WELUPS WHITEPAPER

Whitepaper Version: 1.0

WELUPS Protocol Version: 1.0

1. General

1.1 BlockChain

Blockchain is a type of database or ledger that is replicated and distributed to all participants in its network. It is made up of a collection of nodes that are interconnected to store data or valuable items in blocks. These blocks are verified by transactions and linked chronologically in a chain. Details of these transactions are permanently recorded in the block and cannot be changed.

Blockchain technology, also known as distributed ledger technology (DLT), provides a decentralized and accessible data structure for different records. Such records can include financial transaction and payment details, as well as other types of information – from commerce to the internet of things (IoT).

A blockchain stores data in a decentralized way, independent of centralized controlling or intermediary entities. This provides transparency of data storage and management. An important feature of blockchain is the storage of immutable records, which means they cannot be altered, tampered with or deleted, as this would break the chain of records.

Blockchain is considered an indestructible ledger in which information is kept in all pages.

- Centralized system - All data entry and operations are usually managed by a central server. This increases the risk of single error and also means that the controlling entity (such as a bank or government) acts as a decision maker.
- Decentralized system – it often relies on multiple server nodes, each serving a subset of the total number of end clients.
- Distributed system – all transaction data and records are encrypted and stored not in a single server, but in an independent, interconnected system of nodes and terminals. This ensures independence from centralized entities, transparency and security

Finally, blockchain not only provides an immutable and secure database, but also acts as a functional environment for money transactions, digital currency creation, and complex transactions processing using digital agreements (smart contracts).

1.2 Blockchain ID

The prevalence of identifying users on the Internet is creating security concerns in databases. If AI is the starting point for fears of personal information leakage, another technology – blockchain - is the answer.

Personal data has become an invaluable asset in the rise of AI (Artificial Intelligence) applications. Data is inherently the foundation of AI; thanks to data analysis, AI can go far in

optimizing applications in daily life such as healthcare, digital banking, facial recognition, etc. beyond smart cities and e-government.

Currently, when carrying out the process of declaring personal information on the internet, each individual's data is saved in different places. With traditional methods, central systems where huge volumes of data are kept, have become the target for hackers. Therefore, having the database compromised and causing information of hundreds, thousands or even millions of people to be stolen is the biggest risk facing current data management systems.

The current duo of most prominent technologies - AI and Blockchain - have complementary strategic advantages for each other. While AI creates Orwellian fear, blockchain adds exactly what AI needs. The key point of blockchain is that the storage method is completely different from the traditional one, so it has become the foundation of current AI technology. While the current volume of data that computers are analyzing is on centralized systems, blockchain keeps its data on a decentralized system. This distributing method difference helps to disperse hackers' targets.

Trust is created when users know exactly who used their data. As a technology that keeps information in the form of a blockchain with linking blocks, it is very easy to trace back to the origin of transaction and related users.

Also, blockchain allows individuals to create applications that act as encrypted and fully manageable "e-ID cards". Once information such as home address or work history is personally filled in on a specialized identity application on the blockchain platform, they will have a universal authentication value, which can be used for different services, from websites or apps from around the world. It is a great improvement from having to constantly fill out different information forms like now.

Convenience is also significantly improved when each person does not need to be burdened with cumbersome administrative procedures every time they want to change their personal information like their driver's license, residence or bank account. An identity management system that harnesses the power of blockchain will automatically update and mark changed details, thus frees each individual from wasting time in having to re-verify their personal information.

The combination of digital ID and Blockchain platform offers the optimal for user identification in all aspects of life.

1.3 NFT – The new trend

NFT stands for 'non-fungible token', a unit of data that is stored on a digital ledger - a blockchain that authenticates a file it stores as unique. An NFT functions more like a

cryptographic token than a digital currency like Bitcoin, it is not interchangeable and indivisible, in other words, each NFT is unique.

NFTs are created when the blockchain concatenates encrypted records of a character string that authenticate a certain dataset as unique, linked to previous records; thus forming a sequence of authentication data arrays. This encryption process ensures the authenticity of a file by providing a digital signature, which will be used to obtain ownership of the NFT file. Even so, the ownership attested by an NFT does not in essence endorse the intellectual property rights of the digital assets represented by the NFT. When a user purchases an NFT, the buyer does not necessarily get the rights to the intellectual property (copyrights), so the first owner is allowed to create multiple NFTs of the same work. Therefore, an NFT is simply an ownership certificate, as opposed to intellectual property rights (copyrights).

Although NFT is not a new term, this technology trend has only really been noticed in the last few years because of its usefulness in attesting ownership for digital painting sets, graphics, or movies. NFT market has grown from 42 million dollars to 338 million dollars in just 3 years (2017-2020) as observed by NFT specialist nonfungible.com

As of early March 2021, about 150,000 NFTs have been sold with a total value of 310 million dollars, five times that of the same period in 2020.

Canadian singer, songwriter and visual artist, Claire Elise Boucher, recently successfully sold a piece of digital art through NFT technology for $6.6 million. In early March, a digital video clip of NBA basketball star, LeBron James, was auctioned for a closing price of up to 200,000 USD.

The NFT craze really peaked when, on March 11, Christie's auctioned a piece of digital art called Everyday: The First 5,000 Days for $69.3 million, making it the third most valuable work ever sold by a living artist.

Undoubtedly, this high NFT price is due to the recent spike in crypto prices, most of the NFTs are traded in Ether, the price has increased by 570% in the past year.

2. WELUPS Project

2.1 Vision

The goal of the WELUPS Platform is to build a "financial Internet" where users can easily deploy and trade financial products on the same platform. Sub-networks with different purposes that can interact with each other facilitate the easy creation and trading of digital

assets on complex terms. We can see the great ambition of **OMANEE Group** and the WELUPS platform to strengthen the traditional financial market.

WELUPS platform will push in a new revolution in the field of NFT blockchain and digital asset encryption. It is an ambitious project dedicated to establishing a truly decentralized Internet infrastructure. WELUPS is the first platform that provides identity social networking applications, digital banking, credit support and provides services to connect global transactions. This platform promotes technology application in life, thus creates more values and promotes the development of the world.

2.2 Foundation

The era of technology 4.0 and the revolution of mobility have created a huge amount of data. However, it is very difficult to determine the reliability and accuracy of any information on the internet. On this platform, the lack of transparency's consequences are financial frauds, anonymous harassment, hackers or impersonated accounts.

Understanding the importance of information transparency, **OMANEE Group** boldly aims to make global network information transparent with a detailed, tightly implemented and consistent plan to turn WELUPS into such a special ecosystem with data and credentials, providing safety and trust for users and 4.0 residents of our ecosystem.

The development plan for the ecosystem is meticulously sectionalized into many sub-projects, key projects, connection projects, etc. Each small project has a clear goal, not only ensuring the technology is updated but also ensuring the common ecosystem and corporate's strategies.

2.3 History

OMANEE is a fintech corporation with the world's leading growth rate thanks to its mastery of the idea of rapid growth (blitz scaling).

The corporation was established in 2017 and has been growing for more than 5 years. In 2017 - 2019, the company mainly built the core systems of the ecosystem including IDShare and IDBank. During 2018-2020, **OMANEE** has been successful in building core application projects: **PAYAWE, VUWO, NEEBank.** In 2021, OMANEE aims at the completion of WELUPS ecosystem by connecting the current ecosystem - the transparent records of personal information and the new VUWO ecosystem – specialized in keeping transparent records of financial information, digital assets as well as **NFT** creation.

Since its first days, the corporation has continuously grown the number of employees from a few to hundreds in just 4 years (2017 - 2021), and now **OMANEE** has offices in Vietnam, the Philippines, Korea, the UAE, India, Myanmar, etc. In terms of project development, the number of projects that OMANEE participates in or in charge itself has increased from 5 in 2017 to the current 20 projects. The number of users grew at an exponential rate, about 0.56% per day on average, growing from 5,000 users to over 400,000 within 3 years.

With a consistent strategic direction and detailed plan, the corporation is now fully confident to prepare for a new rapid development with **VU** projects to bring WELUPS ecosystem to the breaking point with the goal of 500 million users worldwide.

OMANEE HISTORY

Phase 1 (2017 - 2020): OMANEE global kick-off and building up the technology foundation

Phase 2 (2021 - 2023): Expanding the digital business ecosystem and launching applications

Phase 3 (2024 - 2030): Developing digital community and smart cities

Phase 4 (2030 - 2050): Creating an ideal living environment for global digital citizens

2.4 WELUPS Platform definition

WELUPS is an Identity Blockchain platform, developed in Dubai under the management of OMANEE. It aims at creating an ecosystem of decentralized applications, NFTs and digital assets. Thanks to all the inheritance of great advantages of Ethereum and Tron, WELUPS is able to form a completely new platform that easily integrates with many other technology products, gradually meeting all humans' needs in their daily life.

With WELUPS, developers can deploy their own smart contracts on WRC at significantly lower fee than other blockchains on the market.

WELUPS ecosystem includes public chain, digital citizen ID verification, asset verification, wallet application, Decentralized applications (DApps), and NFT application (applied to cars, houses, gold, valuables or any other asset that need to be managed on the Internet).

WELUPS is an open-source project implementing a new, high-performance, permissionless blockchain. With the introduction of WELUPS Platform, WEL (WELUPS' Coin) will be migrated from the TRC-20 original blockchain platform to the WRC-20, WELUPS' own blockchain in January 2022.

Therefore, WEL will be considered a base coin for the WELUPS Platform; from this coin, traders can issue, receive and send new tokens on the platform. Moreover, people can propose new trading pairs to be listed on WELUPS platform. This transition will increase the needs to use WEL even more in the future.

2.5 Why WELUPS?

A centralized database can handle 2000 transactions per second on a standard gigabit network. Centralized databases can also self-replicate and maintain high availability without significantly affecting that transaction rate using a distributed systems technique known as Optimistic Concurrency Control. With WELUPS, we are demonstrating that these same theoretical limits apply to blockchain on an adversarial network.

Another important part is finding a way to share the time when the nodes cannot trust each other. Once nodes can trust time and distributed system apply to blockchain, the transactions and records can be done more smoothly with better speed.

Furthermore, this becomes possible using a mechanism that has existed in Bitcoin since day one. Bitcoin's feature is called timing and it can be used to update transactions using block height instead of timestamp. As a client, you would use block height instead of timestamp if you don't trust the network. Block height is an example of what is known as a verifiable Latency Function in cryptographic circles. It is a cryptographically secure way of saying that time has passed. With this feature, we use a more granular verifiable deferred function, a WRC721 chain, to check the ledger and coordinate consensus. Also, we implement Concurrency Control on metrics and are currently on our way towards a theoretical limit of 710,000 transactions per second.

The goal of WELUPS platform is to demonstrate that there exists a set of software algorithms that, when used in combination to implement a blockchain, remove software performance bottlenecks, allowing throughput transaction's scale proportionally to network bandwidth. The blockchain structure further fulfills all three desirable properties of a proper blockchain: scalable, secure, and decentralized.

WELUPS platform cannot be shut down, censored or interfered with by external parties. Interoperability ensures the most cross-functional environment for financial operations, interacting not only with one currency, but with multiple currencies on different blockchain.

In addition, WELUPS also provides a platform for decentralized but identified applications (DApps), allowing users to create their own assets on-chain, which can be stored and transferred back and forth.

3. Operation model

3.1 WELUPS Usage

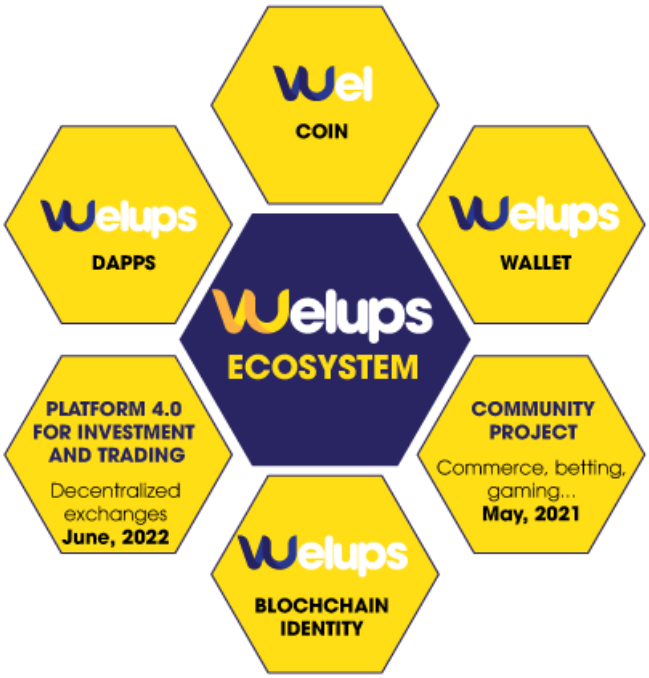
- Issuing tokens
- Sending and receiving WELs
- Sending, receiving, burning, minting (printing), stacking and releasing tokens
- Trading using on-chain pairs
- Exploring transactions and on-chain blocks via WELUPS Explore, API, node RPC interface
- Operating full nodes
- Extracting other data via chain, full node or APIs
- Operating validator node
- Developing tools and applications

WELUPS Blockchain platform is established based on the following special factors to ensure the safety of users.

- WRC is an independent Blockchain which offers security and safety to all users and developers.
- WRC is EVM compatible so it will support all existing WELUPS tools with faster transaction time and cheaper cost.
- WELUPS enables interoperability between 2 blockchains, thus enabling cross-chain communication and scaling for high-yield DApps to run more smoothly.
- Finally, Smart Chain's on-chain governance through DPoS consensus mechanism combined with 19 transaction validators bring decentralization and increase community of users’ power on decisions.

- WELUPS is a multi-chain, heterogeneous and scalable technology. It allows Blockchains to connect with each other to share data and form a common decentralized Network.

3.2 WELUPS Ecosystem



Graph 1: WELUPS Ecosystem graphic

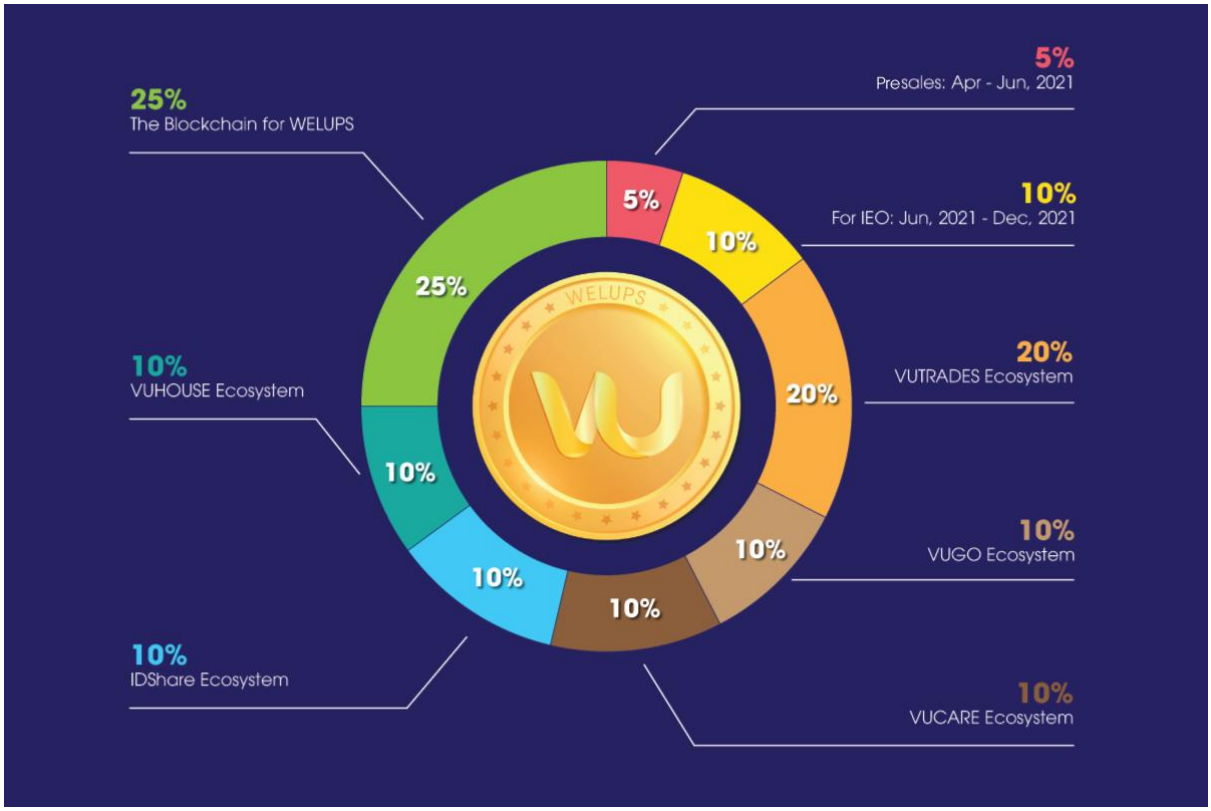
3.2.1. What is WEL?

- WEL is the name of the token for WELUPS Platform
- WEL is the crypto unit used in WELUPS ecosystems
- WEL can be used as fiat currencies
- In January, 2022, WEL is separated from TRON blockchain and operated on its own blockchain, WELUPS.
- WEL was issued on TRC-20, operated with **DPOS (**Delegated Proof of Stake)

- Ticker: WEL
- Blockchain: WRC20
- Smart Contract: TKd9vDzRZHY7LD2NpwAASpgsvSe3wiiGiG
- Circulating Supply: 149,600,000,000 WEL
- Total Supply: 149,600,000,000 WEL

- March, 2021 – December, 2021: Starting WELUPS using TRON Platform (TRC20)
- June, 2021: Introducing WELUPS Testnet
- December, 2021: Introducing Mainnet
- January, 2022: Switching to WELUPS Blockchain – WRC20, website: welscan.io

3.2.2. WEL Distribution



Graph 2: WEL Distribution

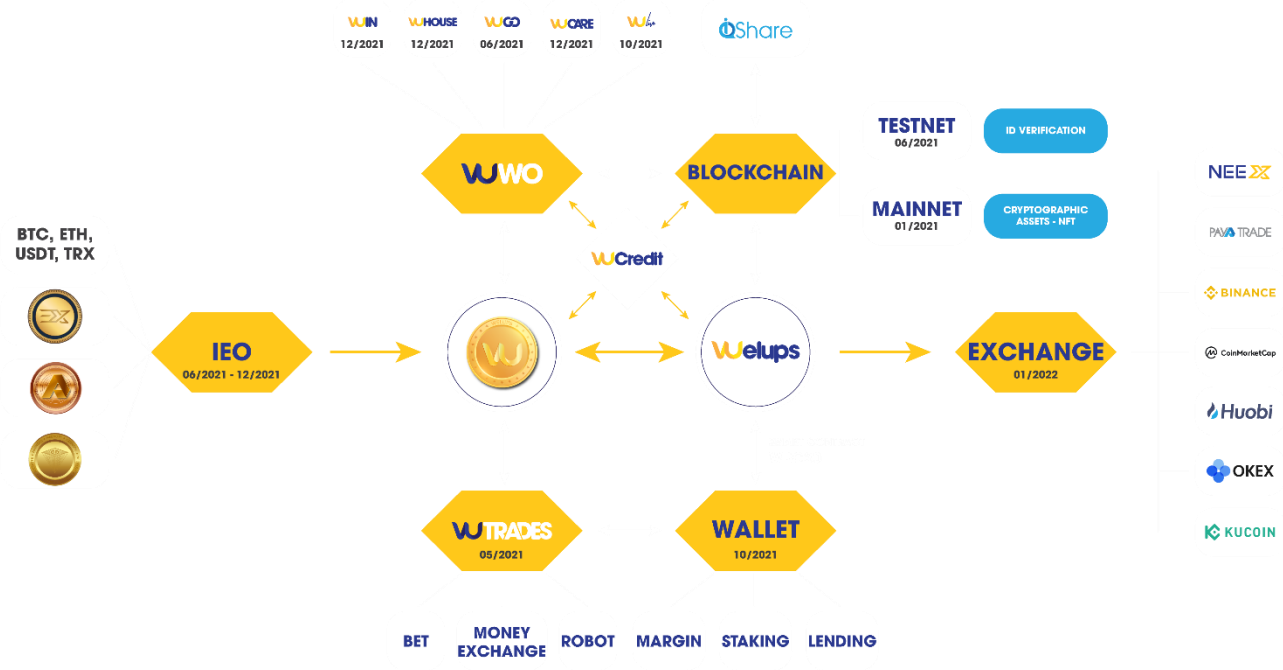
- 5% for Private sales: April – June, 2021

- 10% for IEO: June, 2021 – December, 2021
- 20% for VUTRADES development
- 10% for VUCARE development
- 10% for IDShare and its ecosystem development
- 10% for VUGO development
- 10% for VUHOUSE development
- 25% for WELUPS and its ecosystem development

3.2.3. WELUPS blockchain wallet

- An application to manage money 4.0
- It is applicable to WELUPS and its partners' coins (WEL, PAYA, NEE, AWE, USDex)
- It can be accessed by and connected to all applications in WELUPS' ecosystem
- It contains all functions like other e-wallets (Margin, Staking, E-Voucher, Lending, Lucky Draw, etc)

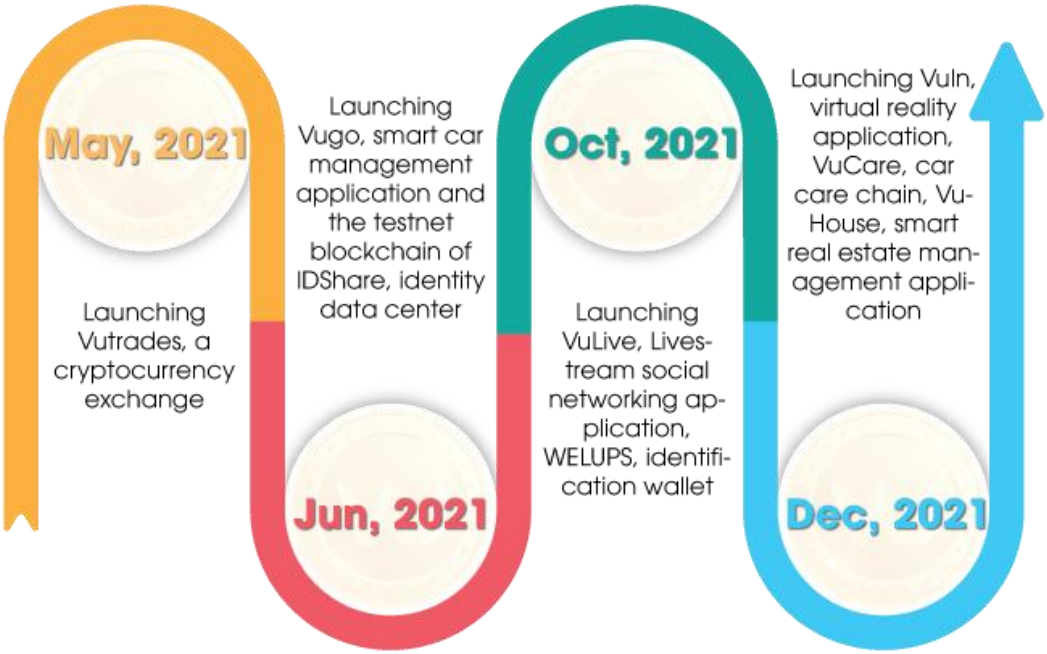
4. Roadmap



Graph 3: WELUPS ecosystem roadmap

4.1 Launching roadmap for WELUPS ecosystem

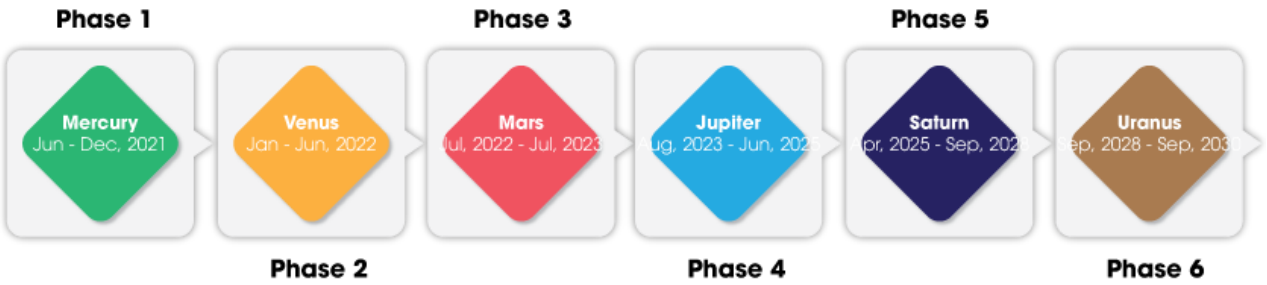
- Existing core systems: IDShare – the core for ID verification and users' personal information, and IDBank – the core banking of the system
- Existing core applications: Payawe – Ecommerce platform, Sàn giao dịch tiền tệ Neex – Trading platform for cryptos, NEEBank – digital bank, Dr.NEE – chat application, NEENote wallet.



Graph 4: WELUPS application launching roadmap

- May, 2021: introducing VuTrades, crypto trading platform
- June, 2021: introducing Vugo, vehicle management application and WELUPS' testnet blockchain
- October, 2021: introducing VuLive – social media streaming platform and WELUPS – verified-ID blockchain wallet
- December, 2021: introducing VuIn – the virtual AI assistant, VuCare – vehicle maintenance chain, and VuHouse – the housing management system

4.2 WELUPS Blockchain Roadmap



Graph 5: WELUPS Blockchain Roadmap

- Phase 1: Mercury, June – Dec, 2021
- Phase 2: Venus, Jan – Jun, 2022
- Phase 3: Mars, Jul, 2022 – Jul, 2023
- Phase 4: Jupiter, Aug, 2023 – Jun, 2022
- Phase 5: Saturn, Apr, 2025 – Sep, 2028
- Phase 6: Uranus, Sep, 2028 – Sep, 2030

5. Technical solution

5.1 Terminology

WELUPS Address/Wallet

An address or wallet consisting of account credentials on the WELUPS network are generated by a key pair, which consists of a private key and a public key, the latter being derived from the former through an algorithm. The public key is usually used for session key encryption, signature verification, and encrypting data that could be decrypted by a corresponding private key.

ABI (Application binary interface)

An application binary interface (ABI) is an interface between two binary program modules; usually one of these modules is a library or an operating system facility, and the other is a user run program**.**

API (Application programming interface)

An application programming interface (API) is mainly used for user clients development. With API support, token issuance platforms can also be designed by WELUPS Blockchain developers.

Asset

In WELUPS' documents, asset is the same as token, which is also denoted as WEL-10 token.

WBP (WELUPS Bandwidth Points)

To keep the network operating smoothly, WELUPS network transactions use WBP as fuel. Each account gets 5000 WBP free daily and more can be obtained by freezing WEL for WBP.

Both WEL and WEL-10 token transfers are normal transactions costing WPB. Smart contract deployment and execution transactions consume both WBP and Gas.

Block

Blocks contain the digital records of transactions. A complete block consists of the magic number, block size, block header, transaction counter, and transaction data.

Block reward

Block production rewards are sent to a sub-account (address/wallet). Super Representatives can claim their rewards on WELUPS scan or through the API directly.

Block Header

A block header is part of a block. WELUPS block headers contain the previous block’s hash, the Merkle root, timestamp, version, and witness address.

Cold Wallet

Cold wallet, also known as offline wallet, keeps the private key completely disconnected from any network. Cold wallets are usually installed on "cold" devices (e.g. computers or mobile phones staying offline) to ensure the security of WEL private key.

DApp

Decentralized Application is an App that operates without a centrally trusted party. An application that enables direct interaction/agreements/communication between end users and/or resources without a middleman.

gRPC

gRPC (gRPC Remote Procedure Calls) is an open-source remote procedure 2 call (RPC) system initially developed at Google. It uses HTTP/2 for transport, Protocol Buffers as the interface description language, and provides features such as authentication, bidirectional streaming and flow control, blocking or nonblocking bindings, and cancellation and timeouts. It generates cross-platform client and server bindings for many languages. Most common usage scenarios include connecting services in microservices style architecture and connecting mobile devices, and browser clients to backend services.

Hot Wallet

Hot wallet, also known as online wallet, allows a user's private key to be used online, thus it could be susceptible to potential vulnerabilities or interception by malicious actors.

JDK

Java Development Kit is the Java SDK used for Java applications. It is the core of Java development, comprising the Java application environment (JVM+Java class library) and Java tools.

KhaosDB

WELUPS has a KhaosDB in the full-node memory that can store all the newly-forked chains generated within a certain period of time and supports witnesses to switch from their own active chain swiftly into a new main chain.

LevelDB

LevelDB was initially adopted with the primary goal to meet the requirements of fast R/W and rapid development. After launching the Mainnet, WELUPS will upgrade its database to an entirely customized one catered to its very own needs.

Merkle Root

A Merkle root is the hash of all hashes of all transactions included as part of a block in a blockchain network. See 5.3 Delegated Proof of Stake (DPoS) for more details.

Public Testnet (Shasta)

A version of the network running in a single-node configuration. Developers can connect and test features without worrying about the economic loss. Testnet tokens have no value and anyone can request more from the public faucet.

RPC 3

In distributed computing, a remote procedure call (RPC) is when a computer program causes a procedure (subroutine) to execute in a different address space (commonly on another computer on a shared network), which is coded as if it were a normal (local) procedure call, without the programmer explicitly coding the details for the remote interaction.

Scalability

Scalability is a feature of WELUPS protocol. It is the capability of a system, network, or process to handle a growing amount of work or its potential to be enlarged to accommodate that growth.

mVU

mVU is the smallest unit of WEL. 1 WEL = 1.000.000 mVU

Throughput

High throughput is a feature of WELUPS Mainnet. It is measured in Transactions Per Second (TPS), namely the maximum transaction capacity in one second, for which WELUPS' max throughput is 300 TPS.

Time Stamp

The approximate time of block production is recorded as Unix timestamp, which is the number of milliseconds that have elapsed since 00:00:00 01 Jan 1970 UTC.

WEL-10

A standard of crypto token on WELUPS platform. Certain rules and interfaces are required to follow when holding an initial coin offering on WELUPS blockchain.

WRC-20

WRC-20 is a technical standard used for smart contracts that implement tokens supported by the WELUPS Virtual Machine. It is fully compatible with TRC-20 and ERC-20.

WRC-721

WRC-721 is a supported technical standard for the issuance of NFTs (Non-Fungible Tokens). It is fully compatible with TRC-721 and ERC-721.

WEL

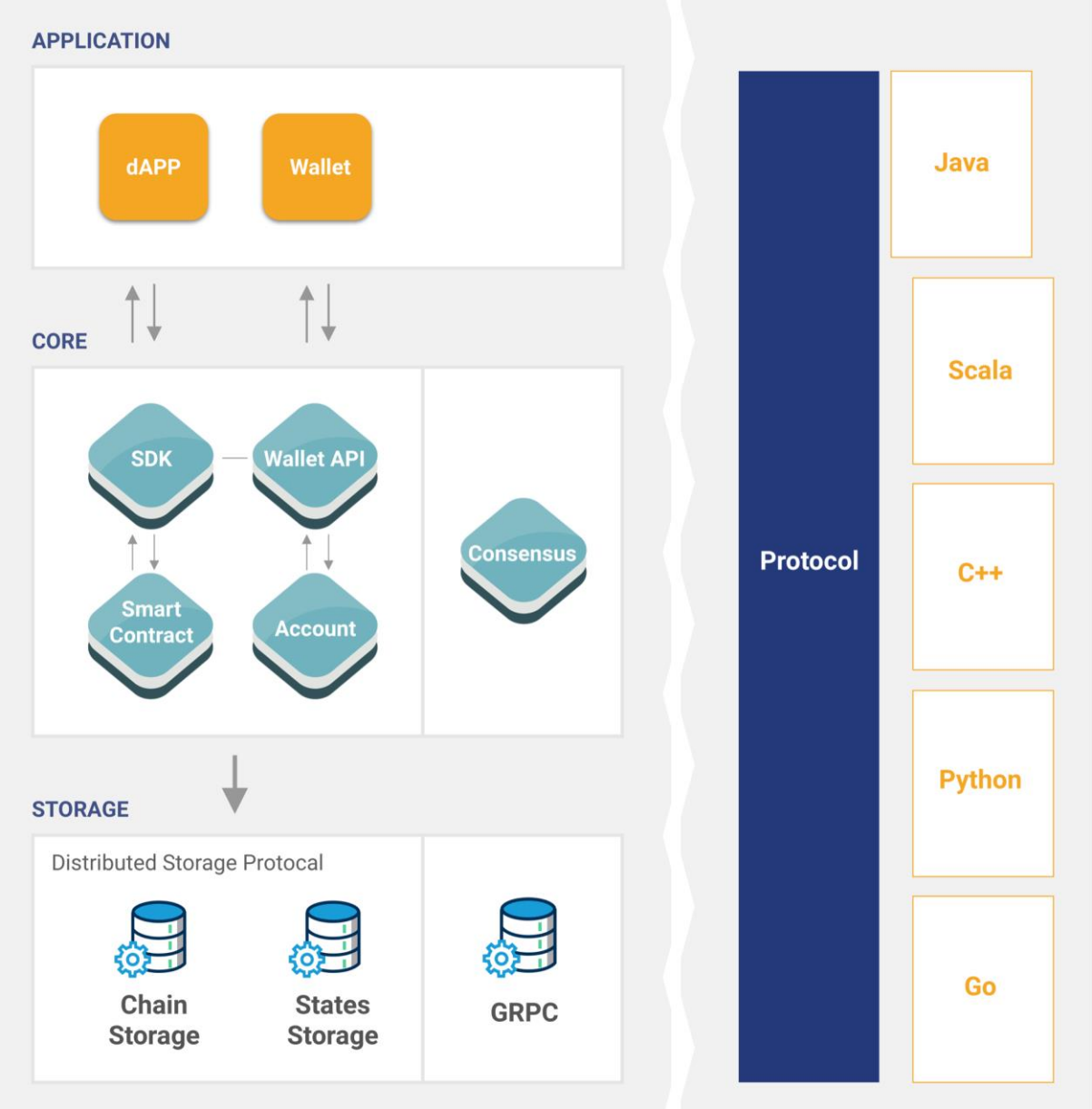
WEL is the official cryptocurrency of WELUPS.

SRS (Super Representatives)

Super Representatives are authorized by all accounts in the WELUPS platform, in charge of the generation of blocks during the processing of all transactions.

5.2 Architecture

WELUPS adopts a 3-layer architecture divided into Storage Layer, Core Layer, and Application Layer. WELUPS protocol adheres to Google Protobuf, which intrinsically supports multi-language extension.



Graph 6: WELUPS' 3-layer architecture

5.3 Core

There are several modules in the core layer, including smart contracts, account management, and consensus. A stack-based virtual machine is implemented on WELUPS and an optimized instruction set is used. In order to better support DApp developers, Solidity was chosen as 4 the smart contract language, followed by future support of other advanced languages. In addition, TRON's consensus mechanism is based on Delegated Proof of Stake (DPoS) and many innovations were made in order to meet its unique requirements.

5.3.1 Storage

WELUPS designed a unique distributed storage protocol consisting of Block Storage and State Storage. The notion of a graph database was introduced into the design of the storage layer to better meet the need for diversified data storage in the real world.

Blockchain Storage

WELUPS blockchain storage chooses to use LevelDB, which is developed by Google and proven successful with many companies and projects. It has high performance and supports arbitrary byte arrays as both keys and values, singular get, put and delete, batched put and delete, bi-directional iterators, and simple compression using the very fast Snappy algorithm.

State Storage

WELUPS has a KhaosDB in the full-node memory that can store all the newly forked chains generated within a certain period of time and supports witnesses to switch from their own active chain swiftly into a new main chain. It can also protect blockchain storage by making it more stable from being terminating abnormally in an intermediate state..

5.3.2 Application

Developers can create a diverse range of DApps and customized wallets on WELUPS. Since WELUPS enables smart contracts to be deployed and executed, the opportunities of utility applications are unlimited.

5.3.3 Protocol

WELUPS protocol adheres to Google Protocol Buffers, which is a language-neutral, 5 platform-neutral, and extensible way of serializing structured data for use in communications protocols, data storage, and more.

Protocol Buffers

Protocol Buffers (Protobuf) is a flexible, efficient, automated mechanism for serializing structured data, similar to JSON or XML, but much smaller, faster and simpler.

Protobuf (.proto) definitions can be used to generate code for C++, Java, C#, Python, Ruby, Golang, and Objective-C languages through the official code generators. Various third-party implementations are also available for many other languages. Protobuf eases development for clients by unifying the API definitions and also optimizing data transfers.

Clients can take the API.proto from WELUPS' protocol repository and integrate through the automatically-generated code libraries.

As a comparison, Protocol Buffers is 3 to 10 times smaller and 20 to 100 times faster than XML, with less ambiguous syntax. Protobuf generates data access classes that are easier to use programmatically.

HTTP

WELUPS protocol provides a RESTful HTTP API alternative to the Protobuf API. They share the same interface but the HTWP API can be readily used in javascript clients.

5.3.4 WELUPS Virtual Machine

WVM is a lightweight, Turing complete virtual machine developed for WELUPS ecosystem. WVM connects seamlessly with the existing development ecosystem to provide millions of global developers with a custom-built blockchain system that is efficient, convenient, stable, secure, and scalable.

5.3.5 Decentralized Exchange - DEX

WELUPS network natively supports decentralized exchange functions. A decentralized exchange consists of multiple trading pairs. A trading pair (notation "Exchange") is an Exchange Market between WEL-10 tokens or between a WEL-10 token and WEL. Any account can create a trading pair between any tokens, even if the same pair already exists on the WELUPS network. Trading and price fluctuations of the trading pairs follow the Bancor Protocol. The WELUPS network stipulates that the weights of the two tokens in all trading pairs are equal, so the ratio of their balances is the price between them. For example, consider a trading pair containing two tokens, ABC and DEF. ABC has a balance of 10 million and DEF has a balance of 1 million. Since their weights are equal, 10 ABC = 1 DEF. This means that the ratio of ABC to DEF is 10 ABC per DEF.

5.3.6 Implementation

The WELUPS blockchain code is implemented in Java and was originally a fork from Tron.

5.4 Consensus

Delegated Proof of Stake - DPoS

The earliest consensus mechanism is the Proof of Work (PoW) consensus mechanism. This protocol is currently implemented in Bitcoin and Ethereum . In PoW systems, 78 transactions broadcast through the network are grouped together into nascent blocks for miner

confirmation. The confirmation process involves hashing transactions using cryptographic hashing algorithms until a merkle root has been reached, creating a merkle tree.

- ***Input / Output length size:*** The algorithm can pass in an input of any length in size, and outputs a fixed length hash value
- ***Efficiency*** - The algorithm is relatively easy and fast to compute.
- ***Preimage resistance*** - For a given output *z*, it is impossible to find any input *x* such that *h(x) = z*. In other words, the hashing algorithm *h (x)* is a one-way function in which only the output can be found, given an input. The reverse is not possible.
- ***Collision resistance*** - It is computationally infeasible to find any pairs *x 1… ≠ x 2* such that *h(x 1) = H(x 2)*. In other words, the probability of finding two different inputs hashing to the same output is extremely low. This property also implies *second preimage resistance.*
- ***Second preimage resistance***: Given *x 1*, and thus *h (x 1),* it is computationally infeasible to find any *x 2* such that *h (x 1) = H (x 2).* While this property is similar to collision resistance, the property differs in that it is saying an attacker with a given *x 1* will find it computationally infeasible to find any *x 2* hashing to the same output.
- ***Deterministic***: maps each input to one and only one output.
- ***Avalanche Effect***: a small change in the input results in an entirely different output.

These properties give the cryptocurrency network its intrinsic value by ensuring attacks do not compromise the network. When miners confirm a block, they are rewarded tokens as a built-in incentive for network participation. However, as the global cryptocurrency market capitalization steadily increased, the miners became centralized and focused their computing resources on hoarding tokens as assets, rather than for network participation purposes. CPU miners gave way to GPUs, which in turn gave way to powerful ASICs. In one notable study, the total power consumption of Bitcoin mining has been estimated to be as high as 3 GW10, comparable to Ireland’s power consumption. This same study projected total power consumption to reach 8 GW in the near future.

To solve the energy waste issue, the Proof of Stake (PoS) consensus mechanism was proposed by many new networks. In PoS networks, token holders lock their token balances to become block validators. The validators take turns proposing and voting on the next block. However, the problem with standard PoS is that validator influence correlates directly to the amount of tokens locked up. This results in parties hoarding large amounts of the network’s base currency wielding undue influence in the network ecosystem.

WELUPS consensus mechanism uses an innovative Delegated Proof of Stake system in which 19 Super Representatives (SRs) produce blocks for the network. Every 6 hours, WEL

account holders who freeze their accounts can vote for a selection of SR candidates, with the top 19 candidates deemed the SRs. Voters may choose SRs based on criteria such as projects sponsored by SRs to increase WEL adoption, and rewards distributed to voters. This allows for a more democratized and decentralized ecosystem. SRs' accounts are normal accounts, but their accumulation of votes allows them to produce blocks. With the low throughput rates of Bitcoin and Ethereum due to their PoW consensus mechanism and scalability issues, WELUPS' DPoS system offers an innovative mechanism resulting in 2000 TPS compared to Bitcoin's 3 TPS and Ethereum's 15 TPS.

The WELUPS protocol network generates one block every three seconds, with each block awarding 32 WEL to Super Representatives. A total of 336,384,000 WEL will be awarded annually to the 19 SRs. Each time an SR finishes block production, rewards are sent to a sub-account in the super-ledger. SRs can check, but not directly make use of these TRX tokens. A withdrawal can be made by each SR once every 24 hours, transferring the rewards from the sub-account to the specified SR account.

The three types of nodes on the TRON network are Witness Node, Full Node, and Solidity Node.

Witness nodes are set up by SRs and are mainly responsible for block production and proposal creation/voting. Full nodes provide APIs and broadcast transactions and blocks. Solidity nodes sync blocks from other Full Nodes and also provide indexable APIs.

5.5 Account

5.5.1 Types

The three types of accounts in the WELUPS network are regular accounts, token accounts, and contract accounts.

- Regular account: used for standard transactions.

- Token account: used for storing WRC - 10, WRC – 721 tokens.

- Contract account: smart contract accounts created by regular accounts and can be triggered by regular accounts as well.

5.5.2 Creation

There are three ways to create a new WELUPS account

- Create a new account through API

- Transfer WEL into a new account address
- Transfer any WRC-10, WRC-721 token into a new account address

An offline key-pair consisting of an address (public key) and a private key, and not recorded by the WELUPS network, can also be generated. The user address generation algorithm consists of generating a key-pair and then extracting the public key (64-byte byte array representing x, y coordinates). Hash the public key using the SHA3-256 function (the SHA3 protocol adopted is KECCAK-256) and extract the last 20 bytes of the result. Add 41 to the beginning of the byte array and ensure the initial address length is 21 bytes. Hash the address twice using SHA3-256 function and take the first 4 bytes as verification code. Add the verification code to the end of the initial address and obtain the address in base58 check format through base58 encoding. An encoded Mainnet address begins with W and is 34 bytes in length.

5.5.3 Structure

The three different account types are Normal, AssetIssue, and Contract. An Account contains 6 parameters:

1. **account_name**: the name for this account – e.g. Bills Account.
2. **type**: what type of this account is – e.g. 0 (stands for type 'Normal').
3. **balance**: balance of this account – e.g. 4213312
4. **vote**: received votes on this account – e.g. {("0x1b7w…9xj3",323), ("0x8djq…j12m",88), …, ("0x82nd…mx6i",10001)}.
5. **Asset**: other assets expected WEL in this account – e.g. {<"Wish Token", 66666>, <"Dogie", 233>}.
6. **last_operation_time**: the latest operation time of this account.

Protobuf data structure:

```
message Account {□ message Vote {□

bytes vote_address = 1;□ }□int64 vote_count = 2;□

bytes accout_name = 1;□ AccountType type = 2;□
bytes address = 3;□
int64 balance = 4;□
repeated Vote votes = 5;□ map<string, int64> asset = 6;

} int64 latest_operation_time = 10;□

enum AccountType {□ Normal = 0;□ AssetIssue = 1;□ Contract = 2;
```

□}

5.5.4 Block

A block typically contains a block header and several transactions.

```
message Block {□
BlockHeader block_header = 1;□

} repeated Transaction transactions = 2;□
```

5.5.5 Block Header

A block header contains raw_data, witness_signature, and blockID.

```
message Block {□
BlockHeader block_header = 1;□

} repeated Transaction transactions = 2;□

message BlockHeader {□ message raw {□

int64 timestamp = 1;□ bytes txTrieRoot = 2; bytes parentHash = 3;□ uint64 number = 4;
uint64 version = 5;□

}□bytes witness_address = 6;□

bytes witness_signature = 2;□ } bytes blockID = 3;□
```

5.5.6 Raw Data

Raw data is denoted as raw_data in Protobuf. It contains the raw data of a message, containing 6 parameters:

1. **timestamp**: timestamp of this message – e.g., 1543884429000.
2. **txTrieRoot**: the Merkle Tree's Root – e.g., 7dacsa… 3ed.
3. **parentHash**: the hash of the last block – e.g., 7dacsa… 3ed.
4. **number**: the block height – e.g., 4638708.
5. **prototype**: reserved – e.g., 5.

6. **Wit_address**: the address of the witness packed in this block – e.g., 41928c ... 4d21.

5.5.7 Witness Signature

Witness signature is denoted as witness_signature in Protobuf, which is the signature for this block header from the witness node.

5.5.8 Block ID

Block ID is denoted as blockID in Protobuf. It contains the atomic identification of a block. A Block ID contains 2 parameters:

1. hash: the hash of a block.

2. number: the hash and height of the block.

5.5.9 Transaction

Signing

WELUPS's transaction signing process follows a standard ECDSA cryptographic algorithm, with a SECP256K1 selection curve. A private key is a random number, and the public key is a point on the elliptic curve. The public key generation process consists of first generating a random number as a private key, and then multiplying the base point of the elliptic curve by the private key to obtain the public key. When a transaction occurs, the transaction raw data is first converted into byte format. The raw data then undergoes SHA-256 hashing. The private key corresponding to the contract address then signs the result of the SHA256 hash. The signature result is then added to the transaction.

Bandwidth Model

Ordinary transactions only consume bandwidth points, but smart contract operations consume both energy and bandwidth points. There are two types of bandwidth points available. Users can gain bandwidth points from freezing WEL, while 10,000 free bandwidth points are also available daily

When a WEL transaction is broadcast, it is transmitted and stored in the form of a byte array over the network. Bandwidth Points consumed by one transaction = number of transaction bytes multiplied by bandwidth points rate. For example, if the byte array length of a transaction is 200, then the transaction consumes 200 bandwidth points. However, if a WEL or token transfer results in the target account being created, then only the bandwidth points consumed to create the account will be deducted, and additional bandwidth points will not be

deducted. In an account creation scenario, the network will first consume the bandwidth points that the transaction initiator gained from freezing WEL. If this amount is insufficient, then the network consumes the transaction initiator's WEL.

In standard WEL transfer scenarios from one WELUPS account to another, the network first consumes the bandwidth points gained by the transaction initiator for freezing WEL. If that is insufficient, it then consumes from the free 5000 daily bandwidth points. If that is still not enough, then the network consumes the WEL of the transaction initiator. The amount is calculated by the number of bytes in the transaction multiplied by 10 mVU. Thus, for most WEL holders who may not necessarily freeze their WEL to participate in SR voting, the first step is automatically skipped (since WEL balance frozen = 0) and the 10,000 daily free bandwidth powers the transaction.

For WRC-10 token transfers, the network first verifies whether the total free WBP of the issued token asset is sufficient. If not, the bandwidth points obtained from freezing WEL are consumed. If there are still not enough bandwidth points, then it consumes the WEL of the transaction initiator.

5.5.10 Fee

WELUPS network generally does not charge fees for most transactions, however, due to system restrictions and fairness, bandwidth usage and transactions do take in certain fees.

Fee charges are broken down into the following categories:

1. Normal transactions cost WELUPS bandwidth points. Users can use the free daily WBP (10,000 WBP) or freeze WEL to obtain more. When bandwidth points are not enough, WEL will be used directly from the sending account. The WEL needed is the number of bytes * 10 mVU.

2. Smart contracts cost energy (Section 6) but will also need WBP, bandwidth points, for the transaction to be broadcasted and confirmed. The bandwidth cost is the same as above.

3. All query transactions are free. It doesn't cost energy or bandwidth.

WELUPS network also defines a set of fixed fees for the following transactions:

- Creating a witness node SRs: 9999 WEL

- Issuing a WRC-10 token: 1024 WEL

- Issuing a WRC-20 token: 5 WEL

- Issuing a WRC-721 token: 350 WEL

- Creating a new account: 0,1 WEL

- Creating an exchange pair: 1024 WEL

5.5.11 Transaction as Proof of Stake (TaPoS)

WELUPS uses TaPoS to ensure the transactions all confirm the main blockchain, while making it difficult to forge counterfeit chains. In TaPoS, the networks require each transaction to include part of the hash of a recent block header. This requirement prevents transactions from being replayed on forks not including the referenced block, and also signals the network that a particular user and their stake are on a specific fork. This consensus mechanism protects the network against Denial of Service, 51%, selfish mining, and double spend attacks.

5.5.12 Transaction Confirmation

A transaction is included in a future block after being broadcast to the network. After 19 blocks are mined on WELUPS (including its own block), the transaction is confirmed. Each block is produced by one of the top 27 Super Representatives in a round robin fashion. Each block takes ~3 seconds to be mined on the blockchain. Time may slightly vary for each Super Representative due to network conditions and machine configurations. In general, a transaction is considered fully confirmed after ~1 minute.

5.5.13 Structure

Transaction APIs consist of the following functions:

message Transaction { **message Contract** {

enum ContractType {
AccountCreateContract = 0; // Create account/wallet
TransferContract = 1; // Transfer WEL
TransferAssetContract = 2; // Transfer TRC10 token
VoteWitnessContract = 4; // Vote for Super Representative (SR) WitnessCreateContract = 5; // Create a new SR account AssetIssueContract = 6; // Create a new TRC10 token
WitnessUpdateContract = 8; // Update SR information ParticipateAssetIssueContract = 9; // Purchase TRC10 token AccountUpdateContract = 10; // Update account/wallet information
FreezeBalanceContract = 11; // Freeze WEL for bandwidth or energy
UnfreezeBalanceContract = 12; // Unfreeze WEL
WithdrawBalanceContract = 13; // Withdraw SR rewards, once per day
UnfreezeAssetContract = 14; // Unfreeze TRC10 token UpdateAssetContract = 15; // Update

```
a TRC10 token’s information ProposalCreateContract = 16; // Create a new network proposal by any SR ProposalApproveContract = 17; // SR votes yes for a network proposal ProposalDeleteContract = 18; // Delete a network proposal by owner CreateSmartContract = 30; // Deploy a new smart contract TriggerSmartContract = 31; // Call a function on a smart contract GetContract = 32; // Get an existing smart contract UpdateSettingContract = 33; // Update a smart contract’s parameters ExchangeCreateContract = 41; // Create a token trading pair on DEX ExchangeInjectContract = 42; // Inject funding into a trading pair

ExchangeWithdrawContract = 43; // Withdraw funding from a trading pair ExchangeTransactionContract = 44; // Perform token trading UpdateEnergyLimitContract = 45; // Update origin_energy_limit on a

smart contract

  }

} }
```

5.6 WELUPS Virtual Machine (WVM)

5.6.1 Introduction

WELUPS Virtual Machine (WVM) is a lightweight, Turing complete virtual machine developed for the WELUPS's ecosystem. Its goal is to provide a custom-built blockchain system that is efficient, convenient, stable, secure and scalable.

WVM initially forked from TVM and can connect seamlessly with the existing solidity 11 smart contract development ecosystem. Based on that, TVM additionally supports DPoS consensus.

5.6.2 Workflow

The compiler first translates the Solidity smart contract into bytecode readable and executable on the WVM. The WVM then processes data through opcode, which is equivalent to operating the logic of a stack-based finite state machine. Finally, the WVM accesses blockchain data and invokes External Data Interface through the Interoperation layer.

5.6.3 Performance

Lightweight Architecture

WVM adopts a lightweight architecture with the aim of reducing resource consumption to guarantee system performance.

Robust

WEL transfers and smart contract execution cost bandwidth points only, instead of WEL, which exempts WELUPS from being attacked. Bandwidth consumption is predictable and static since each computational step cost is fixed**.**

High Compatibility

WVM is compatible with EVM, TVM and will be compatible with more mainstream VMs in the future. Thereby, all smart contracts on EVM and TVM are executable on WVM**.**

Low Cost

Due to WVM's bandwidth setup, development costs are reduced and developers can focus on the logic development of their contract code. WVM also offers all-in-one interfaces for contract deployment, triggering and viewing to offer the convenience for developers.

5.7 Smart Contract

5.7.1 Introduction

A smart contract is a protocol that digitally verifies contract negotiation. They define the rules and penalties related to an agreement and also automatically enforce those obligations. The smart contract code facilitates, verifies, and enforces the negotiation or performance of an agreement or transaction. From a tokenization perspective, smart contracts also facilitate automatic funds transfers between participating parties should certain criteria be met.

WELUPS smart contracts are written in the Solidity language. Once written and tested, they can be compiled into bytecode, then deployed onto the WELUPS network for the WELUPS Virtual Machine. Once deployed, smart contracts can be queried via their contract addresses. The contract Application Binary Interface (ABI) shows the contract's call functions and is used for interacting with the network.

5.7.2 Energy Model (GAS)

The maximum energy limit for deploying and triggering a smart contract is a function of several variables:

- Dynamic energy from freezing 1 WEL is 50,000,000,000 (Total GAS) / (Total GAS Weight)
- Energy limit is the daily account GAS limit from freezing WEL

- Remaining daily account energy from freezing WEL is calculated as GAS Limit - GAS Used
- Fee limit in WEL is set in smart contract deploy/trigger call.
- Remaining usable WEL in the account
- Energy per WEL if purchased directly (10 mVU = 1 GAS) = 100,000, SRs can vote on adjustment

There are two consumption scenarios to calculate for maximum energy limit for deployment and trigger. The logic can be expressed as follows:

const R = Dynamic Energy Limit

const F = Daily account energy from freezing WEL

const E = Remaining daily account energy from freezing WEL

const L = Fee limit in WEL set in deploy/trigger call

const T = Remaining usable WEL in account

const C = Energy per WEL if purchased directly

// Calculate M, defined as maximum energy limit for deployment/trigger of smart contract

if F> L * R

If M = min (E + T * C, L * R)

Else M = E + T * C

5.7.3 Deployment

When a WELUPS solidity smart contract is compiled, the WELUPS Virtual Machine reads the compiled bytecode. The bytecode consists of a section for code deployment, contract code, and the Auxdata. The Auxdata is the source code's cryptographic fingerprint, used for verification. The deployment bytecode runs the constructor function and sets up the initial storage variables. The deployment code also calculates the contract code and returns it to the WVM. The ABI is a JSON file that describes a WELUPS smart contract's functions. This file defines the function names, their payability, the function return values, and their state mutability.

5.7.4 Trigger Function

Once the WELUPS smart contracts are deployed, their functions can be triggered individually either via WELUPS Studio or through API calls. State-changing functions require GAS while read-only functions execute without GAS.

5.7.5 WELUPS Solidity

WELUPS Solidity is a fork from Ethereum's Solidity language. WELUPS modifies the original project to support WEL and mVU units (1 WEL = 1,000,000 mVU). The rest of the language syntax is compatible with Solidity ^0.4.24. Thus the WELUPS Virtual Machine (WVM) is almost 100% compatible with TVM and EVM instructions.

5.8 WELUPS Token

5.8.1 Token WRC-10

In the network, each account can issue tokens at the expense of 1024 WEL. To issue tokens, the issuer needs to specify a token name, the total capitalization, the exchange rate to WEL, circulation duration, description, website, maximum bandwidth consumption per account, total bandwidth consumption, and the amount of token frozen. Each token issuance can also configure each account's maximum daily token transfer Welups Bandwidth Points, the entire network's maximum daily token transfer Welups Bandwidth Points, total token supply, locking duration in days, and the total amount of tokens locked.

5.8.2 Token WRC-20

WEL-20 is a technical standard used for smart contracts implementing tokens supported by the WELUPS Virtual Machine. It is fully compatible with ERC-20.

The interface is as follows:

```
contract TRC20Interface {
function totalSupply() public constant returns (uint);
function balanceOf(address tokenOwner) public constant returns (uint

balance);
function allowance(address tokenOwner, address spender) public constant

returns (uint remaining);
function transfer(address to, uint tokens) public returns (bool success); function approve
(address spender, uint tokens) public r eturns (bool
```

```
success);
function transferFrom(address from, address to, uint tokens) public

returns (bool success);

event Transfer(address indexed from, address indexed to, uint tokens);

event Approval(address indexed tokenOwner, address indexed spender, uint tokens);

}
```

From a developer's perspective, there are several differences between WRC-10 and WRC -20. Some of the key differences are that WRC -10 tokens are accessible by APIs and smart contracts while WEL-20 tokens allow for interface customization but are only accessible within smart contracts.

From a cost perspective, WRC -10 tokens have transaction fees that are 1000 times lower than WRC -20, but carry bandwidth costs for API transfers and deposits. Transfers and deposits in smart contracts for WRC -10 tokens cost both bandwidth and energy.

5.8.3 Token WRC-721

WRC-721 is a technical standard used for smart contracts, issued via tokens powered by the WELUPS Virtual Machine. WRC-721-compliant tokens are NFT (Non-Fungible Tokens) non-fungible tokens and are fully compliant with TRC-721 and ERC-721 standards.

The proposed WRC-721 standard opened a portal for new smart contracts to act as non-fungible commodities. The WRC-721 standard brings great value to applications developed on Blockchain such as DeFI, Gaming... in identification, traceability, and asset value retention because of its unique and impossible characteristics. alternative of this type of token.

5.8.4 Other characters

Since WELUPS uses the same version of Solidity as Tron and Ethereum, it is easy to use more token standards that can be switched to WELUPS.

5.9 Management

5.9.1 Super Representative – SRs

General requirement

Every account in the WELUPS network can apply and have the opportunity to become a Super Representative (denoted as SR). Everyone can vote for SR candidates. The top 19

candidates with the most votes will become SRs with the right and obligation to generate blocks. The votes are counted every 6 hours and the SRs will change accordingly.

To prevent malicious attacks, there is a cost to becoming an SR candidate. When applying, 9999 WEL will be burned from the applicant's account. Once successful, such accounts can join the SR election.

SRs Votes

WELUPS Power (denoted as WP) is needed to vote and the amount of WP depends on the voter's frozen assets (WEL).

WP calculation:

1WP = 1 WEL frozen to get WBP and WP

All accounts in WELUPS network are allowed to vote for their own SR. After the release (unfreeze, available after 3 days), users won't have any frozen assets and lose all WP accordingly. As a result, all votes become invalid for the ongoing and future voting round unless WEL is frozen again to vote.

Note that the WELUPS network only records the most recent vote, which means that every new vote will negate all previous votes.

5.9.2 Reward

a. Vote reward

Also known as Candidate Reward, which the top 127 candidates updated once every round (6 hours) will share 115,200 WEL as mined. The reward will be split in accordance with the vote weight each candidate receives. Each year, the total reward for candidates will be 168,192,000 WEL.

Total vote reward per round

Why 115,200 WEL every round?

115,002 *WEL* = *total vote reward per round* (*VR* / *round*)

VR / *round* = 16 *WEL* / *block* × 20 *block* / *min* × 60 *min* / *hrs* × 6 *hrs*/ *round*

Notice: this is set by WITNESS_STANDBY_ALLOWANCE = 115,200 WEL.

See dynamic network parameters.

Total vote reward per year

Why 168,192,000 WEL every year?

168,192,000 *WEL = total vote reward per year (VR/year)*

VR / year = 115,200 TRX / round × 4 rounds / day × 365 days / year

b. Block reward

Also known as Super Representative Reward, which the top 19 candidates (SRs) who are elected every round (6 hours) will share roughly 230,400 WEL as mined. The reward will be split evenly between the 19 SRs (minus the total reward blocks missed due to network error).

A total of 336,384,000 WEL will be awarded annually to the 19 SRs.

Total block reward per round

Why 230,400 WEL every round?

230,400 WEL = total block reward per round (BR/round)

BR/round = 32 WEL/block × 20 blocks/min × 60 mins/hrs × 6 hrs/round

Notice: the unit block reward is set by WITNESS_PAY_PER_BLOCK = 32 WEL.

See dynamic network parameters.

Total block reward per year

Why 336,384,000 WEL every year?

336,384,000 WEL = total block reward per year (BR/year)

BR/year = 230,400 WEL/round × 4 rounds/day × 365 days/year

January 1, 2021

There will be no inflation on the WELUPS network before January 1, 2021, and the WELUPS Foundation will award all block rewards and candidate rewards prior to that date.

c. Reward calculation

SR reward calculation

$$Total\ reward = vote\ reward\ (VR) + block\ reward\ (BR)$$

$$VR = total\ VR \times votes\ SR\ candidates\ receive\ /\ total\ votes$$

$$BR = total\ BR\ /\ 19 - block\ missed \times 32$$

Rank 28 to rank 127 SR candidate reward calculation

$$Total\ reward = vote\ reward\ (VR)$$

$$VR = total\ VR \times votes\ SR\ candidate\ receive\ /\ total\ votes$$

Note: the reward is calculated per SR candidate per round (6 hours)

5.9.3 Committee

General

The committee is used to modify WELUPS dynamic network parameters, such as block generation rewards, transaction fees, etc. The committee consists of the 19 SRs in the current round. Each SR has the right to propose and vote on proposals. When a proposal receives 13 votes or more, it is approved and the new network parameters will be applied in the next maintenance period (3 days).

Dynamic Network Parameters

1. MAINTENANCE_TIME_INTERVAL

    a. Description

Modify the maintenance interval time in ms. Known as the SR vote interval time per round.

    b. Example

[6 * 3600 * 1000] ms – which is 6 hours.

    c. Range

[3 * 27 * 1000, 24 * 3600 * 1000] ms

2. ACCOUNT_UPGRADE_COST

    a. Description

Modify the cost of applying for an SR account.

b. Example

[9,999,000,000] mVU – which is 9,999 WEL.

c. Range

[0,100 000 000 000 000 000] mVU

3. CREATE_ACCOUNT_FEE

a. Description

Modify the account creation fee.

b. Example

[100.000] mVU – which is 1 WEL.

c. Range

[0,100 000 000 000 000 000] mVU

4. TRANSACTION_FEE

a. Description

Modify the amount of fee used to gain extra bandwidth.

b. Example

[10] mVU/ byte.

c. Range

[0,100 000 000 000 000 000] mVU/ byte

5. ASSET_ISSUE_FEE

a. Description

Modify asset issuance fee.

b. Example

[1024.000.000] mVU- which is 1024 WEL.

c. Range

[0,100 000 000 000 000 000] mVU

6. WITNESS_PAY_PER_BLOCK

a. Description

Modify SR block generation reward. Known as unit block reward.

b. Example

[32.000.000] mVU – which is 32 WEL.

c. Range

[0,100 000 000 000 000 000] mVU

7. WITNESS_STANDBY_ALLOWANCE

a. Description

Modify the rewards given to the top 127 SR candidates. Known as total vote reward per round.

b. Example

[115.200.000.000] mVU – which is 115.200 WEL.

c. Range

[0,100 000 000 000 000 000] mVU

8. CREATE_NEW_ACCOUNT_FEE_IN_SYSTEM_CONTRACT

a. Description

Modify the cost of account creation. Combine dynamic network parameters #8 to get total account creation cost:

CREATE_NEW_ACCOUNT_FEE_IN_SYSTEM_CONTRACT x CREATE_NEW_ACCOUNT_BANWIDTH_RATE

b. Example

[0] mVU.

c. Range

[0,100 000 000 000 000 000] mVU

9. CREATE_NEW_ACCOUNT_BANDWIDTH_RATE

a. Description

Modify the cost of account creation. Combine dynamic network parameters #7 to get total account creation cost:

CREATE_NEW_ACCOUNT_FEE_IN_SYSTEM_CONTRACT x CREATE_NEW_ACCOUNT_BANWIDTH_RATE

b. Example

[0] mVU

c. Range

[0,100,000,000,000,000,000,000] mVU

10. ALLOW_CREATION_OF_CONTRACTS

a. Description

To turn on WELUPS Virtual Machine (WVM).

b. Example

True - set to activate and effect since 10/10/2018 23:47 UTC.

c. Range

True/False

11. REMOVE_THE_POWER_OF_THE_GR

a. Description

Remove the initial GR genesis votes

b. Example

True - effected at 11/4/2018 08:46 UTC.

c. Range

True / False - Notice: cannot set back to False from True.

12. ENERGY_FEE

a. Description

Modify the fee of 1 energy.

b. Example

20 mVU.

c. Range

[0,100 000 000 000 000 000] mVU

13. EXCHANGE_CREATE_FEE

a. Description

Modify the cost of trading pair creation. Known as the cost of creating a trade order.

b. Example

[1,024,000,000] mVU – which is 1024 WEL.

c. Range

[0,100 000 000 000 000 000] mVU

14. MAX_CPU_TIME_OF_ONE_TX

a. Description

Modify the maximum execution time of one transaction. Known as the timeout limit of one transaction.

b. Example

50 ms.

c. Range

[0, 1000] ms

14. ALLOW_UPDATE_ACCOUNT_NAME

a. Description

Modify the option to let an account update their account name.

b. Example

False - which is available to propose from java-WELUPS Odyssey v3.2.

c. Range

True / False - Notice: cannot set back to False from True.

15. ALLOW_SAME_TOKEN_NAME

a. Description

Modify the validation of allowing different token have a duplicate name.

b. Example

False - which is available to propose from java-WELUPS Odyssey v3.2.

c. Range

True / False - Notice: cannot set back to False from True.

16. ALLOW_DELEGATE_RESOURCE

a. Description

Modify the validation of allowing to issue a token with a duplicate name, so the **token ID** of the token, in long integer data type, would be the only atomic identification of a token.

b. Example

False - which is available to propose from java-WELUPS Odyssey v3.2.

c. Range

True / False - Notice: cannot set back to False from True.

17. TOTAL_ENERGY_LIMIT

a. Description

Modify the whole network total energy limit.

b. Example

[50,000,000,000,000,000] mVU – which is 50,000,000,000 WEL.

c. Range

[0,100,000,000,000,000,000,000] mVU

18. ALLOW_TVM_TRANSFER_WEL10

a. Description

Allow WRC-10 token transfer within smart contracts.

ALLOW_UPDATE_ACCOUNT_NAME, ALLOW_SAME_TOKEN_NAME,

ALLOW_DELEGATE_RESOURCE proposals must all be approved before proposing this parameter change.

b. Example

False - which is available to propose from java-WELUPS Odyssey v3.2.

c. Range

True / False - Notice: cannot set back to False from True.

Create Proposal

Only the SR accounts have the rights to propose a change in dynamic network parameters.

Vote Proposal

Only committee members (SRs) can vote for a proposal and the member who does not vote in time will be considered as a disagreement. The proposal is active for 3 days after it is created. The vote can be changed or retrieved during the 3-days voting window. Once the period ends, the proposal will either succeed (13+ votes) or fail (and end).

Cancel Proposal

The proposer can cancel the proposal before it becomes effective.

5.9.4 Structure

SRs are the witnesses of newly generated blocks. A witness contains 8 parameters:

1. **address:** the address of this witness – e.g. 0xu82h… 7237.
2. **voteCount**: number of received votes on this witness – e.g. 234234.
3. **pubKey**: the public key for this witness – e.g., 0xu82h…7237.
4. **url**: the url for this witness – e.g., https://www.noonetrust.com.
5. **totalProduction**: the number of blocks this witness produced – e.g., 2434.
6. **totalMissed**: the number of blocks this witness missed – e.g., 7.
7. **lastBlockNum**: the latest height of block – e.g., 4522.
8. **isjobs**: a boolean flag.

Protobuf data structure:

message Witness {

bytes address = 1;

int64 voteCount = 2;

bytes pubKey = 3;

string url = 4;

int64 totalProduced = 5;

int64 totalMissed = 6;

int64 latestBlockNum = 7;

bool isJobs = 8;

}

5.10 Dapp Development

5.10.1 API

WELUPS network offers a wide selection of over 60+ HTTP API gateways for interacting with the network via Full and Solidity Nodes. Additionally, WELUPSWeb is a comprehensive JavaScript library containing API functions that enable developers to deploy smart contracts, change the blockchain state, query blockchain and contract information, trade on the DEX, and much more. These API gateways can be directed towards a local privatenet, the Shasta Testnet, or the WELUPS Mainnet.

5.10.2 Networks

WELUPS has both a Shasta Testnet as well as a Mainnet. Developers may connect to the networks by deploying nodes, interacting via WELUPSStudio, or using APIs via the WelGrid service. The WelGrid service consists of load balanced node clusters hosted on AWS servers worldwide. As DApp development scales up and API call volumes increase, WelGrid successfully fields the increase in API traffic.

5.10.3 Tools

WELUPS offers a suite of development tools for enabling developers to create innovative DApps. WELUPSBox is a framework that allows developers to test and deploy smart contracts via the WELUPSWeb API. WelGrid is a load balanced and hosted API service that allows developers to access the WELUPS network without having to run their own node. WelGrid offers access to both the Shasta testnet as well as the WELUPS Mainnet. WELUPSStudio is a comprehensive Integrated Development Environment (IDE) that enables developers to compile, deploy, and debug their Solidity smart contracts. WELUPSStudio contains an internal full node that creates a private local environment for smart contract testing prior to deployment. The WELUPSWeb API library connects developers to the network via a wide selection of HTTP API calls wrapped in JavaScript.

5.10.4 Resources

The WELUPS Developer Hub is a comprehensive API documentation site 12 tailored towards developers wishing to build on the WELUPS network. The Developer Hub provides a high-level conceptual understanding of WELUPS and walks users through the details of interacting with the network. The guides walk developers through node setup, deployment and interaction with smart contracts, API interaction and implementation, building sample DApps, and using each of the developer tools. Additionally, developer community channels are available through Discord

6. Disclaimer

All statements, content, design, algorithms, estimates, roadmaps, specifications, and performance measurements described in this project were made with the author's best efforts. Readers must check and confirm their accuracy and truthfulness. Furthermore, nothing in this project constitutes an invitation to invest.

7. Conclusion

With the power of BlockChain and IDShare technology, WELUPS is a future-oriented platform, providing unlimited scalability and development for applications to serve and bring people a good life. WELUPS is confident to become a key platform for people to truly enter the era of technology, the era of a truly free and connected world.

The application ecosystem built on WELUPS platform has been expanding and growing. WELUPS is a platform built by the technologies of the future and will open a new revolution in the field of Blockchain and NFT digital asset encryption to create a truly decentralized Internet in a near future.