PALLETONE

Protocol for Abstract-Level Ledger Ecosystem

Distributed Interchain Protocol

---IP Protocol of Blockchains

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Contents

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.

Statement

Due to the team's recent in-depth research and implementation of the PalletOne technology, we find the solutions in the previous white paper have some security risks and design deficiencies. Therefore, the team members unanimously decided to make the following major changes to PalletOne:

1. Change name Pallet to PalletOne.
2. Remove PDC, but add Mediator.
3. Add Token Abstract Layer.
4. Change smart contract VM from LLVM to Docker.
5. Use DAG as our distributed database.

Due to the above technical changes, PalletOne's development timeline has also been adjusted accordingly. Concerning specific changes, please refer to the white paper.

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 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.

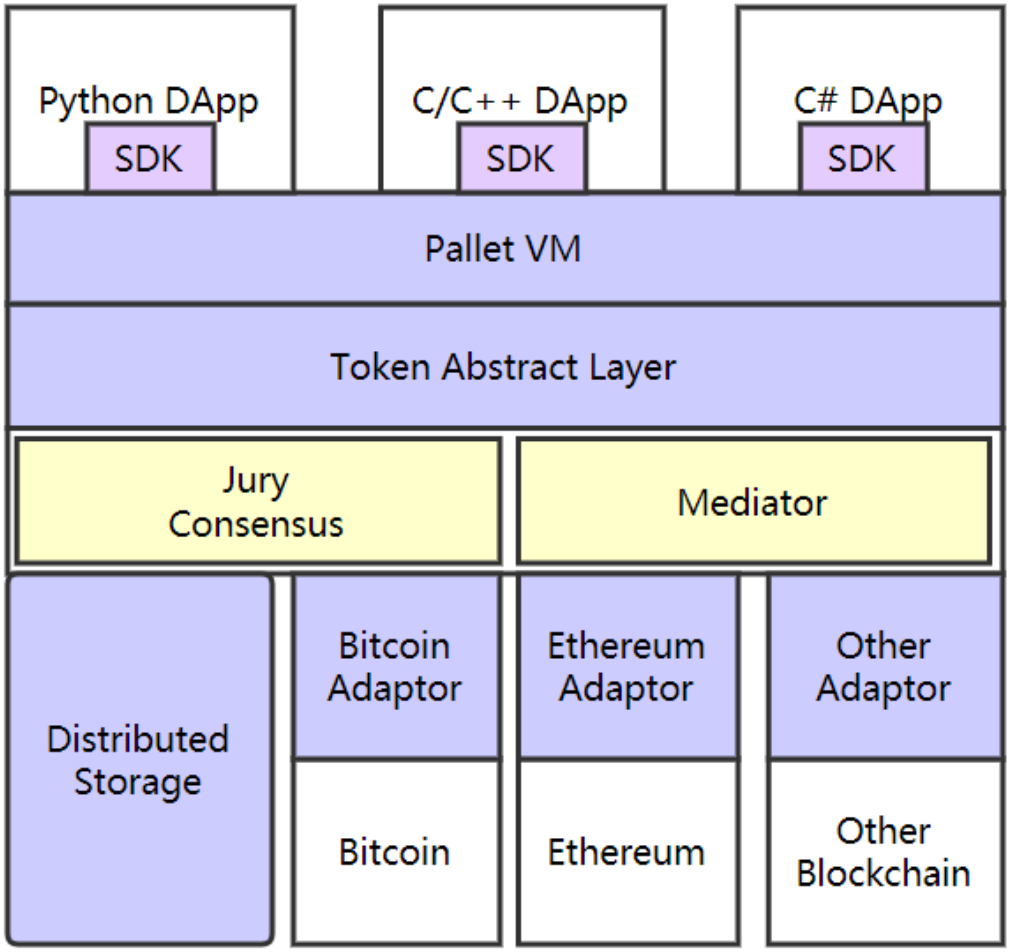


figure 1 PalletOne architecture

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

Token Abstract Layer defines the definition set and operation set of token, which decrease the difficulty and complicity of smart contract development and minimize the smart contract vulnerability, and the definition of digital assets will be more agile.

PalletOne will initially include the following pass-through abstract models:

(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.

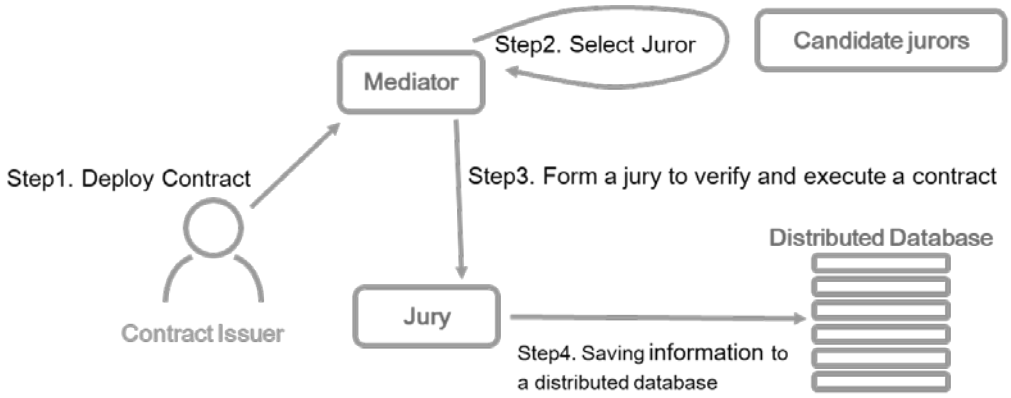
PalletOne Protocol

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:



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.

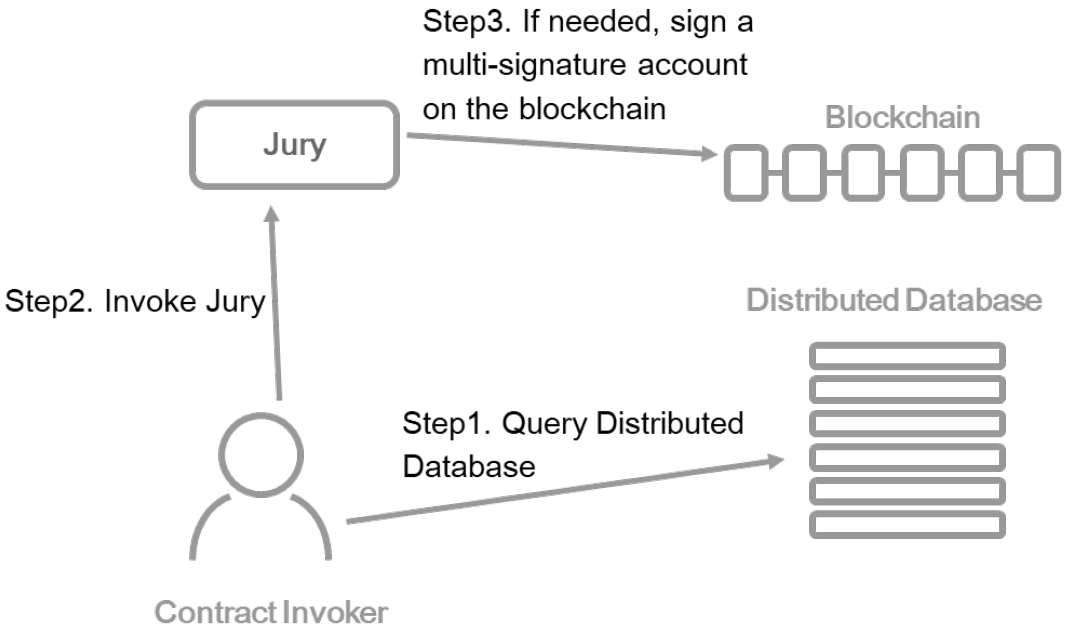
Step 3: Juror list of this jury will communicate each other and receive initial parameters from Mediator. Jury will retrieve template code from distributed storage.

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.

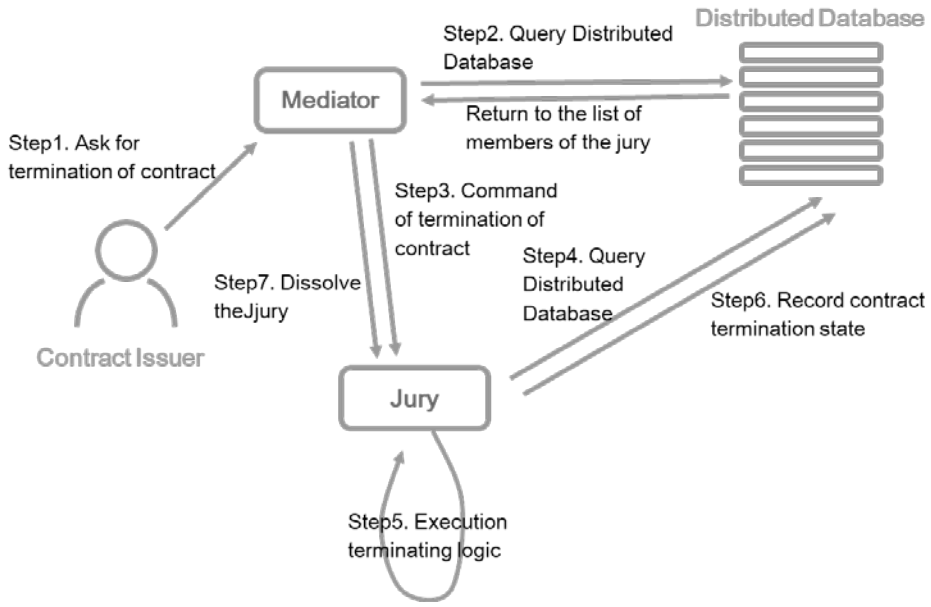
Step 3: If an interchain transaction is triggered, they will sign a multi-signature transaction on that blockchain as well.

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

Token as 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 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 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.

Token as 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. Therefore, the maximum amount of PalletOne tokens generated each year due to consensus awards will be determined based on inflation factors, and the inflation factor is assumed to be 2%.

Transaction fees and incentives in the PalletOne are distributed to every juror who participates in the validation and execution of the contract. Because the Jury was randomly selected, everyone has the opportunity to become a member of the Jury and participate in the token economy.

Token as Contract Deposit

Some contracts (such as currency exchange contracts) require both participants to pay a certain contract deposit 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 attibute 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.

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

Co-founder of PalletOne community

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

Co-founder of PalletOne community

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

Yi Zeng

PalletOne Co-founder&CTO

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 Co-founder&System Analyst

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

Co-founder of PalletOne community

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 STARTHALO (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 STARTHALO (Beijing) Media Technology Co., Ltd., and general manager of Harmony Totem (Beijing) Commercial Management Co.,Ltd.

Minsen Feng

PalletOne Asia-Pacific Marketing Director

PalletOne Asia-Pacific Marketing Director.

Xiang Zhao

PalletOne Asia-Pacific Marketing Director

PalletOne Asia-Pacific Marketing Director.

Zheng Zhang

PalletOne manager of operation

COO for STARTHALO (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 bacherlor’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.

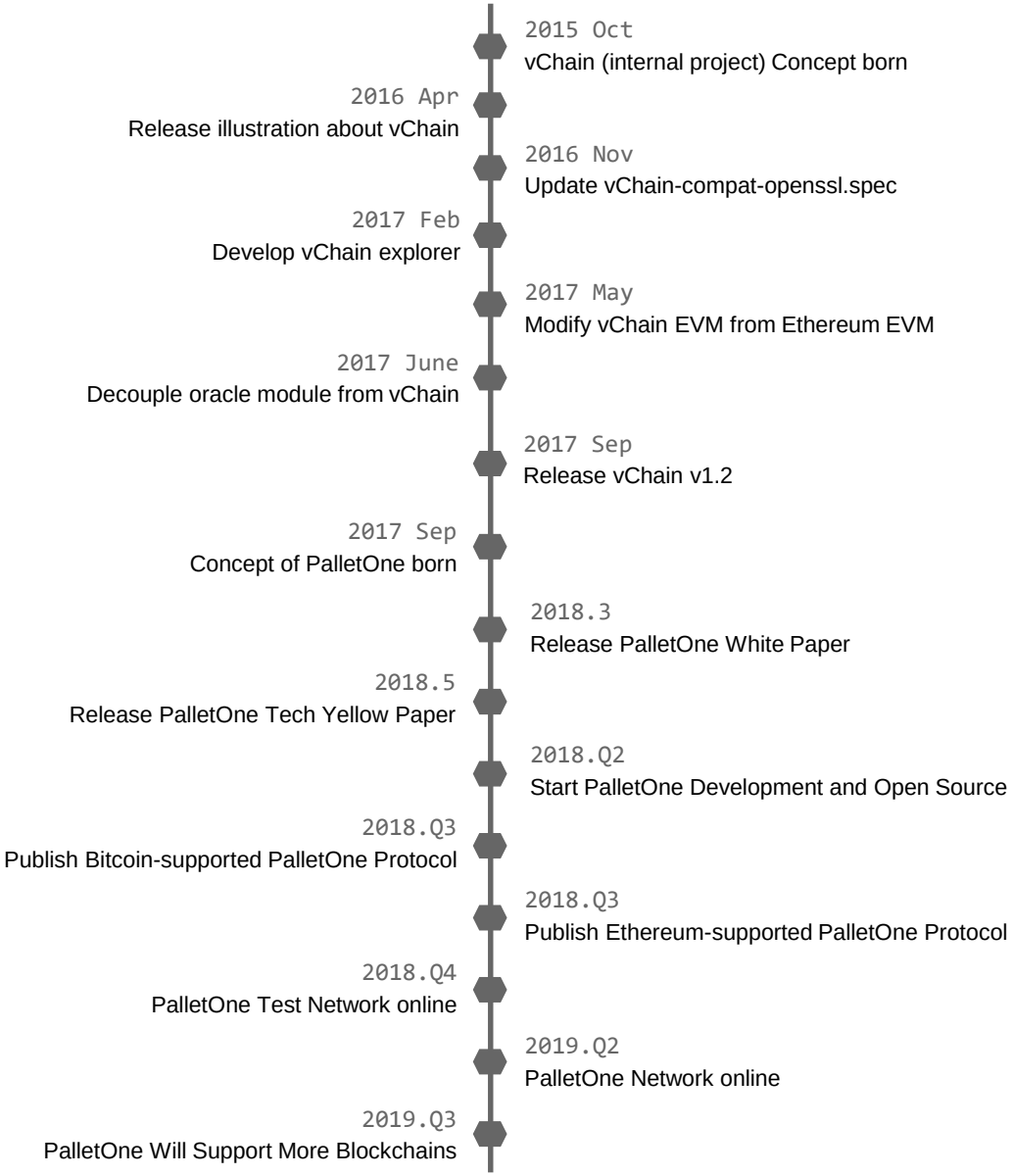
Investment Funds

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.


2015 Oct
vChain (internal project) Concept born
2016 Apr
Release illustration about vChain
2016 Nov
Update vChain-compat-openssl.spec
2017 Feb
Develop vChain explorer
2017 May
Modify vChain EVM from Ethereum EVM
2017 June
Decouple oracle module from vChain
2017 Sep
Release vChain v1.2
2017 Sep
Concept of PalletOne born
2018.3
Release PalletOne White Paper
2018.5
Release PalletOne Tech Yellow Paper
2018.Q2
Start PalletOne Development and Open Source
2018.Q3
Publish Bitcoin-supported PalletOne Protocol
2018.Q3
Publish Ethereum-supported PalletOne Protocol
2018.Q4
PalletOne Test Network online
2019.Q2
PalletOne Network online
2019.Q3
PalletOne Will Support More Blockchains

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.

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 defned in this contract, mint(), transfer()
and get_balance().
There are some predefned 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_isser()
    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 verifer 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.