



PALLETONE

Protocol for **A**bstract-**L**evel **L**edger **E**cosystem

Distributed Interchain Protocol

---IP Protocol of Blockchains

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Abstract

Today's blockchain encounters the following challenges: scalability and interoperability etc. To address these challenges, we propose PalletOne, Protocol for Abstract-Level Ledger Ecosystem.

PalletOne adopts Jury consensus mechanism which combines the whole network consensus and part consensus to ensure the efficiency and safety of cross-chain smart contract execution. Besides, Contract Template and Token Abstract Layer are introduced to decrease the difficulty and complexity of contract development. PalletOne makes inter-chain transactions possible by decoupling the state of contracts from the blockchains. Developers can choose the language they are familiar with and the platform they need. PalletOne interacts with mainstream underlying blockchains and accomplishes interchain interaction.

In PalletOne, we only need a group of verifiers to execute one contract. This group of verifiers is called Jury, which consists of individual verifiers called Jurors. Similar to the IP protocol that separates the physical layer, data link layer from transport layer and application layer, the PalletOne fully decouples the Dapp, contract status, and underlying blockchain three-tier architecture.

PalletOne contract supports multiple blockchains. Through Jury Consensus and Adaptor Layer, it is possible to build a contract that can interact with different blockchains simultaneously, so users can trade tokens from different blockchains in one PalletOne contract invocation to make the inter-chain token exchange distributed, atomic, and immutable. The PalletOne contracts of inter-chain token exchange can be executed in a multi-tasking way by different groups of selected Jury, which can effectively reduce the congestion of the whole network compared with consensus throughout the whole network. We plan to use PalletOne VM as the core technology

to build the contract executable and execute the contracts, which makes the contract execution more secure and developers can choose the language they are familiar with and the platform they need. Token Abstract Layer and Contract Template ensure the convenience and security of Dapp development further.

Introduction

Blockchain technology is considered to be the core technology that has the most potential to trigger the fifth round of disruptive revolution after steam engine, electricity, information and Internet technology. Although blockchain technology is likely to subvert many industries in the next 5-10 years, there are still some technical challenges that restrict its large-scale deployment and application.

Challenges

Scalability

In order to build a distributed trustless network in which the tokens (values) flow, the consensus that bitcoin and Ethereum adopt is reached by every node throughout the network to guarantee the correctness, that is all the nodes execute the same procedure in order to reach the consensus on the state. Based on this kind of consensus of entire network, TPS (Transactions Per Second) of Bitcoin reaches only 7, In December 2017, [Crypto Kitties](#) severely slowed down the Ethereum transactions. These phenomena reveal the problem of resorting to the consensus of the entire network.

Interoperability

Blockchains today such as Bitcoin or Ethereum are using full nodes as brute-forces trust-machines. These full nodes verify transactions on their respective chain without knowing anything outside their chains.

As a result, such a blockchain becomes a silo to itself, making the blockchain look more like intranet today.

Not User Friendly

In the current popular blockchains, there is not yet a blockchain platform, which can meet different needs of developers and users in terms of ease of use, security and high performance.

Platform Lock-in

Similar to the early stage of any computing technology, blockchains have critical "platform lock-in" problems. Developers have to choose which blockchain to support and implement platform-specific code, which makes it difficult to switch an application to another blockchain later on. Developers don't want to be locked into working with a certain underlying blockchain. They need to be free to evaluate, use, and switch between options. Some applications may even need to run on multiple platforms in order to provide the best user experience.

The Birth of PalletOne

Considering the challenges above, interchain interaction has become an important issue in the development of blockchain technology. So we have put forward a distributed interchain protocol -- PalletOne (Protocol for Abstract-Level Ledger Ecosystem).

Introduction to PalletOne

PalletOne propose an effective way to address these challenges that include scalability, interoperability, lacking of the user friendliness as well as platform lock-in.

PalletOne adopts Jury consensus, in which we only need a group of verifiers to execute one contract. This group of verifiers is called Jury, which consists of individual verifiers called Jurors. PalletOne decouples smart contracts from the blockchains to accomplish interchain interaction. Mediator ensures PalletOne security and it is the core component of PalletOne. As the core technology to build the contract executable and execute the contracts. PalletOne make developers can choose the language they are familiar with and the platform they need. Token Abstract Layer defines the definition set and operation set of token, which improves security of token definition in smart contract. The architecture and components of PalletOne is illustrated as figure 1.

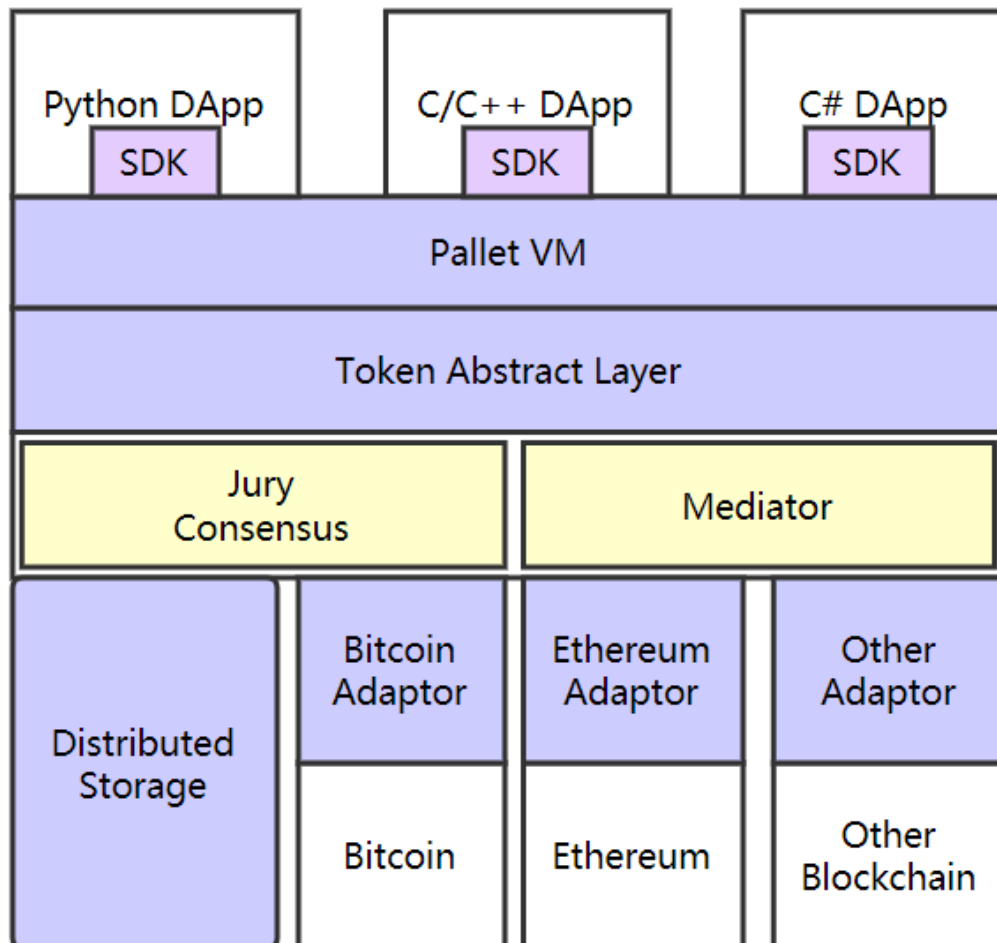


figure 1 PalletOne architecture

SDK

PalletOne provides SDK (Software Development Kit) for each supported programming language. Smart contract developers can quickly complete the development of cross chain smart contracts based on SDK.

PalletOne VM

As the core technology to build the contract executable and execute the contracts, PalletOne VM compile the contracts written in several programming languages into bytecode that allows efficient execution on multiple platforms, which makes PalletOne contract not only decoupled from the underlying blockchains, but also decoupled from contract languages and execution platforms.

When the smart contract is deployed to PalletOne, it will run in the PalletOne VM. PalletOne VM provides a sandbox environment for host safety and eliminates the possibility of host or network attacks from malicious contracts.

Token Abstract Layer

The Token Abstract Layer defines the definition set and operation set of token which may be issued by users on the Platform (although PalletOne will not be responsible for issuing any such tokens), which decreases the difficulty and complexity of smart contract development and increases the security of such smart contracts, while expanding the range of possible digital assets or tokens which can be developed or issued by users on the Platform.

PalletOne will initially include the following pass-through abstract models, which, for the avoidance of doubt, will not be the PalletOne tokens (PTN) that are the native tokens of the PalletOne platform:

- (1) Full pre-excavation Token

Similar to the token issued by Ethereum ERC20, users only need to specify the total amount, accuracy, token name, and abbreviation at the time of issuing the token.

PalletOne generates and distributes the token at one time.

(2) Mining Token

Similar to Bitcoin's economic model, the user does not pre-excavate or not full pre-excavate the token at the issue time, and the token will be generate by time or Unit height.

(3) Fixed Deeds Token

Similar to the cash, the user can define 1, 2, 5, 10, 20, 50, 100 and other denominations of the deeds, and once released, it is inseparable when the token is used.

(4) Non-homogeneity Token

The above-mentioned tokens are homogenous, which means that there is no difference between the 1 Token you have and the 1 token I have. In the real world, there are also a large number of non-homogenized tokens. For example, after tokenization of works of art (such as paintings and calligraphy), each token represents a unique piece of art. This non-homogeneous certification was defined in Ethereum ERC721. PalletOne natively supports non-homogeneous token.

Mediator

Mediator is responsible for the security of PalletOne. The character of Mediator looks like a traditional blockchain, which is a trustworthy machine. So Mediator should guarantee to make all decisions correctly. Mediator uses a Delegated Proof of Stake(DPoS) mechanism to reach a consensus. To prevent Mediator from being the

bottleneck of PalletOne, most of the work is only done by the Jury without invoking Mediator.

Mediator takes the responsibility of the safety of PalletOne network. The following is what Mediator does:

- Maintaining PalletOne tokens, the native token of PalletOne, which is used for transaction fee and maintenance fee.
- Maintaining the deposit of Jurors.
- Randomly selecting the Jurors in a Jury.
- Arbitrating when Jurors cannot reach consensus.

Jury

Jury is the fundamental unit to maintain the security and integrity of PalletOne. More specifically, it will be assigned to run contracts and manage multi-signature accounts. To achieve a secure and decentralized design, Jury is designed to compose of many participants, called Jurors. Every Juror pays a deposit to guarantee the security. Jurors use BFT (Byzantine Fault Tolerance) algorithm to reach consensus.

Distributed Storage

Distributed storage infrastructure will be used to store contract ID, contract code and selected jurors list involved in the execution of Mediator, as well as the contracts states during contract execution of Jury.

In PalletOne, we use Directed Acyclic Graph (DAG) as our distributed database. DAG has many advantages over traditional chained storage.

First of all, there is no concept of a block in a DAG. All transactions are individually encapsulated in a single structure called Unit, and the connections between the units are established by reference.

Secondly, using DAG as distributed storage, transactions can be written in parallel. In traditional blockchains, block is generated by miners, and miners need to select transactions in the transaction pool based on priority and block size, and then transactions are associated by the Merkle tree. Therefore, under the chained storage structure, transactions that are not packaged into the block are all blocked, and transactions packaged into the block are all in an unconfirmed state before the block is broadcasted to the entire network. Compared with the chain storage structure, DAG transactions can be written in real time in parallel to the entire ledger, thus ensuring the speed of transaction confirmation.

Thirdly, in the DAG, by choosing the main chain, each transaction is in an orderly state, which effectively solves the double spend problem.

Finally, with the traditional chained storage architecture, when the volume of transactions continues to increase, there will be network congestion and long-term transactions that cannot be confirmed. But in the DAG, the more nodes that participate, the greater the volume of transactions, and the faster the confirmation of the transaction, because the transactions are confirmed by the relationships that they refer to each other.

In PalletOne distributed storage, the specific information that needs to be stored mainly includes transaction information, contract ID, contract bytecode, contract state, list of jurors corresponding to the contract, and status information processed by the jury during execution of the contract.

Adaptor Layer

PalletOne provides API and library in the adapter layer that not only allows for the interaction with popular underlying blockchains, but also facilitate emerging blockchains interact with PalletOne.

PalletOne Protocol

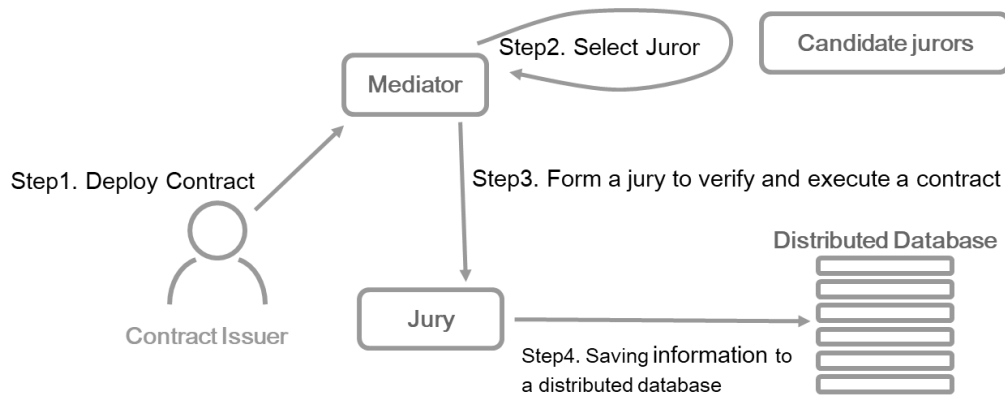
Template Deployment

In PalletOne, all types of services are created by smart contracts. The creation of contracts is based on contract templates. PalletOne provides some contract templates for common scenarios for users. Users can also create a new contract template by themselves and deploy it to PalletOne. The deployment of the contract template needs to be designated by Mediator. Mediator is responsible for checking the syntax, specification, etc. of the contract template and only the contract template that meets the requirements can be successfully deployed. A successful deployment contract template will be saved in the Distributed Storage of PalletOne for contract deployment in the future.

Contract Deployment

In PalletOne, all contract instances are based on templates. If you cannot find correct contract template that you needed in PalletOne, you need deploy template first. Once a contract issuer attempts to deploy the contract, PalletOne will do below steps:

Protocol for Abstract-Level Ledger Ecosystem



Step 1: Contract issuer send template hash and contract initial parameters to Mediator.

Step 2: Mediator will create a jury and random select jurors from "juror pool" based on contract parameters.

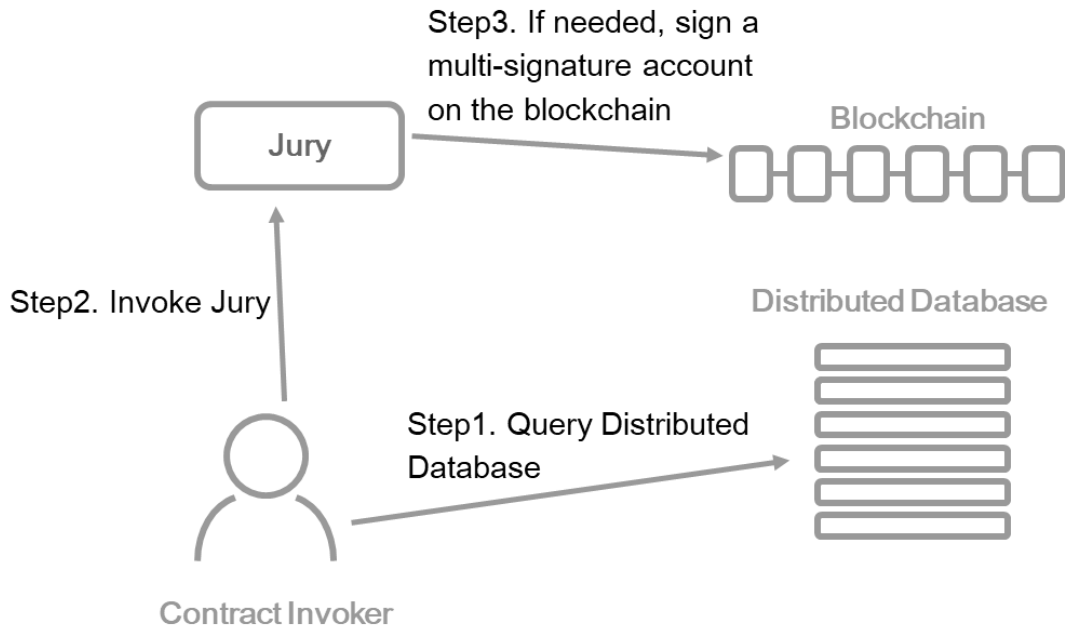
Step 3: Juror list of this jury will communicate each other and receive initial parameters from Mediator. Jury will retrieve template code from distributed storage.

Step 4: Jury will create contract instance based on initial parameters and template code, validate and execution. After validation and execution, jury will write the state data, contract ID and juror list into distributed storage.

Contract execution has two kinds of jury mode to bind: Lock juror mode and Unlock juror mode. User can select different kind of jury when create contract template.

Contract Invocation

After the contract has been deployed, other participants are able to invoke it.



Step 1: To invoke the contract, the contract invoker queries the distributed storage by the contract ID first. Then, the storage will return the contract program and the list of Jurors who are responsible for the execution of the contract on lock juror mode. If in unlock juror mode, Mediator will select a new Jury. After gathering necessary data, the contract will be packed with parameters into request object and sent to Jury.

Step 2: When the Jurors receive the request, they execute the contract independently along with the latest contract state and invocation parameters. If everything runs as expected, the results of those Jurors will be the same, and the contract state will be shifted to the next one.

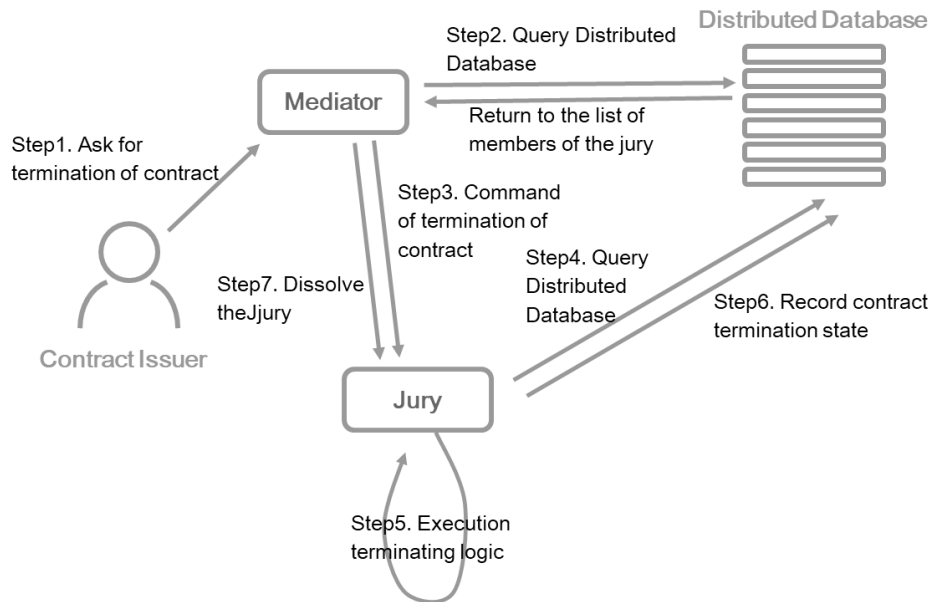
Step 3: If an interchain transaction is triggered, they will sign a multi-signature transaction on that blockchain as well.

Contract Query

After the contract is deployed, the user can use the query interface in the contract to query the contract state data. The query of the contract will not change the Distributed Storage, so it does not need the participation of the Jury.

Contract Termination

After the accomplishment of the contract execution or the contract meets the terminate conditions, the contract issuer may apply for the contract termination.



Step 1: the contract issuer send message to Mediator to apply for the contract termination.

Step 2: On lock juror mode, Mediator select the associated jurors from distributed storage by contract ID. On unlock juror mode, Mediator select a new Jury.

Step 3: Mediator send terminate message to Jury.

Step 4: Jury retrieve contract program and state data from distributed storage by contract ID.

Step 5: Jury check the terminate conditions, if it matched, execute the terminate function.

Step 6: Jury write the state data of terminated contract into distributed storage and send terminated message to Mediator.

Step 7: Mediator validates the terminated status, and then dissolves the corresponding Jury.

Token Economy

Tokens' use as payment of Deposit

To ensure the safety of PalletOne system, Jurors must pay a deposit to prevent them from conducting fraud. To become a Juror to earn transaction fee, participants need to follow this process: First, pay a deposit in the form of the PalletOne tokens ("PTN") to become a candidate Juror. The Juror can earn transaction fee when executing contracts. The deposit can be withdrawn when the smart contract ends. The Juror can also withdraw its deposit after invoking the Mediator to select a new Juror for replacement.

The proper amount of deposit can be evaluated through a model that contains different properties, including the value of the contract, the size of Jury, the credibility of Juror and the design of contract. The Juror must ensure a good host environment and network environment, because poor host environment may cause smart contracts not to complete within the specified time and the poor network environment may cause the communication between the jurors in the Jury to timeout or even offline. As a result, smart contracts could not reach a consensus among the jurors. After multiple consensus failures, deposit will be forfeited and the Juror will be removed from the list of candidate jurors.

Tokens' use as payment of Transaction Fee

To provide an incentive for Jury's execution, Jurors gain fees from contract participants by executing contracts. Contract participants need to pay some PalletOne tokens as the transaction fees to those Jurors. The transaction fee would be much lower than the transaction fee of other blockchains because only the Jurors in the corresponding Jury will run it. The Jury will only execute the contract after they verify that the PalletOne tokens have been successfully transferred.

In PalletOne, to provide an incentive for Jury executing contracts, Jurors gain fees from contract participants by executing contracts. Contract participants need to pay some PalletOne tokens as the transaction fees to those Jurors. The transaction fee would be much lower than the transaction fee of other blockchains because only the Jurors in the

corresponding Jury will run it. The Jury will only execute the contract after they verify that the PalletOne tokens have been successfully transferred into Mediator.

Token as Juror Incentive

For the efficient operation of the PalletOne whole network and to encourage as many as possible nodes to participate in the consensus, in addition to transaction fees, the Mediator will use the PalletOne tokens as incentives for the Jury's participation consensus based on smart contracts. Every juror who participates in the validation and execution of the contract will receive transaction fees and incentives in the form of PalletOne tokens as remuneration for their services. Because the Jury was randomly selected, everyone has the opportunity to become a member of the Jury and participate in the token economy.

Tokens' use as payment of Contract Deposit

Some contracts (such as currency exchange contracts) require both participants to pay a certain contract deposit in the form of PalletOne tokens to the contract to avoid the occurrence of a breach of contract by a single party. If the contract is completed normally, the contract deposit will be refunded to both sides of the contract, and if one party breaches the contract, the other party can apply for a penalty of the defaulting party's contract deposit to compensate for loss.

Recap

Based on the aforementioned PalletOne architecture, the Jury can execute the contracts and interact with the underlying blockchains. Jurors in a Jury reach the consensus to perform the reliable contract execution. Such design makes the execution efficient and scalable, since the consensus is generated by the Jury of this individual contract instead of all Jurors on the network. To reduce the cost of transaction fees and settlement latency, only contract states are stored in the underlying blockchains at the request of contract participants.

PalletOne Attributes

Multi-chain

PalletOne smart contracts support multi-chain. Through the Jury consensus and adaptation layer, PalletOne smart contracts can run on different blockchains at the same time. PalletOne smart contract can interact with different blockchains at the same time, so users can trade tokens from different blockchains in one PalletOne contract invocation to make the inter-chain token exchange distributed, atomic, and immutable.

At the same time, smart contracts (such as Bitcoin) developed for a blockchain can be reused on other blockchains (such as Litecoin), significantly reducing the development costs of smart contracts.

Multi-task

The verification, execution, etc. of the PalletOne smart contract can be done by the Jury specifically created for it. The Jury is composed of a group of jurors that randomly selected from the candidate jurors randomly. Smart contracts in PalletOne can be implemented by selecting different juries in a multi-tasking manner. Compared with the whole-network consensus, PalletOne network congestion will be effectively reduced.

Multi-language

Dapp developers of PalletOne can develop smart contracts using mainstream development languages (such as Java, C++, JS, etc.) without having to learn a new contract development language, such as Solidity for Ethereum. The attribute of PalletOne supporting multiple languages will contribute to prosperous of PalletOne ecosystem.

Multi-platform

As the key tool of smart contract compiling and execution, PalletOne VM is completely decoupled from the underlying operation system, which allow PalletOne smart contract adapt to windows, Linux, Mac as well as other types of platform.

Security

PalletOne's security is reflected in two aspects, one is the security of development, and the other is the security of contract execution.

Development security is reflected in two aspects :

(1) In PalletOne, we will provide sorts of standard contracts for common or specific scenarios. When a user develops a corresponding scene contract, he/she only needs to call a standard contract and complete Dapp development in a few steps. This design reduces the difficulty of user development while also reducing the risk due to incomplete development considerations.

(2) PalletOne provides a comprehensive set of token definitions and operations, making the user's token release process simple and easy to operate. Meanwhile, because of PalletOne has a comprehensive set of license definitions and operations, each license is traceable and safe.

Regarding to smart contract execution, PalletOne VM provides a sandbox environment for host safety and eliminates the possibility of host or network attacks from malicious contracts, which allows PalletOne smart contracts execution more secure.

PalletOne Advantages

High Capacity

In computer architecture, “data + algorithm (calculation)” is the program. While specific to the blockchain world, data is stored in blocks, and calculations are performed at the mining nodes. The block generation speed and block size determine the processing speed of the chain. In Bitcoin and Ethereum's transaction processing using the “serial storage + serial computing” mode, Bitcoin is about 7 TPS and Ethereum is about 15TPS.

DAG is different from the traditional "block + chain" structure, changing the serial nature of single-chain, through the parallel write to solve the data storage bottlenecks. As a blockchain platform for smart contracts, the serialization of computing nodes has become a new

bottleneck in the blockchain. The independent innovation jury consensus mechanism of PalletOne broke the seriality of the traditional consensus mechanism. Multiple juries conducted consensus calculations in a multi-task parallel manner, thereby improving computational performance.

Combining the DAG distributed storage with the jury consensus algorithm, both the storage and the computation break through the technical limitations of the traditional blockchain, and PalletOne thus forms a high-performance distributed ledger.

High Universality

PalletOne aims to establish an "IP protocol" for the blockchain industry, allowing value to flow freely between different blockchains. In the Internet technology, the physical layer may be a cable or an optical fiber; the data link layer includes both ATM, SDH, and Ethernet; but due to the existence of the IP protocol, the upper layer Internet application can not only ignore the physical layer and data link layer technologies. The evolution of physical facilities has changed, and historical accumulation of data has been retained, and the existence and development of sustainability have been maintained. PalletOne also plays this role. Dapp (Decentralized Application) can be deployed on various chains at the same time and is not limited by the underlying chain.

PalletOne provides interfaces and library functions for each chain in the adapter layer through an abstract digital currency chain (Bitcoin as an example) and a smart contract chain (using Ethereum as an example). The smart contract directly addresses the abstract interface without for the specific chain, the smart contract is decoupled from the bottom of the blockchain; the underlying chain can obtain the same information or value of other blockchains through PalletOne's adaptation layer without any requirement, restriction or restricted exchange.

Safe and Smart Token Model

PalletOne has a built-in general-purpose pass-through abstraction model for market and economics. Users can create their own token simply, safely and quickly based on the existing token templates. PalletOne provides support for the token model on the underlying data structure, which isolates the pass-through data from the contract data.

PalletOne uses the UTXO model and provides similar payment methods such as Bitcoin P2PH, P2SH, etc., making users experience as simple as Bitcoin in the payment experience.

In PalletOne token abstract model, integral token methods are provided. Therefore, the users do not need to write any code when issuing a token, but only need to configure the relevant parameters, thus avoiding the smart contract flaw in the issuance of the token.

Healthy Ecosystem

PalletOne aims to establish a complete smart contract ecosystem that allows developers, users, and "miners" to each and every one of PalletOne's platforms to create a healthy ecosystem.

For developers, on the one hand, support for smart contracts provides support for popular development languages. Developers do not need to learn a new contract development language, but only need to use their used development language to develop smart contracts. Reduced the difficulty of contract development. On the other hand, the contract store provides developers with a platform for smart contract sales. Similar to Apple's AppStore, developers can freely price smart contracts, and users benefit from using paid contracts to further improve developers' enthusiasm and smart contract quality.

For end users, user can choose smart contracts that meet their needs through the smart contract store provided by PalletOne. They only need to pay developers a contract fee to realize their own needs, instead of development and debugging by themselves. In addition, PalletOne will also provide a powerful set of contract templates for users to use for free.

For "Miners", they can apply for a juror, provide a good hardware environment for the execution of smart contracts, and collect an execution fee. Due to use of the DPoS consensus and the jury consensus, the "miners" do not need to use a large number of mining machines to compete for mining, avoiding extreme waste of energy and increasing the use of hardware.

Application Scenarios

PalletOne is an promising cross-chain project that will focus on achieving interaction between different blockchains. PalletOne's ultimate vision is to connect all of the blockchains so that

the originally closed and isolated information, values, and applications can be used freely across chains to build a globally interconnected network with no boundaries.

For the avoidance of doubt, PalletOne is not responsible for the offer of the following application scenarios including cross-chain payment, financial instruments, and payment types on dApps – these may be offered by developers of dApps or other participants on the platform. Because these applications may be subject to licensing requirements or other regulations in various jurisdictions, they may not be available in every jurisdiction.

Cross-chain Payment

We can imagine the following scenario: users in the Bitcoin network want to enjoy the fun of playing Crypto Kitties in Ethereum. The most feasible solution is to convert certain BTC to ETH through complex operations on Cryptocurrency exchange with high fees. PalletOne make the payment more convenient, that the user can use PalletOne to pay for the cost directly using BTC, thus avoiding complex currency exchange operations.

Financial Instrument

Mutual Funds

Mutual fund is a professionally managed investment fund that pools assets from many investors to purchase securities. PalletOne is the best platform to share their investment strategies. In other words, they can create their mutual funds, and define the reward in contracts. Everyone will have the right to use the PalletOne as they wish, so everyone has the opportunity to create their own mutual fund. They can distribute the funds into different cryptocurrencies as they want. With PalletOne, human creation has no boundaries.

Exchange Trade Fund

Financial instruments are monetary contracts between parties. They can be created, traded, modified and settled. At present, there are very few cryptocurrency ETF over the world, and they are all controlled by large financial institutions. Users can use PalletOne to create their own ETFs and hold assets such as cryptocurrencies, commodities, or bonds. Create more opportunities for investors all over the world.

Financial Derivatives Instrument

For financial applications, PalletOne also provides convenient services. The token in PalletOne is highly flexible. Any user can use the forensic tool to design a Bitcoin, Ethereum, Litecoin or even stocks and bonds. In the case of a combination of various assets, the value of this certificate will be determined by the real-time market for all the assets that make up the permit, so as to avoid the risk of a large increase or decrease in individual currencies or securities.

In addition, based on the Token Abstraction Layer, the user can also issue different functions for the assets he holds. For example, a house can issue the ownership token and the use right pass, and the user who purchased the ownership pass will have this. A home, and the user who purchased the pass will be able to use the house during the life cycle of the permit. PalletOne provides a comprehensive set of at-risk definitions and warrants that can accomplish this and ensure security.

Support for Multiple Payment Types on Dapps

Based on PalletOne, developers can deploy various types of Dapps, unlike the case where Dapp on Ethereum only supports ETH payments. When users use Dapps built on PalletOne, the payment method is more flexible and free: both through PalletOne Token and You can choose BTC, ETH, or even random combination of several ways. The flexibility of payment methods will stimulate the diversity of users to a certain extent, which will further promote the development of the PalletOne ecosystem.

Core Team



Peijiang Zhu

PalletOne Global Community Leading Official

Secretary General of Z-Park Blockchain Industry Alliance Engaged in network, video as well as blockchain technology research for years. Expert at underlying blockchain technology, consensus algorithm, token economy ecosystem.



Matthew Jones

PalletOne North American Business Official

Business Planner, MICROSOFT Acquired master degree from the University of Texas at Austin.



Yi Zeng

PalletOne Technical Director

Database expert, author of "SQL Server database technical handbook", work and research in database application, data warehouse, big data and blockchain technology. Expert at development on Fabric.



Cuicui Wang

PalletOne Architect & Researcher

M.A. of Beijing University of Posts and Telecommunications, worked in Baidu and subordinate research institution of certain state management department. Expert at research of network security, network traffic analysis as well as blockchain technology.



Kenneth Chen

Specialist of PalletOne

Co-Founder & CTO of GenieNRM, Chief Strategy officer of TelTel, Co-Founder & CTO of Datamite Technology, 20 years experience in products design and management.



Dr. Jian Liu
Specialist of PalletOne

The doctor of National University of Defense Technology,
Engaged in the development and research of operating system, distributed computing,
supercomputer and so on for years.



Dr. Yu Chen
Specialist of PalletOne

Received the doctorate degree in mathematics from the University of South Carolina
Served as a research scientist in the US Summus Inc, mainly developing algorithms and
software for image processing and pattern recognition in the US Defense Research
Department, such as ONR and Sandia National Labs.



Ningning Shi
Specialist of PalletOne

Specialist of PalletOne.



Xiaojun Mao
PalletOne CMO

As Senior Market Consultant for Blockchain Industrial Alliance of Zhongguancun , as
CEO of STARHALO (Beijing) Media Technology Co., Ltd. as master of management of
MSC, ESC Rennes School of Business, France. Having worked in the Economic
Management College for DBA Office of Beijing University of Posts and
Telecommunications.



Donghai Liu
PalletOne director of operation

As Senior Market Director for Blockchain Industrial Alliance of Zhonggancun, as
executive director of STARHALO (Beijing) Media Technology Co., Ltd., and general
manager of Harmony Totem (Beijing) Commercial Management Co.,Ltd.



Zheng Zhang
PalletOne manager of operation

COO for STARHALO (Beijing) Media Technology Co., Ltd.

**Yu Yang****PalletOne Distributed Storage DAG Module Leader**

Master of Science in Electronics and Communication Engineering, Beijing Jiaotong University. Has many years of development experience, early researcher of Bitcoin, Ethereum and DAG technology.

**Lihua Guo****PalletOne senior engineer
leader of virtual machine and contract management module**

Engaged in software development, architecture design and multi-year technical management of the Internet and broadcasting industry. Has in-depth research and practical development experience on blockchains such as fabric and bitcoin.

**Jiyou Wang****Leader of the PalletOne code framework
and p2p network module**

Master of Bohai University. Proficient in C, C++, Go languages, rich experience in DHCPv6, ND, RUI protocols, and high-performance server design and development; Familiar with block chain P2P network design and development.

**Jie Yang****PalletOne development engineer
storage DAG and memory management**

Graduated from Beijing university of chemical technology, majoring in computer science, I have been engaged in the development of the back-end of go language for a long time, and have a deep understanding of the basic elements and design of block chain.

**Albert Gou****PalletOne development engineer
leader of consensus algorithm module**

Familiar with a variety of front-end and back-end technology, many years of C++ language research and development experience, participate in application software development in multiple industries, and have in-depth research on BitShares and DPoS consensus.

**Xiangli Zhang****PalletOne Senior Core R&D Engineer**

manager of the underlying chain transaction adapter model

With years of experience in C / CPP development, familiar with encryption and decryption algorithms, bitcoin, data structure and algorithms have a deeper understanding, block chain lover.

**Ligang Wang****PalletOne Senior Development Engineer****leader of chain data API and wallet service module**

Master degree from China University of Petroleum (Beijing), with experience in data communications, big data, block chains, micro-services related development, and engaged in economic research.

**Zhiyuan Wu****PalletOne Senior Development Engineer****head of system contract module**

Graduated from Beijing University of Posts and Telecommunications, MBA. Engaged in block chain investment and Practice for many years. Focus on technology and study the sociological and economic significance of blockchain.

Advisors

**Yan Meng****Vice president of the well-known open source community-CSDN**

one of the promoters of “Tong Zheng” (Token) conception

**Dr. Li Gong****PalletOne Chief Scientist**

President of Mozilla company, Former vice president of Microsoft China R & D group, president of China Engineering Research Institute of Sun. Got a bachelor's degree and a master's degree in computer science of Tsinghua University, Ph. D. of computer science of University of Cambridge.

**Akiyoshi Fukumitsu****Founder & CEO of Hivelocity Inc.**

Mr. Fukumitsu is based in Tokyo, has over 20 years of web development, online marketing and business solutions extensive experience. Founder & CEO of Hivelocity Inc.

Mr. Fukumitsu received a Bachelor's degree in Civil Engineering and M.A. in Urban Planning from Waseda University in Tokyo, Japan.

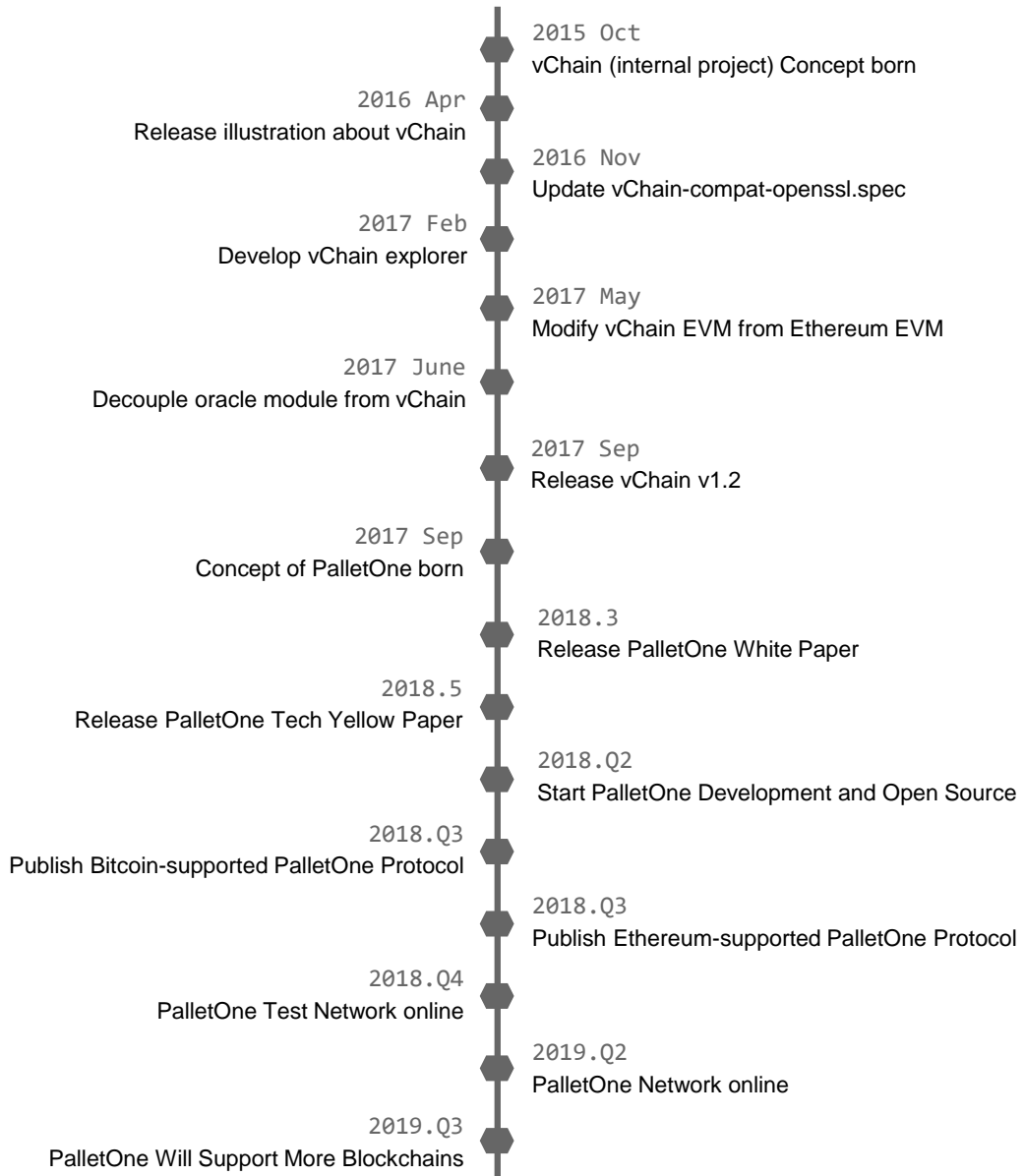
Time Line

We are a group of passionate people who are fond of technology and believe in the future vision of blockchain: the Internet of Value. We have developed vChain (internal project) since Oct 2015. In the meantime, we have developed explorer, VM etc. for vChain and tried to promote blockchain technology for practical usage.

Starting in 2016, we tried to decouple Ethereum's smart contract system to make it adaptable to Bitcoin, and even other existing chains.

Meanwhile, we noticed the real potential of decoupling. It can do more than we think before, which is capable of overcoming the challenges nowadays and reaching the Internet of value. From then on, we start to research and design a protocol based on this concept. Thanks to the effort so far, we now introduce PalletOne to start a new generation of the Internet of Value.

Protocol for Abstract-Level Ledger Ecosystem



Road Map

Conclusion

PalletOne is an abstract-level smart contract protocol which decouples execution from underlying blockchains. As a result, execution of contracts can be more scalable and able to interact with different blockchain. Benefiting from leveraging PalletOne VM, contract in PalletOne can not only be programmed in multiple languages but also be reused by existing tools to provide a secure and high performance execution.

PalletOne allows users to trade on-chain and off-chain properties. To drive PalletOne protocol, users can buy PalletOne tokens and use them as transaction fees to Jury, or users can become Jurors to earn PalletOne tokens.

STATEMENT

This document or any other document prepared in connection with the sale of PalletOne tokens has not been and will not be lodged or registered as a prospectus with the Monetary Authority of Singapore (the “MAS”) under the Securities and Futures Act, Chapter 289 of Singapore, as may be amended from time to time (the “SFA”). The MAS assumes no responsibility for the contents of this document or any such document. Accordingly, statutory liability under the SFA in relation to the content of prospectuses would not apply.

Notwithstanding anything in this document, the Palletone tokens’ sole purpose and function will be their potential use by users who wish to participate as Mediators, Jurors, DApp or smart contract template developers, or common users on the Palletone platform or otherwise access services on the Platform as contemplated in this document (which potential use remain subject to change in PalletOne Foundation’s sole and absolute discretion). Ownership of the PalletOne tokens carries no rights, express or implied, other than the right to use the PalletOne tokens as a means to enable usage of and interaction with the Platform, if successfully completed and deployed. The PalletOne tokens therefore do not represent or confer any ownership right or stake, share, equity or security or equivalent rights, or any right to receive any future profit or revenue shares, intellectual property rights or any other asset in or relating to the Platform or any Group Entity. The PalletOne tokens will be sold to any purchaser solely on the understanding that any interest the purchaser may have in the PalletOne tokens is solely limited to potentially using the PalletOne tokens as contemplated in this document, and not for any other purposes, including, but not limited to, any investment, speculative, or financial purpose or with a view towards making a profit from the secondary sale of the PalletOne tokens. No promises of future performance or value are or will be made with respect to Tokens, including no promise of inherent value, and no guarantee that the PalletOne Tokens will hold any particular value. The PalletOne Tokens should not be acquired for speculative or investment purposes with the expectation of making a profit on resale.

For the avoidance of doubt, the consideration paid for the PalletOne Tokens, as well as the PalletOne platform and any other assets of the platform, will belong to the PalletOne Foundation both legally and beneficially and may be used by PalletOne Foundation in its sole and absolute discretion as it deems fit, and none of the consideration nor any property, asset,

revenue, profit, shares, interest, or any other rights are managed or collectively managed for or for the benefit of any holder or holders of the PalletOne tokens whatsoever.

The Tokens (a) are not a loan to any Group Entity; (b) do not provide any ownership or other interest or rights whether actual or notional in any Group Entity or any other company, enterprise, or undertaking or any kind of venture; (c) are not intended to be a representation of currency or money (whether fiat or virtual or any form of electronic money), security, unit in a collective investment scheme, commodity, bond, debt instrument, stored value facility, or any other kind of financial instrument or investment; (d) are not a commodity or asset that any person is obliged to redeem or purchase; (e) are not any note, debenture, warrant, or other certificate that entitles the holders of the Tokens to interest, dividend, or any kind of return from any person; (f) are not intended to be a security, unit in a collective investment scheme, commodity, financial derivative, commercial paper or negotiable instrument, or any other kind of financial instrument or investment between the holders of Tokens and any other person, nor is there any expectation of profit or returns; and the purchasers of the Tokens will not have any right to a refund in any circumstances including if the Platform is not developed or successfully developed.

The purchasers of the Tokens from the Company that the purpose of the Tokens is to enable Users to access, use, and enjoy the Platform whether as a Mediator, Juror, developer of DApp or smart contract template, or any other common User. It will be made clear to the purchasers of the Tokens that the Tokens are not sold as an investment and no person should purchase the Tokens from the Company with any expectation that the Company will take any action for the purposes of or in any way increasing or creating an increase in the value or maintaining the value of the Tokens. The Company's sole focus will be on developing and operating the Platform to ensure that the Platform will be attractive for use by its Users.

RISKS AND UNCERTAINTIES

Prospective purchasers or holders of PalletOne Tokens ("PTN") ("Purchasers", "Holders", or "You") should carefully consider and evaluate all risks and uncertainties associated with PTN, the PalletOne Platform ("Platform"), PalletOne Foundation Ltd and any of its related corporations ("Group Entities") and their respective businesses and operations, any sale and purchase of PTN including the terms and conditions governing such sale ("T&Cs"), and all information set out in this white paper ("White Paper") prior to any purchase of PTN. You should not purchase PTN unless you have understood and accepted all risks involved in the

purchasing, holding and using of the PTN including the risks set out in this document. If any of such risks and uncertainties develops into actual events, the business, financial condition, results of operations and prospects of PTN and/or any or all of the Group Entities could be materially and adversely affected. No person owes you any returns in respect of the PTN or can guarantee that the Platform, any PTN and any and all the activities and businesses contemplated and discussed in this White Paper will definitely be established, materialise and be carried out, or result in any returns now or in the future. In such cases, you may lose all or part of the value of the PTN which you and you alone will have to solely bear.

For the avoidance of doubt, the risks involved with purchasing PTN include (but are not limited to) the following:

1. Risk of Uninsured Losses

Unlike bank accounts or accounts at some other financial institutions, PTN is uninsured unless you specifically obtain private insurance to insure them. Thus, in the event of loss or loss of utility value, there is no public insurer or private insurance arranged by any person to provide recourse (and in any event, no person is obliged to compensate or insure you for any event of loss or loss of utility value).

2. Risks Associated with Uncertain Regulations and Enforcement Actions

The regulatory status of PTN and distributed ledger technology is unclear or unsettled in many jurisdictions, but numerous regulatory authorities across jurisdictions have been outspoken about considering the implementation of regulatory regimes which govern cryptocurrency or cryptocurrency markets. It is difficult to predict how or whether regulatory agencies may apply existing regulation with respect to such technology and its applications, including the Platform and PTN. It is likewise difficult to predict how or whether legislatures or regulatory agencies may implement changes to law and regulation affecting distributed ledger technology and its applications, including the Platform and PTN. Regulatory actions could negatively impact the Platform and PTN in various ways, including, for purposes of illustration only, through a determination that PTN is a regulated financial instrument that require registration or licensing, which may force the Platform to be made unavailable in certain areas. Any Group Entity may cease operations in a jurisdiction in the event that regulatory actions, or changes to law or regulation, make it illegal or difficult to operate in such jurisdiction, or commercially undesirable to obtain the necessary regulatory approval(s) to operate in such jurisdiction.

3. Risks Arising from Taxation

The tax characterisation of PTN is uncertain. You must seek your own tax advice in connection with purchasing, holding and utilising PTN, which may result in adverse tax consequences to you, including, without limitation, withholding taxes, transfer taxes, value added taxes, income taxes and similar taxes, levies, duties or other charges and tax reporting requirements.

4. Risk of alternative competing platforms

It is possible that alternative platforms could be established in an attempt to facilitate services similar to those provided by the Platform. The Platform may compete with these alternative platforms, which could negatively impact the Platform and PTN.

5. Risk of Insufficient Interest in the Platform or Distributed Applications

It is possible that the Platform will not be used by a large number of individuals, companies and other entities or that there will be limited or no public interest in the creation and development of distributed platforms (such as the Platform) more generally. Such lack of use or interest could negatively impact the development of the Platform and therefore the potential utility of PTN.

6. Risks Associated with the Development and Maintenance of the Platform

The Platform is still under development and may undergo significant changes over time. Although it is intended for PTN and the Platform to have the features described in this White Paper, and the relevant Group Entity will endeavour to work towards those ends (subject to internal business considerations), changes may be required to be made to the specifications of PTN or the Platform for any number of reasons. This could create the risk that PTN or the Platform, as further developed and maintained, may not meet your expectations or requirements at the time of purchase. Furthermore, despite the relevant Group Entity's good faith efforts to develop and maintain the Platform, it is still possible that the Platform will experience malfunctions or otherwise fail to be adequately developed or maintained, which may negatively impact the Platform and PTN.

7. Inadequate disclosure of information.

As at the date hereof, the Platform is still under development and its design concepts, consensus mechanisms, algorithms, codes, and other technical details and parameters may be

constantly and frequently updated and changed. Any statement in the White Paper is subject to change and may be adjusted and updated from time to time.

8. Risk of an Unfavourable Fluctuation of Currency Value

The proceeds from selling PTN are intended to fund the development and maintenance of the Platform. If the value of digital assets in which the PTN sale proceeds are denominated fluctuates unfavourably during or after the sale of PTN, the relevant Group Entity which will undertake development of the Platform may not be able to fund development, or may not be able to develop and/or maintain the Platform in the manner that it intended.

9. Risk of Dissolution of any Group Entity or Platform

Start-up companies such as any of the Group Entities involve a high degree of risk. Financial and operating risks confronting start-up companies are significant, and the Group Entities are not immune to these. Start-up companies often experience unexpected problems in the areas of product development, marketing, financing, and general management, among others, which frequently cannot be solved.

It is possible that, due to any number of reasons, including, but not limited to, an unfavourable fluctuation in the value of cryptographic and fiat currencies, decrease in the utility of PTN due to negative adoption of the Platform, the failure of commercial relationships, or intellectual property ownership challenges, the Platform may no longer be viable to be developed or even if developed, maintained and operated, and the Group Entities may be dissolved.

10. Risks Arising from Lack of Governance Rights

Because PTN confers no governance rights of any kind with respect to the Platform or any Group Entity, all decisions involving the Platform or any Group Entity will be made by the relevant Group Entity at its sole and absolute discretion, including, but not limited to, decisions to discontinue the Platform, or to sell or liquidate any Group Entity. These decisions could adversely affect the Platform and PTN you hold.

11. Risks associated with markets for PTN

There is no prior market for PTN and the PTN token sale may not result in an active or liquid market for PTN. PTN is designed to be used solely within the Platform, hence there may be illiquidity risk with respect to the PTN you hold. PTN is not a currency issued by any central bank or national, supra-national or quasi-national organisation, nor is it backed by any hard

assets or other credit nor is it a "commodity" in the usual and traditional sense of that word. No Group Entity is responsible for, or obliged to pursue, the circulation and trading of PTN on any market. Trading of PTN will merely depend on the consensus on its value between the relevant market participants. No one is obliged to purchase any PTN from any holder of PTN, nor does anyone guarantee the liquidity or market price of PTN to any extent at any time. Furthermore, PTN may not be resold to a purchaser who faces restrictions in the purchase of cryptographic tokens or with respect to whom the purchase of PTN may be in violation of applicable laws. Accordingly, no Group Entity or any person makes any representation, warranty or guarantee that there will be any demand or market for PTN, or that the price you pay for PTN is indicative of any market valuation or market price for PTN.

Even if secondary trading of PTN is facilitated by third party exchanges, such exchanges may be relatively new and subject to little or no regulatory oversight, making them more susceptible to fraud or manipulation. Furthermore, to the extent that third parties do ascribe an external exchange value to PTN (e.g., as denominated in a digital or fiat currency), such value may be extremely volatile, decline below the price which you have paid for PTN, and/or diminish to zero.

12. Loss of Talent

The development of the Platform depends on the continued co-operation of the existing technical and commercial team and expert consultants, who are highly knowledgeable and experienced in their respective sectors. The loss of any member may adversely affect the Platform or its future development. Further, stability and cohesion within the team is critical to the overall development of the Platform. There is the possibility that conflict within the team and/or departure of core personnel may occur, resulting in negative influence on the project in the future.

13. Failure to develop

The Platform is still in the developmental stage, hence there may be large changes to the final design before the official version is released. There is the risk that the development of the Platform will not be executed or implemented as planned, or may not meet any expectation of purchasers of PTN, for a variety of reasons, including without limitation the event of a decline in the prices of any digital asset, virtual currency or PTN, unforeseen technical difficulties, and shortage of development funds for activities.

14. Risks Associated with the related Blockchain

Because PTN and the Platform are based on blockchain technology, any malfunction, breakdown or abandonment of the relevant blockchain may have a material adverse effect on the Platform or PTN. Moreover, advances in cryptography, or technical advances such as the development of quantum computing, could present risks to PTN and the Platform by rendering ineffective the cryptographic consensus mechanism that underpins the relevant Blockchain. The future of cryptography and security innovations are highly unpredictable.

15. Risk of Losing Access to PTN Due to Loss of Private Key(s)

A private key, or a combination of private keys, is necessary to control and dispose of PTN stored in your digital wallet, vault or other storage mechanism. Accordingly, loss of requisite private key(s) associated with your digital wallet, vault or other storage mechanism storing PTN may result in loss of such PTN. Moreover, any third party that gains access to such private key(s), including by gaining access to login credentials of a hosted wallet service you use, may be able to misappropriate your PTN. No Group Entity can or will be responsible for any such losses.

16. Risk of Mining Attacks

As with other decentralised cryptographic tokens based on blockchain technology, PTN is susceptible to attacks by miners in the course of validating PTN transactions on the relevant blockchain, including, but not limited to, double-spend attacks, majority mining power attacks, and selfish-mining attacks. Any successful attacks present a risk to the Platform and PTN, including, but not limited to, accurate execution and recording of transactions involving PTN.

17. Risk of Hacking and Security Weaknesses

Hackers or other malicious groups or organisations may attempt to interfere with the Platform or PTN in a variety of ways, including, but not limited to, malware attacks, denial of service attacks, consensus-based attacks, Sybil attacks, smurfing and spoofing. Furthermore, because the Platform is based on open-source software, there is a risk that a third party or a member of any Group Entity may intentionally or unintentionally introduce weaknesses into the core infrastructure of the Platform, which could negatively affect the Platform and PTN.

18. Forking

The Platform is a community project and certain elements are open-sourced. The Group Entities do not and cannot monopolise the development, marketing, operation or otherwise of the Platform's blockchain. Any entity may independently develop a patch or upgrade of the source code of the Platform's blockchain without prior authorisation of any other party. The acceptance of these patches or upgrades by a sufficient (not necessarily overwhelming) percentage of PTN holders could result in a "fork" in the blockchain, and consequently two diverging networks may emerge and remain. Each branch of the blockchain arising from the fork will have its own native cryptographic tokens – accordingly there will be two different versions of PTN respectively residing in the two divergent branches with almost identical technical features and functions. The community in the Platform may split into two groups in support of the two branches respectively.

Further, it is theoretically possible for each branch of the forked blockchain to be further forked an unlimited number of times. The temporary or permanent existence of forked blockchains could adversely affect the operation of blockchain and the PTN which you hold, and may ruin the sustainability of the Platform.

19. Unanticipated Risks

The PTN, being cryptographic tokens, are a new and untested technology. In addition to the aforementioned risks, there may be other risks associated with your purchase, holding and use of PTN, including those may not be anticipated by the Group Entities. Such risks may further materialise as unanticipated variations or combinations of the risks discussed above or otherwise howsoever arise.

CAUTIONARY NOTE ON FORWARD-LOOKING STATEMENTS

All statements contained in this White Paper, statements made in press releases or in any place accessible by the public and oral statements that may be made by any of the Group Entities or their respective directors, executive officers or employees or agents or contractors acting on their respective behalves, that are not statements of historical fact, constitute "forward-looking statements", whether or not identified by forward-looking terms such as "aim", "target", "anticipate", "believe", "could", "estimate", "expect", "if", "intend", "may", "plan", "possible", "probable", "project", "should", "would", "will" or other similar terms. However, these terms are not the exclusive means of identifying forward-looking statements.

All statements regarding any of the Group Entities' financial position, business strategies, plans and prospects and the future prospects of the industry which the Group Entities is or will be in are forward-looking statements. These forward-looking statements, including but not limited to statements as to any of the Group Entities' revenue and profitability, prospects, future plans, other expected industry trends and other matters discussed in this White Paper regarding the Platform and/or any of the Group Entities are matters that are not historic facts, but only statements of intention or predictions which cannot in any way be guaranteed.

These forward-looking statements involve known and unknown risks, uncertainties and other factors that may cause the actual future results, performance or achievements of the Platform and/or any of the Group Entities to be materially different from any future results, performance or achievements expected, expressed or implied by such forward-looking statements. These factors include, amongst others:

- (1) changes in political, social, economic and stock or cryptocurrency market conditions, and the legal and regulatory environment in the countries in which any of the Group Entities conduct their respective businesses and operations;
- (2) the risk that the Platform may require regulatory licences or other similar regulatory approvals or clearances to be used by persons in your jurisdiction, and that you may not be able to use the Platform or PTN or any tokens offered under the platform if the operator of the Platform or the relevant issuer of the token is unable to obtain the necessary regulatory licence or other similar regulatory approval or clearance;
- (3) the risk that any of the Group Entities may be unable to execute or implement their respective business strategies and future plans;
- (4) changes in the anticipated growth strategies and expected internal growth of any of the Group Entities;
- (5) changes in the availability and fees payable to any of the Group Entities in connection with their respective businesses and operations;
- (6) changes in the availability and salaries of employees who are required by any of the Group Entities to operate their respective businesses and operations;
- (7) changes in preferences of customers or targeted users and participants of any of the Group Entities or the Platform;
- (8) changes in competitive conditions under which any of the Group Entities operate, and the ability of any of the Group Entities to compete under such conditions;
- (9) changes in the future capital needs of any of the Group Entities and the availability of financing and capital to fund such needs;
- (10) war or acts of international or domestic terrorism;
- (11) occurrences of catastrophic events and natural disasters that affect the businesses and/or operations of any of the Group Entities;
- (12) other factors beyond the control of any of the Group Entities; and

- (13) any risk and uncertainties associated with any of the Group Entities and their businesses and operations, the PTN and any sale of PTN.

All forward-looking statements made by or attributable to any of the Group Entities or persons acting on behalf of any of the Group Entities are expressly qualified in their entirety by such factors. Given the risks and uncertainties that may cause the actual future results, performance or achievements of any of the Group Entities to be materially different from that expected, expressed or implied by the forward-looking statements in this White Paper, no reliance must be placed on these statements. These forward-looking statements are applicable only as of the date of this White Paper. None of the Group Entities nor any other person represents, warrants and/or undertakes that the actual future results, performance or achievements of any of the Group Entities will be as discussed in those forward-looking statements. The actual results, performance or achievements of any of the Group Entities may differ materially from those anticipated in these forward-looking statements.

Nothing contained in this White Paper is or may be relied upon as a promise, representation or undertaking as to the future performance or policies of any of the Group Entities including the Platform. Further, none of the Group Entities shall have any responsibility to update any of the above-mentioned forward-looking statements or publicly announce any revisions to the forward-looking statements to reflect future developments, events or circumstances, even if new information becomes available or other events occur in the future.

Appendix

Token issuance demo code

Code 1: Pseudo code of token issuance

/* This is a pseudo code of a contract running on PalletOne. This contract will demonstrate how to issue a token in a contract.

Some methods are defined in this contract, `mint()`, `transfer()` and `get_balance()`.

There are some predefined variables and methods provided by PalletOne contract APIs. */

```
init(args):
    // init(args) will be called only once when deploying.
    state = new_contract_state()
    state.set_issuer(current_user)
    state.set_empty_user_balance()
    set_contract_state(state)
run(args):
    // All invocations will start here.
    current_user = get_current_user()
    state = get_contract_state()
    param = get_parameters()
    if (args == "Mint N") {
        return mint(N)
    } else if (args == "transfer N tokens to user U"){
        return transfer(N, U)
    } else if (args == "get_balance of user U") {
        return get_balance(U)
    } else {
        return invalid_invocation("Wrong arguments")
    }
mint(n):
    issuer = state.get_issuer()
    user_balance = state.get_user_balance()
    if (current_user == issuer) {
```

```
        user_balance[issuer] += n
        state.set_user_balance(user_balance)
        set_contract_state(state)
        return OK
    } else {
        return invalid_invocation("Permission denied.")
    }
}

transfer(n, receiver):
    user_balance = state.get_user_balance()
    if (user_balance[current_user] >= N) {
        user_balance[current_user] -= N
        user_balance[receiver] += N
        state.set_user_balance(user_balance)
        set_contract_state(state)
        return OK
    } else {
        return invalid_invocation("Insufficient token.")
    }
}

get_balacne(user):
    // Assume all balance infos are public.
    user_balance = state.get_user_balance()
    return user_balacne[user]
```

Glossary

Abstract level: PalletOne is a light-weight protocol running on a higher level on the blockchain, which we call abstract level.

Jury: A group of chosen workers who are responsible for executing and verifying contract running on PalletOne.

Juror: Contract verifier who is responsible for contract execution in the Jury group.

PalletOne Token: PalletOne token is used as the transaction fees of contract executions for Jury and is the native token of PalletOne.

Mediator: A smart contract on PalletOne which maintains PalletOne token.