



ZEROLIMIT

White Paper

Open a trusted, low-cost and efficient decentralized
mobile application model

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1 Brief Introduction to Blockchain Technology

Blockchain is an organic combination of a series of mature technologies that distribute effective records of accounts and provide perfect scripts to support different business logic. In a typical Blockchain system, data is generated and stored in blocks, and linked into a chain data structure in chronological order. All nodes participate in data validation, storage and maintenance of Blockchain system. The creation of new blocks usually needs to be confirmed by the majority of the nodes (the number depends on different consensus mechanisms) and broadcast to each node to achieve network synchronization, which can not be changed or deleted after that. Blockchain technology is a new application mode of computer technology, which integrates distributed storage, point-to-point transmission, consensus mechanism and cryptography. As the bottom core technology of Bitcoin, Blockchain technology has been recognized as a revolutionary technology to subvert the Internet since its birth, and even a new industrial revolution is widely expected. However, after nearly ten years of development, we regret to see that block chain technology only reflects its financial attributes, and can not serve the real economy. The reason is that although Blockchain's thought expresses its strong and broad application prospects, even the global representative public chain has not really expressed Blockchain's thought in technology realization, and there are still many painful points that restrict the application of Blockchain technology to the ground :

(1) All kinds of consensus algorithms in Blockchain technology are to determine that individual miners or disguised miners will get the right to account. The existence of miners will either aggravate inequity or greatly waste energy, which will eventually lead to a more and more serious trend of centralization, but will endanger the safety of Blockchain and Blockchain's going. The original intention of the heart is contrary to the original intention.

(2) The number of transactions that can be processed per unit time (TPS) is limited and insufficient to support high concurrent usage scenarios worldwide. As the number of users increases, congestion will inevitably occur.

(3) The speed of transaction validation limits real-time application scenarios. Bitcoin can take up to an hour at the fastest, and more than 20 hours in congestion. The application experience is very poor.

(4) The increasing capacity of nodes requires more and more Blockchain nodes. With the passage of time, fewer and fewer nodes can truly maintain Blockchain security, and the application based on Blockchain will be overburdened. Under the current conditions of Blockchain technology, only the participation of all nodes of Blockchain can make an effective contribution to the security of Blockchain. For the slowest growing Bitcoin Blockchain, the storage requirement is increasing at the rate of 6MB per hour and the annual growth is over 50GB.

If the Bitcoin network wants to reach the transaction volume of 2000 TPS processing VISA level, the annual storage increment will exceed 8TB. Such an application scenario may be possible. As a result, only a small number of high-end businesses and enthusiasts will run the entire node, leading to the risk of centralization of Blockchain.

(5) High transaction costs exacerbate the rise in application costs.

(6) The rapid development of quantum computer technology poses a great threat and challenge to cryptography. Once practical quantum computers appear, Public Key Cryptosystems Based on discrete logarithm and Integer Decomposition (including RSA/ECC/DH) will be quickly broken down, which directly threatens the security of existing Blockchain ecosystem.

ZEROLIMIT, as an explorer of the new generation of Blockchain technology, develops the concept of mobile TXCHAIN aiming at the pain points and application bottlenecks of the current Blockchain technology. It emerges in order to eliminate the application threshold of Blockchain and popularize the practical landing of Blockchain.

2 ZEROLIMIT Summary

ZEROLIMIT is a new application mode of computer technology, such as distributed storage, point-to-point extreme speed transmission, code consensus, anti-quantum computing cryptography, etc. It is a completely decentralized application network based on mobile device nodes to meet the requirements of low storage and high frequency transactions. ZEROLIMIT's mobile TXCHAIN concept is to host TXCHAIN nodes on mobile devices, such as smartphones and tablets, which can run TXCHAIN nodes. Mobile TXCHAIN truly embodies the characteristics of decentralization. Every additional node adds a chip to the security of the whole chain. The more nodes involved, the faster the transaction confirmation speed and the stronger the throughput capacity of the system. Figure 1 shows the ZEROLIMIT system architecture.

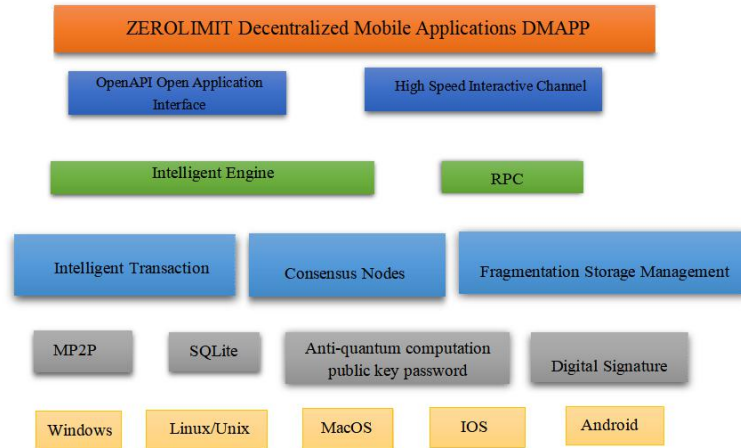


Figure 1 ZEROLIMIT Framework

The top application of ZEROLIMIT is loaded directly into the intelligent engine through Open Application Interface and High Speed Interactive Channel, so the ZEROLIMIT application is in fact seamlessly integrated with the ZEROLIMIT network. ZEROLIMIT's client is also the client of ZEROLIMIT application program. ZEROLIMIT strives to provide a platform without threshold for application developers and users.

ZEROLIMIT itself and ZEROLIMIT applications are both cross-platform and can run on a variety of node devices, compatible with Windows, Linux, Unix, MacOS, IOS and Android operating systems. Nodes participating in ZEROLIMIT are not necessarily suitable for running on mobile terminals, such as those of large businesses, which often have fixed addresses. The number of transactions generated by their own nodes may be huge.

Mobile TXCHAIN makes application deployment based on TXCHAIN simple. Each mobile node is both a server and a client. The application cost based on mobile TXCHAIN will be greatly reduced, because there is no need for backend server support, all applications are truly decentralized.

ZEROLIMIT guarantees the lightweight of nodes from the design of the underlying protocol to meet the deployment requirements of mobile consensus nodes in the whole network. ZEROLIMIT adopts the method of code consensus. All participating nodes have the same ability of consensus. They have equal status and no competition relationship. They can not form a centralized advantage. Therefore, it is impossible to form a new center. Because all the participating nodes have the ability to deal with transactions, every additional node in the whole network will increase a processing capacity. The more participating nodes, the faster the overall processing speed of the whole network will be,

and there is no ceiling in processing capacity.

Lightweight, unlimited processing power and complete de-centralization without server make ZEROLIMIT provide a low-cost, high-efficiency and fully trusted network environment for unlimited applications worldwide, and create a completely de-centralized Peer-to-Peer Network application mode that subverts the C/S and B/S application modes in the Internet era.

In a word, ZEROLIMIT is about to open a credible, low-cost and efficient decentralized mobile application mode. With the infinite increase of participating nodes in zero-pole network, ZEROLIMIT will achieve unlimited distributed storage space, unlimited transaction processing speed, unlimited data security and unlimited load applications. Zero represents the origin and fundamentality in philosophy. ZEROLIMIT network realizes the basic idea of Blockchain from a unique technical point of view, solves all the pain points of traditional Blockchain technology, and represents the beginning of the application era of Blockchain technology.

3. Peer-to-Peer Network (MP2P) Based on Mobile Nodes

Peer-to-Peer Network(P2P) is the foundation of Blockchain's de-centralized idea. At the same time, it has the characteristics of scalability, robustness, high cost performance, privacy protection, load balancing, etc. In P2P networks before Blockchain 2.0, Participating nodes are usually PC or server nodes with stable IP addresses, while ZEROLIMIT's P2P network nodes are generally mobile device nodes. The IP addresses of nodes are generally not fixed, and may drop or switch IP networks at any time, which puts forward higher requirements for ZEROLIMIT's network processing ability.

The Peer-to-Peer Network, which constitutes ZEROLIMIT, is an MP2P network composed of ZEROLIMIT nodes, each of which is both a client and a server. It is not only the provider of information but also the requester of information. As a service node, it may be connected with multiple customer nodes to provide information services. As a client node, it may also be connected with multiple service nodes to request service information from them. These nodes can join or leave ZEROLIMIT network at any time.

ZEROLIMIT network adopts structured dynamic networking (Kademila), each node needs to maintain the local routing table, and complete the construction and maintenance of the routing table, node search, data transmission and data reception. The node broadcast algorithm

based on routing table in ZEROLIMIT MP2P network provides effective support for distributed storage of node transaction information and avoids network broadcast storm.

In mobile networks, not all types of nodes can establish point-to-point communication through penetration. At this time, data forwarding must be completed through intermediate nodes. In ZEROLIMIT networks, the nodes that complete data forwarding are called "data base stations". Full Cone NAT nodes in IPV4 network and fixed public network IP nodes, as well as nodes in IPV6 network, can assume the functions of data base station. The node software of ZEROLIMIT network can detect whether the node itself can act as a data base station and provide participation options. ZEROLIMIT network encourages capable nodes to participate in the data base station plan and gives corresponding incentives.

4 De-block mobile TXCHAIN

ZEROLIMIT embodies the real Blockchain idea, but it is not the traditional Blockchain in the technical implementation. Because ZEROLIMIT does not have the concept of block, only the concept of transaction unit. All transactions sent by nodes logically constitute a set of multiple directed acyclic graph MDAG. Here we call the set of MDAG composed of transactions TXCHAIN. As shown in Figure 1 (in which time moves from left to right), the edges in this graph are formed as follows: when a new transaction arrives, it must verify the previous two transactions, and these validation relationships are represented by directed edges, with the arrow pointing to the verifier. If there is only one directed edge path between transaction B and transaction A, we say that transaction B directly verifies transaction A. If there are at least two directed edge paths between transaction B and transaction A, we say that transaction B indirectly verifies transaction A.

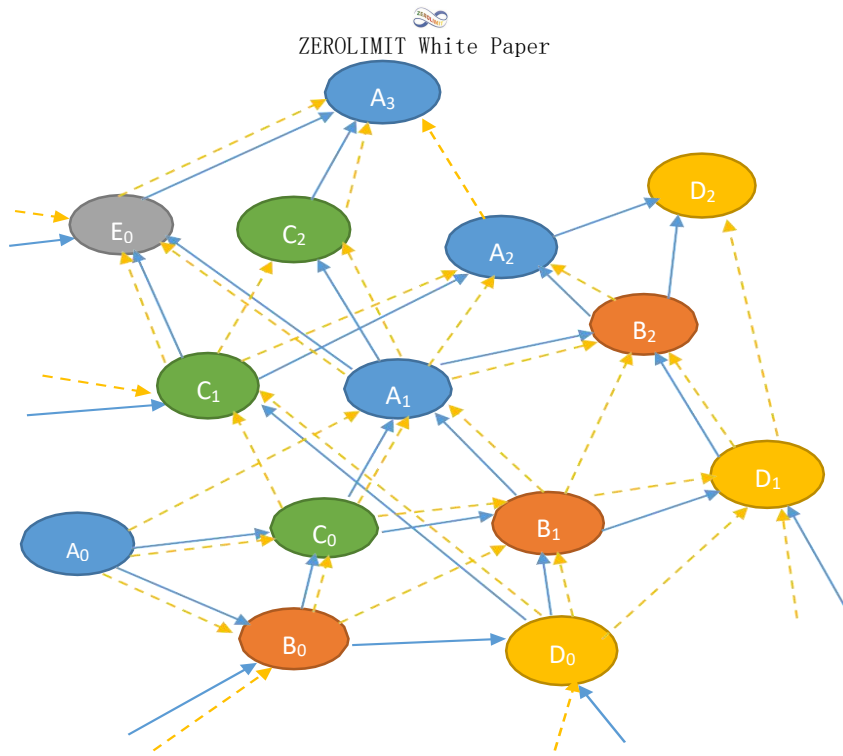


Figure 1 -TXCHAIN Logic Diagram

In the TXCHAIN sketch above, we assume that A, B, C, D and E are addresses of five nodes, and that their subscripts represent the sequence number of transactions issued by that address. The solid arrows in the figure represent the validation relationship. For example, transaction A₁ directly validates transaction C₀ and indirectly validates transaction B₀. The dashed arrow represents both the connection relationship (implying the temporal relationship) and the storage relationship. The transactions issued by each node address constitute the order TXCHAIN of the node itself, and the validation TXCHAIN is formed by the validation relationship between TXCHAIN of different nodes.

We call the source address the transaction of the node's own address as the output transaction of the node, and the destination address the transaction of the node's own address as the input transaction of the node. Nodes must save all output and input transactions related to their addresses, as well as the actual transactions of other nodes that are directly validated. When a transaction is generated and broadcasted to the whole network through the node routing table, not all nodes will confirm the transaction. Only when the transaction is verified and meets the node condition of distributed transaction distribution, the transaction will be stored, that is, the confirmation process will be completed. Illegal transactions will be abandoned by nodes and will not be broadcast, while legitimate transactions will be instantly confirmed and accepted by the network.

There are two motivations for the verification of transactions, one is passive verification, that



is, the verification work must be done before issuing new transactions; the other is active verification, which is benefit-driven, but this verification work can not be rewarded immediately. Because some nodes have enough storage space to accommodate more transactions, they are willing to contribute to network security. In this way, as long as the transaction is validated, the transaction related to the validated TXCHAIN can be stored. When the node associated with the stored transaction needs to re-download the transaction, the saved node of the transaction can get the corresponding reward. Another type of non-asset transfer transaction is the deployment of ZEROLIMIT application on the whole TXCHAIN. An application is divided into multiple transactions, which will be verified by active or passive verification nodes to achieve distributed storage. When the mobile node downloads these transactions to access the application, the publisher of the application will pay a certain fee for the downloaded nodes. Of course, when the same node account downloads the same application resources many times, the publisher only pays for the first download.

5 Intelligent Transaction

In the traditional Blockchain protocol, the interpretation of transactions is accomplished through a stack-based script interpreter. Bitcoin is based on a limited scripting system, which is extended by ETF to execute scripts through virtual machines. Both Bitcoin's limited scripting system and ETF's Turing's complete scripting system are executed based on script interpretation, and their efficiency is discounted in terms of transaction processing speed. ZEROLIMIT is based on mobile devices, and computing resources are limited. It is necessary to ensure fast enough transaction processing capability in the protocol. So we abandoned scripting system and introduced the concept of intelligent trading in ZEROLIMIT design.

The so-called intelligent transaction refers to the introduction of programmable features in the transaction data structure and the processing of transactions by executing programmable code. Programmable code area supports ECMA6 standard JavaScript to write application code. You can activate the code by sending messages to the smart transaction or execute the code when the node confirms the transaction. Intelligent transaction code is executed by ZEROLIMIT intelligent engine. Intelligent engine contains Google's V8 engine. Using JIT technology, JavaScript code can be compiled into machine code of target running platform to improve code execution efficiency.

Intelligent transaction code extends the function of transaction and enhances the flexibility of transaction processing.

Publishing transactions on ZEROLIMIT platform is free of transaction fees, which is especially suitable for micro-payment application scenarios.

6 Code Consensus CODEC

Blockchain consensus is achieved through a very rigorous mechanism. Adding the next block to Blockchain requires competition from multiple parties and access to block awards or transaction fees. Because of this, consensus and transaction generation are separated and done by a small part of the network, usually with a higher threshold (like Bitcoin), which leads to further centralization.

In ZEROLIMIT network, all rights and interests (assets) are created only once in the creation transaction, and all subsequent transactions only exist the transfer of equity assets, and will not be created again. Therefore, it is not necessary to determine the right to account by mining. We need to get rid of the traditional Blockchain mentality to understand this. In the implementation of traditional Blockchain technology, all nodes have the same data replica. It is not necessary to design a special consensus mechanism to judge the validity of data. Data replica itself is a consensus. The role of consensus mechanism is to determine the right to account, because at a time-Cycle node, only the only node can implement the behavior of accounting, which is also the root of the inefficiency of traditional Blockchain technology.

ZEROLIMIT does not have block-chain accounts. All transactions form a logically multiple directed acyclic graph through connection, storage and verification relationships. Once a transaction is validated, it will be stored by the validation node, that is, confirmed by the validation node. Transactions are broadcast to the whole network through node routing tables, and are verified and stored by nodes on specific paths according to the distributed storage distribution algorithm. That is, all nodes in ZEROLIMIT network have equal accounting rights. The purpose of consensus mechanism is no longer to determine accounting rights, but to verify and confirm transactions.

The lightweight characteristics of ZEROLIMIT nodes make it impossible to judge the validity of transactions by tracing the full data of the verified nodes. It is to achieve the consensus of all nodes in the network, such as the joining of nodes, the generation of transactions, digital signatures, the verification of transactions, and so on. All nodes will execute the same consensus code under the

consensus environment. The consequences of leaving the consensus environment or changing the consensus code are discarded by honest nodes.

ZEROLIMIT advocates the spirit of open source, but it has its own unique licensing principles. All ZEROLIMIT source code is for research and learning purposes only, and can not be disseminated, modified or resold for other personal or commercial purposes. When the ZEROLIMIT code is improved and re-added to the ZEROLIMIT ecosystem, the official digital signature of ZEROLIMIT must be obtained. That is to say, when a node joins ZEROLIMIT network, consensus code will verify the validity of the node, and illegal nodes will be removed.

In the implementation of traditional Blockchain technology, the process of transaction generation and verification is separated from the process of consensus. ZEROLIMIT has changed this process. It integrates transaction generation, digital signature, distributed storage and validation into consensus process, and executes the same consensus code in all nodes of the network to achieve unauthorized, unforgettable and undeniable results of transaction data. ZEROLIMIT's nodes are lightweight. Compared with the entire network account, a single node only keeps a very small amount of transaction data. The local node not only saves the complete input and output transactions of its own account, but also saves the transaction feature information state tree with joint account. The "related nodes" here refer to these types of nodes, one is the node corresponding to the destination address in the output transaction, the other is the sending node of the confirmed transaction, and the third is the node corresponding to the publisher of the DMAPP used by the node. Characteristic information state tree is a kind of simplified information. It determines the stored transactions according to the distributed transaction distribution algorithm. It constitutes a key checkpoint in the feature information state tree, and all consecutive transactions that only verify and do not store between checkpoints will be compressed as feature checkpoints. This method verifies the validity, validity and correctness of node transactions through the node's characteristic information state tree, which is called "Proof of Consistency" mechanism in ZEROLIMIT. PoC mechanism solves the contradiction between lightweight storage and data security, so that all participating nodes can participate in the consensus process.

Code is the rule, only all nodes follow the same rule is the best consensus. Code consensus ensures high throughput and security of ZEROLIMIT. Because each participating node has the ability to deal with transactions, that is to say, it has the ability of consensus, so every additional node, the whole network will increase a processing capacity. The more nodes involved, the faster

transactions will be processed, so that there will never be congestion. In other words, ZEROLIMIT can support the growing global application demand.

7 Endogenous fragmentation

ZEROLIMIT's membership consensus mechanism and distributed storage distribution mechanism are actually the fragmentation processing mechanism along a specific path in the whole network. Each node in the whole network can publish transactions at the same time, and distribute them through the node routing table and be confirmed by other nodes. This consensus process is concurrent, not only guarantees the characteristics of ZEROLIMIT light nodes from the protocol, but also has no upper limit on processing speed, and truly achieves the perfect deduction of time and space.

Code consensus and piecewise processing mechanism make ZEROLIMIT very suitable for deployment in resource-constrained systems such as mobile devices. Super-high transaction throughput processing capacity is sufficient to meet all applications in real life.

8 Quantum Computing Security

Quantum Resistant Cryptography (QRC) essentially refers to "a mathematical password that can resist quantum computer attacks". At present, there are mainly Grover algorithm and Shor algorithm which can be used in quantum computation for cryptographic decoding. For cryptographic decoding, Grover algorithm can reduce the length of the secret key by half. Shor algorithm can attack RSA, DSA, ECC public key cryptography and DH secret key agreement protocol which are widely used at present. This shows that in quantum computing environment, the cryptographic algorithm used by traditional Blockchain will no longer be secure.

There are many cryptosystems that can resist quantum computer attacks, such as HASH-based cryptography, error-correcting code-based cryptography, lattice-based cryptography, multivariable quadratic system cryptography and so on. However, these cryptosystems are not suitable for Blockchain applications, especially mobile Blockchain based on mobile device nodes, because of the long secret key length and signature information, and the long operation time.

ZEROLIMIT adopts an improved 512-bit SHA3 hash function one-time signature scheme, which solves the problems of too long secret key and signature information and too slow computation speed, and is especially suitable for mobile node deployment. Two patents of the

digital signature scheme against quantum computer attacks have been examined and approved by the relevant State Intellectual Property Office.

9 Intelligent Engine

The virtual machine provided in the implementation of traditional Blockchain technology will translate scripting language into byte code that the virtual machine can understand, and then interpret and execute these byte code by the virtual machine. Undoubtedly, the way of byte code interpretation will greatly reduce the execution efficiency. It is not suitable for mobile devices to act as Blockchain nodes under the load of high transaction throughput.

ZEROLIMIT does not provide a virtual machine in general sense, but a very high-performance intelligent engine (zolEngine). Not only can it execute JS code in intelligent transaction, but also zolEngine is the executing mechanism of DMAPP. It can achieve different handover of DMAPP by dynamically loading and unloading DMAPP.

Intelligent transaction and the implementation code of ZEROLIMIT application program (DMAPP) are Turing's complete general high-level language, which currently supports javascript. The zolEngine can compile the code into machine code compatible with the host processor and run across platforms. It supports Win32/Win64, Linux, Android, Mac OS, iOS simulator and iOS devices.

10 Open Application Interface

The High Speed Interactive Channel of the intelligent engine makes ZEROLIMIT a completely open application platform. ZEROLIMIT not only provides third-party applications with direct access to ZEROLIMIT's API, allowing third-party applications to integrate Blockchain applications quickly and easily; and ZEROLIMIT provides a common underlying API interface for all types of DMAPP.

10.1 High Speed Interactive Channel (HSIC)

High speed interactive channel (hsic) is a mechanism that allows ZEROLIMIT application (DMAPP) and ZEROLIMIT bottom layer to cross-reference. The ZEROLIMIT bottom layer can exchange messages and data with DMAPP through (HSIC) and can directly initiate function calls. DMAPP's "client" logic and "server" logic can also interact through (HSIC). The ZEROLIMIT bottom layer and the ZEROLIMIT application (DMAPP) are both interrelated and independent of each other. the ZEROLIMIT network provides a full range of Open Application

Interface and data interface to the ZEROLIMIT application through the High Speed Interactive Channel. At the same time, access to ZEROLIMIT application functions and data is provided in predefined form. In other words, this High Speed Interactive Channel is a two-way channel through which applications can be seamlessly integrated with ZEROLIMIT networks.

10.2 Graphic User Interface

ZEROLIMIT application program (DMAPP) is a decentralized mobile APP that runs completely on ZEROLIMIT intelligent engine. It can be implemented by high-level languages such as JavaScript and C++. In order to unify the user interface, the interface of ZEROLIMIT application program and ZEROLIMIT node software are integrated. ZEROLIMIT node software and DMAPP running on ZEROLIMIT use interface description language to realize graphical user interface, and implement interface description language through ZEROLIMIT intelligent engine.

10.3 Distributed Dynamic SDK

The goal of ZEROLIMIT is to provide the bottom support for the chain application of the whole industry. With the popularization of the application, SDK supporting the development of DMAPP will become very bulky, which is inconsistent with the requirement of lightweight node characteristics of ZEROLIMIT. For this reason, we design the mechanism of distributed dynamic SDK. Firstly, the deployment of SDK on the chain is distributed. Secondly, the development and invocation of SDK are dynamic. SDK is designed as a part of node software, but it can be dynamically plugged in. SDK is compiled into machine instructions of host operating environment, which can execute quickly and ensure the efficiency of DMAPP. In a sense, DMAPP can be understood as the "front end" and SDK can be understood as the "back end". The SDK on the chain is downloaded on demand with DMAPP or can be uninstalled with DMAPP.

11 ZEROLIMIT application (DMAPP)

ZEROLIMIT application (DMAPP) can achieve any function you want. Intelligent engine and Turing's complete high-level language provide a complete degree of freedom, allowing users to build a variety of applications, even mobile applications with graphical user interface.

To create a ZEROLIMIT application, or an application project, is to publish one or more smart transactions with executable code. Each ZEROLIMIT node has only one account and one address, but it can create multiple applications. Each application corresponds to the inherent address of the

node account. Sending a message with the application index number to this address can download the transaction related to the application from the ZEROLIMIT network and restore it to DMAPP locally, which is integrated with the local ZEROLIMIT node software. Each DMAPP is a decentralized application, because the code of this application is divided into different parts and stored in multiple smart transactions, once these smart transactions are verified by other nodes. These validation nodes are saved, so the application is distributed on ZEROLIMIT, and even if the application publisher node is offline, it does not prevent the application from being accessed.

Publishing applications on ZEROLIMIT networks requires payment, which is partly paid by transaction validators and partly rewarded to nodes that provide application downloads.

All applications are automatically integrated into the node client, because the node client itself is an APP, and the ZEROLIMIT application is embedded in this APP, so it seems that the ZEROLIMIT node client is an application-based APP.

(1) DMAPP Development Environment

ZEROLIMIT provides a programmable development environment (IDE) for desktop-level integrated intelligent transactions, a visual syntax-highlighted code editor, a one-step tracking debugger, simulation runs, and deployment tools. The development environment is a desktop tool provided by ZEROLIMIT. It is not a part of ZEROLIMIT node software. It contains all the functions of ZEROLIMIT node software and runs the application simulation on the test chain of ZEROLIMIT.

The development environment also supports the syntax highlighting of JavaScript language and provides the corresponding code compiler. It also provides a visual source code level tracking debugger. Developing a ZEROLIMIT application is easier and more intuitive than developing a traditional mobile app application, because this application is not only decentralized, but also cross-platform, and can run on multiple operating systems with only one encoding.

(2) DMAPP Deployment

After the ZEROLIMIT application has been developed and verified in the development environment, the next step is to deploy the application to the ZEROLIMIT network. The deployment process is actually the process of dividing the application's machine code into multiple intelligent transactions and sending them to ZEROLIMIT network.

DMAPP must undergo official ZEROLIMIT network audits and obtain official digital



signatures before deploying online. When the DMAPP is loaded into the smart engine, the signature will be verified, and invalid or expired signatures will be rejected.

ZEROLIMIT's node account can deploy multiple applications. Publishers need to pay for each application's release in advance. All the savers of the application (including the publishers themselves) will save and synchronize the application's account information. The code size and number of users of DMAPP determine the running cost of the application. Publishers can also recharge the application account at any time to ensure the continuous online operation of the application.

(3) DMAPP Upgrade

Applications can be upgraded online at any time. This upgrade can be either patched updates of local modules or incremental upgrades with additional functions. For the additional download workload of the node caused by the application update and upgrade part, the publisher does not need to bear additional costs, but for the incremental upgrade part, the publisher needs to bear the corresponding download costs.

(4) Synchronization between DMAPP Nodes

When the DMAPP is downloaded from the ZEROLIMIT node and loaded into the intelligent engine, the ZEROLIMIT node is transformed into the DMAPP node at the same time. All on-line nodes of the same DMAPP form their own networks, which constitute a subnet of ZEROLIMIT and also a part of ZEROLIMIT network. We can also call this subnet the application group of DMAPP, in which both the status information of the publisher account of DMAPP and the application data of DMAPP need to be synchronized. For example, the information such as the DMAPP in the chain store, the updating of goods on the shelf and inventory, and the user evaluation, needs to be updated synchronously to all online DMAPP nodes.

(5) Function Call Between DMAPP

The core functions of DMAPP are encapsulated as dynamic libraries and loaded into ZEROLIMIT node software. ZEROLIMIT network defines the standard call interface between them. It is not only suitable for the interaction between the bottom of DMAPP and ZEROLIMIT, but also suitable for the function call between DMAPP and ZEROLIMIT. For example, if a ZEROLIMIT node is equipped with social DMAPP and mall DMAPP, and both of them have open functional interfaces, the shopping function can be easily imported into social DMAPP, and chat function can be embedded in mall DMAPP to achieve functional reuse between DMAPP, which can save development resources and deployment resources.

12 ZEROLIMIT Ecology

12.1 ZEROLIMIT Account

Use the account model in ZEROLIMIT. Accounts are divided into two types: basic account and application account. Basic account is controlled by private key, while application account is controlled by consensus code. The address of application account is calculated according to the address of basic account. Each ZEROLIMIT node has a unique basic account and application account, and saves the complete state tree of the basic account and application account, while the other nodes only save their characteristic information state tree. A ZEROLIMIT node can publish several applications (DMAPP). All applications share the same application account. All nodes using DMAPP need to synchronize the application of the basic account and the application account's characteristic information state tree of the publishing node. The running cost of DMAPP and the reward cost of providing the download of DMAPP are automatically deducted from the application account of the application publishing node. The application publishing node can know the balance of the application account at any time, and can recharge the application account and withdraw it from the application account to the basic account through the basic account at any time.

12.2 Unique ID ZID

In ZEROLIMIT network, each node has a unique account address, which represents the unique identity (ZID) of the node in ZEROLIMIT network. Accounts can have a variety of role attributes at the same time, such as the developers of DMAPP, game operators, online shopkeepers, enterprises, government agencies, etc., up to 65536 roles can be defined. All DMAPPs constitute a complete ZEROLIMIT ecosystem, and the identity of nodes is unique and consistent when participating in all

DMAPP application scenarios.

12.3 ZEROLIMIT Ecological Warrant

ZEROLIMIT Digital Assets (ZOL) has a total circulation of 1 billion, which represents the proof of ZEROLIMIT ecological rights and interests. During the private placement period of ZEROLIMIT project, subscriptions are offered in the form of substitute chain assets, with a total subscription volume of only 12 million. After subscription, the offspring chain assets will be listed on the mainstream exchanges, and the total circulation of substitute chain assets will not exceed 50 million, i.e. 95% of the equity assets will be locked up for the landing application and promotion of later DMAPP. After the development of the main chain is completed, the generation chain assets will be converted to the main chain assets one to one. ZEROLIMIT Digital Assets (Zollar) is the value embodiment of ZEROLIMIT ecosystem. ZEROLIMIT, as the leader of the new generation of Blockchain technology, emphasizes its endogenous landing application. When the development of its main chain is completed, various de-centralized applications can be developed on the chain. Compared with traditional applications, these applications can greatly reduce costs, because ZEROLIMIT-based applications are mobile applications on the chain and do not need the support of background servers. ZEROLIMIT has a wide range of application scenarios, and you can use your imagination as much as possible. ZEROLIMIT's digital asset (Zollar) fully embodies its application value. With the continuous popularization of its application in the future, Zollar's scarcity will rapidly push up its price.

12.4 ZEROLIMIT Equity Node

In front of ZEROLIMIT's main network, ZEROLIMIT team has issued recruitment orders for application promotion to the whole world, inviting people of all walks of life to draw application blueprints, share ZEROLIMIT's ecological rights and interests, and witness the arrival of Blockchain's application era together. When a ZEROLIMIT node account holds an average of 500,000 Zollars per day in the past six months, the ZEROLIMIT node is promoted to an application promotion node. When the application project promoted by application promotion node runs successfully on ZEROLIMIT network and brings corresponding benefits to ZEROLIMIT network, the application promotion node will get 70% dividend right. When a ZEROLIMIT node account holds an average of 1 million Zollars per day in the past 12 months, the ZEROLIMIT node is promoted to an ecological rights node. In addition to the rights and interests of the application and promotion nodes, the ecological rights node also enjoys the 1% dividend right of the ZEROLIMIT ecosystem as a whole.

Equity node is a logical concept. The size of equity does not affect the status of node itself in ZEROLIMIT network. All nodes in ZEROLIMIT network are functionally equal, and there is no resource aggregation advantage that threatens the whole network security.

12.5 ZEROLIMIT application scenario

ZEROLIMIT network can meet the unlimited growth of application demand worldwide. The application goal of ZEROLIMIT network is to make Blockchain application civilian, so that ZEROLIMIT-based applications cover all aspects of people's lives.

(1) ZEROLIMIT mobile node characteristics and high transaction throughput processing capacity are particularly suitable for financial applications.

(2) Payment scenario is the native application of ZEROLIMIT. ZEROLIMIT has inherent advantages in mobile payment, micro-payment and cross-border payment.

(3) ZEROLIMIT has a unique advantage in mobile e-commerce. Everyone can open an online store on ZEROLIMIT, only need to pay a small amount of operation and maintenance costs, no deposit and platform costs, and no backstage server support.

(4) Ciphertext social software is also an application worth looking forward to.

(5) Game applications must be benevolent. The dramatic drop in operating costs will encourage game operators to benefit players, and a better sense of experience will lead to more fans.

(6) The lightweight node and micro-payment characteristics of ZEROLIMIT are particularly suitable for deployment of Internet of Things nodes.

(7) ZEROLIMIT mobile phone integrates ZEROLIMIT bottom core with mobile operating system. Each mobile phone is a node of ZEROLIMIT. It can directly install and run DMAPP on the mobile phone to realize the real sense of Blockchain mobile phone.

(8) Search engine, the popularization of DMAPP will make ZEROLIMIT network the largest Peer-to-Peer network system in the world. New search engine will be able to accurately and quickly locate the required information from the massive information stored in distributed storage.

(9) Direct advertising, massive node networks and exclusive application groups of DMAPP can achieve accurate advertising and full-network direct delivery effect.

(10) New domain name system, personal display and enterprise display will be realized through new ways. That is to say, the traditional website will be replaced by the



new display application and connected through the new domain name system.

(11) ZEROLIMIT team will continue to explore the application scenarios of different industries, including social security, e-government, e-commerce, food traceability, anti-counterfeiting certification, electronic archives, business management, electronic taxation, electronic law, finance, and provide reference design prototypes.

DMAPP means that future Internet applications will no longer need the support of central servers, and will directly reduce the sky-high application cost to the horizon. All applications based on ZEROLIMIT networks do not need to consider the cost escalation caused by traffic increase at all.

13 Major network Online Plan

ZEROLIMIT core team is pushing forward the development of the project as planned. It is expected that the main network will be officially launched in the first quarter of 2020, along with payment of DMAPP and Mall DMAPP. In addition, tax DMAPP and social security DMAPP are also in progress.