

MULTI-X BLOCKCHAIN

Factor

Blockchain integrated development platform

Our Factor main Blockchain development has been a success. Existing coins (Ethereum, Quantum, Neo etc) or new developers, have to use the several blockchains. With Factor Blockchain's high scalability and compatibility we can create a more comfortable and convenient inte grated system.

> Business Introduction V 1.0 Factor Development

MX Blockchain is a platform that embraces the fourth industrial revolution!

FACTOR

Factor MX Blockchain

Factor MX Node

FACTOR DApp

Factor Blockchain was developed to be the cornerstone of the next generation of Blockchain technology. Factor Blockchain was developed to integrate current blockchains (such as Ethe reum, Quantum, Neo). It also reinforces network stability, security and connectivity via Factor MX-node and the Factor Block design. Factor makes the job of the developers easier, ena

bling them to create Dapps able to communicate with a variety of blockchains.

For that reason, Factor Blockchain is the next generation of blockchain technology.



Chapter



FACTOR MX BLOCK CHAIN TECHNOLOGY INTRODUCTION



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FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION

01-0. Introduction

Factor Blockchain is leading the 4th Industrial Revolution, by providing the core technology to integrate current blockchains

Factor Blockhain integrated successfully the mainstream blockchains (such as Ethereum, Quantum, Neo...) using:

- An innovative and patented block design (composed of several hash functions).
- An innovative and patented node design (inspired from Gossiping protocol).
- A developer environment running on Factor MX Blockchain that we Factor team have used to develop a

Dapp creating a link between the different integrated development environment (IDE) supported by factor blockchain







FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION

01-1. MX Blockchain Hash Function

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MX Hash Function	Supported Algorithms	Characteristics	Advantages	

The MX Platform is a self-developed, decentralized operating system, power ed by a coin mining Hash algorithm (MX Hash Function) creating a blockchain.

What is Factor MX-Blockchain? MX(Multi X) Blockchain is a platform which integrates 26 hashes function (patented) with secp256r1.



[Picture 1: Structure of the Factor MX Blockchain



FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION

01-1. MX Blockchain Hash Function



Algorithm	Hash Value Size	Internal Size	Block Size	Length Limit	Word Size	The number of progress	Computing Used	Note
SHA-0	160	160	512	64	32	80	+, and, or, xor, rotl	
SHA – 1	160	160	512	64	32	80	+, and, or, xor, rotl	
SHA – 256/224	256/224	256	512	64	32	64	+, and, or, xor, shr, rotr	
SHA – 512/384	512/384	512	1024	128	64	80	+, and, or, xor, shr, rotr	





FACTOR MULTI-X BLOCKCHAIN

Technology introduction



FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION

MX Hash Function

Supported Algorithms

Characteristics

3

Advantages

Success in developing a hash function compatible with POW and POS method

Factor MX-Block uses several algorithms to form its key pairs. Unifying the various algorithms into a Secp256r1 key Therefore it is different to the Secp256k1 key used by Bitcoin. Ethereum, and Neo etc...



- MX Blockchain developed a block which is compatible with both POW and POS methods.
- MX Blockchain uses several algorithms to for m a block, unifying the various algorithms to generate its private key and public key pair. It i s different technology to the one used by Bitc oin, Ethereum, Neo etc, which all use a Secp 256k1 key pair.



- Because Factor uses a multiple algorithm generated Secp256r1 key, the speed and security is superior to an Secp256k1 key.
- While generating the (Public/Private) key pair, a Base58 algorithm is used to generate the addresses of the wallets.



- MX-Node, which maintains network connection can solve the problem caused by the concentration of miners.
- The interactions between the mining se rvers and the Masternode servers form s a secure and stable decentralized Blo ckchain.



FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION

01-1. MX Blockchain Hash Function MX Hash Function Supported Algorithms Characteristics

FACTOR Multi-X BLOCKCHAIN

Hash 26 algorithm for multiple hash data

Several Hash Function Included

Advantages

Speed

Double-Encryption Method

- Factor MX Blockchain has a fast computation capacity able to cope with 5G internet or the next generation Inte rnet.
- Excellent computing speed
- Coping with the network infrastructures of the next generation.
- Increasing consensus speed thanks to the node design.



- Applicable to and compatible with not only existing blockchains but also future blockchains (new al gorithms can be added in the fu ture).
- Applicable to various industrial fields: self-driving vehicles, IOT, 5
 G, internet communication protocol (replacing TCP/IP) etc.

- Encryption technology for Quantum computing, based on NSA designed hash function.
- Anonymity thanks to "dark send" feature
- Improved security by sending data via multiple nodes

FACTOR MULTI-X BLOCKCHAIN



FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION

01-2 Factor MX Block is

MX Block Structure

Characteristics

Data Spreading

Blockchain formation – The Merkle Tree

Factor MX Block forms a Merkle Tree, which is an interactive, hashtree able to verify the integrity of the data for all the copies of the blockchains on every node of the network. A hash of the previous tree (Merkle Root) is included in the header of every new Factor block. And since the hash function gives a unique output for every input, the entire database integrity can be verified only by looking at the hash of the previous tree (Merkle root). So, by computing only one hash value of the blockchain we can verify its integrity, and only the new data, not the entire blockchain, needs to be verified. Since blocks are mined when connected to previous blocks (using a merkle root in the block header), a distributed and secure blockchain is formed.







FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION

01-2. Factor MX Block is



02

- Block formation
 The block header, which contains the hash information of the previous
- block, adds a Nonce value to the previous block + hash root value (uni que hash value) + time stamp)time). The same technology is used in b itcoin. It prevents replay attacks from blocks randomly generated and encrypted.
- Factor MX blockchain forms a distributed ledger composed of trusted blocks, which are connected to previous blocks and keep forming.

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Data Spreading

01

Ability to check integrity rapidly by Merkle root

- Factor MX Block forms a hash tree, called the Merkle Tree. It has an interactive hash of A, B, C, D, E, F, G, H. If some part of the data ne eds to be tested, all of the data of the child nodes can be tested by ca lculating only one hash value of the child nodes.
- The advantage is that if some part of the data is damaged, it is possible to receive the damaged data again by easily finding out which data has been damaged.
- If Data A in Data AB is damaged in Factor MX Blockchain structure, a root hash in AB is different, but A in ABCD and A is not.







FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION

01-1. Factor MX Block

		<u>_</u>	
MX Block	Characteristic	Data Spreading	V

2

Even though Factor MX Block adopts the 51% consensus method like other blockchains, Factor MX blockchain uses a patented data spreading method among the nodes. When a block is mined, the next node to receive the data is based on its connection speed with the previous node. When a node is connected, as shown bel ow, connection from Node 1 to Node 2 and then Node 3 is made, which makes node speed faster gradually as the number of nodes increases. It then takes less

time to reach the 51% consensus agreement between the nodes.







FACTOR MULTI-X BLOCKCHAIN

Technology introduction

FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION



Factor MX-Node combines: mining server + Masternode + Darksend

A key advantage of Factor MX node is that it combines a mining server, a Masternode, and Darksend server all together. Factor MX node is capable of





FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION

01-3. MX node is





FACTOR MULTI-X BLOCKCHAIN



FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION

01-3. Factor MX node is



Factor MX Node features include anonymity, scalability, and attack prevention

Factor MX Node performs, 3 main functions: anonymous sending between users, network scalability and attack prevention.

Anonymous Sending



Attack prevention

Network Connectivity







FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION

01-3. Factor MX node



to a whole node with many hash algorithms, the

possibility of hacking is almost ZERO.





FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION

01-3. Factor MX node is



구 분	Bitcoin	ET H	NEO	EO S	Factor
Generation	1 st Generation	2 nd Generation	3 rd Generation		Next Gerneation
Cycle of Block Formation	10 minutes	12 seconds	2 seconds		1 second
Synchronizing speed	3 yrs 10 wks	330 hours	4~7days	2 days	1 day
Characteristics	Distributed ledger / Smart contract		Smart Contract / Self-decision making		All the functions + multiple algorithms
Problem	Network TPS slowdown / Scalability degraded		Reliability ▼		Security · Reliability · Scalability▲
Solution	POW	/ POS	DPOS		Multi X (POW / POS)





FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION



The next generation of decentralized operating systems.

Factor DApp is compatible with the Factor MX Blockchain System, thus it will reduce costs for sharding and TPS to expand compatibility. Current DApps are compatible with Factor Blockchain, and we invite the developers to copy and paste their source code on Factor Blockchain to make their DApps faster, and to test our platform.





[Picture 4: Structure of Factor DApp]



FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION



Multi-X Blockchain, multiple algorithm works on a DApp

Multi X Current Blockchains are usually connected from outside of the blockchain, but Factor Blockchain is connected from inside of the blockchain using a multi algorithm hash function which makes speed, security, and connection high-performing.



 $F = Q \operatorname{sol} + E \operatorname{sol} + N \operatorname{sol} = F$ / $F = 1.0 = Q + E + N \operatorname{Sol} = 1.0$





FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION

Factor MX Blockchain



Build faster DApp with Factor Dapp toolkit







01-4. Factor Dapp



Factor DApp Toolkit, the factor developer environment

Factor DApp toolkit is a developer environment in which high-technology evolution is fully integrated for the coming 4th Industrial Revolution.

It is increased with open sources accessible to all users.

<u>01</u>

Easy for development

With Factor Toolkit it is easy to make various kinds of tokens. .Combined with the Factor DApp algorithm, D App developers can use different s upported blockchains easily.

02

Compatibility

Factor Toolkit provides developers with a toolkit compatible with current cryptocurrencies such as Ethereum, EOS, NEO, Quantum, and can meet the purposes of every developer.



CR Scalability

Using Factor Toolkit, developers are being provided with a blockchain environment able to support an increasing volume of data. Scalability is no longer an issue.

04 Effectiveness

Considering that the current Ethereum w as developed only in a circumstance that was already set, the use of Factor DApp and toolkit makes it possible to develop v arious tokens freely. Also, users can deve lop blockchain technology on their own in the system.











- As shown before (the 26 hash functions and the Secp256r1 key pair), Bitcoin-Ethereum-Neo-Quantum are compatible with each other due to its bidirectional connection.
- In terms of security, hacking the Factor blockchain is only possible after hacking every algorithm contained in the Factor blockchain.
- Reaching the Factor core Blockchain is very unlikely and very hard to hack. The system is much safer than one of the current blockchains, especially when it comes to quantum computing attacks.







Technology introduction

FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION

01-5. Factor Integrated Algorithm

Factor Integrated Algorithm

Characteristics

2

Factor Blockchain forming MX Blockchain is the next generation technology which combines and connects all of the blockchain.



Factor Blockchain will become the blockchain for the next generation. Factor MX Blockchain uses different technology to the Side Blockchain technology.







Technology introduction

FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION

01-5. Factor Integrated Algorithm

Factor Integrated Algorithm

Characteristics

2

Factor Blockchain forming MX Blockchain is the next generation technology which combines and connects all of the blockchain.



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01-6. Differences With Current Nlockchains

Improvement to blockchain

Factor MX Blockchain

Alternative to Blockchain

Challenge of current blockchains

There are two types of blockchain: public blockchains and private blockchains. Public blockchains can be joined by anyone. Bitcoin is open to anyone who wants to buy the currency, and is a typical example of a public blockchain.

Because the public blockchain is open and transparent, all users on the chain can see the transaction transparently.

Private blockchains, on the other hand, are managed solely in the central zone and require approval to join. It is mainly used between companies or partner companies, so only authorized users can join the blockchain.

Whether public or private, blockchains are basically uncontrollable. Each transaction record, or 'block,' cannot be changed randomly, because it is connected to all other blocks. Therefore, security is guaranteed. To add a new block to this blockchain, consent from other users is needed.

Depending on the blockchain used, the consensus agreement can vary. But, it is true that the blockchain technology relies on application software and encryption t echnology, and among the hundreds of startups that are developing and providing recent blockchain technology. But, most of them are using the same algorithm s. The bitcoin, for example, uses SHA-256 k1 for the hash, which is a proven algorithm. However, several studies show that guantum computing will

ultimately change this algorithm. Other blockchains still use algorithms that have to be trusted just because developers "guarantee" safety.

Bennett actually pointed out that many startups were trying to introduce a new hash algorithm, but all of these attempts turned into terrib le failures". Forester pointed out that CIOS should be aware that serious software bugs are found in the process of introducing blockchain technology, or even that there is a risk of starting a project over and over again.

Improvement to blockchains

The Factor Development Team has succeeded in adding different hash algorithms inside the main hash function of Factor Blockchain.

The speed of other blockchains decreases as the number of nodes increases. However, Factor Blockchain was designed to be faster. The MX (Multi-X) blockchain of Factor, which is a blockchain as a distributed ledger, cannot be manipulated.

However, Factor MX (Multi-X) algorithms can be updated easily, without changing the value returned by the main hash function of Factor, and therefore cope with the emergence of quantum computers and other challenges that may be faced in the future.

Factor Coin is safe because it can be mined with quantum computers, too.





FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION

01-6. Differences from current blockchains



Single Blockchain Method

Current blockchains (taking the form of a single blockchain) are usually divided into public and private. However, the issues of a single blockchain (such as c ompatibility, speed, and connectivity) have previously been dealt with using "Segwit" or "lightning networks" or the same way as "hybrid blockchains", "side bl ockchains", and "double blockchains", which combine two blockchains.

However, these methods still have problems with ranking multi-pattern matching in terms of inter-block compatibility, and it is necessary to use an algorithm t hat binds blocks because of the feature of blocks that is to be formed separately when using the algorithm processing method of random data text.

We are trying to solve the problems of inefficiency and development at present, but are experiencing many difficulties in reality.

Factor MX Blockchain Method

The Factor Blockchain can be judged to be superior in speed, compatibility, and security in comparison to the current single blockchain type because the Factor Blockchain is formed by bringing together the multiple hashes into one.

The patented MX blockchain hash algorithm can overcome the problem of DApp development incompatibility and security issues found in current blockchains.

Furthermore, with the Factor algorithm developed for quantum mechanics, even if a future quantum computer is developed, the problem can be secured, since the block formed by the patented MX node method becomes faster as the number of Factor nodes increases.





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FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION

01-6. Difference to other blockchains



Technology introduction

FACTOR MULTI-X BLOCKCHAIN





FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION

01-6. Difference to other blockchains





FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION

01-7. Factor COIN

Factor Digital Game

Factor Coin (FTC) Platform Use

- The Factor MX Blockchain is connected to the Factor Game Engine through Factor DApps.

- Factor has 7 kinds of game engines that have been self-developed and is planning to develop and open 3 kinds of game engines additionally.

-In the types of rpg, fps, role-playing, single games, etc. we currently have, we first connect the Unreal engine, the Unity engine, and the Delta 3D game to the Factor blockchain engine.

Factor coin will be a convenient payment tool for numerous gamers to use within the Factor ecosystem.

Factor Coin will provide full support by recognizing game developers and gamers as a single provider so that it can be profitable for their business.

-The Factor game development team will be able to connect to the engine of the Factor blockchain to ensure stable server maintenance and eliminate server overload.

-MX blockchain has a hash algorithm in the mainblock suitable for games. That algorithm has data capability, so that all Factor games are operated smoothly without any problems. The Factor game engine will be designed as above.

- The Factor will resolve problems as quickly as possible in the community with customers, and the Factor game development team will continue to work on efforts to prevent game errors.











FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION

02-1. Application to Industry

Based on the Factor Blockchain algorithm and Factor DApp,

the Factor Blockchain will be utilized as a basis of technology for all industries.





FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION

02-2. Plan for Application to Industry





FACTOR MULTI-X BLOCKCHAIN

Technology introduction

- Havoc engine Cry engine
- Unreal engine
- Gamebryo engine Unity
- Jupiter engine

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Using Factor DApp and Toolkit it is possible to develop in C++ and JAVA, which is appropriate to game engine and other systems .

Source engine





- Distributed ledger for money transaction, and listed
- IBM Mainframe (Integrated Banking System)
- HP UNIX (The Next Generation System)
- HP Superdome (The integrated next generation
- 1st Finance, 2nd Finance, 3rd Finance, etc.







FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION

02-2. Plan for Application to Industry

03 IOT Industry



- AMQP(Advanced Message Queuing Protocol)
- CoAP(Constrained Application Protocol)
- DDS(Data Distribution Service)
- JSON-LD(JavaScript Object Notation for Linked Data)
- MQ Telemetry Transport
- Near-field Communication
- Supervisory Control and Data Acquisition
- 6LoWPAN
- HomeKit

LoRaWAN

IoTivity

Zigbee

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Use factor toolkit and master node network connectivity speed. Built to ensure security and connectivity between the Internet of Things





- CRM
- SCM
- ERP
- Logistic System

In the distribution system, it is possible to check the movement of goods not by a centralized way, but just through QR code and a decentralized note.

CHAPTE R 02

Factor MX Blockchain FACTOR BLOCK CHAIN TECHNOLOGY INTRODUCTION

02-2. Plan for Application to Industry



05



BLOCK CHAIN TECHNOLOGY

Food distribution channel tracking · Software development security · Digital c ontents management · Medical records · Insurance Claims · Tax and budget management · Public data protection · Energy field

In the end, the Factor blockchain, as a blockchain that combines new technologies, will be used for food distribution channel tracking, software devel opment security, digital contents management, tracking medical records, insurance claims, tax-budget management, public data protection, and ener gy fields. As a result, Factor Coin will appreciate in the future as the utility of the blockchain grows.







THANK YOU

