

TrueChain White Paper 2019

The Blockchain Infrastructure for Global Asset
Transaction and Decentralized Applications



TrueChain

V2.0

TrueChain Foundation

Contents



Background	01
The Rise of Global Digital Asset Transactions	
TrueChain's Consensus and Technology	02
Minerva Hybrid Consensus	
Incentive Model	04
Governance	05
Ecosystem	06
Global Developer Community & Dapp Development Support	
TrueChain Developer Platform	
TrueGlobal Competitions	
TRUE Holder Communities	
Tools and Dapps	
Tokenized Assets (Coming Soon)	
Roadmap	08
Founding Team and Key Contributors	10
Research and Developers Community	
Growth and Operation Community	
Advisors	
Token Utilities and Token Distribution	14

TrueChain is decentralizing global asset transactions.

Background

The Rise of Global Digital Asset Transactions

Over the past two years, there have been a number of public blockchains. Each of these blockchains adopts a certain kind of consensus. All wanted to solve the impossible triangle problem and achieve efficiency, decentralization, security in the same time.

A public chain that truly solves the impossible triangle problem could ultimately support potential large volume of transactions of digital assets worldwide in a decentralized financial infrastructure that is totally independent of centralized authorities and centralized trust.

There are three trends that we pay most attention to:

- A. The liquidation of digital assets on blockchain**
- B. The tokenization and liquidation of all financial assets and real estate assets on blockchain**
- C. Enterprise applications on blockchain**

These trends are providing real values to public blockchains after the fall of utility tokens.

Therefore, we need a public chain to have following features:

- A. Permissionless**
- B. Efficient, or fast**
- C. Secure**
- D. Decentralized**
- E Right gas model to incentivize miner communities and token holder communities**

TrueChain is building up such a public blockchain and the ecosystem around it. This whitepaper will brief consensus, architecture, incentive

model, and TrueChain ecosystem. There are more details available on Web. For technical details, there is a yellow paper at <https://arxiv.org/abs/1805.01457>. For public chain developers, the GitHub link is <https://github.com/truechain>.

TrueChain's Consensus and Technology

Minerva Hybrid Consensus

After the invention of smart contract mechanism by Ethereum, there has been a continuous evolution of consensus technologies. The first stage was to improve efficiency of blockchain networks by adopting protocols that use delegation to reduce processing nodes. Among these technologies, DPoS was the most successful and mostly adopted. However, there is a fatal problem of DPoS chains -- the inability to support decentralized trust ultimately, and the inevitable fate to be reduced to a centralized infrastructure.

There are a number of trials to invent consensus technologies that could solve the impossible triangle:

- A. Casper is a roadmap that eventually transforms ethereum into a PoS public chain**
- B. DAGs are consensus mechanisms that allow parallel processing of transactions normally on a PoW chain**
- C. Hybrid Consensus is a way to allow a BFT protocol to work in a permissionless environment**

TrueChain adopts its own version of hybrid consensus.

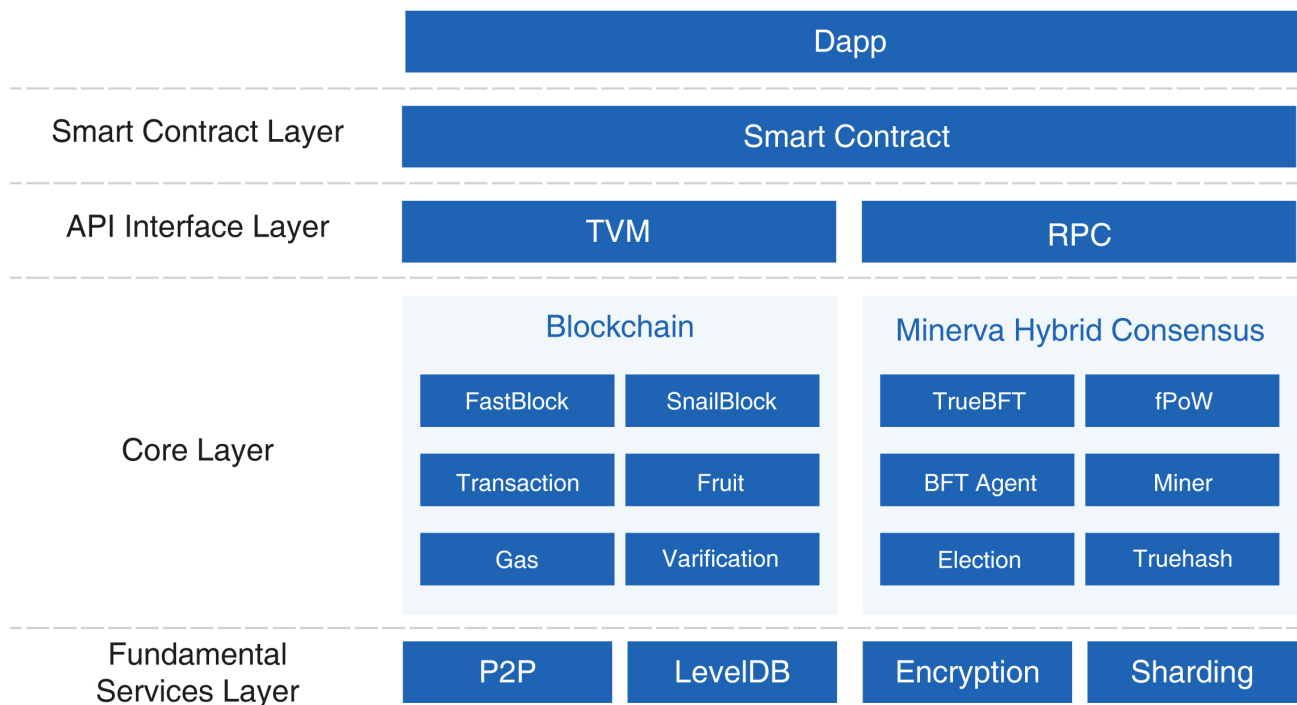
Hybrid consensus was firstly proposed on a research paper (<https://eprint.iacr.org/2016/917.pdf>) as a theory. TrueChain's core research team and core engineering team largely improved the original proposal and delivered the first working implementation. There are few key features of Minerva Consensus:

- A. Replaced Nakamoto PoW (traditional PoW protocol) with fPoW**
- B. Designed TrueHash, a fundamentally ASIC-resistant algorithm**
- C. Designed a working architecture of PBFT-fPoW consensus protocol**

The fPoW protocol eliminates selfish mining attack (a.k.a 25% attack) and brings miners of different hash powers to the miner community. TrueHash makes ASIC mining hard. The PBFT-fPoW hybrid consensus achieves speed, decentralization and security.

The architecture of TrueChain is as below.

TrueChain Blockchain Technology Architecture



TrueChain is implemented as a double-chain structure (Fast Chain and Snail Chain).

The block of Fast Chain, which mainly contains the transactions and smart contracts, is generated by the BFT committee when they reach a consensus. Similar to Ethereum block, fast block provides TxHash, Root, ReceiptHash for other non-members to verify transactions included at fast block body.

The block of Snail Chain contains several fruits, and each fruit stamps the corresponding fast block. Fruit is hanged on snail block, when a fruit points to a fast block, the fruit stamps the fast block's hash and number in it. Every fast block has only one fruit to stamp its hash and number.

TrueBFT is PBFT implementation of truechain. The classical PBFT assumes less than $\frac{1}{3}$ of the participating nodes are corrupt. TureBFT assumes mildly adaptive adversary model to improve the chain quality.

The committee instance is switched after a fixed period of time (with the snail chain as a logical clock). The members of the next committee are chosen from Fruit and Block Miners of the current committee.

Truehash is the mining algorithm for TrueChain and is a fundamentally achieving ASIC resistant algorithm. The implementation of truehash is to set a group which is complex enough. The principle of truehash's switching algorithm is that the group elements will be changed every 12 thousand snail blocks and composed by these snail blocks. Because the hash value of the block is unpredictable in advance, it's impossible for anyone to know anything about the new algorithm. From the last cycle, to the algorithm being invalidated, there is only 88 days in total, so it makes no sense to produce ASIC in such a short period of time.

Incentive Model

The Ethereum block incentive model and gas model have been widely adopted for a long time in many public chains' designs. Over the year 2018, utility tokens have been largely failing because most of them are not backed by valuable assets. In other words, the value of utility tokens are unsure and their economic models are generally not successful. For example, a utility token with only economic model but no revenue would fail miserably.

Therefore, public chains have to support such asset backed tokens. The key to this problem is incentive model. The economic model of ETH has to be re-thought and a new incentive model has to be proposed to fulfill the needs of valuable transactions.

There is a recent article from TrueChain's research community stating the problem of Ethereum incentivization mechanism. https://www.reddit.com/r/ethereum/comments/arsu33/on_the_security_economics_of_public_blockchains/

An proper model has to incentivize more hash power with larger on-chain asset value in order to provide corresponding level of security to the network. Therefore such an incentive mechanism has to build a linkage between TRUE token and the gross value of assets being liquidated on TrueChain.

TrueChain is planning to implement three mechanisms. Combined they form the new incentive model.

A. Allow tokens to be used as gas fee

B. Token gas fees are distributed to miner communities according to miners' stake (TRUE token * days) and mining results (blocks and fruits successfully mined in history)

C. TRUE token awards for successful block & fruit mining

Governance

TrueChain's goal of governance is to ultimately establish a decentralized governing model. At the time TrueChain was founded, it was contributed mostly by the founding time. In summer of 2018, TrueChain Foundation currently established a board of directors (7 people). Each of the seven directors is in charge of one part of the foundation's governance -- research, core engineering, product development, developers community & human resource, global token holders community, marketing and ecosystem building. Together the board directors make strategic and managerial decisions.

Given the blockchain industry's fast pace, the foundation's board is serving two purposes:

A. Risk control of the decision making process

B. Encourage thorough understanding of problems and improve decision quality

There is an elected president for the board of directors. The president's most important responsibility is to coordinate between each part of the foundation's work and guarantee that TrueChain's strategies and plans are well executed. This president is acting as an effective "CEO" of the project, but is re-elected every 3-6 months.

This governance model will last until TrueChain's mainnet is supporting a fairly large amount of tokenized assets on-chain and TRUE tokens are greatly distributed across large number of holders worldwide. After that, TrueChain will enter the era of totally decentralized governance. Under a decentralized governance model, TrueChain will form a Committee of Representatives that is elected by all TRUE holders, and a president will be elected from the Committee of Representatives by all TRUE holders.

A term limit will be imposed on both the committee and the president, with enforcement of smart contracts on TrueChain that transfers the rights of using Foundation funds to the newly elected committee.

Ecosystem

Global Developer Community & Dapp Development Support



There are over 3000 developers in TRUE tech community. The majority of them are from China, America, India, Singapore, and Vietnam.

TrueChain Developer Platform

TrueChain's in-house product team has built a developers' platform to support deployment and management of smart contracts. To access is, go to link <http://dev.truechain.pro/>

TrueGlobal Competitions

TrueGlobal is an on-going, independent community effort to support Dapp developments on TrueChain across the world. The first round of TrueGlobal competition has finished in Jan 2019 with more than 20 Dapps submitted to TrueChain's BetaNet.

TRUE Holder Communities

Over one year, there has been more than 150,000 TRUE holders worldwide. Active communities are located in East Asia, South-East Asia, Mid-East, North America and Europe. TrueChain has built up a network of community nodes (a.k.a. contributors) in each country.



There are more than 150,000 TRUE holders worldwide

Tools and Dapps

Blockchain browsers: TrueScan, TrueLens;
Games: BC.GAME, AIPACA, TrueHeart Game, TrueCard, TrueHonor Red Packet;
Enterprise Dapps: Pickus, Base.io, True Art, Rose Chain;
Layer 2: ShineChain, Smartins, Nest, Traceability;
Wallet: True Wallet 3.0, Meta True, Money Safe;
Tokenization: TrueST(PandaST), DigiST;
Others: One True for All

To be continued

Tokenized Assets (Coming Soon)

Roadmap

Genesis Phase

From Sep 2017 to Oct 2018
(Completed)

- ✓ TrueChain's white paper v1.0 released
- ✓ TrueChain's PBFT consortium chain released
- ✓ TrueChain technical yellow paper v1.0 released
- ✓ Hybrid consensus mechanism design completed
- ✓ Stellar -- smart contract management engine -- released and open sourced
- ✓ TrueChain's engineering roadmap released on github
- ✓ TrueChain Light Wallet released
- ✓ TrueChain's election system for decentralized nodes released
- ✓ TrueChain has been listed on OKex, ZB, BitThumb, HitBTC and many other major exchanges
- ✓ Globally TrueChain's token holder exceeds 100k
- ✓ Hybrid consensus framework code open source
- ✓ TrueChain Foundation Board of Directors Elected
- ✓ Hybrid consensus incentives release
- ✓ TrueChain technical yellow paper v2.0 released
- ✓ TrueChain TestNet -- BetaNet released
- ✓ TrueChain's First Blockchain Explorer TrueScan launched
- ✓ Developer platform released
- ✓ >10 Dapps running and testing on TrueChain BetaNet

Columbus

From November 2018 - Dec 2019
(In Process)

- ✓ Support security token issuance platform PandaST
- ✓ Design TrueST Protocol
- Implement 3rd-party gas payment agent
- Main Net Launch
- Reform gas fee mechanism
- Reform public chain incentive model
- Increase and stabilize mining hash power for main net to ensure high-level security
- >100 Dapps & Asset tokens on TrueChain
- >10 Million USD asset value issued on TrueChain
- >500k TRUE token holders globally
- Add Zero-knowledge Proof and related privacy features

The Republic

2020 Onwards

- >1000 Dapps & Asset tokens on TrueChain and keep fast growth
- >1 Billion USD asset value issued on TrueChain and keep fast growth
- >1 Million TRUE token holders globally and keep fast growth
- Decentralized governance

Founding Team and Key Contributors

Research and Developers Community

Eric Zhang

Board Director and Executive President

MSc Computer Science, Oxford University

B.E. Computer Engineering, University of Minnesota Twin Cities

Worked at CERN Openlab

Organizer of CERN Webfest, THacks

Founder of DoraHacks, the most active hacker community and hackathon organizer in the world

Yang Liu

Board Director and CTO

B.S. & M.S. Computer Science, Tsinghua University

10+ years experience in system architecture

Expert in cryptography and algorithms

Qingsong Zhou

Board Director and Product Team Lead

Co-founder & Former CTO of Honest Doctor

More than 10 years experience in large-scale distributed systems, architectures and products

Ming Tian

Integration Lead

Golang development engineer with more than 10 years of c/c++ development experience and responsible for large projects

Experience in implementing digital currency trading platform and cryptocurrency wallets

Felix Cai

Frontend Engineering Lead

Xi'an Jiao Tong University Youth Class.

Champion (1st prize) at DoraHacks Autumn@Xi An 2017

Handeric C

Research Community Lead

PhD in Mathematics

Deep experience in blockchain consensus mechanisms, cryptography and

security.

Seay (wizard)

Security Coordinator

The blogger of well-known security blog "cnseay.com"

Former lead of an Alibaba security laboratory

Served Alibaba security, Sobug Technology

10+ years experience in network security, attack and defense

Brian Liu

Blockchain Evangelist

MSc and B.S from Peking University

Author of "Blockchain: 101"

10+ years experience in software development, leading and coaching high performing teams

Worked at IBM China Development Lab (CDL) High Performance Computing team

Worked at "LERO", an Irish software engineering research center's distributed systems group

Binqi Tang

Senior Developer

Former manager of Shengzhen Coship electronics company's development department

Former Architect of Jwinlink

Former Architect at 58 Home

Growth and Operation Community

Xiaoyong Cheng

Board Director and Chief Strategy Officer

Part-time Researcher at Tsinghua University

Executive Director of China Cloud System Industry Innovation Strategy Alliance

Member of Chang An Club.

Larry Lin

Board Director and Chief Development Officer

Expert of Internet Marketing and Community Operation

Was responsible for the operation of "Baidu Encyclopedia", the largest collaborative community in China. Larry has more than 10 years of digital

advertising and Internet industry experience, he was the author of several bestsellers in digital marketing.

Maria Gu

Marketing and PR Head

BComm in Marketing, Canada

5 year experience in business analysis at one of the largest telecommunication companies in Canada

International marketing and PR experience in Fintech and Blockchain industry

Hillary Nguyen

TrueChain Vietnamese Partner

Managing partner of AlphaWhale Capital.

A strategist, advisor, communicator, consultant, community influencer and Speaker in blockchain and digital asset management.

Diverse set of skills, Hillary executes her management role effectively into the new foundation of company in 4.0 revolution.

Paulus Pham

TrueChain Vietnamese Community Partner

Blockchain community management professional

Pingping Wang

TrueChain Strategic partner of Korea

China Business Director of Element

Money Today Innovation Strategy Team Reporter One Asia Reporter

Asia Today Multimedia Desk & International Reporter

Sun-Woo Chu

TrueChain Strategic partner of Korea

Founder & CEO of Element

Global Finance Society's China committee chairman Former Editor-in-Chief of Strategy Team Asia at Money Today Innovation

Multimedia Desk Editor/International Editor at Asia Today

Advisors

Chuizhou Lin

Member of the Royal Swedish Academy of Engineering Sciences and Hong Kong Academy of Engineering Sciences

Former Vice Principle of Hong Kong University of Science and Technology, Former President of Industrial Technology Research Institute

Former Visiting Professor of National University of Singapore, Tsinghua University, University of Science and Technology of China, Shanghai Jiaotong University and many prestigious Institutions at home and abroad.

Yushi Shen

Secretary General of China Cloud System Industry Innovation Strategic Alliance, Bachelor of Electronic Engineering from Tsinghua University, Master of Science and Doctor of Computer Science from the University of California-San Diego. National Thousand Talents Program Review Specialist, Tsinghua University and many other university researchers. He has served as a strategic consultant for Microsoft Corporation, head of cloud computing government affairs and business development in China, and worked at Microsoft headquarters from 2006 to 2012 as a senior software architect.

Puntil Jongjittrakoon

President of Thailand Crypto Beach Association

Jimmy Zhao

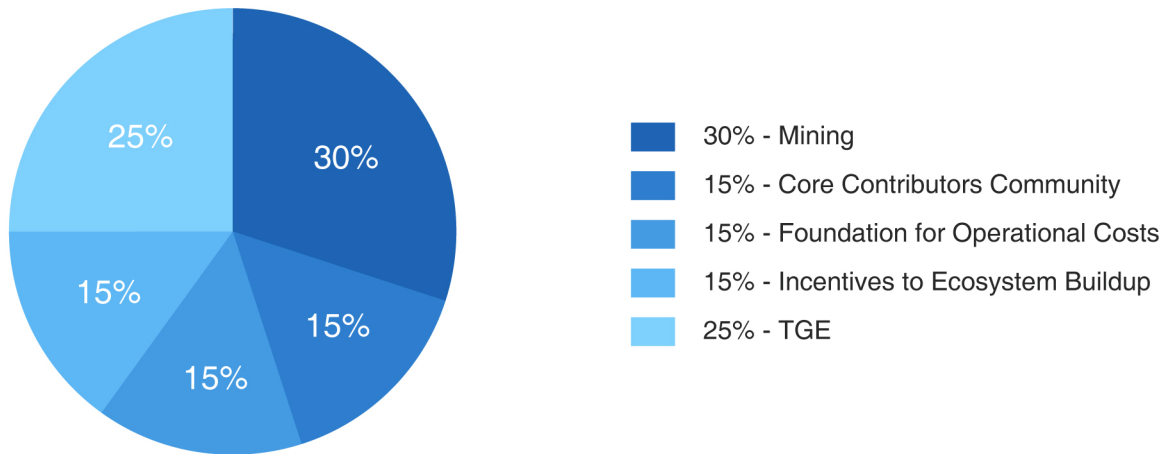
Founder of ZBX.COM(European branches of ZB),

Founder of Cryptonord (Cryptonord is the Cornerstone Investors of TrueChain)

A prominent figure in the blockchain industry of Europe, Jimmy manages a fund of 10,000 bitcoins

Token Utilities and Token Distribution

TrueChain's mainnet currency is TRUE token, a utility token for transaction gas and staking. The total amount of issuance is 100 million TRUE tokens. The proportion of TRUE distribution is shown as follows:



TRUE allocated to the TrueChain core contributors' team and community members will be restricted by the long-term weighting schedule, and the specific contract rules are as follows:

- A. 20%, or 3000000 TrueChain Currency (TRUE), is released after 3 months of token distribution.**
- B. 25%, or 3750000 TrueChain Currency (TRUE), is released after 12 months of token distribution.**
- C. 25%, or 3750000 TrueChain Currency (TRUE), is released after 24 months of token distribution.**
- D. 30%, or 4500000 TrueChain Currency (TRUE), is released after 36 months of token distribution.**



TrueChain

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