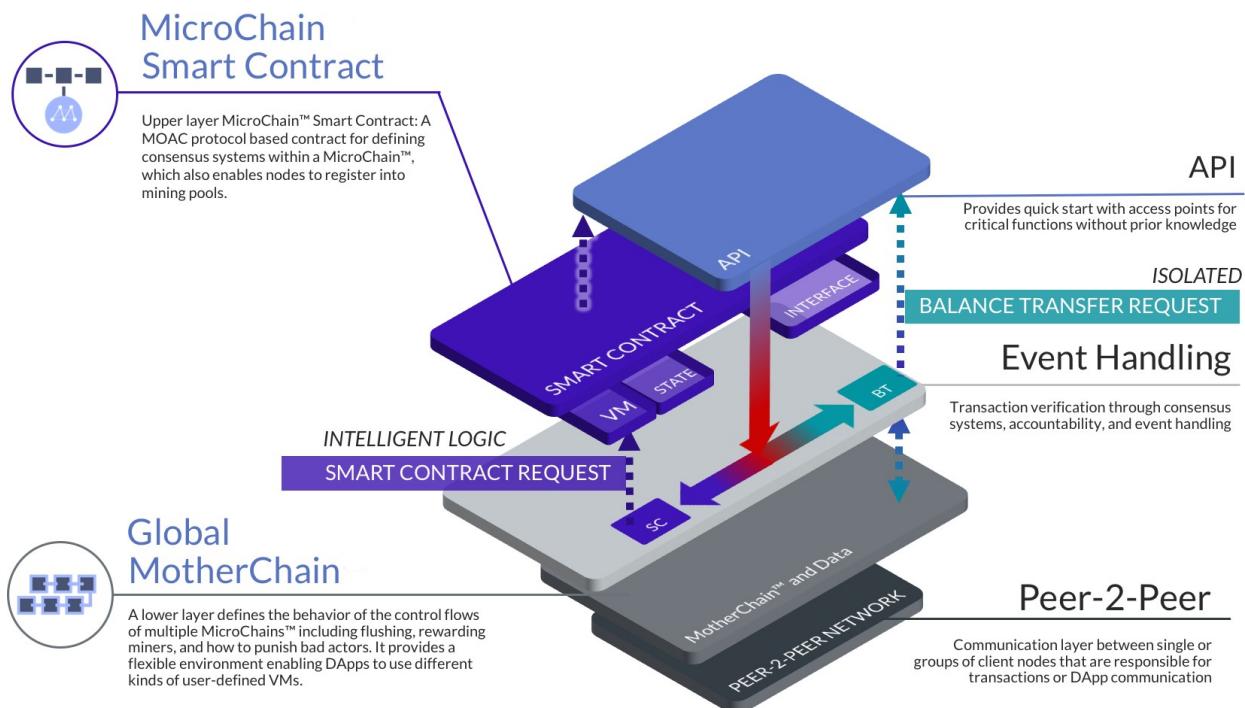
On the MOAC Platform, MotherChain is the public blockchain layer that processes balance transfers, blockchain operation, consensus, and data access. The platform also supports other consensus models using Micro-Chains.



SMART CONTRACTS AS MICROCHAINS

MOAC is one of the first blockchain solutions to implement a unique MicroChain per Smart Contract, providing for efficiency and scalability beyond existing solutions.

The MOAC Platform uses MicroChains to separate processing tasks and isolate blockchain functions from business logic for each individual smart contract. By providing each Smart Contract with its own unique Micro-Chain, it enables Smart Contracts to use a variety of consensus protocols and results in a wider range of potential business logic use cases. Developers have the freedom to select the consensus protocol that best fits their use case and determine the number of nodes allocated to a specific Smart Contract. All the states of the Smart Contract are saved inside the local MicroChain and can write data to the MotherChain as needed for finality.



MICROCHAINS FOR VARIABLE CONSENSUS SYSTEMS

With the ability to have MicroChains in a layer above the MotherChain, each MicroChain can have its own unique consensus system and algorithm.

For example, you could create a MicroChain which uses a Proof of Stake consensus model specifically for scalable rapid high volume transactions. A Proof of Stake (POS) is a type of algorithm by which a cryptocurrency blockchain network aims to achieve distributed consensus.

Instead of processing large amounts of data like a strictly Proof of Work blockchain, a Proof of Stake blockchain relies on validator nodes within a network to verify transactions. In Proof of Stake blockchains, the creator of the next sequential block is chosen by randomized algorithms based on a combination of

factors such as wealth or age (I.e., the stake).

The advantage of a Proof of Stake system is that it is fully scalable for enterprise-level volume, is energy efficient, and supports variable transactions. It also increases verification capacity proportional to the number of nodes on the network, and enables microtransactions within DApp MicroChains without having to constantly access the MotherChain.

In addition to supporting Proof of Stake and Proof of Work blockchains, the MOAC Platform can also support additional plug-and-play consensus systems such as Proof of Activity, Proof of Burn, Proof of Elapsed Time, etc.

MicroChains run on Smart Contract Server (SCS). Currently there are two types of MicroChain available: ProcWind and FileStorm.

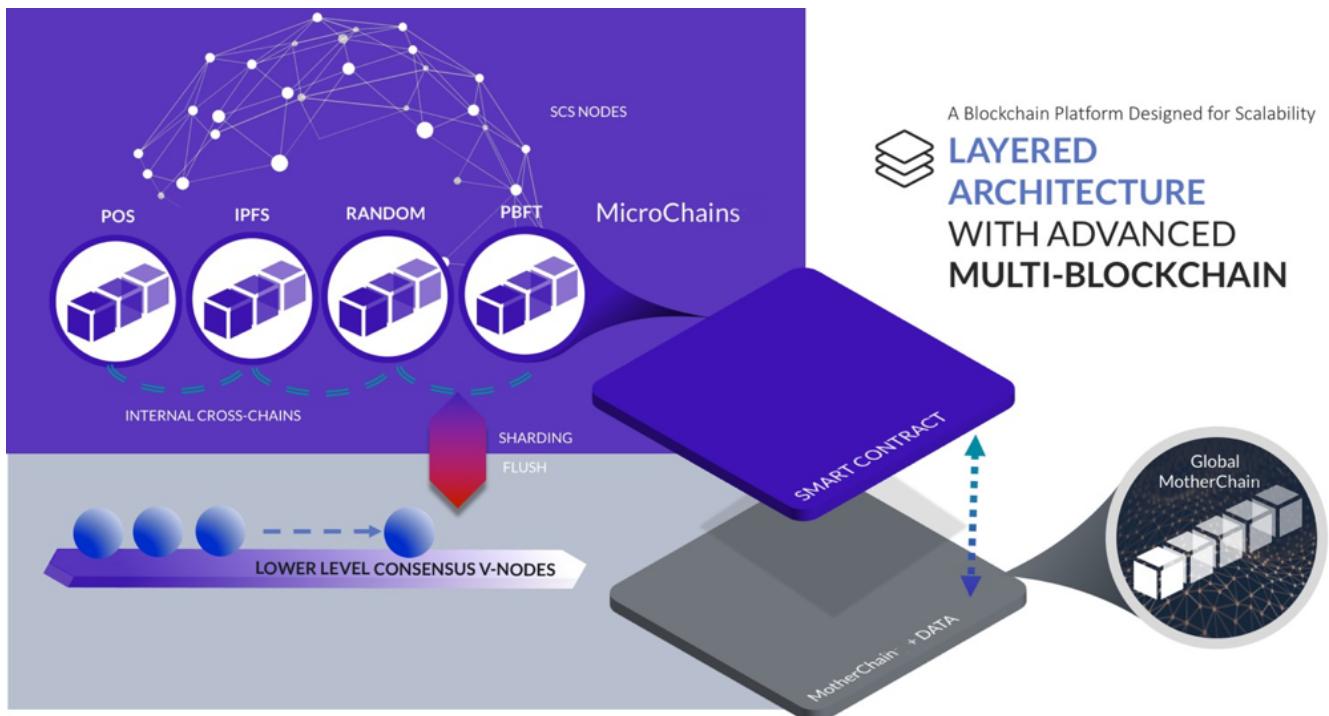
1. **ProcWind:** POS-like consensus, supporting multiple smart contract running inside the MicroChain. Currently ProcWind supports two types of Atomic Swap, enabling exchange between MicroChain tokens with MotherChain native tokens or ERC20 tokens;
2. **FileStorm:** is the MicroChain that utilizes IPFS file system as storage. On top of FileStorm, user is able to perform read/write IPFS functions with Smart Contract. FileStorm MicroChain will periodically verify the file content validity and availability, as well as pay out tokens to storage nodes.

There are another two types of MicroChain under development and will be rolled out soon: RandDrop and IOTMist.

1. **RandDrop:** utilizes BLS signature, to combine signature fragments from multiple consensus nodes into a valid threshold signature, which is further to be used as a seed for random number. The random number could be directly accessed from the smart contract inside RandDrop. The advantage of RandDrop is to eliminate the manipulation possibility by

miners, making the random number secure and liable. At the same time, RandDrop incorporates the communication scheme with only $O(n)$ message complexity, superior to other similar blockchain solution with BLS signature. RandDrop MicroChain is in its alpha by 4/15/2019, will be soon available for large scale test and use.

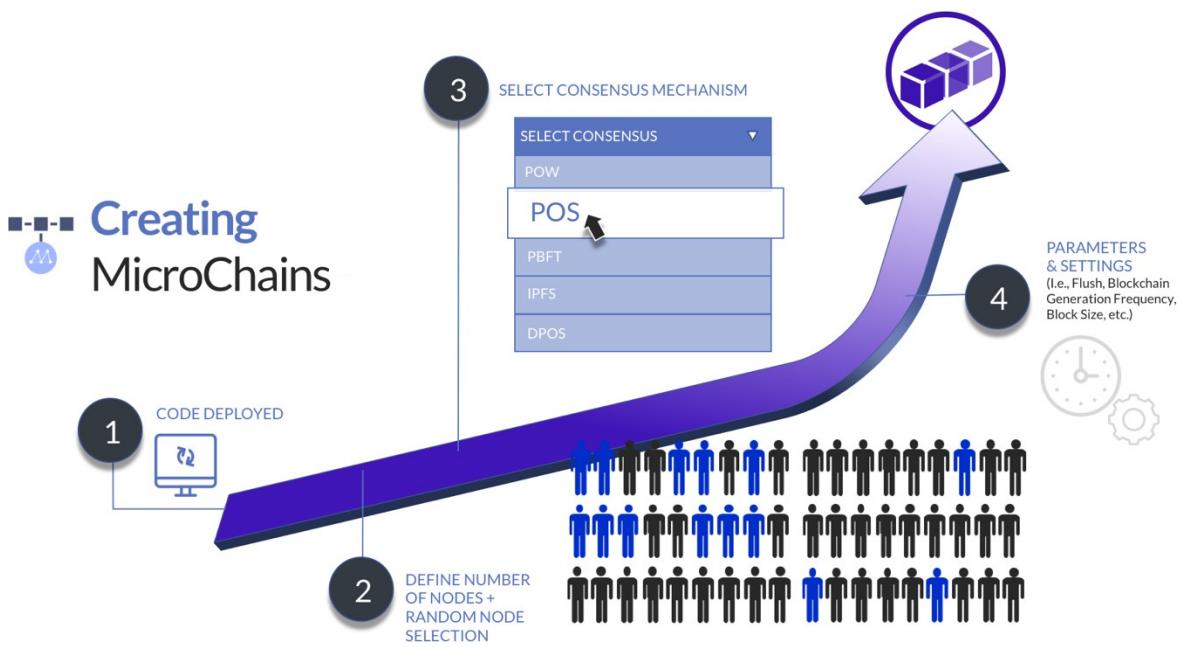
2. **IOTMist**: utilizes both horizontal and vertical scalable mechanism, to support massive nodes by updating consensus layer and p2p layer. IOTMist enabled MicroChain can effectively support large scale IOT applications. Without reducing the TPS for individual MicroChain, combination of horizontal and vertical MicroChains, can be the backbone of real IOT applications.





MICROCHAINS AS A SERVICE

Since MicroChains are isolated, they can run a variety of virtual machines for Smart Contract on a per instance basis. This enables MicroChains to initiate a wide range of business logic and DApp use cases. In addition, it enables the use of different file systems such as IPFS, sensor networks for data storage, and even MicroChains implemented by artificial intelligence.



Since DApps are deployed in a developer-selected virtual machine, they do not require additional programming. MOAC can run existing Ethereum Smart Contracts with lower fees, and developers can leverage the platform's API to expand existing Smart Contract functionality without having to learn how to program the blockchain.

By isolating each Smart Contract with its own unique virtual machine and MicroChain, the MOAC Platform boosts Smart Contracting efficiency, allowing for more cost effective processing fees. This significantly lowers

the cost of deployment for developers, and enables them to build high transaction volume based DApps.



ASYNCHRONOUS SMART CONTRACTS

Using Multi-Blockchain architecture, the platform leverages Asynchronous Smart Contracts with MicroChains to accelerate DApp development and deployment. This advanced architecture design also extends the functionality of Solidity and Ethereum Smart Contracts.

The MOAC Platform supports two types of Smart Contracts:

1. An Upper Layer Smart Contract is a protocol based contract for defining consensus systems within a MicroChain. MicroChain Smart Contracts also enable nodes to register into mining pools.
2. A Lower Layer MotherChain Global Smart Contract defines the behavior of the control flows of multiple MicroChains including flushing, rewarding miners, and how to punish bad actors. It provides a flexible environment that enables DApps to use different kinds of virtual machines including Ethereum, Java (JVM), and other developer-selected virtual machines.

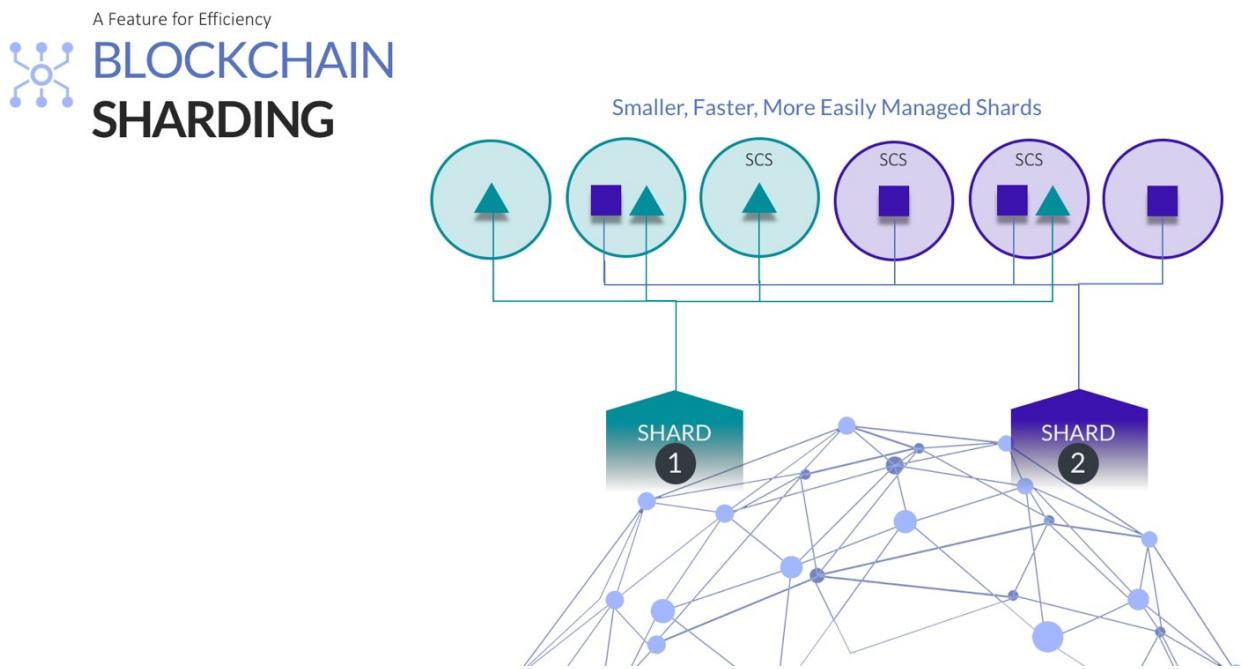


BLOCKCHAIN SHARDING

The MOAC Platform also provides blockchain sharding, a feature to horizontally partition data across multiple blockchains and nodes. Existing blockchain solutions are inefficient and process the same task multiple times which degrades system performance. Sharding helps by using a node based approach, providing more processing power proportional to the number of nodes in the network.

When smart contracts are deployed developers will define the number of service nodes, a consensus protocol, block size, block generation time, and flush frequency. This will then form a shard and provide a byzantine fault tolerant solution for that smart contract, which then forms a MicroChain.

Learn more at https://en.wikipedia.org/wiki/Byzantine_fault_tolerance.



Similar to database sharding, blockchain sharding is a type of blockchain partitioning that separates very large blockchain nodes into smaller, faster, and more easily managed shards.

By using this solution, the platform can scale more effectively, significantly increasing TPS by extending the network with more nodes. Sharding subdivides the whole network into multiple shards, and as long as there are sufficient nodes in each shard, the system is still highly secured. This allows secure processing of parallel

transactions, further increasing the number of TPS over existing blockchain solutions.



CROSS-CHAIN READY

Cross-Chain functionality enables MOAC to interact with a variety of blockchain systems within the platform as well as externally to third party blockchains and cryptocurrencies.



The MOAC Platform can swap blocks and data between multiple blockchains and use atomic swap based Cross-Chains. Cross-Chains are a trust based system for atomically swapping cryptocurrencies in a single transaction between various blockchains and cryptocurrencies.

The MOAC Platform offers three types of Cross-Chains:

1. Atomic swap tokens between MotherChain and MicroChains;
2. Cross-Chains between MicroChains within the MOAC Platform;
3. Atomic swap cross-chain transactions with other non-MOAC blockchain systems like Bitcoin and Ethereum.



EVENT HANDLING

Above the distributed network layer of the MotherChain is an Event Handling system for network event requests and replies. It also processes control flow requests and can invoke Smart Contract related operations. The event handling system relays transaction calls between multiple layers within the platform multi-directionally, and is primarily used for all balance transfers, global Smart Contract control, flushing, and other consensus related messaging.



MINING

Mining is the process by which transactions are verified. It is the means through which new MOAC coins are released and rewarded to miners for the results of their computing processing power and storage.

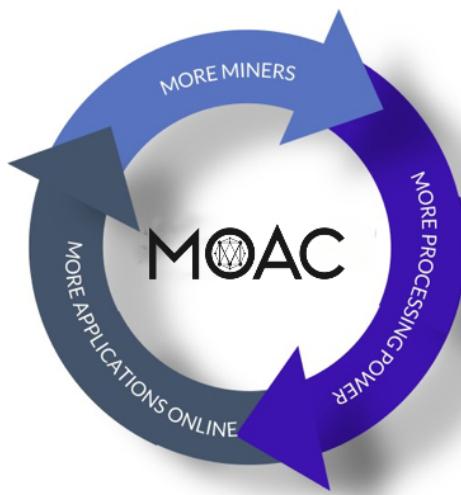
The MOAC Platform has two types of mining:

1. MicroChain Mining

The upper layer of the MOAC Platform where a node verifies transactions for smart contracts and other consensus systems. Each node is rewarded for processing Smart Contracts and verifying transactions. Mining for MicroChains will be rewarded with MOAC tokens and tokens associated with that specific MicroChain.

2. MotherChain Mining

The lower layer is the Proof of Work MotherChain, which is the foundational layer for data processing and storage. Mining on the MotherChain functions similarly to Ethereum, and existing ETH miners can easily switch to MOAC. Mining for the MotherChain is how miners can earn the MOAC cryptocurrency.



WALLET AND PAYMENT SYSTEM

The MOAC Platform features a fully functional wallet protocol. This enables MOAC to work with a variety of 3rd party wallet solutions. Any wallet compatible with the MOAC protocol will work smoothly with the platform.

In addition, MOAC is working with the developer community to develop multiple open source web and desktop wallets which will work on the web, Windows, Mac, iOS, and Android, such as [moacwalletonline](#), [token pocket](#), etc.

API

The platform API provides a quick start for DApp developers by providing easy access points for DApps to access blockchain specific functions without having to know the specifics of blockchain implementation. This enables developers to build complex applications by simply calling those functions from the MOAC Platform.



SECURITY

MOAC prioritizes security first. When developing the platform, the MOAC team reviewed the security settings and measures of all major blockchain systems in order to utilize the best practices in the market. During their audit of existing blockchain security, they found several vulnerabilities in existing blockchain solutions and were able to predict several exploits which have been patched in The MOAC Platform.

When code is committed to the platform there is a thorough security review process in place. The MOAC team - in partnership with other high profile security organizations - has also prepared counter measures and solutions to address common and future attacks. MOAC routinely employs contracted blackhat and whitehat security firms to analyze the platform for vulnerabilities.

MOAC will also be issuing a bounty program for exploits and bugs making it more profitable for hackers to inform on security issues instead of attempting to ransom users. Meanwhile, the platform's intelligently designed architecture isolates each MicroChain, limiting the potential attack capabilities on each Smart Contract.

ECOSYSTEM



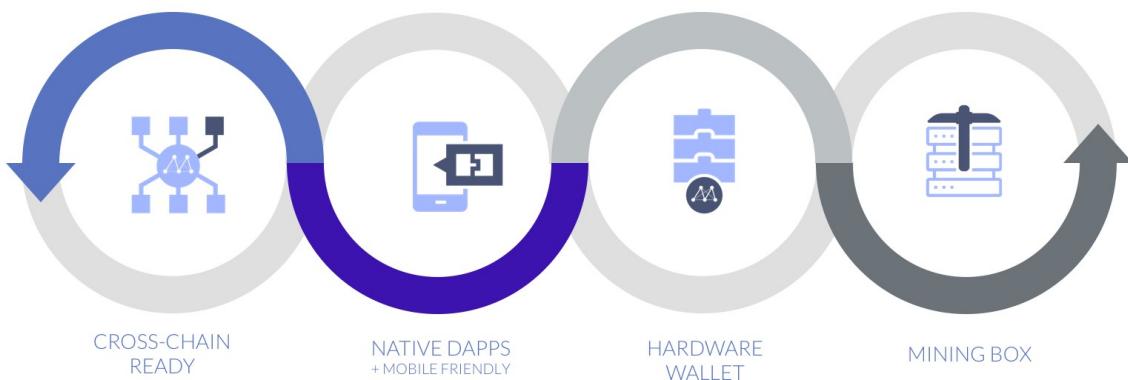
COMMUNITY

At the core of the MOAC Platform are the users that power it, the developers who create DApps, the end-users who use those DApps, and the miners and node operators who keep the network running gracefully.

MOAC will be providing an extensive wiki, tutorials, a glossary of terms, white papers, a knowledge base, help desk, and other user resources, and is committed to staying actively engaged with user communities on Telegram, Facebook, Twitter, and other social media platforms.

ECOSYSTEM FOR INTERCONNECTIVITY

Supporting Developers, Technologies, and Their Growth



The MOAC Platform can be deployed onto all major operating systems such as Windows, Mac OS and Linux/UNIX. The first official MOAC client is written in Golang and other languages will be developed in the future.

The community includes DApp Labs to encourage developer testing and experimentation, enabling developers to test DApps in isolation before releasing them to the public network. The testnet explorer can be found at <http://testnet.moac.io> and developers can get the testnet token from <https://faucet.moacchina.com>.

Beyond Cross-Chain capabilities that enable interconnectivity with other blockchains and cryptocurrencies, the platform also runs on a foundational P2P distributed network. By using a P2P network, the platform is able to provide a distributed network for DApps to interact with each other.

The P2P network is the underlying layer of communication between any singular or grouped nodes running the same protocol. A node in this use case refers to a client that is sharing blocks and transactions across the network. Nodes communicate by sending messages using RLPx, an encrypted and authenticated transport protocol.



DAPP DEVELOPER BENEFITS

| | | |
|---|---|---------|
|  MOAC June 2018 | | 100,000 |
|  ETH 07.2015 | https://github.com/ethereum/wiki/wiki/Sharding-FAQs | 15* |
|  ETH 2.0 Fall 2019 | https://github.com/ethereum/wiki/wiki/Sharding-FAQs | 100,000 |
|  EOS 06.2018 | https://medium.com/eosio/eosio-dawn-3-0-now-available-49a3b99242d7 | 8,000 |
|  ADA 09.2017 | https://theindependentrepublic.com/2018/04/03/cardano-ada-scale-2018/ | 4,000 |
|  NEO 07.2016 | https://steemit.com/cryptocurrency/@pandorasbox/trinity-lightning-network-for-the-neo-blockchain | 1,000 |
|  ICON 02.2018 | http://cryptocurrencybitcointips.blogspot.com/2017/12/why-icon-will-be-top5-coin-in-terms-of.html | 9,000 |

- **Quality of Service**

DApps will run more efficiently on the MOAC Platform when compared with other platforms. Since Ethereum is limited by its scalability and transactions-per-second, it inherently cannot handle large transactions and computation volume. That is why a simple game like CryptoKitties caused a traffic jam in the entire Ethereum network. A similar jam caused as a result of 10 apps or 100 apps running together on Ethereum could be even more catastrophic.

Learn more at <http://www.bbc.com/news/technology-42237162>

| FEATURES | MOAC June2018 | ETH 07.2015 | ETH 2.0 Fall 2019 | EOS 06.2018 | ADA 09.2017 | NEO 07.2016 | ICX/ICON 02.2018 |
|--------------------------|------------------|----------------|----------------------|----------------|----------------|-------------------------|-------------------------|
| Decentralization | Y | Y | Y | NA | Y | NA | NA |
| Cross | Y | NA | Y(Polkadot) | NA | NA | In WhitePa- per only | In WhitePa- per only |
| IPFS | Y | NA | NA | NA | N | NA | NA |
| Flexible system contract | N | NA | N | NA | NA | NA | NA |
| smart contract | Y | Y | Y | Y | Y | Y | Y |
| Asyn-smart contract | Y | NA | NA | NA | NA | NA | NA |
| EVM | Y | Y | Y | NA | Y | NA | NA |
| System TPS | 100,000 | 15* | 100,000 | 8,000 | 4,000 | 1,000 | 9,000 |
| Sharding | Y | NA | Y | NA | LAYERED | NA | NA |

- **Cost**

It is very costly to run a Smart Contract or DApp on Ethereum. Each transaction initiated or triggered by the Smart Contract requires a certain amount of gas. The average amount of gas per transaction is very high, which means the cost per transaction is very high. If some Smart Contracts trigger many transactions, that means the developers or users of the Smart Contract must pay a lot of currency, crypto or otherwise, to maintain the DApp.

The MOAC Platform boasts lower-layer transaction costs at 1/10th the cost of Ethereum, and the upper layer contract calls are free.

| SMART CONTRACT | MOAC | Ethereum |
|-------------------------|--|-----------------|
| Default Block Gas Limit | 9,000,000 | 8,000,000 |
| Transaction Fee | 1,000 | 21,000 |
| Global Contract Gas | 100,000-200,000 | 100,000-200,000 |
| Direct Contract Gas | NO FEE | N/A |
| BOND | CONFIGURABLE | N/A |
| DEPLOY | Pay Gas Fee to VNODE | Pay Gas Fee |
| MAINTENANCE | MicroChain owner pay rewards to SCS | NO FEE |
| USER | NO FEE | PAY GAS FEE |
| CONSENSUS | Flexible at MicroChain, POW at MotherChain | POW |

- **Flexibility and Simplicity**

Most DApps only have their transaction logic in Ethereum, while the rest of the logic and components are “off-the-chain” solutions-, relying on traditional server and databases, making them centralized systems. By contrast, DApps deployed on the MOAC Platform maintain decentralization. MOAC also provides upper layer MicroChains for CPU computation, GPU computation, file storage, databases, and many other services, while maintaining a decentralized structure.

- **Cross-Chain**

The MOAC Platform is the only blockchain platform available with Cross-Chain capabilities.

Now developers can switch between tokens within specific DApps and are not limited to any specific platform or technology. Any Bitcoin, Ethereum, or other cryptocurrency user will be able to interact with MOAC DApps without going back and forth between exchanges. Without MOAC, a user cannot easily process a transaction between Bitcoin and Ethereum. Unfortunately, each existing blockchain system is like an island, without any bridges between them.

Imagine a world where every website and mobile app is unable to communicate via the internet and IoT we know today. MOAC Cross-Chain technology makes connectivity possible, a potential yet to be realized in the market with promising high-impact use cases in the future.

- **One-Click-Chain**

The MOAC Platform developed a tool to help developers deploy their own MicroChain. One-Click-Chain (OC2) is a script that developers can use to launch their own MicroChain on MOAC with minimal efforts. Thus, developers can focus on his business logic instead of spending time to develop a blockchain.



EXCHANGES

The exchange is a decentralized exchange (DEX) for swapping various cryptocurrencies with no centralized server or 3rd party authority governance. It is instead governed by a decentralized system.

Within the platform, a MicroChain can be deployed to provide the founda-

tion of the DEX. In addition, a MicroChain based DEX could be developed to gather trade information, match buyers and sellers, and provide the decentralized atomic swap for users. MicroChain can implement Cross-Chain consensus protocols and can provide miners access to both.

The Cross-Chain consensus protocol utilizes unique features of the platform to create hash-and-time-locked transactions. A MicroChain will provide the atomic swap function for exchange between the MOAC Platform and external blockchain tokens. Similar MicroChains can be deployed to enable the exchange between MOAC coins, BTC, ETH or LTC.

A user holds all coins in his wallet via DEX until a successful swap happens. Unlike a centralized exchange, the user benefits with a reduced risk of the coins being stolen. All DEX exchange information is public and available to all, thus mitigating fake orders, and providing for a healthier marketplace.

TOKENS

MOAC's Smart Contract system is fully compatible with Ethereum's EVM system, supporting ERC20 and ERC721 token standards.

MOAC COIN MARKET CAPITALIZATION

The initial supply of MOAC coin is 150 million. The MOAC foundation holds about 53 million coins and the rest is in circulation. The value of MOAC coin fluctuates daily, and can be found at CoinMarketcap.com (<https://coinmarketcap.com/currencies/moac>).

The MOAC coins first issued as ERC20 token on Ethereum in July 2017. After MOAC mainnet was successfully launched in April 2018, all the MOAC coins on the Ethereum were exchanged to MOAC native token with a 1:1 ratio. The ERC20 contract of MOAC was closed in 2018 and there is no ERC20 token of MOAC on Ethereum platform anymore.

Six million additional coins per year will be generated during mining, further increasing the supply in circulation. After 4 years, the production will halve to 3 million, then will halve again the following 4 years. The total supply will be 210 million coins by 2058.



GOVERNANCE

MOAC Blockchain project (MOAC) is managed by the MOAC Foundation, a cooperative not-for-profit organization, founded in Singapore. The MOAC Foundation is the entity responsible for efficient use of funds resulting from any token sales from the MOAC Reserve. Responsibility for all platform development (including development of applications and associated services), ongoing maintenance, and support (including public educational content for the community) is provided by the MOAC Foundation

The MOAC Foundation's vision is to interconnect and grow blockchain markets through harmony, accessibility, and ease of use.

MOAC Blockchain Tech, Inc. is a registered for-profit U.S. entity with executive offices in Palo Alto, California and extended development teams in Shanghai, China. MOAC Blockchain Tech was a major tech provider of MOAC project.

The MOAC Foundation is also working with other companies and organizations to expand MOAC community and provide services, such as Jingchang tech, Sparkchain inc., Token Pocket, etc.



- **Moodada**

Moodada is a fully decentralized app (DApp) based on MicroChain. It is a tokenized application that rewards users for answering questions. Participants can place a bounty on any question and crowdsource voters to determine the best response. Tokens placed in the bounty pool will automatically distribute to voters and responders in tiers based on criteria such as participation or best answer. More information can be found at <https://www.moac.io/newmoodada.html>.

- **FileStorm**

FileStorm is a decentralized storage network built on top of IPFS protocol and MOAC Blockchain. InterPlanetary File System (IPFS) is a file sharing protocol on a P2P network. By using MicroChain service on MOAC platform, FileStorm implemented data verification consensus on IPFS and can become next generation big data storing, processing and sharing platform, which is much more cost efficient than today's cloud storage service. More information can be found at <https://www.filestorm.net>.

- **PAS**

Planet Accuracy Simpler (PAS) project is to provide centimeter precision location and nano second accurate timing service by using the Geobee node (GNSS raw measurements receivers) as a mining machine in the MOAC MicroChain. The Geobee node receives satellite navigation observations to form a data source. Through the registration in network, a qualified miner node will be identified and examined by the system, and only miners whose data sources are of acceptable quality will be rewarded PAS tokens. Users of the data need to pay PAS token to get the real time streaming service from GNSS stations. This process happened automatically by using smart contract on the MOAC MicroChain. In addition to the mined token, the network will reward miners extra token for continuity and long-term stability. Over time, more nodes can maintain long term stability. Therefore, the generation, use and consumption of tokens form a closed loop.

- **Big Data Exchange**

Big Data Exchange (BDE) is a platform built on the MOAC MicroChain to exchange data products. In traditional data trading platforms, data products from the sellers were stored in the data exchanges, which brought big concerns in data safety and copyright protection. It is also difficult to make both buyers and sellers have a consensus on the data trading records, which could bring problems in the accounting reconcile. Using MOAC MicroChain and its smart contract, BDE can execute data trading without saving actual data in the platform. It can also reach consensus among multiple groups easily and make trading records publicly available on the MicroChain. Using BDE, we can ensure both data safety and trading security for data exchanges, and further promote the data market.

PRODUCT EVOLUTION AND ROADMAP





Sha Zhou Founder



Mr. Sha Zhou founded MOAC foundation in 2017. He has led and backed multiple high tech companies, focusing on block-chain, VR/AR, robotic engineer, and autopilot technology. The portfolio companies that Sha invested and manages include Jingtum Tech, Outpost, Tersus, Wellwit Robotics, etc. Sha has authored several books about blockchain and big data, including "Blockchain World" and "Blockchain and Bigdata". Sha has extensive technical and managerial experiences in computer, communication and data networking industries.

David Xiaohu Chen Co-Founder



David Xiaohu Chen is a blockchain theorist and cross-domain software engineer- architect with extensive experience. David has a deep passion in emerging technology, having built his career in Silicon Valley for decades as an executive technologist. Before MOAC, he was the CTO and one of the original founders of Jingtum Tech, a leading blockchain platform and solution provider for physical asset tokenization.

MOAC Foundation Structure



APPENDIX A: DISCLAIMER

All of the technology in this paper is currently in early development, and is subject to future changes, improvements, and innovations. While MOAC Blockchain Tech, Inc. does take security seriously, platforms may still have bugs, which is why there is a bug bounty program.

There is no warranty or assurance that the process for creating and processing cryptocurrency on the platform will be uninterrupted or error free, and there is an inherent risk that the software could contain defects, weaknesses, vulnerabilities, viruses, or bugs. Additionally, all cryptocurrency has risks associated with acquisition, storage, transfer, and use of tokens or coins, and the MOAC Platform is subject to the same risks.

For more information on risks associated with using the MOAC Platform please read our terms of service on our website.

APPENDIX B: LIST OF TERMS

Bitcoin

Bitcoin is a distributed ledger based cryptocurrency that uses a Proof of Work consensus system requiring miners to process the creation of new coins.

Blockchain

The underlying distributed database technology that powers decentralized ledger systems and cryptocurrencies.

Consensus System

A system, protocol, or algorithm used to reach a general agreement. In this context, it refers to a blockchain based cryptocurrency agreeing to the verification of a transaction or Smart Contract.

Cross-Chain

The capability to move data from one blockchain to another using a atomic swap exchange.

Cryptocurrency

A digital currency based on a distributed ledger powered by blockchain technology.

Decentralization

A system that does not rely on a centralized authority for approving transactions.

Decentralized Application (DApp)

An application where its backend code is running on a decentralized peer-to-peer network with multiple nodes or hosts, as compared to a traditional cloud app that runs on a centralized server.

Distributed Computing or Network

A model where components of a software system are shared among multiple computers to improve efficiency and performance.

Ethereum

Ethereum is a distributed computing platform for Smart Contracting that uses a ProofofWork consensus system requiring miners for processing data.

MicroChain

The upper transactional processing blockchain layer for the MOAC Platform that operates on a per Smart Contract basis.

MOAC

MOAC Blockchain Tech, Inc. and its team, that have developed the MOAC Platform.

MotherChain

The bottom data processing and storage blockchain layer within the MOAC Platform.

The MOAC Platform

A blockchain system created by the MOAC foundation (MOAC). It utilizes Multi-Blockchain architecture as its underlying technology to achieve high performance Smart Contract execution, increased transactions-per-second (TPS), and improved scalability.

Multi-Blockchain

The architecture used in The MOAC Platform with MotherChain as its bottom primary blockchain and upper sharded children MicroChains.

Node

A redistribution point in a network, commonly used for connecting peers and/or verifying transactions.

Peer-to-Peer Network (P2P)

A network where each computer can act as a server for others, and allow shared access to files, data processing, and storage without the need for a centralized server.

Proof of Stake

A type of algorithm by which a cryptocurrency blockchain network aims to achieve distributed consensus. The creator of blocks is chosen via various combinations of selection such as wealth or age.

Proof of Work

A system, protocol, or algorithm that is an economic measure to deter denial of services attacks and other service abuses such as spam by requiring computational work from the service requester, commonly processing time by a computer.

Sharding

A feature to horizontally partition data and events across multiple blockchains and nodes.

Smart Contact

A computer protocol intended to digitally facilitate, verify, or enforce the negotiation or performance of a contract. Smart contracts allow the transparent performance of credible transactions without third parties.

Smart Contract As A MicroChain

A Smart Contact as a MicroChain is a Smart Contract with its own unique blockchain, or “MicroChain”, providing for Smart Contract isolation between other Smart Contracts and a more efficient overall systems.

SCS

Smart Contract Server(SCS) is the application running MicroChains in the MOAC network. It can mine MicroChain blocks, transfer MicroChain tokens, and execute the Smart Contract on the MicroChains.

VNODE

Verification node (VNODE or V-node), is the application that running a full MOAC MotherChain node in the MOAC network. It can mine blocks in the network, transfer moac, perform the POW consensus, and pass MicroChains data in MOAC network.

The logo consists of the letters "MOAC" in a bold, white, sans-serif font. The letter "O" is replaced by a stylized icon resembling a molecular or geometric structure, composed of several points connected by lines.

MOAC

www.moacfoundation.org